

# Energy Tidbits

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Produced by: Dan Tsubouchi

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## Supplemental Documents

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**Dan Tsubouchi**  
Principal, Chief Market Strategist  
dtsubouchi@safgroup.ca

**Ryan Dunfield**  
Principal, CEO  
rdunfield@safgroup.ca

**Aaron Bunting**  
Principal, COO, CFO  
abunting@safgroup.ca

**Ryan Haughn**  
Principal, Energy  
rhaughn@safgroup.ca

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## Short-Term Energy Outlook

### Forecast highlights

#### Global liquid fuels

- The June *Short-Term Energy Outlook* (STEO) remains subject to heightened levels of uncertainty related to the ongoing economic recovery from the COVID-19 pandemic. The U.S. economy continues to rise after reaching multiyear lows in the second quarter of 2020 (2Q20). The increase in economic activity and easing of the COVID-19 pandemic have contributed to rising energy use. U.S. gross domestic product (GDP) declined by 3.5% in 2020 from 2019 levels. This STEO assumes U.S. GDP will grow by 6.7% in 2021 and by 4.9% in 2022. The U.S. macroeconomic assumptions in this outlook are based on forecasts by IHS Markit. Our forecast assumes continuing economic growth and increasing mobility as a result of the easing of the COVID-19 pandemic. Any developments that would cause deviations from these assumptions would likely cause energy consumption and prices to deviate from our forecast.
- Brent crude oil spot prices averaged \$68 per barrel (b) in May, up \$4/b from April. Brent prices were higher in May as global oil inventories continued to decline, albeit at a slower pace than in the first four months of the year. In the coming months, we expect that global oil production will increase to match rising levels of global oil consumption. The rising oil production in the forecast is largely a result of the OPEC+ decision to raise production. We expect rising production will end the persistent global oil inventory draws that have occurred for much of the past year and lead to relatively balanced global oil markets in the second half of 2021 (2H21). We expect Brent prices will remain near current levels in 3Q21, averaging \$68/b. However, in 2022, we expect that continuing growth in production from OPEC+ and accelerating growth in U.S. tight oil production—along with other supply growth—will outpace decelerating growth in global oil consumption and contribute to declining oil prices. Based on these factors, we expect Brent to average \$60/b in 2022.
- We expect U.S. gasoline consumption will average 9.1 million barrels per day (b/d) this summer (April–September), which is 1.3 million b/d more than last summer but still more than 0.4 million b/d less than summer 2019. Weekly consumption data reflect the Colonial Pipeline outage and subsequent increase in gasoline demand, but consumption both before and after this event indicate more gasoline demand than we had previously forecast. Our latest forecast also reflects IHS Markit’s increased employment forecast.

We expect U.S. gasoline consumption to average 8.7 million b/d in for all of 2021 and 9.0 million b/d in 2022.

- For the 2021 April–September summer driving season, we forecast U.S. regular gasoline retail prices will average \$2.92 per gallon (gal), up from an average of \$2.07/gal last summer. The higher forecast gasoline prices reflect higher crude oil prices and higher wholesale gasoline margins. Wholesale gasoline margins have risen as a result of [relatively low inventories and rising gasoline demand](#). Margins also temporarily widened because of outages on the Colonial Pipeline. These developments caused U.S. average regular gasoline retail prices to reach a monthly average of \$2.99/gal in May, peaking at [\\$3.03/gal on May 17](#), which were the highest monthly and weekly prices since 2014. We expect that prices will average \$3.03/gal in June before falling to \$2.76/gal by September. The drop in forecast retail gasoline prices reflects our forecast that gasoline margins will fall this summer in response to rising refinery utilization. For all of 2021, we expect U.S. regular gasoline retail prices to average \$2.77/gal and gasoline retail prices for all grades to average \$2.87/gal. Higher prices and more gasoline consumption would result in the average U.S. household spending about \$570 (38%) more on motor fuel in 2021 compared with 2020.
- We estimate that 96.2 million b/d of petroleum and liquid fuels was consumed globally in May, an increase of 11.9 million b/d from May 2020 but 3.7 million b/d less than in May 2019. We forecast that global consumption of petroleum and liquid fuels will average 97.7 million b/d for all of 2021, which is a 5.4 million b/d increase from 2020. We forecast that global consumption of petroleum and liquid fuels will increase by 3.6 million b/d in 2022 to average 101.3 million b/d.
- We forecast OPEC crude oil production will average 26.9 million b/d in 2021 and 28.7 million b/d in 2022. OPEC crude oil production in the forecast rises from 25.0 million b/d in April to an average of 28.0 million b/d in 3Q21. Our expectation of rising OPEC production is primarily based on our assumption that OPEC will raise production by about 1 million b/d in both June and in July in response to rising global oil demand and seasonal increases in oil consumption for power generation for some OPEC members. It also reflects an assumption that Iran’s crude oil production will continue to increase this year. Although sanctions that target Iran’s crude oil exports remain in place, crude oil exports—according to ClipperData, LLC.—and production from Iran are up from most of 2020.
- According to [our most recent data](#), U.S. crude oil production averaged 11.2 million b/d in March 2021, an increase of 1.4 million b/d from February. The March rise indicates that the production outages caused by the February winter freeze were temporary and that production came back online quickly. Because prices of West Texas Intermediate crude oil remain above \$60/b during 2021 in the current forecast, we expect that producers will drill and complete enough wells to raise 2022 production from 2021

levels. We estimate that 2022 production will average 11.8 million b/d, up from a forecast average of 11.1 million b/d in 2021.

### **Natural Gas**

- In May, the natural gas spot price at Henry Hub averaged \$2.91 per million British thermal units (MMBtu), which is up from the April average of \$2.66/MMBtu. We expect the Henry Hub spot price will average \$2.92/MMBtu in 3Q21 and \$3.07/MMBtu for all of 2021, which is up from the 2020 average of \$2.03/MMBtu. Higher natural gas prices this year primarily reflect two factors: growth in liquefied natural gas (LNG) exports and rising domestic natural gas consumption outside of the power sector. In 2022, we expect the Henry Hub price will average \$2.93/MMBtu amid slowing growth in LNG exports and rising U.S. natural gas production.
- We expect that U.S. consumption of natural gas will average 82.9 billion cubic feet per day (Bcf/d) in 2021, down 0.5% from 2020. U.S. natural gas consumption declines in the forecast, in part, because electric power generators switch to coal from natural gas as a result of rising natural gas prices. In 2021, we expect residential and commercial natural gas consumption combined will rise by 1.2 Bcf/d from 2020 and industrial consumption will rise by 0.7 Bcf/d from 2020. Rising consumption outside of the power sector results from expanding economic activity and colder winter temperatures in 2021 compared with 2020. We expect U.S. natural gas consumption will average 82.8 Bcf/d in 2022.
- We estimate that natural gas inventories ended May 2021 at almost 2.4 trillion cubic feet (Tcf), which is 3% lower than the five-year (2016–20) average. More natural gas was withdrawn from storage during the winter of 2020–21 than the previous five-year average, largely as a result of the colder-than-average February temperatures that contributed to a drop in natural gas production. We forecast that inventories will end the 2021 injection season (end of October) at 3.6 Tcf, which would be 4% below the five-year average.
- Following a significant weather-related decline in U.S. natural gas production in February, U.S. dry natural gas production rose by 6.0 Bcf/d in March to 92.3 Bcf/d. We expect dry natural gas production will average 92.9 Bcf/d in 2H21 and then rise to 93.9 Bcf/d in 2022.

### **Electricity, coal, renewables, and emissions**

- We forecast that retail sales of electricity in the United States will increase by 2.3% in 2021 after falling by 3.9% in 2020. The largest increase in consumption will occur in the residential sector, where we forecast retail sales of electricity will grow by 2.8% this year. This growth is primarily a result of colder temperatures in the first quarter of 2021 compared with the same period in 2020. Much of the forecast increase in electricity consumption in the commercial and industrial sectors reflects improving economic

conditions in 2021. We expect retail electricity sales to these two sectors combined will increase by 2.0% in 2021. For 2022, we forecast that U.S. retail sales of electricity will grow by another 1.4%.

- We expect the share of electric power generation produced by natural gas in the United States will average 36% in 2021 and 35% in 2022, down from 39% in 2020. The forecast share for natural gas as a generation fuel declines in response to our expectation of a higher delivered natural gas price for electricity generators, which we forecast will average \$4.09/MMBtu in 2021 compared with an average of \$2.39/MMBtu in 2020. As a result of the higher expected natural gas prices, the forecast share of generation from coal rises from 20% in 2020 to 23% this year but falls to 22% next year. New additions of solar and wind generating capacity support our expectation that the renewables share of U.S. generation will rise from 20% in 2020 to 21% in 2021 and to 23% in 2022. The nuclear share of U.S. electricity generation declines from 21% in 2020 to 20% in 2021 and to 19% in 2022 as a result of retiring capacity at some nuclear power plants.
- We forecast that planned additions to U.S. wind and solar generating capacity in 2021 and 2022 will contribute to rising electricity generation from those sources. We estimate that the U.S. electric power sector added 14.8 gigawatts (GW) of new wind capacity in 2020. We expect 16.0 GW of new wind capacity will come online in 2021 and 5.3 GW in 2022. Utility-scale solar capacity rose by an estimated 10.5 GW in 2020. Our forecast for added utility-scale solar capacity is 15.5 GW 2021 and 16.6 GW for 2022. We expect significant solar capacity additions in Texas during the forecast period. In addition, 4 GW to 5 GW of small-scale solar capacity (systems less than 1 megawatt) will come online each year during the 2021–22 STEO forecast.
- We expect U.S. coal production to total 600 million short tons (MMst) in 2021, which is 61 MMst (11%) more than in 2020. The increase is driven primarily by rising electricity demand. In 2022, we expect coal production to grow by an additional 5 MMst (1%).
- We expect U.S. coal exports to be about 81 MMst in 2021, 12 MMst (17%) more than in 2020. We expect most of this growth to come from rising demand for steam coal in Europe and Asia as increased steel prices during 2021 and 2022 drive exports. Forecast U.S. coal exports in 2022 rise by an additional 12 MMst (14%).
- We estimate that U.S. energy-related carbon dioxide (CO<sub>2</sub>) emissions decreased by 11% in 2020 as a result of less energy consumption related to reduced economic activity and responses to COVID-19. In 2021, we forecast energy-related CO<sub>2</sub> emissions will increase about 6% from the 2020 level as economic activity increases and leads to rising energy use. We also expect energy-related CO<sub>2</sub> emissions to rise in 2022, but by a slower rate of 2%. We forecast that after declining by 19% in 2020, coal-related CO<sub>2</sub> emissions will rise by 15% in 2021 and then decrease by 1% in 2022.

## Petroleum and natural gas markets review

**Prices:** The front month futures price for Brent crude oil settled at \$71.31 per barrel (b) on June 3, up \$3.75/b from \$67.56/b on May 3. The front-month futures price for West Texas Intermediate (WTI) crude oil for delivery at Cushing, Oklahoma, increased by \$4.32/b during the same period, settling at \$68.81/b on June 3 (**Figure 1**).



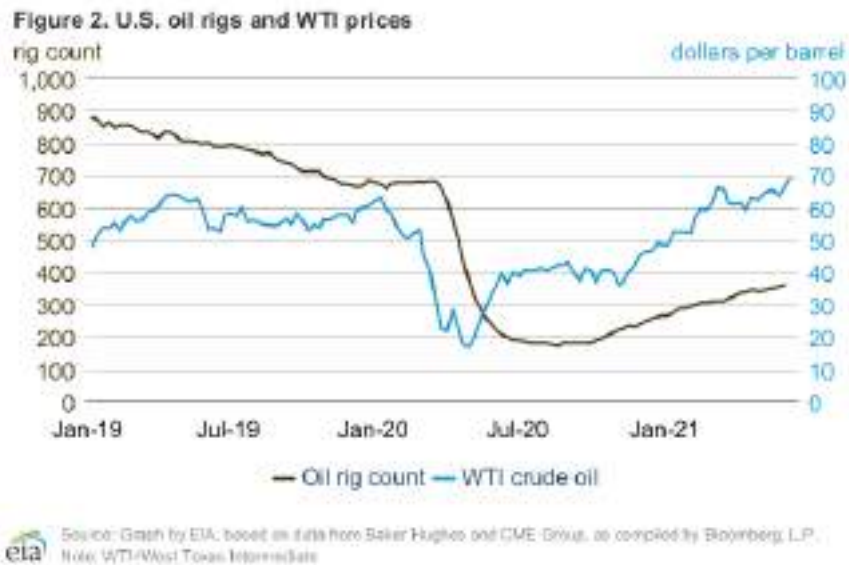
After declining in April, crude oil prices in May moved toward post-pandemic daily highs at nearly \$70/b. Continuing draws on global oil inventories contributed to upward crude oil price pressures. Despite rising COVID-19 case counts in some countries, particularly India, global oil demand remained higher than supply in May, contributing to continued global withdrawals from inventories of crude oil and petroleum products. However, we estimate withdrawals fell to 1.2 million barrels per day (b/d) in May, compared with average monthly withdrawals of 2.1 million b/d since June 2020.

On June 1, front-month Brent futures prices closed above \$70/b for the first time since January 2020. At its [June 1 meeting](#), OPEC+ reaffirmed its commitment to continued production increases in the coming months. Despite the group's plans to raise production, prices increased as the market weighed the planned increases relative to expected increases in consumption. Scheduled increases in production targets contributed to OPEC crude oil production reaching 25.5 million barrels per day (b/d) in May, its highest level since April 2020. This increase brought global supply to an estimated 95.0 million b/d compared with consumption of 96.2 million b/d. We expect OPEC crude oil production will increase to an average of 28.0 million b/d in the third quarter of 2021 (3Q21).

In the June STEO, we raised our Brent price forecast for the coming months. We now expect Brent prices to average \$69/b in June and \$68/b in 3Q21, which are \$4/b and \$5/b higher, respectively, than in last month's forecast. This price forecast keeps prices near or slightly below

current levels through 3Q21, and it incorporates the recent price increases and our forecast of mostly balanced oil markets in the coming months. Given announced increases in OPEC crude oil production, we expect production to increase more rapidly in the second half of 2021 (2H21) to keep pace with rising demand. In the forecast, global oil consumption rises by 2.8 million b/d from 2Q21 to 2H21 while global oil production rises by 4.3 million b/d during the same period, balancing out the 1.5 million b/d of global oil inventory draws from 2Q21. We expect more significant downward oil price pressures to emerge later in 2021 and into 2022 as forecast global oil supply outpaces slowing oil demand growth.

**U.S. oil rigs and WTI prices:** Baker Hughes' U.S. crude oil rotary rig count, which serves as an indicator of active U.S. crude oil production capacity, reached a low of 172 active rigs on August 14, 2020 (Figure 2). Since then, the number of U.S. oil rigs has more than doubled, increasing by 187 rigs to a total of 359 rigs as of May 28. The pace at which crude oil producers deploy drilling rigs at any price level is an important driver of crude oil production in U.S. tight oil basins.



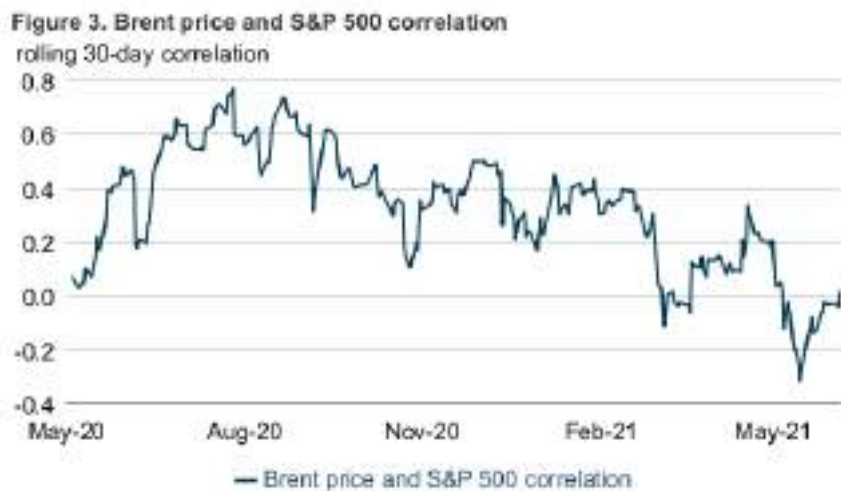
We expect that the rig count is likely to continue to increase in response to WTI crude oil prices rising from less than \$50/b in late 2020 to a monthly average of \$65/b in May. Our models show changes in rig counts typically lag behind changes in the WTI price from between three and six months, and production typically comes online about two months after rig deployment.

Assuming that other factors remain constant, price increases over the past month will likely continue to drive rig deployments through much of the rest of 2021. However, the recent changes in rig counts indicate operators, notably in the Permian, could be deploying fewer rigs at current oil prices than they have previously deployed when oil prices were at similar levels. In the forecast, we have slightly reduced the responsiveness of rig deployments in the Permian to upward oil price movements.



Although U.S. crude oil producers have some incentive to remain cautious about deploying rigs and increasing production because of overall market uncertainty, if WTI crude oil prices remain near \$65/b in the coming months, as we forecast, prices will continue to provide an incentive for producers to deploy additional rigs and resume production. Onshore U.S. crude oil production in the Lower 48 states during May 2021 was 8.9 million b/d, near its highest level so far in 2021, and we expect production to reach almost 9.3 million b/d by December 2021 with further increases into 2022. However, our crude oil production forecast is lower than in recent STEOs because of relatively fewer rig deployments at existing price levels, particularly in the Permian. In the March STEO, we forecast slightly more onshore U.S. crude oil production at almost 9.4 million b/d by December 2021, while we forecast WTI prices in 2Q21 and 3Q21 to average \$6/b less than in our current forecast. Assumptions about the oil price levels at which rigs are deployed are one of the key uncertainties in our forecast.

**Brent Price and S&P 500 correlation:** In 2020, the widespread impact of the COVID-19 pandemic across sectors resulted in an increased correlation between the Brent crude oil price and S&P 500, an equity index of widely traded U.S. public companies (**Figure 3**). Historically, the relationship between Brent prices and publicly traded equities is often mixed. Among many factors, rising oil prices present the risk of inflation and can increase transportation fuel costs for most firms, contributing to negative correlation. However, rising oil prices can also reflect strong economic growth, which leads to rising profitability for many companies, contributing to positive correlation. Rising oil prices can also indicate potentially higher earnings for many large companies in the S&P 500 that produce and refine petroleum, also contributing to a positive correlation. A positive correlation between the two can suggest that both asset prices are being determined primarily by demand-side factors, such as global economic growth, which can influence both demand for crude oil and for goods and services from other sectors. The rolling 30-day correlation between the Brent price and the S&P 500 reached a high point of 0.77 during July 2020, the highest correlation between the two series since December 2010.



etia Source: Graph by EIA, based on data from Bloomberg L.P.



Uneven increases in crude oil prices and equity values contributed to a gradual decrease in the correlation since July 2020, suggesting that drivers of the crude oil price are driven more by sector-specific, supply-side factors and less by macroeconomic conditions or global demand. In March 2021, the correlation decreased when crude oil prices increased more rapidly than the S&P 500 overall, which was after OPEC+ producers announced they would maintain production curtailments amid rising crude oil demand. After crude oil prices decreased later in March, and remained relatively flat through April, the S&P 500 climbed to record highs. The opposite directional movements between the two series resulted in a shift to a negative correlation between them. The correlation between the Brent crude oil price and the S&P 500 index reached -0.32 on May 13, the largest negative correlation since July 2014.

**Crude oil and inflation expectations:** The percentage difference in yields for five-year Treasury Inflation-Protected Securities (TIPS) compared with U.S. treasury bonds is often used to measure market expectations of inflation. Responses to the COVID-19 pandemic resulted in a dramatic decline in demand for goods, which significantly reduced petroleum and other commodity prices in early 2020. Because crude oil and other commodity prices are inputs to other sectors of the economy, changes in crude oil prices can also affect inflation expectations. The TIPS-Treasury spread decreased to an average of 0.7% in March 2020, reflecting low inflation expectations as a result of lower prices and reduced economic activity (**Figure 4**).



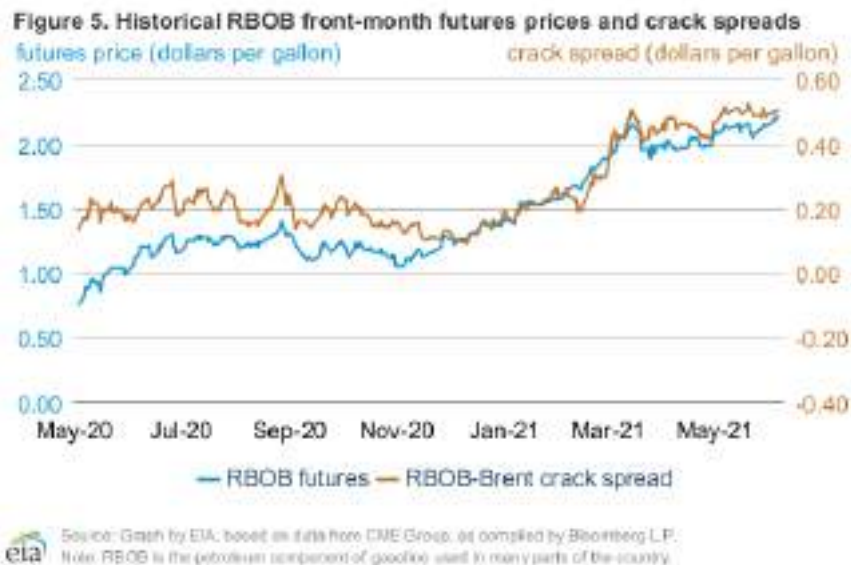
Source: Graph by EIA, based on data from Bloomberg L.P. and Federal Reserve Bank of St. Louis  
 Note: TIPS=Treasury Inflation Protected Securities

Inflation expectations have generally increased since August 2020. The TIPS-Treasury spread increased from 2.55% on April 1, 2021, to 2.60% on May 3 (the first trading day of May), before reaching a high of 2.72% on May 12, the spread's highest point since 2008. The increasing inflation expectations correspond to increases in the Brent crude oil price, which increased from \$65/b on April 1 to \$68/b on May 3 and \$69/b on May 12. Fuel price increases for consumers and firms as a result of high crude oil prices are an important contributor to inflation expectations. However, the TIPS-Treasury spread also increased at the end of March and into

April, while Brent prices remained below their mid-March levels. Differing directional movements between the spread and the crude oil price reflect the effects of other goods and commodity prices on inflation expectations.

## Petroleum products

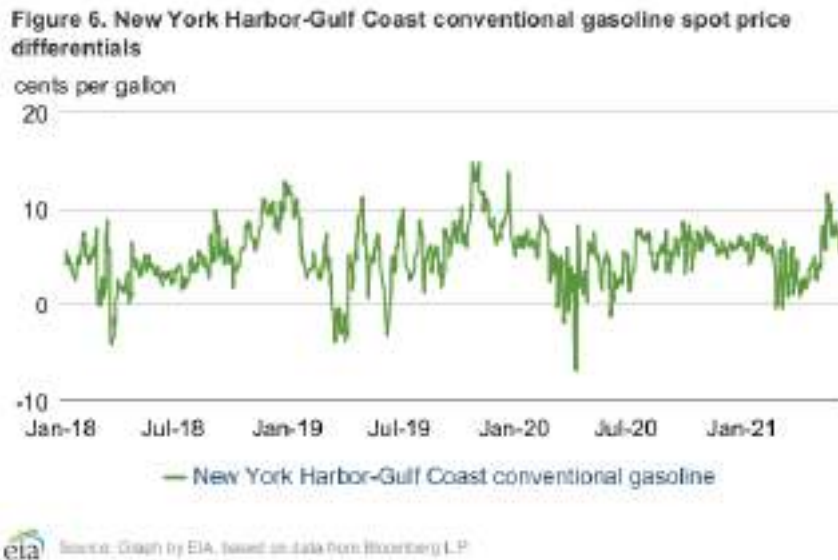
**Gasoline prices:** The front-month futures price of RBOB (the petroleum component of gasoline used in many parts of the country) settled at \$2.20 per gallon (gal) on June 3, up 10 cents/gal from May 3 (**Figure 5**). The RBOB–Brent crack spread (the difference between the price of RBOB and the price of Brent crude oil) increased by 1 cent/gal to settle at 50 cents/gal during the same period.



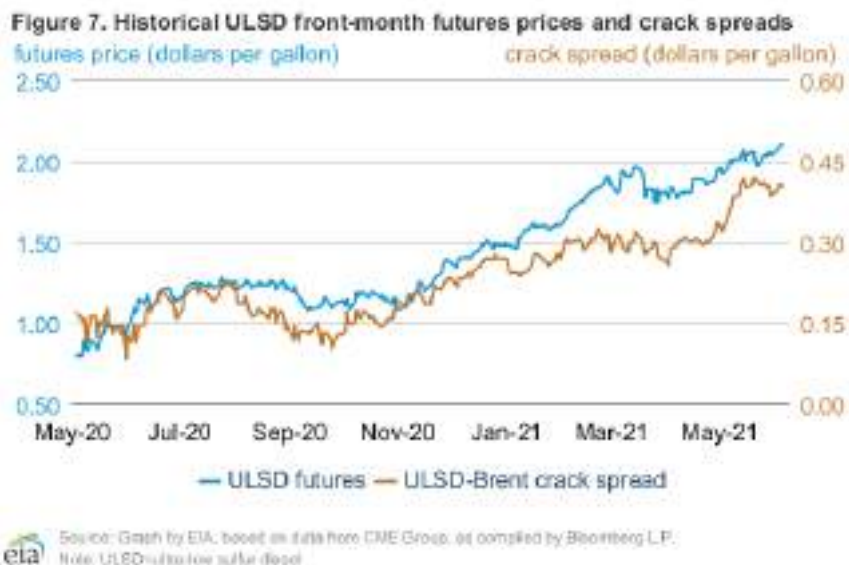
The average RBOB–Brent crack spread of 50 cents/gal in May was the highest since July 2015. The high spread reflected increasing demand, low inventories, and disruptions to the flow of gasoline along the U.S. East Coast because of the Colonial Pipeline outage. We estimate U.S. gasoline consumption averaged 9.1 million b/d in May, a 4% increase from April and the highest level since November 2019. The increase in gasoline demand likely reflected typical seasonal factors such as Memorial Day travel, as well as increased willingness to travel as a result of rising vaccinations, rising employment, and increased gasoline purchases in response to outages at many gas stations during the Colonial Pipeline disruption in early May. In addition, refinery production has not kept up with the increases in demand the past few months. Gasoline stocks fell sharply because of [weather-related outages in February](#). Those disruptions were followed by increasing gasoline consumption from March through May. The increase in gasoline consumption and supply disruptions have resulted in gasoline inventories being below the five-year average for every month in 2021. Low gasoline inventories have supported the high gasoline crack spread, and helped push [retail gasoline prices above \\$3.00/gal](#). We forecast that as refineries increase runs in the coming months and increases in gasoline consumption slow, it

will put some downward pressure on gasoline crack spreads and contribute to U.S. average retail gasoline prices falling to \$2.76/gal by September. However, we expect gasoline stocks to remain near five-year lows for the rest of 2021, keeping gasoline crack spreads higher than the five-year average.

**Regional gasoline prices:** The Colonial Pipeline outage interrupted the flow of gasoline from the U.S. Gulf Coast to the East Coast and led to a short-term increase in the spread between New York Harbor gasoline spot prices and Gulf Coast conventional gasoline spot prices (**Figure 6**). The spread peaked on May 13 at 11.5 cents/gal, the highest spread since December 16, 2019. The New York Harbor gasoline price increased relative to the Gulf Coast conventional gasoline price likely because of a combination of increasing stocks in the U.S. Gulf Coast, decreasing stocks in the East Coast, and increased demand in the Lower Atlantic. The Lower Atlantic, which receives much of its gasoline from the pipeline, had lower-than-average gasoline stocks at the time of the pipeline outage, and as a result had the highest demand for substitute supply sources. Although the spread exceeded 10 cents/gal for only four days in the month, the spread remained slightly elevated through May, averaging 8 cents/gal, which is higher than the five-year May average of 5 cents/gal and higher than the April 2021 average of 3 cents/gal. The spread decreased in early June, settling at 6 cents/gal on June 3.



**Ultra-low sulfur diesel prices:** The front-month futures price for ultra-low sulfur diesel (ULSD) for delivery in New York Harbor settled at \$2.10/gal on June 3, up 15 cent/gal from May 3 (**Figure 7**). The ULSD–Brent crack spread (the difference between the price of ULSD and the price of Brent crude oil) increased 6 cents/gal, settling at 40 cents/gal during the same period.



May had the highest average ULSD–Brent crack spread since December 2019. The crack spread increase was likely the result of the most U.S. consumption of distillate fuel since November 2019 and relatively low distillate production. We estimate May distillate consumption of 4.1 million b/d, an increase of 0.5 million b/d (15%) from the May 2020 levels and 3% higher than the average from the five previous years (2015–2019). Although distillate consumption has increased above the five-year average for May, distillate production was at its lowest May level since 2012.

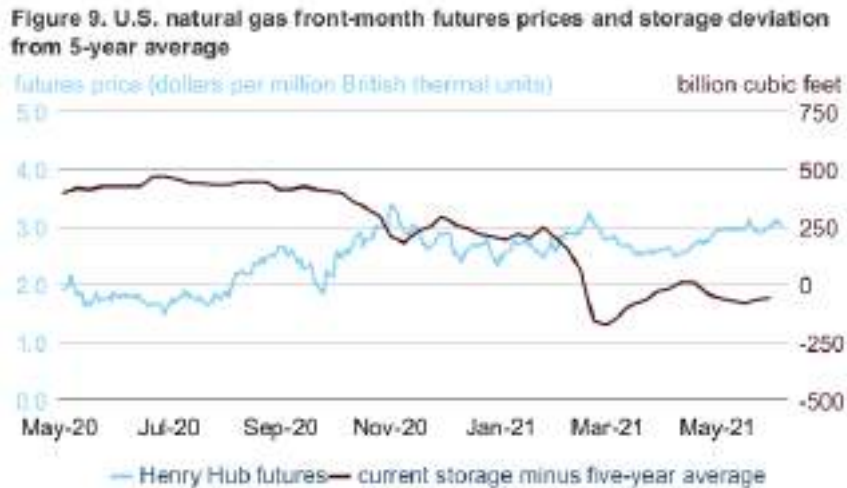
Because increases in distillate consumption have been outpacing increases in production and net imports in recent months, distillate inventories have been decreasing, which has supported increases in the ULSD–Brent crack spread (**Figure 8**). From August 2020 to April 2021, distillate inventories decreased from 179 million barrels, the highest level since 1982, to approximately 136 million barrels. During that same period, the ULSD–Brent crack spread increased from 17 cents/gal to 31 cents/gal. In May, we estimate inventories fell to about 133 million barrels, which is lower than the five-year average, and this reduction has coincided with steeper increases in the crack spread. On May 11, the crack spread exceeded 40 cents/gal for the first time since March 2020 and remained close to 40 cents/gal through June 3.



Source: Graph by EIA, based on data from Weekly Petroleum Status Report and Bloomberg L.P.  
 Note: ULSD=Ultra-low sulfur diesel

## Natural Gas

**Prices:** The front-month natural gas futures contract for delivery at the Henry Hub settled at \$3.04 per million British thermal units (MMBtu) on June 3, 2021, which was up 7 cents/MMBtu from May 3, 2021 (**Figure 9**). The average price for front-month natural gas futures contracts in May was \$2.96/MMBtu, the highest May average since 2017.

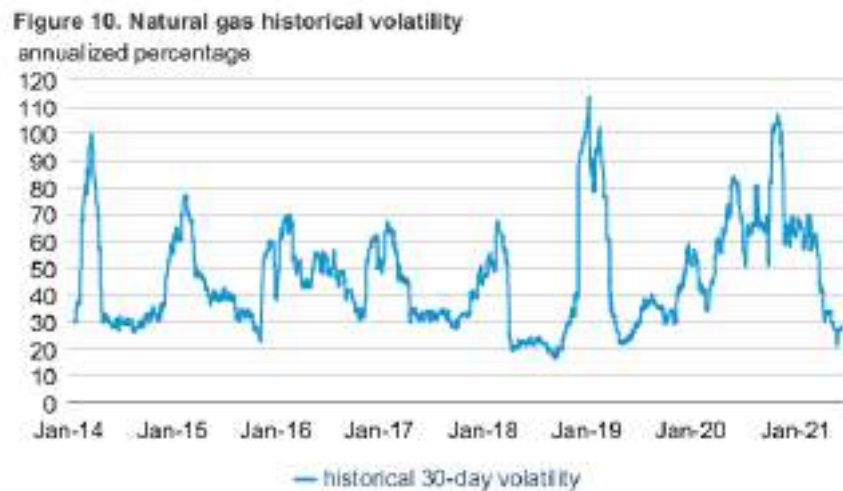


Source: Graph by EIA, based on data from ONE Group, as compiled by Bloomberg L.P.

High levels of U.S. LNG exports continued in May and supported Henry Hub natural gas futures prices above \$3.00/MMBtu. We estimate U.S. LNG exports of 10.0 billion cubic feet per day (Bcf/d) in May, the most on record for the month. Every month since November 2020 has been among the 10 highest months for U.S. LNG exports on record. Stable U.S. production during this

period in combination with high exports reduced storage levels below their previous five-year average. Although natural gas stocks were 191 Bcf higher than the five-year (2016–20) average at the start of the year, they were 61 Bcf lower than the five-year average as of the week ending May 28. Front-month natural gas futures prices have increased as stocks have decreased, starting the year at \$2.58/MMBtu and closing at \$3.04/MMBtu on June 3.

Although U.S. natural gas futures prices have risen, futures price volatility has declined to low levels. Historical volatility measures the magnitude of daily changes in closing prices for a commodity during a given time in the past. Based on rolling front-month contracts, the 30-day historical volatility of U.S. natural gas futures prices was 27.9% on June 3, a significant decrease from 73.5% a year ago. (Figure 10). However, the May 2020 historical volatility was unusually high as a result of COVID-19-related disruptions, and historical volatility tends to be low around May because of less demand for natural gas as a fuel for heating or cooling. The previous five-year (2015–19) average historical volatility for the first trading day of June was 35.7%. This year, historical volatility has been even lower so far than the seasonal average. Prices have hovered within a somewhat narrow range around \$3.00/MMBtu, likely because of stable U.S. production and relatively stable U.S. consumption as a result of slightly below-average cooling demand during May.



eia Source: Graph by EIA, based on data from Bloomberg L.P.

**International natural gas prices:** International LNG spot prices often reach yearly lows in May, but this year they have climbed to the high prices typically seen in winter months. The Japan-Korea Marker (JKM) price exceeded \$10/MMBtu this May, compared with May 2019 and 2020 averages near \$5/MMBtu and \$2/MMBtu, respectively. The Title Transfer Facility (TTF) and National Balancing Point (NBP) prices in Europe have shown similar trends (Figure 11). In Asia, efforts to build stocks in anticipation of demand for summer electricity and to prepare for heating demand next winter has increased demand for LNG imports and supported high prices. Because LNG stocks in Asia have been lower than usual this year as a result of significant draws



during the extremely cold winter, demand in Asia for LNG imports has been much greater than usual. In Europe, [the coldest April in nearly a century](#) and [low inventories](#) also supported higher global demand and higher prices for LNG. Because of this strong global demand for LNG, we forecast that U.S. LNG exports will continue to be high and average more than 9.0 Bcf/d during the remainder of 2021.



Source: Graph by EIA, based on data from CME Group, as compiled by Bloomberg L.P.  
Note: TTF=Title Transfer Facility.



## Notable forecast changes

- We forecast Brent and WTI crude oil spot prices will average \$65/b and \$62/b, respectively, in 2021. Both of these forecasts are \$3/b higher than forecast in the May STEO. The higher forecasts reflect the incorporation of higher-than-forecast actual prices during May, along with our expectation that crude oil markets will be in balance through much of the second half of the year, limiting downward price pressures. However, we expect that Brent crude oil prices will decline to \$60/b on average in 2022 as global oil supply begins to outpace global oil demand.
- We expect global oil inventories will build by 0.5 million b/d in 2022, compared with our expectation of generally unchanged inventories in the May STEO. Our forecast of inventory growth is the result of our expectation of higher global oil supply in 2022. We raised expectations of supply growth across several key producers in the June STEO including OPEC, China, and Mexico.
- We forecast U.S. coal production to total 600 MMst in 2021, up 18 MMst (3%) from last month's STEO. High U.S. coal production in this forecast is the result of our expectation of higher inventory levels and more exports compared with the May STEO.

This report was prepared by the U.S. Energy Information Administration (EIA), the statistical and analytical agency within the U.S. Department of Energy. By law, EIA's data, analyses, and forecasts are independent of approval by any other officer or employee of the United States Government. The views in this report therefore should not be construed as representing those of the U.S. Department of Energy or other federal agencies.

**Table 3a. International Petroleum and Other Liquids Production, Consumption, and Inventories**

U.S. Energy Information Administration | Short-Term Energy Outlook - June 2021

	2020				2021				2022				Year		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2020	2021	2022
<b>Supply (million barrels per day) (a)</b>															
OECD .....	<b>32.95</b>	<b>29.43</b>	<b>29.97</b>	<b>30.69</b>	<b>30.20</b>	<i>30.89</i>	<i>31.53</i>	<i>32.00</i>	<i>32.20</i>	<i>32.48</i>	<i>32.76</i>	<i>33.21</i>	<b>30.76</b>	<i>31.16</i>	<i>32.67</i>
U.S. (50 States) .....	<b>20.22</b>	<b>17.58</b>	<b>18.30</b>	<b>18.31</b>	<b>17.63</b>	<i>18.74</i>	<i>18.89</i>	<i>19.19</i>	<i>19.39</i>	<i>19.81</i>	<i>20.17</i>	<i>20.40</i>	<b>18.60</b>	<i>18.62</i>	<i>19.95</i>
Canada .....	<b>5.65</b>	<b>4.92</b>	<b>4.95</b>	<b>5.55</b>	<b>5.65</b>	<i>5.26</i>	<i>5.74</i>	<i>5.77</i>	<i>5.81</i>	<i>5.78</i>	<i>5.80</i>	<i>5.83</i>	<b>5.27</b>	<i>5.61</i>	<i>5.80</i>
Mexico .....	<b>2.00</b>	<b>1.94</b>	<b>1.91</b>	<b>1.90</b>	<b>1.93</b>	<i>1.95</i>	<i>1.92</i>	<i>1.89</i>	<i>1.83</i>	<i>1.80</i>	<i>1.77</i>	<i>1.73</i>	<b>1.94</b>	<i>1.92</i>	<i>1.78</i>
Other OECD .....	<b>5.08</b>	<b>4.99</b>	<b>4.81</b>	<b>4.94</b>	<b>4.99</b>	<i>4.93</i>	<i>4.98</i>	<i>5.15</i>	<i>5.17</i>	<i>5.10</i>	<i>5.02</i>	<i>5.25</i>	<b>4.95</b>	<i>5.01</i>	<i>5.13</i>
Non-OECD .....	<b>67.69</b>	<b>63.02</b>	<b>61.06</b>	<b>62.10</b>	<b>62.63</b>	<i>64.44</i>	<i>67.55</i>	<i>68.09</i>	<i>67.83</i>	<i>69.21</i>	<i>69.84</i>	<i>69.70</i>	<b>63.46</b>	<i>65.70</i>	<i>69.16</i>
OPEC .....	<b>33.50</b>	<b>30.72</b>	<b>28.65</b>	<b>30.00</b>	<b>30.35</b>	<i>30.90</i>	<i>33.30</i>	<i>34.12</i>	<i>34.26</i>	<i>34.13</i>	<i>34.16</i>	<i>34.20</i>	<b>30.71</b>	<i>32.18</i>	<i>34.19</i>
Crude Oil Portion .....	<b>28.28</b>	<b>25.65</b>	<b>23.63</b>	<b>24.88</b>	<b>25.08</b>	<i>25.64</i>	<i>27.97</i>	<i>28.75</i>	<i>28.67</i>	<i>28.67</i>	<i>28.67</i>	<i>28.67</i>	<b>25.60</b>	<i>26.87</i>	<i>28.67</i>
Other Liquids (b) .....	<b>5.22</b>	<b>5.07</b>	<b>5.02</b>	<b>5.12</b>	<b>5.27</b>	<i>5.26</i>	<i>5.33</i>	<i>5.38</i>	<i>5.59</i>	<i>5.46</i>	<i>5.49</i>	<i>5.53</i>	<b>5.11</b>	<i>5.31</i>	<i>5.52</i>
Eurasia .....	<b>14.73</b>	<b>13.18</b>	<b>12.72</b>	<b>13.13</b>	<b>13.39</b>	<i>13.68</i>	<i>13.73</i>	<i>13.88</i>	<i>14.06</i>	<i>14.65</i>	<i>14.80</i>	<i>14.94</i>	<b>13.44</b>	<i>13.67</i>	<i>14.62</i>
China .....	<b>4.96</b>	<b>4.91</b>	<b>4.95</b>	<b>4.90</b>	<b>5.05</b>	<i>5.04</i>	<i>5.01</i>	<i>5.06</i>	<i>5.05</i>	<i>5.08</i>	<i>5.08</i>	<i>5.13</i>	<b>4.93</b>	<i>5.04</i>	<i>5.08</i>
Other Non-OECD .....	<b>14.50</b>	<b>14.21</b>	<b>14.75</b>	<b>14.06</b>	<b>13.84</b>	<i>14.83</i>	<i>15.51</i>	<i>15.02</i>	<i>14.46</i>	<i>15.36</i>	<i>15.79</i>	<i>15.44</i>	<b>14.38</b>	<i>14.81</i>	<i>15.27</i>
Total World Supply .....	<b>100.64</b>	<b>92.45</b>	<b>91.04</b>	<b>92.79</b>	<b>92.83</b>	<i>95.33</i>	<i>99.08</i>	<i>100.10</i>	<i>100.03</i>	<i>101.70</i>	<i>102.60</i>	<i>102.91</i>	<b>94.22</b>	<i>96.86</i>	<i>101.82</i>
Non-OPEC Supply .....	<b>67.14</b>	<b>61.73</b>	<b>62.39</b>	<b>62.79</b>	<b>62.48</b>	<i>64.43</i>	<i>65.78</i>	<i>65.97</i>	<i>65.77</i>	<i>67.57</i>	<i>68.44</i>	<i>68.71</i>	<b>63.51</b>	<i>64.68</i>	<i>67.63</i>
<b>Consumption (million barrels per day) (c)</b>															
OECD .....	<b>45.26</b>	<b>37.40</b>	<b>42.12</b>	<b>42.80</b>	<b>42.29</b>	<i>43.90</i>	<i>45.11</i>	<i>45.96</i>	<i>45.51</i>	<i>45.29</i>	<i>46.20</i>	<i>46.37</i>	<b>41.90</b>	<i>44.33</i>	<i>45.85</i>
U.S. (50 States) .....	<b>19.33</b>	<b>16.08</b>	<b>18.36</b>	<b>18.71</b>	<b>18.45</b>	<i>19.73</i>	<i>19.97</i>	<i>20.26</i>	<i>20.06</i>	<i>20.58</i>	<i>20.90</i>	<i>20.90</i>	<b>18.12</b>	<i>19.61</i>	<i>20.61</i>
U.S. Territories .....	<b>0.17</b>	<b>0.15</b>	<b>0.16</b>	<b>0.17</b>	<b>0.20</b>	<i>0.18</i>	<i>0.18</i>	<i>0.19</i>	<i>0.20</i>	<i>0.18</i>	<i>0.19</i>	<i>0.20</i>	<b>0.16</b>	<i>0.19</i>	<i>0.19</i>
Canada .....	<b>2.33</b>	<b>1.88</b>	<b>2.16</b>	<b>2.05</b>	<b>2.03</b>	<i>2.16</i>	<i>2.28</i>	<i>2.31</i>	<i>2.27</i>	<i>2.22</i>	<i>2.32</i>	<i>2.30</i>	<b>2.10</b>	<i>2.20</i>	<i>2.28</i>
Europe .....	<b>13.33</b>	<b>11.01</b>	<b>12.87</b>	<b>12.51</b>	<b>11.96</b>	<i>12.75</i>	<i>13.41</i>	<i>13.38</i>	<i>13.05</i>	<i>13.21</i>	<i>13.57</i>	<i>13.27</i>	<b>12.43</b>	<i>12.88</i>	<i>13.28</i>
Japan .....	<b>3.69</b>	<b>2.89</b>	<b>3.03</b>	<b>3.50</b>	<b>3.67</b>	<i>3.00</i>	<i>3.12</i>	<i>3.45</i>	<i>3.64</i>	<i>2.98</i>	<i>3.06</i>	<i>3.37</i>	<b>3.27</b>	<i>3.31</i>	<i>3.26</i>
Other OECD .....	<b>6.41</b>	<b>5.41</b>	<b>5.55</b>	<b>5.87</b>	<b>5.98</b>	<i>6.08</i>	<i>6.15</i>	<i>6.37</i>	<i>6.29</i>	<i>6.13</i>	<i>6.16</i>	<i>6.32</i>	<b>5.81</b>	<i>6.15</i>	<i>6.22</i>
Non-OECD .....	<b>50.13</b>	<b>47.45</b>	<b>51.21</b>	<b>52.59</b>	<b>52.21</b>	<i>52.96</i>	<i>53.85</i>	<i>54.31</i>	<i>54.36</i>	<i>55.72</i>	<i>55.85</i>	<i>55.92</i>	<b>50.35</b>	<i>53.34</i>	<i>55.47</i>
Eurasia .....	<b>4.86</b>	<b>4.48</b>	<b>5.28</b>	<b>5.17</b>	<b>4.92</b>	<i>5.00</i>	<i>5.39</i>	<i>5.23</i>	<i>5.05</i>	<i>5.13</i>	<i>5.54</i>	<i>5.39</i>	<b>4.95</b>	<i>5.14</i>	<i>5.28</i>
Europe .....	<b>0.71</b>	<b>0.69</b>	<b>0.71</b>	<b>0.72</b>	<b>0.72</b>	<i>0.73</i>	<i>0.73</i>	<i>0.74</i>	<i>0.73</i>	<i>0.74</i>	<i>0.76</i>	<i>0.76</i>	<b>0.71</b>	<i>0.73</i>	<i>0.75</i>
China .....	<b>13.89</b>	<b>14.08</b>	<b>14.65</b>	<b>15.11</b>	<b>15.03</b>	<i>15.59</i>	<i>15.30</i>	<i>15.59</i>	<i>15.89</i>	<i>16.11</i>	<i>15.78</i>	<i>16.02</i>	<b>14.43</b>	<i>15.38</i>	<i>15.95</i>
Other Asia .....	<b>13.16</b>	<b>11.64</b>	<b>12.60</b>	<b>13.61</b>	<b>13.83</b>	<i>13.52</i>	<i>13.61</i>	<i>14.17</i>	<i>14.53</i>	<i>14.77</i>	<i>14.34</i>	<i>14.74</i>	<b>12.75</b>	<i>13.78</i>	<i>14.60</i>
Other Non-OECD .....	<b>17.53</b>	<b>16.55</b>	<b>17.98</b>	<b>17.99</b>	<b>17.71</b>	<i>18.12</i>	<i>18.81</i>	<i>18.58</i>	<i>18.16</i>	<i>18.97</i>	<i>19.43</i>	<i>19.00</i>	<b>17.51</b>	<i>18.31</i>	<i>18.89</i>
Total World Consumption .....	<b>95.40</b>	<b>84.85</b>	<b>93.33</b>	<b>95.39</b>	<b>94.50</b>	<i>96.86</i>	<i>98.96</i>	<i>100.27</i>	<i>99.86</i>	<i>101.01</i>	<i>102.05</i>	<i>102.29</i>	<b>92.26</b>	<i>97.67</i>	<i>101.31</i>
<b>Total Crude Oil and Other Liquids Inventory Net Withdrawals (million barrels per day)</b>															
U.S. (50 States) .....	<b>-0.43</b>	<b>-1.68</b>	<b>0.49</b>	<b>0.89</b>	<b>0.48</b>	<i>0.39</i>	<i>-0.14</i>	<i>0.47</i>	<i>0.06</i>	<i>-0.53</i>	<i>0.03</i>	<i>0.42</i>	<b>-0.18</b>	<i>0.30</i>	<i>0.00</i>
Other OECD .....	<b>-0.50</b>	<b>-1.17</b>	<b>0.04</b>	<b>0.68</b>	<b>0.43</b>	<i>0.36</i>	<i>0.00</i>	<i>-0.10</i>	<i>-0.07</i>	<i>-0.05</i>	<i>-0.18</i>	<i>-0.33</i>	<b>-0.23</b>	<i>0.17</i>	<i>-0.16</i>
Other Stock Draws and Balance .....	<b>-4.32</b>	<b>-4.75</b>	<b>1.77</b>	<b>1.03</b>	<b>0.77</b>	<i>0.78</i>	<i>0.01</i>	<i>-0.21</i>	<i>-0.16</i>	<i>-0.11</i>	<i>-0.40</i>	<i>-0.72</i>	<b>-1.55</b>	<i>0.34</i>	<i>-0.35</i>
Total Stock Draw .....	<b>-5.25</b>	<b>-7.60</b>	<b>2.30</b>	<b>2.60</b>	<b>1.67</b>	<i>1.53</i>	<i>-0.12</i>	<i>0.17</i>	<i>-0.17</i>	<i>-0.69</i>	<i>-0.55</i>	<i>-0.62</i>	<b>-1.96</b>	<i>0.80</i>	<i>-0.51</i>
<b>End-of-period Commercial Crude Oil and Other Liquids Inventories (million barrels)</b>															
U.S. Commercial Inventory .....	<b>1,321</b>	<b>1,453</b>	<b>1,422</b>	<b>1,344</b>	<b>1,302</b>	<i>1,284</i>	<i>1,297</i>	<i>1,258</i>	<i>1,257</i>	<i>1,309</i>	<i>1,309</i>	<i>1,280</i>	<b>1,344</b>	<i>1,258</i>	<i>1,280</i>
OECD Commercial Inventory .....	<b>2,963</b>	<b>3,201</b>	<b>3,166</b>	<b>3,026</b>	<b>2,945</b>	<i>2,895</i>	<i>2,907</i>	<i>2,877</i>	<i>2,883</i>	<i>2,939</i>	<i>2,956</i>	<i>2,957</i>	<b>3,026</b>	<i>2,877</i>	<i>2,957</i>

(a) Supply includes production of crude oil (including lease condensates), natural gas plant liquids, biofuels, other liquids, and refinery processing gains.

(b) Includes lease condensate, natural gas plant liquids, other liquids, and refinery processing gain. Includes other unaccounted-for liquids.

 (c) Consumption of petroleum by the OECD countries is synonymous with "petroleum product supplied," defined in the glossary of the EIA *Petroleum Supply Monthly*.

DOE/EIA-0109. Consumption of petroleum by the non-OECD countries is "apparent consumption," which includes internal consumption, refinery fuel and loss, and bunkering.

- = no data available

OECD = Organization for Economic Cooperation and Development: Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Latvia, Lithuania, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, Turkey, the United Kingdom, the United States.

OPEC = Organization of the Petroleum Exporting Countries: Algeria, Angola, Congo (Brazzaville), Equatorial Guinea, Gabon, Iran, Iraq, Kuwait, Libya, Nigeria, Saudi Arabia, the United Arab Emirates, Venezuela.

Notes: EIA completed modeling and analysis for this report on Thursday June 3 2021.

The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

**Historical data:** Latest data available from Energy Information Administration international energy statistics.

Minor discrepancies with published historical data are due to independent rounding.

**Forecasts:** EIA Short-Term Integrated Forecasting System.

**Table 4a. U.S. Petroleum and Other Liquids Supply, Consumption, and Inventories**  
U.S. Energy Information Administration | Short-Term Energy Outlook - June 2021

	2020				2021				2022				Year		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2020	2021	2022
<b>Supply (million barrels per day)</b>															
<b>Crude Oil Supply</b>															
Domestic Production (a) .....	<b>12.75</b>	<b>10.81</b>	<b>10.81</b>	<b>10.90</b>	<b>10.70</b>	<i>11.04</i>	<i>11.17</i>	<i>11.38</i>	<i>11.55</i>	<i>11.67</i>	<i>11.88</i>	<i>12.05</i>	<b>11.31</b>	<i>11.08</i>	<i>11.79</i>
Alaska .....	<b>0.48</b>	<b>0.41</b>	<b>0.44</b>	<b>0.46</b>	<b>0.46</b>	<i>0.41</i>	<i>0.40</i>	<i>0.44</i>	<i>0.43</i>	<i>0.39</i>	<i>0.39</i>	<i>0.43</i>	<b>0.45</b>	<i>0.42</i>	<i>0.41</i>
Federal Gulf of Mexico (b) .....	<b>1.96</b>	<b>1.69</b>	<b>1.45</b>	<b>1.52</b>	<b>1.81</b>	<i>1.77</i>	<i>1.75</i>	<i>1.73</i>	<i>1.77</i>	<i>1.74</i>	<i>1.75</i>	<i>1.79</i>	<b>1.66</b>	<i>1.76</i>	<i>1.76</i>
Lower 48 States (excl GOM) .....	<b>10.31</b>	<b>8.71</b>	<b>8.92</b>	<b>8.91</b>	<b>8.44</b>	<i>8.87</i>	<i>9.02</i>	<i>9.21</i>	<i>9.35</i>	<i>9.54</i>	<i>9.73</i>	<i>9.84</i>	<b>9.21</b>	<i>8.89</i>	<i>9.62</i>
Crude Oil Net Imports (c) .....	<b>2.90</b>	<b>3.08</b>	<b>2.31</b>	<b>2.51</b>	<b>2.87</b>	<i>3.34</i>	<i>4.34</i>	<i>3.71</i>	<i>3.71</i>	<i>4.74</i>	<i>4.79</i>	<i>4.08</i>	<b>2.70</b>	<i>3.57</i>	<i>4.33</i>
SPR Net Withdrawals .....	<b>0.00</b>	<b>-0.23</b>	<b>0.15</b>	<b>0.04</b>	<b>0.00</b>	<i>0.19</i>	<i>0.00</i>	<i>0.05</i>	<i>0.05</i>	<i>0.05</i>	<i>0.03</i>	<i>0.11</i>	<b>-0.01</b>	<i>0.06</i>	<i>0.06</i>
Commercial Inventory Net Withdrawals .....	<b>-0.55</b>	<b>-0.54</b>	<b>0.38</b>	<b>0.13</b>	<b>-0.18</b>	<i>0.39</i>	<i>0.20</i>	<i>-0.02</i>	<i>-0.27</i>	<i>0.00</i>	<i>0.27</i>	<i>-0.02</i>	<b>-0.14</b>	<i>0.10</i>	<i>0.00</i>
Crude Oil Adjustment (d) .....	<b>0.67</b>	<b>0.03</b>	<b>0.38</b>	<b>0.32</b>	<b>0.42</b>	<i>0.40</i>	<i>0.23</i>	<i>0.16</i>	<i>0.22</i>	<i>0.22</i>	<i>0.23</i>	<i>0.16</i>	<b>0.35</b>	<i>0.30</i>	<i>0.21</i>
Total Crude Oil Input to Refineries .....	<b>15.77</b>	<b>13.16</b>	<b>14.03</b>	<b>13.90</b>	<b>13.81</b>	<i>15.38</i>	<i>15.94</i>	<i>15.28</i>	<i>15.27</i>	<i>16.68</i>	<i>17.20</i>	<i>16.38</i>	<b>14.21</b>	<i>15.11</i>	<i>16.39</i>
<b>Other Supply</b>															
Refinery Processing Gain .....	<b>1.02</b>	<b>0.82</b>	<b>0.94</b>	<b>0.92</b>	<b>0.84</b>	<i>1.09</i>	<i>1.08</i>	<i>1.05</i>	<i>1.06</i>	<i>1.10</i>	<i>1.15</i>	<i>1.15</i>	<b>0.92</b>	<i>1.02</i>	<i>1.11</i>
Natural Gas Plant Liquids Production .....	<b>5.12</b>	<b>4.96</b>	<b>5.33</b>	<b>5.23</b>	<b>4.86</b>	<i>5.32</i>	<i>5.34</i>	<i>5.46</i>	<i>5.48</i>	<i>5.70</i>	<i>5.80</i>	<i>5.85</i>	<b>5.16</b>	<i>5.24</i>	<i>5.71</i>
Renewables and Oxygenate Production (e) .....	<b>1.11</b>	<b>0.80</b>	<b>1.03</b>	<b>1.07</b>	<b>1.03</b>	<i>1.08</i>	<i>1.10</i>	<i>1.08</i>	<i>1.08</i>	<i>1.11</i>	<i>1.12</i>	<i>1.12</i>	<b>1.01</b>	<i>1.07</i>	<i>1.11</i>
Fuel Ethanol Production .....	<b>1.02</b>	<b>0.70</b>	<b>0.92</b>	<b>0.97</b>	<b>0.90</b>	<i>0.98</i>	<i>0.99</i>	<i>0.98</i>	<i>0.97</i>	<i>0.99</i>	<i>1.00</i>	<i>1.00</i>	<b>0.91</b>	<i>0.96</i>	<i>0.99</i>
Petroleum Products Adjustment (f) .....	<b>0.22</b>	<b>0.19</b>	<b>0.20</b>	<b>0.19</b>	<b>0.19</b>	<i>0.21</i>	<i>0.21</i>	<i>0.21</i>	<i>0.21</i>	<i>0.22</i>	<i>0.22</i>	<i>0.22</i>	<b>0.20</b>	<i>0.21</i>	<i>0.22</i>
Product Net Imports (c) .....	<b>-4.03</b>	<b>-2.94</b>	<b>-3.12</b>	<b>-3.32</b>	<b>-2.94</b>	<i>-3.13</i>	<i>-3.35</i>	<i>-3.27</i>	<i>-3.32</i>	<i>-3.66</i>	<i>-4.32</i>	<i>-4.16</i>	<b>-3.35</b>	<i>-3.18</i>	<i>-3.87</i>
Hydrocarbon Gas Liquids .....	<b>-1.99</b>	<b>-1.86</b>	<b>-1.86</b>	<b>-2.03</b>	<b>-2.02</b>	<i>-2.12</i>	<i>-2.18</i>	<i>-1.99</i>	<i>-2.04</i>	<i>-2.23</i>	<i>-2.27</i>	<i>-2.13</i>	<b>-1.94</b>	<i>-2.08</i>	<i>-2.17</i>
Unfinished Oils .....	<b>0.31</b>	<b>0.25</b>	<b>0.34</b>	<b>0.19</b>	<b>0.14</b>	<i>0.39</i>	<i>0.45</i>	<i>0.30</i>	<i>0.21</i>	<i>0.26</i>	<i>0.30</i>	<i>0.20</i>	<b>0.27</b>	<i>0.32</i>	<i>0.24</i>
Other HC/Oxygenates .....	<b>-0.10</b>	<b>-0.05</b>	<b>-0.04</b>	<b>-0.04</b>	<b>-0.08</b>	<i>-0.07</i>	<i>-0.06</i>	<i>-0.07</i>	<i>-0.08</i>	<i>-0.06</i>	<i>-0.06</i>	<i>-0.07</i>	<b>-0.06</b>	<i>-0.07</i>	<i>-0.07</i>
Motor Gasoline Blend Comp. ....	<b>0.39</b>	<b>0.36</b>	<b>0.48</b>	<b>0.43</b>	<b>0.55</b>	<i>0.62</i>	<i>0.51</i>	<i>0.15</i>	<i>0.53</i>	<i>0.75</i>	<i>0.43</i>	<i>0.22</i>	<b>0.42</b>	<i>0.46</i>	<i>0.48</i>
Finished Motor Gasoline .....	<b>-0.72</b>	<b>-0.40</b>	<b>-0.58</b>	<b>-0.78</b>	<b>-0.66</b>	<i>-0.59</i>	<i>-0.60</i>	<i>-0.58</i>	<i>-0.77</i>	<i>-0.64</i>	<i>-0.76</i>	<i>-0.78</i>	<b>-0.62</b>	<i>-0.61</i>	<i>-0.74</i>
Jet Fuel .....	<b>-0.07</b>	<b>0.09</b>	<b>0.12</b>	<b>0.07</b>	<b>0.03</b>	<i>0.06</i>	<i>0.00</i>	<i>0.06</i>	<i>-0.04</i>	<i>0.01</i>	<i>0.10</i>	<i>0.16</i>	<b>0.05</b>	<i>0.04</i>	<i>0.06</i>
Distillate Fuel Oil .....	<b>-1.19</b>	<b>-0.86</b>	<b>-1.15</b>	<b>-0.74</b>	<b>-0.49</b>	<i>-0.76</i>	<i>-0.85</i>	<i>-0.52</i>	<i>-0.55</i>	<i>-0.98</i>	<i>-1.28</i>	<i>-1.11</i>	<b>-0.98</b>	<i>-0.66</i>	<i>-0.98</i>
Residual Fuel Oil .....	<b>-0.02</b>	<b>0.02</b>	<b>0.05</b>	<b>0.05</b>	<b>0.08</b>	<i>0.03</i>	<i>-0.01</i>	<i>0.05</i>	<i>-0.03</i>	<i>-0.07</i>	<i>-0.06</i>	<i>0.04</i>	<b>0.02</b>	<i>0.04</i>	<i>-0.03</i>
Other Oils (g) .....	<b>-0.65</b>	<b>-0.49</b>	<b>-0.49</b>	<b>-0.48</b>	<b>-0.49</b>	<i>-0.69</i>	<i>-0.61</i>	<i>-0.66</i>	<i>-0.55</i>	<i>-0.68</i>	<i>-0.71</i>	<i>-0.70</i>	<b>-0.52</b>	<i>-0.61</i>	<i>-0.66</i>
Product Inventory Net Withdrawals .....	<b>0.12</b>	<b>-0.91</b>	<b>-0.04</b>	<b>0.71</b>	<b>0.66</b>	<i>-0.20</i>	<i>-0.34</i>	<i>0.45</i>	<i>0.28</i>	<i>-0.58</i>	<i>-0.28</i>	<i>0.34</i>	<b>-0.03</b>	<i>0.14</i>	<i>-0.06</i>
Total Supply .....	<b>19.33</b>	<b>16.08</b>	<b>18.36</b>	<b>18.71</b>	<b>18.45</b>	<i>19.73</i>	<i>19.97</i>	<i>20.26</i>	<i>20.06</i>	<i>20.58</i>	<i>20.90</i>	<i>20.90</i>	<b>18.12</b>	<i>19.61</i>	<i>20.61</i>
<b>Consumption (million barrels per day)</b>															
Hydrocarbon Gas Liquids .....	<b>3.31</b>	<b>2.83</b>	<b>2.95</b>	<b>3.70</b>	<b>3.40</b>	<i>3.16</i>	<i>3.01</i>	<i>3.69</i>	<i>3.84</i>	<i>3.31</i>	<i>3.35</i>	<i>3.88</i>	<b>3.20</b>	<i>3.32</i>	<i>3.59</i>
Unfinished Oils .....	<b>0.14</b>	<b>0.11</b>	<b>0.01</b>	<b>0.03</b>	<b>0.05</b>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<b>0.07</b>	<i>0.01</i>	<i>0.00</i>
Motor Gasoline .....	<b>8.49</b>	<b>7.11</b>	<b>8.50</b>	<b>8.02</b>	<b>8.00</b>	<i>9.04</i>	<i>9.12</i>	<i>8.80</i>	<i>8.50</i>	<i>9.24</i>	<i>9.24</i>	<i>8.90</i>	<b>8.03</b>	<i>8.74</i>	<i>8.97</i>
Fuel Ethanol blended into Motor Gasoline .....	<b>0.85</b>	<b>0.72</b>	<b>0.87</b>	<b>0.84</b>	<b>0.82</b>	<i>0.95</i>	<i>0.93</i>	<i>0.90</i>	<i>0.86</i>	<i>0.94</i>	<i>0.94</i>	<i>0.92</i>	<b>0.82</b>	<i>0.90</i>	<i>0.92</i>
Jet Fuel .....	<b>1.56</b>	<b>0.69</b>	<b>0.97</b>	<b>1.09</b>	<b>1.13</b>	<i>1.33</i>	<i>1.47</i>	<i>1.50</i>	<i>1.50</i>	<i>1.63</i>	<i>1.78</i>	<i>1.79</i>	<b>1.08</b>	<i>1.36</i>	<i>1.68</i>
Distillate Fuel Oil .....	<b>3.97</b>	<b>3.51</b>	<b>3.70</b>	<b>3.92</b>	<b>3.97</b>	<i>4.07</i>	<i>4.04</i>	<i>4.23</i>	<i>4.28</i>	<i>4.22</i>	<i>4.15</i>	<i>4.25</i>	<b>3.78</b>	<i>4.08</i>	<i>4.22</i>
Residual Fuel Oil .....	<b>0.17</b>	<b>0.15</b>	<b>0.32</b>	<b>0.23</b>	<b>0.26</b>	<i>0.21</i>	<i>0.28</i>	<i>0.24</i>	<i>0.24</i>	<i>0.21</i>	<i>0.26</i>	<i>0.26</i>	<b>0.22</b>	<i>0.25</i>	<i>0.24</i>
Other Oils (g) .....	<b>1.68</b>	<b>1.68</b>	<b>1.91</b>	<b>1.71</b>	<b>1.63</b>	<i>1.91</i>	<i>2.05</i>	<i>1.79</i>	<i>1.72</i>	<i>1.96</i>	<i>2.12</i>	<i>1.83</i>	<b>1.75</b>	<i>1.85</i>	<i>1.91</i>
Total Consumption .....	<b>19.33</b>	<b>16.08</b>	<b>18.36</b>	<b>18.71</b>	<b>18.45</b>	<i>19.73</i>	<i>19.97</i>	<i>20.26</i>	<i>20.06</i>	<i>20.58</i>	<i>20.90</i>	<i>20.90</i>	<b>18.12</b>	<i>19.61</i>	<i>20.61</i>
<b>Total Petroleum and Other Liquids Net Imports</b> .....	<b>-1.13</b>	<b>0.14</b>	<b>-0.81</b>	<b>-0.81</b>	<b>-0.07</b>	<i>0.20</i>	<i>0.99</i>	<i>0.44</i>	<i>0.40</i>	<i>1.08</i>	<i>0.48</i>	<i>-0.09</i>	<b>-0.65</b>	<i>0.39</i>	<i>0.47</i>
<b>End-of-period Inventories (million barrels)</b>															
<b>Commercial Inventory</b>															
Crude Oil (excluding SPR) .....	<b>482.5</b>	<b>531.9</b>	<b>497.3</b>	<b>485.3</b>	<b>501.9</b>	<i>466.1</i>	<i>447.3</i>	<i>449.4</i>	<i>473.5</i>	<i>473.2</i>	<i>447.9</i>	<i>449.5</i>	<b>485.3</b>	<i>449.4</i>	<i>449.5</i>
Hydrocarbon Gas Liquids .....	<b>180.8</b>	<b>233.9</b>	<b>299.1</b>	<b>229.2</b>	<b>168.6</b>	<i>204.0</i>	<i>244.0</i>	<i>198.7</i>	<i>156.7</i>	<i>205.2</i>	<i>246.2</i>	<i>204.8</i>	<b>229.2</b>	<i>198.7</i>	<i>204.8</i>
Unfinished Oils .....	<b>100.1</b>	<b>91.9</b>	<b>81.4</b>	<b>78.2</b>	<b>93.3</b>	<i>89.5</i>	<i>89.8</i>	<i>83.0</i>	<i>93.1</i>	<i>90.8</i>	<i>89.8</i>	<i>83.1</i>	<b>78.2</b>	<i>83.0</i>	<i>83.1</i>
Other HC/Oxygenates .....	<b>33.6</b>	<b>26.2</b>	<b>25.2</b>	<b>29.9</b>	<b>29.1</b>	<i>25.5</i>	<i>25.3</i>	<i>25.6</i>	<i>27.7</i>	<i>26.4</i>	<i>26.1</i>	<i>26.4</i>	<b>29.9</b>	<i>25.6</i>	<i>26.4</i>
Total Motor Gasoline .....	<b>260.8</b>	<b>253.3</b>	<b>226.5</b>	<b>243.2</b>	<b>237.6</b>	<i>232.5</i>	<i>226.4</i>	<i>234.2</i>	<i>241.7</i>	<i>245.6</i>	<i>233.2</i>	<i>249.4</i>	<b>243.2</b>	<i>234.2</i>	<i>249.4</i>
Finished Motor Gasoline .....	<b>22.6</b>	<b>23.5</b>	<b>22.4</b>	<b>25.3</b>	<b>20.3</b>	<i>23.4</i>	<i>22.2</i>	<i>24.4</i>	<i>24.1</i>	<i>23.9</i>	<i>23.1</i>	<i>26.2</i>	<b>25.3</b>	<i>24.4</i>	<i>26.2</i>
Motor Gasoline Blend Comp. ....	<b>238.3</b>	<b>229.8</b>	<b>204.1</b>	<b>217.9</b>	<b>217.4</b>	<i>209.2</i>	<i>204.1</i>	<i>209.8</i>	<i>217.6</i>	<i>221.8</i>	<i>210.1</i>	<i>223.2</i>	<b>217.9</b>	<i>209.8</i>	<i>223.2</i>
Jet Fuel .....	<b>39.9</b>	<b>41.5</b>	<b>40.1</b>	<b>38.6</b>	<b>39.0</b>	<i>41.8</i>	<i>43.8</i>	<i>40.5</i>	<i>39.9</i>	<i>40.7</i>	<i>43.0</i>	<i>39.9</i>	<b>38.6</b>	<i>40.5</i>	<i>39.9</i>
Distillate Fuel Oil .....	<b>126.7</b>	<b>175.4</b>	<b>171.7</b>	<b>160.4</b>	<b>145.5</b>	<i>135.3</i>	<i>138.5</i>	<i>140.9</i>	<i>130.2</i>	<i>134.7</i>	<i>141.5</i>	<i>142.4</i>	<b>160.4</b>	<i>140.9</i>	<i>142.4</i>
Residual Fuel Oil .....	<b>34.4</b>	<b>39.6</b>	<b>32.1</b>	<b>30.2</b>	<b>30.9</b>	<i>33.2</i>	<i>31.3</i>	<i>32.5</i>	<i>32.0</i>	<i>32.7</i>	<i>31.0</i>	<i>32.4</i>	<b>30.2</b>	<i>32.5</i>	<i>32.4</i>
Other Oils (g) .....	<b>62.0</b>	<b>59.2</b>	<b>48.6</b>	<b>49.3</b>	<b>55.8</b>	<i>56.3</i>	<i>50.7</i>	<i>53.0</i>	<i>62.0</i>	<i>59.8</i>	<i>50.5</i>	<i>52.0</i>	<b>49.3</b>	<i>53.0</i>	<i>52.0</i>
Total Commercial Inventory .....	<b>1320.8</b>	<b>1452.8</b>	<b>1422.0</b>	<b>1344.3</b>	<b>1301.7</b>	<i>1284.3</i>	<i>1297.1</i>	<i>1257.7</i>	<i>1256.8</i>	<i>1309.2</i>	<i>1309.3</i>	<i>1279.8</i>	<b>1344.3</b>	<i>1257.7</i>	<i>1279.8</i>
Crude Oil in SPR .....	<b>635.0</b>	<b>656.0</b>	<b>642.2</b>	<b>638.1</b>	<b>637.8</b>	<i>620.1</i>	<i>620.1</i>	<i>615.8</i>	<i>611.5</i>	<i>607.3</i>	<i>604.6</i>	<i>594.9</i>	<b>638.1</b>	<i>615.8</i>	<i>594.9</i>

(a) Includes lease condensate.

(b) Crude oil production from U.S. Federal leases in the Gulf of Mexico (GOM).

(c) Net imports equals gross imports minus gross exports.

(d) Crude oil adjustment balances supply and consumption and was previously referred to as "Unaccounted for Crude Oil."

(e) Renewables and oxygenate production includes pentanes plus, oxygenates (excluding fuel ethanol), and renewable fuels. Beginning in January 2021, renewable fuels includes biodiesel, renewable diesel, renewable jet fuel, renewable heating oil, renewable naphtha and gasoline, and other renewable fuels. For December 2020 and prior, renewable fuels includes only biodiesel.

(f) Petroleum products adjustment includes hydrogen/oxygenates/renewables/other hydrocarbons, motor gasoline blend components, and finished motor gasoline.

(g) For net imports and inventories "Other Oils" includes aviation gasoline blend components, finished aviation gasoline,

**Table 5a. U.S. Natural Gas Supply, Consumption, and Inventories**  
 U.S. Energy Information Administration | Short-Term Energy Outlook - June 2021

	2020				2021				2022				Year		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2020	2021	2022
<b>Supply (billion cubic feet per day)</b>															
Total Marketed Production .....	<b>102.27</b>	<b>96.83</b>	<b>97.55</b>	<b>98.70</b>	<b>97.55</b>	99.36	99.76	100.44	100.30	100.68	101.58	102.10	<b>98.83</b>	99.29	101.17
Alaska .....	<b>0.96</b>	<b>0.88</b>	<b>0.88</b>	<b>0.98</b>	<b>1.02</b>	0.78	0.72	0.88	0.92	0.78	0.72	0.87	<b>0.92</b>	0.85	0.82
Federal GOM (a) .....	<b>2.72</b>	<b>2.22</b>	<b>1.72</b>	<b>1.73</b>	<b>2.27</b>	2.24	2.14	2.06	2.06	1.98	1.87	1.84	<b>2.09</b>	2.18	1.94
Lower 48 States (excl GOM) .....	<b>98.58</b>	<b>93.74</b>	<b>94.95</b>	<b>95.99</b>	<b>94.27</b>	96.33	96.89	97.50	97.32	97.92	98.98	99.39	<b>95.81</b>	96.26	98.41
Total Dry Gas Production .....	<b>94.79</b>	<b>89.68</b>	<b>89.83</b>	<b>91.15</b>	<b>90.53</b>	92.26	92.63	93.26	93.13	93.48	94.31	94.80	<b>91.35</b>	92.18	93.93
LNG Gross Imports .....	<b>0.24</b>	<b>0.12</b>	<b>0.09</b>	<b>0.09</b>	<b>0.15</b>	0.18	0.18	0.20	0.32	0.18	0.18	0.20	<b>0.13</b>	0.18	0.22
LNG Gross Exports .....	<b>7.92</b>	<b>5.52</b>	<b>3.91</b>	<b>8.78</b>	<b>9.27</b>	9.83	8.68	9.73	9.96	8.83	8.33	9.78	<b>6.53</b>	9.38	9.22
Pipeline Gross Imports .....	<b>7.60</b>	<b>6.08</b>	<b>6.39</b>	<b>7.27</b>	<b>8.64</b>	6.56	6.71	6.83	7.38	6.36	6.37	6.69	<b>6.84</b>	7.18	6.70
Pipeline Gross Exports .....	<b>8.15</b>	<b>7.17</b>	<b>8.09</b>	<b>8.18</b>	<b>8.30</b>	8.42	9.30	9.49	9.32	8.66	9.38	9.38	<b>7.90</b>	8.88	9.18
Supplemental Gaseous Fuels .....	<b>0.19</b>	<b>0.17</b>	<b>0.15</b>	<b>0.18</b>	<b>0.18</b>	0.17	0.18	0.18	0.18	0.18	0.18	0.18	<b>0.17</b>	0.18	0.18
Net Inventory Withdrawals .....	<b>12.74</b>	<b>-12.24</b>	<b>-7.68</b>	<b>5.36</b>	<b>17.19</b>	-9.69	-7.50	6.68	17.19	-11.70	-9.26	4.49	<b>-0.46</b>	1.62	0.12
Total Supply .....	<b>99.49</b>	<b>71.12</b>	<b>76.78</b>	<b>87.09</b>	<b>99.12</b>	71.24	74.22	87.92	98.90	71.01	74.08	87.19	<b>83.61</b>	83.07	82.74
Balancing Item (b) .....	<b>-0.18</b>	<b>-0.29</b>	<b>0.05</b>	<b>-1.01</b>	<b>0.11</b>	-0.53	-0.28	-0.15	-0.09	-0.02	0.63	-0.10	<b>-0.36</b>	-0.21	0.11
Total Primary Supply .....	<b>99.31</b>	<b>70.84</b>	<b>76.83</b>	<b>86.08</b>	<b>99.22</b>	70.70	73.94	87.78	98.81	70.99	74.72	87.09	<b>83.25</b>	82.85	82.85
<b>Consumption (billion cubic feet per day)</b>															
Residential .....	<b>22.83</b>	<b>8.20</b>	<b>3.82</b>	<b>16.00</b>	<b>25.59</b>	7.14	3.68	16.97	24.59	7.68	3.73	16.79	<b>12.70</b>	13.29	13.15
Commercial .....	<b>13.93</b>	<b>5.82</b>	<b>4.36</b>	<b>10.31</b>	<b>14.81</b>	6.67	4.73	10.87	14.83	6.24	4.65	10.79	<b>8.60</b>	9.25	9.11
Industrial .....	<b>24.65</b>	<b>20.62</b>	<b>21.15</b>	<b>23.83</b>	<b>24.08</b>	22.31	21.82	24.82	25.47	22.78	22.05	24.53	<b>22.56</b>	23.25	23.70
Electric Power (c) .....	<b>29.55</b>	<b>29.05</b>	<b>40.10</b>	<b>28.19</b>	<b>26.65</b>	27.07	36.34	27.39	26.05	26.86	36.86	27.15	<b>31.74</b>	29.39	29.25
Lease and Plant Fuel .....	<b>5.17</b>	<b>4.90</b>	<b>4.93</b>	<b>4.99</b>	<b>4.93</b>	5.02	5.04	5.08	5.07	5.09	5.14	5.16	<b>5.00</b>	5.02	5.12
Pipeline and Distribution Use .....	<b>3.02</b>	<b>2.15</b>	<b>2.33</b>	<b>2.61</b>	<b>3.01</b>	2.35	2.18	2.50	2.65	2.18	2.13	2.50	<b>2.53</b>	2.51	2.36
Vehicle Use .....	<b>0.16</b>	<b>0.10</b>	<b>0.13</b>	<b>0.13</b>	<b>0.14</b>	0.15	0.15	0.15	0.16	0.16	0.16	0.16	<b>0.13</b>	0.15	0.16
Total Consumption .....	<b>99.31</b>	<b>70.84</b>	<b>76.83</b>	<b>86.08</b>	<b>99.22</b>	70.70	73.94	87.78	98.81	70.99	74.72	87.09	<b>83.25</b>	82.85	82.85
<b>End-of-period Inventories (billion cubic feet)</b>															
Working Gas Inventory .....	<b>2,030</b>	<b>3,133</b>	<b>3,840</b>	<b>3,341</b>	<b>1,801</b>	2,682	3,372	2,757	1,210	2,275	3,126	2,714	<b>3,341</b>	2,757	2,714
East Region (d) .....	<b>385</b>	<b>655</b>	<b>890</b>	<b>763</b>	<b>313</b>	521	778	546	71	376	647	454	<b>763</b>	546	454
Midwest Region (d) .....	<b>472</b>	<b>747</b>	<b>1,053</b>	<b>918</b>	<b>395</b>	621	941	749	181	482	862	732	<b>918</b>	749	732
South Central Region (d) .....	<b>857</b>	<b>1,221</b>	<b>1,313</b>	<b>1,155</b>	<b>760</b>	1,037	1,076	975	609	904	1,000	959	<b>1,155</b>	975	959
Mountain Region (d) .....	<b>92</b>	<b>177</b>	<b>235</b>	<b>195</b>	<b>113</b>	177	224	184	124	170	234	212	<b>195</b>	184	212
Pacific Region (d) .....	<b>200</b>	<b>308</b>	<b>318</b>	<b>282</b>	<b>197</b>	302	329	280	201	318	360	333	<b>282</b>	280	333
Alaska .....	<b>23</b>	<b>25</b>	<b>31</b>	<b>28</b>	<b>23</b>	24	24	24	24	24	24	24	<b>28</b>	24	24

(a) Marketed production from U.S. Federal leases in the Gulf of Mexico.

(b) The balancing item represents the difference between the sum of the components of natural gas supply and the sum of components of natural gas demand.

(c) Natural gas used for electricity generation and (a limited amount of) useful thermal output by electric utilities and independent power producers.

(d) For a list of States in each inventory region refer to *Weekly Natural Gas Storage Report, Notes and Definitions* (<http://ir.eia.gov/hgs/notes.html>).

- = no data available

LNG: liquefied natural gas.

Notes: EIA completed modeling and analysis for this report on Thursday June 3 2021.

The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

**Historical data:** Latest data available from Energy Information Administration databases supporting the following reports: *Natural Gas Monthly*, DOE/EIA-0130; and *Electric Power Monthly*, Minor discrepancies with published historical data are due to independent rounding.

**Forecasts:** EIA Short-Term Integrated Forecasting System.

## Only The Strong Survive, Part 2 - How COVID-19 Reshaped The Future Of North American LNG Projects

Thursday, 06/03/2021

Published by: [Lindsay Schneider](#)

Global gas prices are in the midst of the longest and strongest bull run since 2018 and fundamentals appear supportive of sustaining the rally through at least the upcoming winter. The higher international prices relative to Henry Hub have buoyed demand for U.S. LNG exports. Existing terminals are operating at or near full capacity, and their combined feedgas demand has been steady, averaging more than 6 Bcf/d higher than this time last year when economic cargo cancellations from COVID-19 were heading towards their summer peak. The improved economics for delivering U.S. LNG to international destinations have also renewed interest in offtake agreements for a handful of the second wave of North American LNG projects that had been sidelined because of the pandemic (many others still are). These projects are taking advantage of the less crowded market, which gives them a realistic path forward to reach a final investment decision (FID). In today's blog, we continue the series on the status of the second wave of LNG projects.

We began this LNG project update in [Part 1](#) with a recap of the proposed facilities that have fallen by the wayside in the past year or so. Either they were officially placed on the back burner by their developers, lost funding (Kitimat LNG in Western Canada), were put on hold (Jordan Cove LNG), or in the case of Annova LNG, was even cancelled completely due to COVID and the ensuing economic meltdown. As we noted in the previous blog, still others have simply gone quiet and are by all indications out of the running, albeit unofficially, for achieving FIDs.

That whittling down of competing projects has left just a handful with improved prospects for securing offtaker commitments and reaching FID in the next few years. In our [LNG Voyager Quarterly supplement](#), we monitor the latest news and progress of 25 pre-FID projects (in addition to the operations, construction and commissioning status of the 10 LNG facilities that have already taken FID). We group them into the following categories: operational, under construction, pre-FID but "probable" for reaching FID in the next year, and "possible" but not likely to be greenlighted in the next year. Within the "possible" bucket, we further group them into Tier 1, Tier 2, and Tier 3, based on the likelihood that they will achieve FID in the next 1-3 years. The map in Figure 1 highlights the projects we currently designate as "probable" (dark orange), Tier 1 (light orange), Tier 2 (yellow).

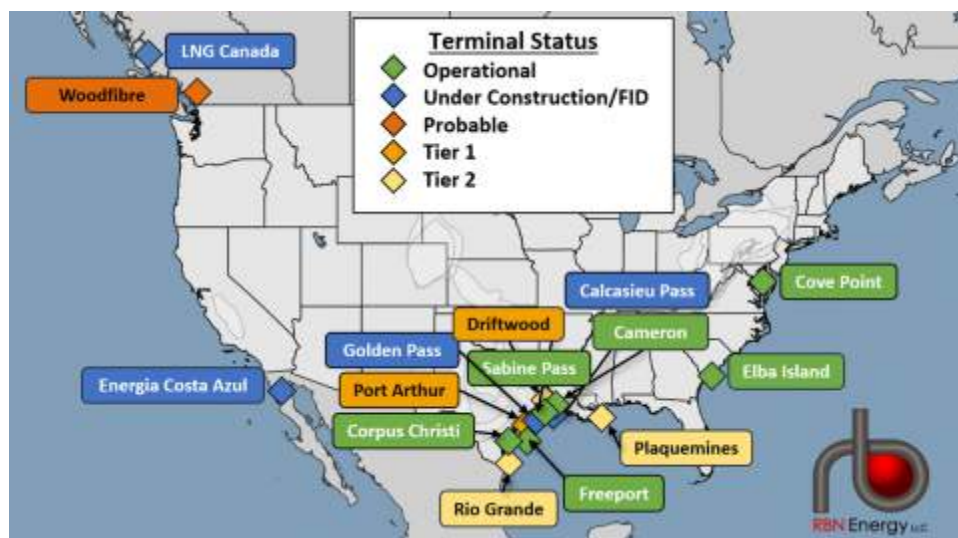


Figure 1. Map of Probable, Tier 1 and Tier 2 Pre-FID LNG Terminals. Source: [RBN LNG Voyager](#)

We began our review of the frontrunners in [Part 1](#) with an update on two projects that we categorize as "probable" — Woodfibre LNG and Cameron LNG Phase 2 — because they could realistically reach FID in the next six months. Next, we continue our update with a closer look at the other projects that have shown resilience and are signaling a realistic path toward FID in the next few years, putting them in the Tier 1 and Tier 2 brackets.



Specifically, there are four projects we place as Tier 1: Cheniere Energy’s Corpus Christi Stage III expansion, Sempra’s Port Arthur LNG, Freeport LNG Train 4, and Tellurian’s Driftwood LNG. And then, there are two projects we consider Tier 2: Venture Global’s Plaquemines LNG and NextDecade’s Rio Grande LNG. They have all of their regulatory approvals and at least one has got firm capacity commitments. Unlike the two “probable” projects, however, each of these needs to secure more commercial agreements in order to achieve FID. Figure 2 is an abbreviated version of a detailed project table from the LNG Voyager Quarterly and shows the number of trains, capacity, and current firm offtake commitments for each project.

Select North American Pre-FID LNG Export Projects								
Project	Developer	Region	Location	Trains	Capacity MMtpa	Capacity Bcf/d	SPAs MMtpa	Status
Woodfibre	Pacific Oil and Gas	British Columbia	Squamish, BC	1	2.1	0.3	1.5	Probable
Cameron T4-5	Sempra et al	Sabine River	Hackberry, LA	2	10.0	1.3	10 (credible, non-binding)	Probable
Corpus Christi Ph 3	Cheniere	Texas Gulf Coast	Corpus Christi, TX	7	9.5	1.3	1.7	Tier 1
Port Arthur Ph 1	Sempra	Sabine River	Port Arthur, TX	2	11.0	1.4	7.0	Tier 1
Freeport Train 4	Freeport LNG	Texas Gulf Coast	Freeport, TX	1	5.1	0.7	2.2	Tier 1
Driftwood Ph1	Tellurian	Sabine River	Calcasieu Parish, LA	12	16.6	2.2	8.5	Tier 1
Plaquemines Ph1	Venture Global	Louisiana Gulf Coast	Plaquemines, LA	36	10.0	2.8	3.5	Tier 2
Rio Grande	NextDecade	TX/Mexico Border	Brownsville, TX	5	22.5	3.0	2.0	Tier 2

Figure 2. Select North American Pre-FID LNG Projects. Source: [RBN LNG Voyager](#)

The top two Tier 1 projects — the Corpus Christi Stage III expansion and Port Arthur — are attractive projects being developed by two of the current major players in North American LNG, Cheniere and Sempra. While they are not top priority for their developers at present, both of these projects will likely go ahead.

Corpus Christi Stage III, a 9.5-MMtpa (1.3-Bcf/d) expansion of Cheniere’s operational terminal in South Texas, is the company’s only project currently in the pre-FID stage. However, Cheniere has excess unsold capacity at its existing terminals resulting from maintenance and optimization efforts. This has led to increased offtake capacity of about 7 MMtpa combined between its Sabine Pass and Corpus Christi terminals. Earlier this year, Cheniere said that 4 MMtpa was sold in deals ranging from 5 to 11 years, and on its latest earnings call, the company said all its cargoes for the remainder of this year had been sold. Cheniere is currently targeting additional short- and mid-term contracts for the excess capacity through its marketing arm, CMI, and is prioritizing that over the Corpus Christi expansion. These shorter-term SPAs are proving popular and, once Cheniere has locked up the mid-term capacity, which will likely be soon given the volumes it has already sold, it will probably shift its focus back to Corpus Christi Stage III. The project has 1.7 MMtpa secured in Integrated Production Management (IPMs), a new type of offtake agreement that Cheniere introduced for Corpus Christi Stage III, under which a U.S. gas producer provides the feedgas to the terminal and Cheniere produces and markets the LNG on its behalf. Cheniere is the powerhouse in North American LNG, and while the company appears to be in no rush, this project will almost certainly achieve FID eventually.

As for Sempra’s project, in the past, the company has found success in achieving FID by focusing on one project at a time. While ECA LNG was in the final stages of negotiating its offtake agreements, Sempra delayed FID on Cameron Phase 2 and Port Arthur. It is only now, after the FID on ECA LNG, that Sempra has shifted its focus to Cameron Phase 2, which, as we noted above, is now in our “probable” category (see [Part 1](#) for that discussion). It looks like the developer is now taking the same tack with its other two projects. Last month, Sempra said it is delaying FID on Port Arthur to 2022 while it works on the final pre-FID stages of Cameron Phase 2. It is likely that once it takes FID on Cameron Phase 2, the company will shift its attention back to furthering the 11-MMtpa (1.4 Bcf/d) Port Arthur terminal. With Sempra’s track record of success with ECA LNG and 7 MMtpa (63%) of Port Arthur’s slated capacity already secured in SPAs, this project is likely to take off eventually.

The remaining two projects in Tier 1 — Freeport Train 4 and Tellurian’s Driftwood LNG — are top priority for their respective developers. The Freeport Train 4 is a single-train expansion of the existing terminal and about half its capacity is already secured in an SPA. So, one more offtake agreement is likely all it needs before the company moves forward. However, this project has not reported any news in some time, and it is unclear what prospects Freeport is exploring for a final offtaker. That being said, as an existing terminal expansion with only one more commitment needed, the project could move quickly.

On the opposite end of the news spectrum, Tellurian has been incredibly vocal in support of its project, Driftwood LNG. At the beginning of May, the company said that it will finalize 12-15 MMtpa of commercial agreements in the next few weeks, and while that has not happened yet, the company is well on its way to making good on that promise with two new offtake agreements: a 3-MMtpa, 10-year SPA with Swiss trading firm Gunvor announced last week and another 3-MMtpa, 10-year agreement announced just yesterday with Vitol. The company previously had a binding agreement with Total (now called TotalEnergies) equivalent to 2.5 MMtpa of capacity, including 1 MMtpa in a traditional 20-year SPA and 1.5 MMtpa equity equivalent in the project. However, that deal expires at the end of June, and Tellurian has already said that the deal is not going ahead as it is currently written. We've left that capacity in Figure 2 for now but are waiting to see what the new terms are or if TotalEnergies walks away from the project all together. The project likely needs at least 12 MMtpa secured in binding agreements before taking FID.

The two projects in Tier 2, Venture Global's Plaquemines LNG and NextDecade's Rio Grande LNG, were originally two of the largest projects proposed, with around 22 MMtpa of capacity each — that's a lot of capacity that has to be sold before making an FID. With that in mind, Venture Global has begun focusing on just the first 10 MMtpa of the project and rebranding that as phase 1 in order to make FID more likely in the near-term, the idea being that it would revisit the second half of the project as an expansion if there is still appetite for the incremental capacity. Plaquemines has 3.5 MMtpa sold currently, with a more manageable 6.5 MMtpa left in capacity, rather than 17 MMtpa, making an FID more achievable in the near term.

That leaves Rio Grande as the only project among the Tier 1 and 2 facilities on our list that is wholly a greenfield endeavor and still intact (i.e., not split into phases). That means it has much more capacity to sell than the other projects on the list. However, NextDecade is banking on attracting offtakers by making the terminal the greenest in North America, if not the world. Specifically, it has proposed a carbon capture and storage system for the terminal capable of processing and storing as much as 5 million mt/year of the CO<sub>2</sub> produced by the terminal. It's the first such system proposed for a North American LNG terminal. It's an expensive bet, but one that could pay off as offtakers are increasingly interested in reducing their carbon footprints. With that in mind, Venture Global has also begun exploring carbon capture, albeit on a smaller scale, and last week announced that it was developing a carbon capture system to be shared between its two Louisiana projects: the under-construction project Calcasieu Pass and Plaquemines, subject to regulatory approval. The system would capture 500,000 tons/year of CO<sub>2</sub> for injection into a nearby reservoir already under development in southern Louisiana.

The past year has reshaped the future of LNG and the projects that have survived have done so by learning to adapt. Offtake agreements and project development look different now than they did prior to COVID. The Tier 1 and 2 projects, along with the two probable projects, Woodfibre and Cameron LNG, and the most recent project to take FID, Sempra's ECA LNG, are well-positioned in part because of their ability to navigate four emerging trends that are key for offtaker agreements in the post-COVID era: shorter contract terms, increased pricing diversity, reduced environmental impact, and a prioritization of brownfield expansions or, in the case of greenfield projects, a phased approach. In Part 3, we'll wrap up the series by diving into these themes and how the second-wave projects are adapting their development and capacity agreements in order to achieve FID.

"Only the Strong Survive" was written by Jerry Butler, Kenny Gamble, and Leon Huff. It was the third song on Butler's 11th studio album, *The Ice Man Cometh*. It was released as a single in March 1969 and went to #1 on the Hot R&B Singles chart and #4 on the Billboard Hot 100 Singles chart. It was the most successful single of Butler's career, and it has been certified Gold by the Recording Industry Association of America. Artists such as Elvis Presley, Skeeter Davis, Billy Paul, and The Trammps have covered the song. Personnel on the record were: Jerry Butler (lead vocals), Curtis Mayfield (lead guitar), Norman Harris, Bobby Eli (guitar), Ronnie Baker (bass), Earl Young (drums), Leon Huff (piano), and Vince Montana (vibes).

*The Ice Man Cometh* was recorded between September 1967 and September 1968 at Bell Sound Studio in New York City and Cameo-Parkway Studios and Sigma Sound Studio in Philadelphia. Kenny Gamble and Leon Huff produced the record. Released in November 1968, it went to #2 on the R&B Album chart and #29 on the Billboard Top 200 Albums chart. Three singles were released from the album.

Jerry Butler is an American soul singer, songwriter, record producer, musician, and retired politician. He was the original lead vocalist for The Impressions and was inducted with the R&B group into the Rock and Roll Hall of Fame in 1991. Since leaving the group in 1960 to pursue the career of a solo artist, Butler has had over 50 charting Billboard hits. He was inducted into the Rhythm and Blues Hall of Fame in 2015. From 1985 to 2018, he served as a commissioner for Cook County, Illinois. He has released 34 studio albums and 75 singles as a solo artist. Butler, 81, is now retired and lives in Chicago.



## Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?

Posted Wednesday April 28, 2021. 9:00 MT

The next six months will determine the size and length of the new LNG supply gap that is hitting harder and faster than anyone expected six months ago. Optimists will say the Mozambique government will bring sustainable security and safety to the northern Cabo Delgado province and provide the confidence to Total to quickly get back to LNG development such that its LNG in-service delay is a matter of months and not years. We hope so for Mozambique's domestic situation, but will it be that easy for Total's board to quickly look thru what just happened? Total suspended LNG development for 3 months, restarted development on March 25, but then 3 days of violence led it to suspend development again on March 28, and announce force majeure on Monday April 26. Even if the optimists are right, Mozambique LNG is counted on for LNG supply and the major LNG supply project that are in LNG supply forecasts are now all delayed – Total Phase 1 of 1.7 bcf/d and its follow on Phase 2 of 1.3 bcf/d, and Exxon's Rozuma Phase 1 of 2.0 bcf/d. It is important to remember this 5.0 bcf/d of major LNG supply is being counted in LNG supply forecasts and starting in 2024. At a minimum, we think the more likely scenario is a delay of at least 2 years in this 5.0 bcf/d from the pre-Covid timelines. And this creates a much bigger and sooner LNG supply gap starting ~2025 and stronger outlook for LNG prices. Thermal coal in Asia will play a role in keeping a lid on LNG prices. But there will be the opportunity for LNG suppliers to at least review the potential for brownfield LNG projects to fill the growing supply gap. The thought of increasing capex was a non-starter six months ago, but there is a much stronger outlook for global oil and gas prices. Oil and gas companies are pivoting from cutting capex to small increases in 2021 capex and expecting for higher capex in 2022. We believe this sets the stage for looking at potential FID of brownfield LNG projects before the end of 2021 to be included in 2022 capex budgets. Mozambique is causing an LNG supply gap that someone will try to fill. And if brownfield LNG is needed, what about Shell looking at 1.8 bcf/d brownfield LNG Canada Phase 2? Cdn natural gas producers hope so as this would mean more Cdn natural gas will be tied to Asian LNG markets and not competing in the US against Henry Hub.

Total declares force majeure on Mozambique LNG, Yesterday, Total announced [LINK](#) "Considering the evolution of the security situation in the north of the Cabo Delgado province in Mozambique, Total confirms the withdrawal of all Mozambique LNG project personnel from the Afungi site. This situation leads Total, as operator of Mozambique LNG project, to declare force majeure. Total expresses its solidarity with the government and people of Mozambique and wishes that the actions carried out by the government of Mozambique and its regional and international partners will enable the restoration of security and stability in Cabo Delgado province in a sustained manner". Total is working Phase 1 is ~1.7 bcf/d (Train 1 + 2, 6.45 mtpa/train) and was originally expected to being LNG deliveries in 2024. There was no specific timeline for Phase 2 of 1.3 bcf/d (Train 3 + 4, 5.0 mtpa/train), but was expected to follow Phase 1 in short order to keep capital costs under control with a continuous construction process with a potential onstream shortly after 2026.

## Total Mozambique Phase 1 and 2



Source: Total Investor Day September 24, 2019

Total's Mozambique force majeure is no surprise, especially the need to the restoration of security and stability "in a sustained manner". Yesterday, Total announced [\[LINK\]](#) "*Considering the evolution of the security*". No one should be surprised by the force majeure or the sustained manner caveat. SAF Group posts a weekly Energy Tidbits research memo [\[LINK\]](#), wherein we have, in multiple weekly memos, that Total had shut down development in December for 3 months due to the violent and security risks. It restarted development on Wed March 24, violence/attacks immediately resumed for 3 consecutive days, and then Total suspended development on Sat March 27. Local violence/attacks shut development down in Dec, the situation gets settled enough for Total to restart in March, only to be shut down 3 days thereafter. No one should be surprised especially with Total's need to see security and stability "in a sustained manner".

Does anyone really think Total will risk another quick 2-3 month restart or even in 2021? The Mozambique government will be working hard to convince Total to restart soon. We just find it hard to believe Total board will risk a replay of March 24-27 in 2021. Unfortunately, Mozambique has had internal conflict for years. It reached a milestone to the positive in August 2019. Our SAF Group August 11, 2019 Energy Tidbits memo [\[LINK\]](#) highlighted the signing of a peace pact between Mozambique President Nyusi and leader of the Renamo opposition Momade. This was the official end to a 2013 thru 2016 conflict following a failure to hold up the prior peace pact. At that time, FT reported [\[LINK\]](#) "Mr Nyusi has said that *"the government and Renamo will come together and hunt" rebels who fail to disarm. The government has struggled to stem the separate insurgency in the north, which has killed or displaced hundreds near the gas-rich areas during the past two years. While the roots of the conflict remain murky, it is linked to a local Islamist group and appears to be drawing on disaffection over sharing gas investment benefits, say analysts.*" This is just a reminder this is not a new issue. LNG is a game changer to Mozambique's economic future. It is, but also has been, a government priority to have the security and safety for Total and Exxon to move on their LNG developments. Its hard to believe the Mozambique government will be able to quickly convince Total and Exxon boards that they can be comfortable there is a sustained security/safety situation and they can send their people back in to develop the LNG. Total's board would allow any resumption of development before year end 2021. The last thing Total wants is a replay of March 24-27. The first question is how long will it take before the Total board is convinced its safe to restart. Could you imagine them doing a replay of what just happened? Wait three months, restart development and have to stop again right away? We have to believe that could lead the Total board to believe it is unfixable for years. We just don't think they are to prepared to risk that decision in 3 months. Its why we have to think there isn't a restart approval until at least in 2022 at the earliest ie. why we think the likely scenario is a delay of 2-3 years, and not a matter of months.

Mozambique's security issues pushes back 5.0 bcf/d of new LNG supply at least a couple years. The global LNG issue is that 5 bcf/d of new Mozambique LNG supply (apart from the Eni Coral FLNG of 0.45 bcf/d) won't start up in 2024 and

continuing thru the 2020s. And we believe all LNG forecasts included this 5.0 bcf/d to be in service in the 2020s as Mozambique had been considered the best positioned LNG supply to access Asia after Australia and Papua New Guinea. (i) Eni Coral Sul (Rovuma Basin) FLNG of 0.45 bcf/d planned in service in 2022. [\[LINK\]](#) This is an offshore floating LNG vessel that is still expected to be in service in 2022. (ii) Total Phase 1 to add 1.7 bcf/d with an in service originally planned for 2024. We expect the in service date to be pushed back to at least 2026 assuming Total gives a development restart approval in Dec 2021. In theory, this would only be a 1 year loss of time. However, Total has let services go, the project will be idle for 9 months, it isn't clear if the need to get people out quickly let them do a complete put the project on hold, and how many people will be on site maintaining the status of the development during the force majeure. Also what new procedures and safety will be put in place for a restart. These all mean there will be added time needed to get the project back to where it was when force majeure was declared ie. why we think a 12 month time delay will be more like an 18 month project delay. (iii) Exxon's Rozuma Phase 1 LNG will add 2.0 bcf/d and, pre-Covid, was expected to be in service in 2025. We believe the delays related to security and safety at Total are also going to impact Exxon. We find it highly unlikely the Exxon board would take a different security and safety decision than Total. Pre-pandemic, Exxon's March 6, 2019 Investor Day noted their operated Mozambique Rovuma LNG Phase 1 was to be 2 trains each with 1.0 bcf/d capacity for total initial capacity of 2.0 bcf/d with FID expected in 2019 and first LNG deliveries in 2024. The 2019 FID expectation was later pushed to be expected just before the March 2020 investor day. But the pandemic hit, and on March 21, 2020, we tweeted [\[LINK\]](#) on the Reuters story "*Exclusive: Coronavirus, gas slump put brakes on Exxon's giant Mozambique LNG plan*" [\[LINK\]](#) that noted Exxon was expected to delay the Rovuma FID. There was no timeline, but the expectation was that FID would now be in 2022 (3 years later than original timeline) and that would push first LNG likely to 2027. (iv) Total Phase 2 was to add 1.3 bcf/d. There was no firm in service date but it was expected to follow closely behind Phase 1 to maintain services. That would have put it originally in the 2026/2027 period. But if Phase 1 is pushed back 2 years, so will Phase 2 so more likely 2028/2029.. (v) Total Phase 1 + 2 and Exxon Rozuma Phase 1 total 5.0 bcf/d and would have been (and still are) in all LNG supply forecasts for the 2020s. (vi) We aren't certain if the LNG supply forecasts include Exxon Rozuma Phase 2, which would be an additional 2.0 bcf/d on top of the 5.0 bcf/d noted above. Exxon Rozuma has always been expected to be at least 2 Phases. This has been the plan since the Anadarko days given the 85 tcf size of the resource on Exxon's Area 4. There was no firm in service data for Phase 2, but it was expected they would also closely follow Phase 1 to maintain services. We expect that original timeline would have been 2026/2027 and that would not be pushed back to 2029/2030. (vii) It doesn't matter if its only 5 bcf/ of Mozambique that is delayed 2 to 3 years, it will cause a bigger LNG supply gap and sooner. The issue for LNG markets is this is taking projects that are in development effectively out of the queue for some period.

## Exxon Mozambique LNG

LIPSTREAM MOZAMBIQUE  
Five outstanding developments



Source: Exxon Investor Day March 6, 2019

Won't LNG and natural gas get hit by Biden's push for carbon free electricity? Yes, in the US. For the last 9 months, we have warned on Biden's climate change plan that were his election platform and now form his administration's energy transition map. We posted our July 28, 2020 blog "*Biden To Put US On 'Irreversible Path to Achieve Net-Zero Emissions, Economy-Wide'*" Is a Major Negative To US Natural Gas in 2020s "[\[LINK\]](#) on Biden's platform "*The Biden Plan to Build a Modern, Sustainable Infrastructure and an Equitable Clean Energy Future*" [\[LINK\]](#). Biden's new American Jobs Plan

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[\[LINK\]](#) lines up with his campaign platform including to put the US “on the path to achieving 100 percent carbon-free electricity by 2035.” Our July 28, 2020 blog noted that it would require replacing ~60% of US electricity generation with more renewable and it could eliminate ~40% (33.5 bcf/d) of 2019 US natural gas consumption. If Biden is 25% successful by 2030, it would replace ~6.3 bcf/d of natural gas demand. It would be a negative to US natural gas and force more US natural gas to export markets. The wildcard when does US natural gas start to decline if producers are faced with the reality of natural gas being phased out for electricity. The other hope is that when Biden says “carbon-free”, its not what ends up in the details of any formal policy statement ie. carbon electricity will be allowed with Biden’s push for CCS.

Will Cdn natural gas be similarly hit by if Trudeau move to “emissions free” and not “net zero emissions” electricity? Yes and No. Our SAF Group April 25, 2021 Energy Tidbits memo [\[LINK\]](#) was titled ““Bad News For Natural Gas, Trudeau’s Electricity Goal is Now 100% “Emissions Free” And Not “Net Zero Emissions””. On Thursday, PM Trudeau spoke at Biden’s global climate summit [\[LINK\]](#) and looks like he slipped in a new view on electricity than was in last Monday’s budget and his Dec climate plan. Trudeau said “In Canada, we’ve worked hard to get to over 80% emissions-free electricity, and we’re not going to stop until we get to 100%.” Speeches, especially ones made on a global stage are checked carefully so this had to be deliberate. Trudeau said “emissions free” and not net zero emissions electricity. It seems like this language is carefully written to exclude any fossil fuels as they are not emissions free even if they are linked to CCS. Recall in Liberals big Dec 2020 climate announcement [\[LINK\]](#), Liberals said ““Work with provinces, utilities and other partners to ensure that Canada’s electricity generation achieves net-zero emissions before 2050.” There is no way Trudeau changed the language unless he meant to do so. And this is a major change as it would seem to indicate his plan to eliminate all fossil fuels used for electricity. If so this would be a negative to Cdn natural gas that would be stuck within Western Canada and/or continuing to push into the US when Biden is trying to switch to carbon free electricity. We recognize that there is still some ambiguity in what will be the details of policy and the Liberals aren’t changing to no carbon sourced electricity at all. Let’s hope so. But let’s also be careful that politicians don’t change language without a reason or at least with a view to setting up for some future hit. Plus Trudeau had a big warning in that same speech saying “we will make it law to respect our new 2030 target and achieve net-zero emissions by 2050”. They plan to make it the law that Canada has to be on track for the Liberals 2030 emissions targets. This means that the future messaging will be that the Liberals have no choice but to take harder future emissions actions as it is the law. They will be just obeying the law as they will be obligated to obey the law. Everyone knows the messaging will be we have to do more get to Net Zero, that in itself will inevitably mean it will be the law if he actually does move to eliminate any carbon based electricity. So yes it’s a negative, that is unless more Cdn natural gas can be exported via LNG to Asia. We believe this would be a plus to be priced against global LNG instead of Henry Hub.

Biden’s global climate summit reminded there is too much risk to skip over natural gas as the transition fuel. Apart from the US and Canada, we haven’t seen a sea shift to eliminating natural gas for power generation, especially from energy import dependent countries. There is a strong belief that hydrogen and battery storage will one day be able to scale up at a competitive cost to lead to the acceleration away from fossil fuels. But that time isn’t yet here, at least not for energy import dependent countries. One of the key themes from last week’s leader’s speeches at the Biden global climate summit – to get to Net Zero, the world is assuming there will be technological advances/discoveries that aren’t here today and that have the potential to immediately ramp up in scale. IEA Executive Director Faith Birol was blunt in his message [\[LINK\]](#) saying “Right now, the data does not match the rhetoric – and the gap is getting wider.” And “IEA analysis shows that about half the reductions to get to net zero emissions in 2050 will need to come from technologies that are not yet ready for market. This calls for massive leaps in innovation. Innovation across batteries, hydrogen, synthetic fuels, carbon capture and many other technologies. US Special Envoy for Climate John Kerry said a similar point that half of the emissions reductions will have to come from technologies that we don’t yet have at scale. UK PM Johnson [\[LINK\]](#) didn’t say it specifically, but points to this same issue saying “To do these things we’ve got to be constantly original and optimistic about new technology and new solutions whether that’s crops that are super-resistant to drought or more accurate weather forecasts like those we hope to see from the UK’s new Met Office 1.2bn supercomputer that we’re investing in.” It may well be that the US and other self sufficient energy countries are comfortable going on the basis of assuming technology developments will occur on a timely basis. But, its clear that countries like China, India, South Korea and others are not prepared to do so. And not prepared to have the confidence to rid themselves of coal power generation. This is why there hasn’t been any material change in the LNG demand outlook



We expect the IEA's blunt message that the gap is getting wider will be reinforced on May 18. We have had a consistent view on the energy transition for the past few years. We believe it is going to happen, but it will take longer, be a bumpy road and cost more than expected. This is why we believe the demise of oil and natural gas won't be as easy and fast as hoped for by the climate change side. The IEA's blunt warning on the gap widening should not be a surprise as they warned on this in June 2020. Birol's climate speech also highlighted that the IEA will release on May 18 its roadmap for how the global energy sector can reach net zero by 2050. Our SAF Group June 11, 2020 blog "[Will The Demise Of Oil Take Longer, Just Like Coal? IEA and Shell Highlight Delays/Gaps To A Smooth Clean Energy Transition](#)" [\[LINK\]](#) feature the IEA's June 2020 warning that the critical energy technologies needed to reduce emissions are nowhere near where they need to be. In that blog, we said "there was an excellent illustration of the many significant areas, or major pieces of the puzzle, involved in an energy transition by the IEA last week. The IEA also noted the progress of each of the major pieces and the overall conclusion is that the vast majority of the pieces are behind or well behind where they should be to meet a smooth timely energy transition. It is important to note that these are just what the IEA calls the "critical energy technologies" and does not get into the wide range of other considerations needed to support the energy transition. The IEA divides these "critical energy technologies" into major groupings and then ranked the progress of each of these pieces in its report "[Tracking Clean Energy Progress](#)" [\[LINK\]](#) by on track, more efforts needed, or not on track". Our blog included the below IEA June 2020 chart.

**IEA's Progress Ranking For "Critical Energy Technologies" For Clean Energy Transition**



Source: IEA

● On Track      ● More Efforts Needed      ● Not on Track

Source: IEA Tracking Clean Energy Progress, June 2020

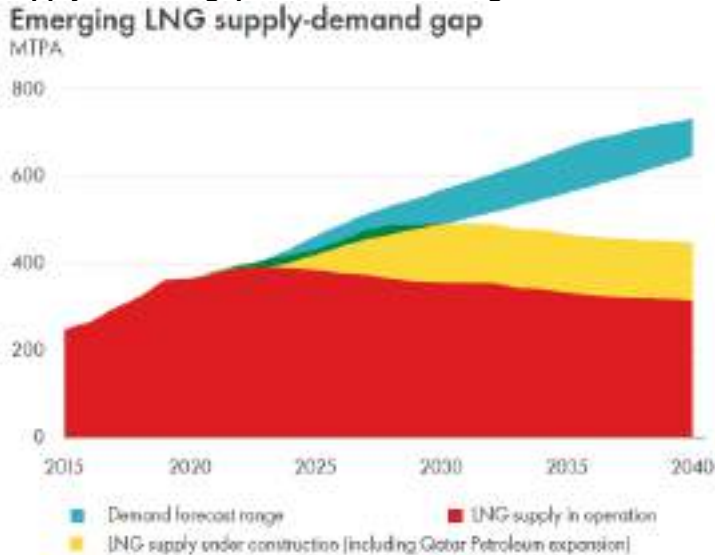
We are referencing [Shell's long term outlook for LNG](#). We recognize there are many different forecasts for LNG, but are referencing Shell' LNG Outlook 2021 from Feb 25, 2021 for a few reasons. (i) Shell's view on LNG is the key view for when and what decision will be made for LNG Canada Phase 2. (ii) Shell is one of the global leaders in LNG supply and trading. (iii) Shell provides on the record LNG outlooks every year so there is the ability to compare and make sure the outlook fits the story. It does. (iv) Shell, like other supermajors, has had to make big capex cuts post pandemic and that certainly wouldn't put any bias to the need for more capex.

[Shell's March 2021 long term outlook for LNG demand was basically unchanged vs 2020 and leads to a LNG supply gap in mid 2020s](#). Shell does not provide the detailed numbers in their Feb 25, 2021 LNG forecast. We would assume they

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would have reflected some delay, perhaps 1 year, at Mozambique but would be surprised if they put a 2-3 year delay in for the 5 bcf/d from Total Phase 1 +2 and Exxon Rozuma Phase 1. Compared to their LNG Outlook 2020, it looks like there was no change for their estimate of global natural gas demand growth to 2040, which looked relatively unchanged at approx. 5,000 bcm/yr or 484 bcf/d. Similarly, long term LNG demand looked unchanged to 2040 of ~700 mm tonnes (92 bcf/d) vs 360 mm tonnes (47 bcf/d) in 2020. In the 2021 outlook, Shell highlighted that the pandemic delayed project construction timelines and that the “*lasting impact expected on LNG supply not demand*”. And that Shell sees a LNG “*supply-demand gap estimated to emerge in the middle of the current decade as demand rebounds*”. Comparing to 2020, it looks like the supply-demand gap is sooner.

### Supply-demand gap estimated to emerge in the middle of the current decade



Mozambique delays are redefining the LNG markets for the 2020s: Delaying 5 bcf/d of Mozambique new LNG supply 2-3 years means a much bigger supply gap starting in 2025. Even if the optimists are right, there are now delays to all major Mozambique LNG supply from LNG supply forecasts. We don't have the detail, but we believe all LNG forecasts, including Shell's LNG Outlook 2021, would have included Total's Phase 1 and Phase 2 and Exxon Rozuma Phase 1. As noted earlier, we believe that the likely impact of the Mozambique security concerns is that these forecasts would likely have to push back 1.7 bcf/d from Total Phase 1 to at least 2026, 2.0 bcf/d Exxon Rozuma Phase 1 to at least 2027, and 1.3 bcf/d Total Phase 2 to at least 2028/2029 with the real risk these get pushed back even further. 5.0 bcf/d is equal to 38 mtpa. These delays would mean there is an increasing LNG supply gap in 2025 and increasingly significantly thereafter. And even if a new greenfield LNG project is FID's right away, it wouldn't be able to step in to replace Total Phase 1 prior startup timing for 2024 or likely the market at all until at least 2027. Its why the decision on filling the gap will fall on brownfield LNG projects.

### And does this bigger, nearer supply gap force LNG players to look at what brownfield LNG projects they could advance?

A greenfield LNG project would likely take at least until 2027 to be in operations. Its why we believe the Mozambique delays will effectively force major LNG players to look to see if there are brownfield LNG projects they should look to advance. Prior to the just passed winter, no one would think Shell or other major LNG players would be considering any new LNG FIDs in 2021. All the big companies are in capital reduction mode and debt reduction mode. But Brent oil is now solidly over \$60 and LNG prices hit record levels in Jan and the world's economic and oil and gas demand outlook are increasing with vaccinations. And we are starting to see companies move to increasing capex with the higher cash flows. We would not expect any major LNG players to move to FID right away. But we see them watching to see if 2021 plays out to still support this increasing LNG supply gap. And unless new mutations prevent vaccinations from returning the world to normal, we suspect that major LNG players, like other oil and gas companies, will be looking to increase

capex as they approve 2022 budgets. The outlook for the future has changed dramatically in the last 5 months. The question facing Shell and others, should they look to FID new LNG brownfield projects in the face of an increasing LNG supply gap that is going to hit faster and harder than expected a few months ago. We expect these decisions to be looked at before the end of 2021. LNG prices will be stronger, but we expect the limiting cap in Asia will be that thermal coal will be used to mitigate some LNG price pressure.

Back to Shell, does increasing LNG supply gap provide the opportunity to at least consider a LNG Canada Phase 2 FID over the next 9 months? Shell is no different than any other major LNG supplier in always knowing the market and that the oil and gas outlook is much stronger than 6 months ago. No one has been or is talking about this Mozambique impact and how it will at least force major LNG players to look at if they should FID new brownfield LNG projects to take advantage of this increasing supply gap. We don't have any inside contacts at Shell or LNG Canada, but that is no different than when we looked at the LNG markets in September 2017 and saw the potential for Shell to FID LNG Canada in 2018. We posted a September 20, 2017 blog "*China's Plan To Increase Natural Gas To 10% Of Its Energy Mix Is A Global Game Changer Including For BC LNG*" [\[LINK\]](#). Last time, it was a demand driven supply gap, this time, it's a supply driven supply gap. We have to believe any major LNG player, including Shell, will be at least looking at their brownfield LNG project list and seeing if they should look to advance FID later in 2021. Shell has LNG Canada Phase 2, which would add 2 additional trains or approx. 1.8 bcf/d. And an advantage to an FID would be that Shell would be able to commit to its existing contractors and fabricators for a continuous construction cycle following on LNG Canada Phase 1 ie. to help keep a lid on capital costs. No one is talking about the need for these new brownfield LNG projects, but, unless Total gets back developing Mozambique and keeps the delay to a matter of months, its inevitable that these brownfield LNG FID internal discussions will be happening in H2/21. Especially since the oil and gas price outlook is much stronger than it was in the fall and companies will be looking to increase capex in 2022 budgets

A LNG Canada Phase 2 would be a big plus to Cdn natural gas. A LNG Canada Phase 2 FID would be a big plus for Cdn natural gas. It would allow another ~1.8 bcf/d of Cdn natural gas to be priced against Asian LNG prices and not against Henry Hub. And it would provide demand offset versus Trudeau if he moves to make electricity "emissions free" and not his prior "net zero emissions". Mozambique may be in Africa, but, unless sustained peace and security is attained, it is a game changer to LNG outlook creating a bigger and sooner LNG supply gap. And with a stronger tone to oil and natural gas prices in 2021, the LNG supply gap will at least provide the opportunity for Shell to consider FID for its brownfield LNG Canada Phase 2 and provide big support to Cdn natural gas for back half of the 2020s. And perhaps if LNG Canada is exporting 3.6 bcf/d from two phases, it could help flip Cdn natural gas to a premium to US natural gas especially if Biden is successful in reducing US domestic natural gas consumption for electricity. The next six months will be very interesting to watch for LNG markets.



## Trinidad aims for pre-Covid gas levels by 2022

Published date: 09 June 2021

Share:

Trinidad and Tobago is aiming to restore natural gas production to pre-Covid-19 levels by the end of 2022, energy minister Stuart Young said.

More than 1 Bcf/d of production will come from offshore developments by foreign producers BP, Shell, BHP and EOG, Young told an Energy Chamber conference this week.

The government will encourage further development over the next 12 months with licensing rounds for deepwater, shallow-water and onshore acreage, he said.

Gas production was running at 3.62 Bcf/d in March 2020, but has since fallen because of a pandemic-induced decline in demand. Output 2.81 Bcf/d in the first quarter of 2021 was down by 18.7pc year on year.

Young's projection suggests end-2022 production could approach 4 Bcf/d, replenishing supply to [LNG exporter Atlantic](#) and [petrochemical plants](#).

Anglo-Australian BHP's Ruby development, commissioned in May, will deliver 80mn cf/d by the third quarter, the company's head of finance for Trinidad Soraya Khan told the conference.

Another 600mn cf/d will come from BP's Matapal and Cassia compression projects off the southeast coast of Trinidad starting in 2022, the UK major says.

Shell's Barracuda project in the east coast marine area and Colibri in the north coast marine area are projected to produce a combined 450mn cf/d by 2022, the company's manager for Trinidad upstream assets Ronald Adams said.

"Beyond 2022 there is a bank of upstream gas projects on land and in the shallow and moderate marine areas that are awaiting sanctioning," Young told the conference.

"These projects have the potential to produce up to 1.8 Bcf/d. In addition, there are the deepwater gas resources of BHP's Calypso project that are being appraised but are estimated with a potential production of 600mn to 1 Bcf/d."

The government is in "advanced negotiations" with Shell about contract terms for the Manatee field on the maritime border with Venezuela, Young said.

Manatee is "great prospect" with estimated recoverable resources of 2.7 Tcf, Adams said.

Trinidad still has "considerable" gas resources to be utilized, prime minister Keith Rowley told the conference.

"While oil may be up against a clock with less time on it, there is still significant potential for natural gas."

By Canute James

## Strong emissions reduction targets approved for next stage of Pluto LNG

8/06/2021 6:00 AM

- Pluto LNG project now subject to a 30 per cent emissions reduction target by 2030 and targeting net-zero emissions by 2050

- New Greenhouse Gas Abatement Program applies to entire project, including existing Train 1 and proposed Train 2

- Decision made following expert, independent advice from the Environmental Protection Authority
- The Minister has now requested the EPA review Woodside's Ministerial Statement to reflect the revised program, ensuring strengthened compliance with the new targets

Environment Minister Amber-Jade Sanderson has approved Pluto LNG's new Greenhouse Gas Abatement Program (GGAP), significantly reducing the project's projected carbon impact and providing another step towards the development of a second train at the facility.

The decision has been made following expert, independent advice from the Environmental Protection Authority.

Approvals for the construction and operation of two trains at the Pluto LNG project were granted in December 2007.

The enhanced GGAP includes:

- interim and long-term targets to achieve a 30 per cent emissions reduction from approved levels by 2030 and net-zero by 2050 across the entire project;
- measures to support achievement of long-term targets;
- a requirement to offset any shortfall in meeting the interim targets, including details of how these offsets will meet contemporary standards; and
- additional reporting requirements.

These new requirements apply to the entire Pluto LNG project - representing a significant reduction in emissions for both the existing Train 1 and new Train 2 from levels approved in 2007.

The new GGAP outlines the efficiency measures to achieve a reduction in greenhouse gas emissions of approximately 1.2 million tonnes per annum less than the original approval by 2030 for a two-train facility.

With the new GGAP now in place, the Minister has asked the Environmental Protection Authority to inquire into and report on the greenhouse gas emissions condition in the project's Ministerial Statement.

This work aims to contemporise the conditions under which the project operates to reflect the enhanced GGAP, ensuring strengthened compliance with the new emissions targets.

The new GGAP aligns the Pluto LNG project with the McGowan Government's commitment to net-zero emissions by 2050.

### Comments attributed to Environment Minister Amber-Jade Sanderson:

"The enhanced Greenhouse Gas Abatement Program brings the Pluto LNG development's emissions reduction targets in line with the McGowan Government's Greenhouse Gas Emissions Policy for Major Projects.

"This is a significant advance in management of greenhouse gas emissions for this important project, committing both the existing and new trains to reduce emissions by 30 per cent by 2030 and set a clear trajectory towards achieving net-zero by 2050.

"I have asked the EPA to inquire into updating the Ministerial Statement under which the project operates to ensure these new targets are enforceable and subject to transparent reporting measures."

# Media Release

Tuesday, 8 June 2021

**Woodside Energy Ltd.**

ACN 005 482 986

Mia Yellagonga  
11 Mount Street  
Perth WA 6000  
Australia

T +61 8 9348 4000

F +61 8 9214 2777

[www.woodside.com.au](http://www.woodside.com.au)

## WOODSIDE SETS NEW TARGETS TO REDUCE GREENHOUSE GAS EMISSIONS AT PLUTO LNG

Woodside has set new interim and long-term targets to achieve net zero greenhouse gas emissions by 2050 at Pluto LNG.

The targets, which have been approved by Western Australian Minister for Environment Amber-Jade Sanderson under Woodside's contemporised Pluto Greenhouse Gas Abatement Program (GGAP), include an interim target to abate 30% of emissions by 2030 and long-term targets to abate 100% of emissions by 2050. The targets are based on the proposed expansion of Pluto LNG and account for emissions associated with a two-train facility.

Woodside will integrate a number of measures to reduce greenhouse gas emissions at Pluto LNG by adopting technology considered to be best practice for liquefied natural gas (LNG) developments in Australia, implementing operational improvements and offsetting all reservoir carbon dioxide.

Woodside Acting CEO Meg O'Neill said Woodside shared the State Government's aspiration to reduce and offset carbon emissions to net zero by 2050.

"We are pleased to have agreed these new contemporary greenhouse gas emission reduction targets with the State for Pluto LNG. The targets, which are based on the proposed expansion of the facility to enable the processing of gas from the offshore Scarborough field, demonstrate how we have applied our corporate decarbonisation targets at Pluto LNG.

"These efforts are complemented by our investment in generating high-quality offsets and potential opportunities in renewable power and hydrogen," she said.

Woodside is currently investigating the supply of approximately 50 MW of solar energy to Pluto LNG from its proposed Woodside Power Project, which would result in a direct reduction in Scope 1 greenhouse gas emissions from Pluto LNG.

The Pluto Greenhouse Gas Abatement Program is a condition of Ministerial Statement 757, the primary State environmental approval granted for Pluto LNG in 2007. Woodside is the Operator of Pluto LNG on behalf of the Pluto Joint Venture participants Woodside Burrup Pty Ltd (90%), Kansai Electric Power Australia Pty Ltd (5%) and Tokyo Gas Pluto Pty Ltd (5%).

Woodside is proposing to develop the Scarborough gas resource through new offshore facilities connected by an approximately 430 km pipeline to a proposed expansion of the existing Pluto LNG onshore facility. Expansion includes modifications to the existing Train 1 and construction of a second gas processing train (Train 2) and additional domestic gas infrastructure.

Scarborough gas would primarily be processed through Train 2 and contains negligible reservoir carbon dioxide. Combined with the adoption of best available proven technology in design, together these developments will be amongst the lowest-carbon LNG sources globally for Woodside's North Asian customers.

Woodside is targeting a final investment decision for Scarborough and Pluto Train 2 in the second half of 2021. Full details on the Pluto GGAP are available at [Pluto LNG - Woodside Energy](#)

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**Contact:**

**MEDIA**

**Christine Forster**

M: +61 484 112 469

E: [christine.forster@woodside.com.au](mailto:christine.forster@woodside.com.au)

# Woodside sees some cost pressures facing \$11 bln Scarborough gas project

CONTRIBUTOR

Sonali Paul [Reuters](#)

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CREDIT: REUTERS/DAVID GRAY

Woodside Petroleum is in the final stages of working out costs on its Scarborough gas and Pluto LNG expansion project, as it faces rising labour and steel costs, the company's boss said on Tuesday.

By Sonali Paul

MELBOURNE, June 8 (Reuters) - Woodside Petroleum WPL.AX is in the final stages of working out costs on its Scarborough gas and Pluto LNG expansion project, as it faces rising labour and steel costs, the company's boss said on Tuesday.

The Scarborough development offshore Western Australia will feed an expansion of Woodside's Pluto LNG (liquefied natural gas) plant, with the combined project previously estimated at \$11.4 billion.

Acting CEO Meg O'Neill, who took the reins in April, said the company is facing skyrocketing steel prices for a project where raw steel costs amount to 10% or 15% of total costs, and acknowledged that there is tight competition for workers amid a mining boom in Western Australia.

At the same time, she said Woodside had been able to work out some cost savings in the project design with its contractors after putting it on hold last year, when oil and gas prices crashed amid the COVID-19 pandemic.

"It's probably too early to say, but there's some cost pressures on the ledger, there's some cost savings on the ledger and as soon as we have those updated bids from our contractors, we'll be communicating with our shareholders," O'Neill said at Credit Suisse's 8th Australian energy conference.

The Scarborough and Pluto LNG expansion project is the company's only big growth option in the near term.

[Read More](#)

Woodside is targeting a final investment decision with its partner BHP Group BHP.AXBHP.L within the next six months.

The Western Australian government said on Tuesday it had approved Woodside's plan to cut emissions from the Pluto LNG project by 30% by 2030 and reach net zero by 2050, which the state's environment minister said represented a sharp reduction in emissions from levels approved in 2007.

The gas industry two years ago fought to block a proposal by the state's environment regulator that would have required all new projects with carbon emissions of more than 100,000 tonnes to fully offset their emissions.

(Reporting by Sonali Paul; editing by Jason Neely)

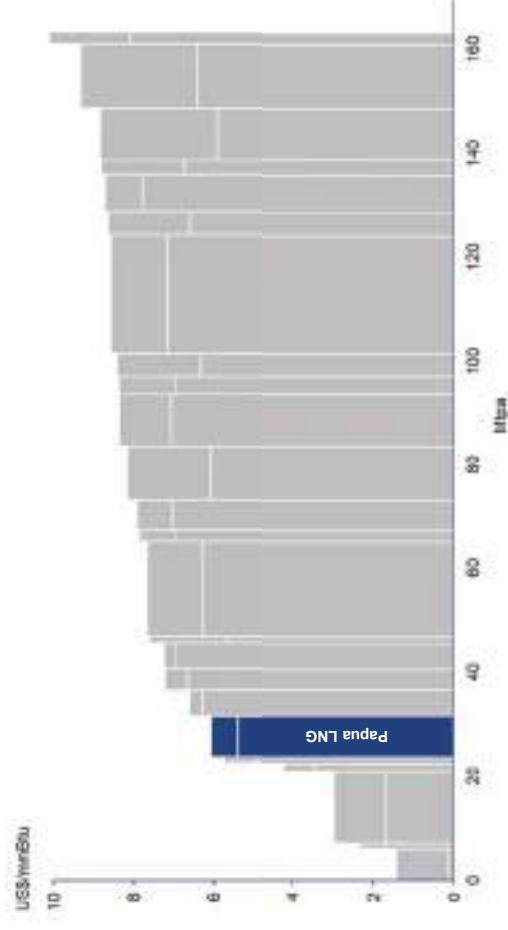
(([Sonali.Paul@thomsonreuters.com](mailto:Sonali.Paul@thomsonreuters.com); +61 407 119 523;))

*The views and opinions expressed herein are the views and opinions of the author and do not necessarily reflect those of Nasdaq, Inc.*









# PNG – Strong cashflows and strong partner alignment for growth

## Papua LNG well placed against competing projects

LNG Breakeven Costs<sup>1</sup>



## Papua LNG: Steps to FEED Entry

-  Government support of key projects (Papua, Porgera, P'nyang)
-  Strong partner alignment and project prioritization
-  Mobilise project teams (TotalEnergies upstream, ExxonMobil downstream)
-  Optimise synergies with PNG LNG infrastructure
-  Market soundings for LNG contracting
-  Downstream infrastructure sharing agreements
-  Restart project financing activities
-  **FEED entry**

1. Delivered to Asia. Source: Wood Mackenzie (2017/18)

# Priorities for 2021



Executing a clear set of priorities in 2021

Continue to sustain and improve low cost operations	<b>Cost control</b>	<ul style="list-style-type: none"> <li>Continue to progress a reduction in opex by 40% (2023 target)<sup>1</sup></li> </ul>
	<b>Cashflow</b>	<ul style="list-style-type: none"> <li>Operating and exploration discipline driving strong cash flow conversion (75% reduction in average annual exploration capex)</li> </ul>
Progress growth projects	<b>Pikka</b>	<ul style="list-style-type: none"> <li>Targeting &lt;\$40/bbl breakeven outcome and driving returns above 10%<sup>2</sup></li> <li>FID targeted for 4Q21, subject to funding certainty</li> </ul>
	<b>Papua LNG</b>	<ul style="list-style-type: none"> <li>2022 FEED, 2023 FID targeting 2027 first gas</li> </ul>
Maintain a flexible balance sheet	<b>Financing</b>	<ul style="list-style-type: none"> <li>Syndicated corporate loan refinancing in progress</li> <li>Enhancing balance sheet strength to support growth</li> </ul>
	<b>Hedging</b>	<ul style="list-style-type: none"> <li>Executed hedging arrangements with price floor of \$55/bbl Brent for 9 million barrels</li> <li>Consider long-term strategy to support balance sheet and cash flows</li> </ul>
Optimise organisation for the future	<b>Sustainability</b>	<ul style="list-style-type: none"> <li>Started carbon abatement and offset programs on path to 30% GHG intensity reduction by 2030</li> <li>Build knowledge and develop plans for achieving net zero by 2050</li> </ul>
	<b>Divestments</b>	<ul style="list-style-type: none"> <li>Optimise the portfolio and allocate capital towards higher returning developments</li> </ul>

1. Opex reduction for operated assets when compared with FY opex in 2019, based on Oil Search internal estimates. Actual opex will be subject to JV approvals (as relevant). 2. Returns cover capital, opex, capex, taxes and royalties.



# India's natural gas consumption starts to rebound in June

Reuters - Last Updated: Jun 09, 2021 00:45:14 IST

**Synopsis**  
One in the Indian market there was some slowdown, but the situation is not as bad as last year," Manoj Jain, chairman of GAIL (India), the country's biggest gas pipeline operator, said at a news briefing to announce quarterly results.



India's natural gas consumption is recovering in June after declining in the previous two months, as states ease restrictions in the wake of a drop in coronavirus infections, officials said on Wednesday.

"In the Indian market there was some slowdown, but the situation is not as bad as last year," Manoj Jain, chairman of GAIL **NSE: 3.22%** (India), the

country's biggest gas pipeline operator, said at a news briefing to announce quarterly results.

He said gas consumption in April and May fell by about 10% to 15% compared to a 50% reduction last year when there was a nationwide lockdown to stem the spread of the virus.

Instead of a national lockdown, the state governments imposed their own restrictions to stem the spread of deadly second wave of COVID-19. The states, however, started this month to ease the curbs after the decline in reported infections.

Gas consumption has returned to its normal level in the last week, Jain said.

The COVID-19 pandemic, globally and in India, is causing "significant disturbance in economic and business activities. It has also temporarily impacted the business activities of the Company," GAIL said in a stock exchange filing.

The company, however, has now achieved a pre-pandemic operational level of operations, it said.

**Petronet LNG NSE: 8.00%**, the country's top gas importer, is operating its 17.5 million tonne-per-year Dabhol terminal in western Gujarat state at 87% capacity, its chief executive, A.K. Singh, said at a separate news briefing.

The company was operating India's biggest LNG import plant at about 80% capacity in April and May, he said, adding that higher spot prices of liquefied natural gas (LNG) and pandemic-induced lockdowns in states had dented gas demand in the last two months.

Due to falling local gas consumption in April and May, GAIL diverted two cargoes to international markets while Petronet deferred one cargo for delivery in June.

GAIL's Jain, however, said India's gas consumption could grow by 6% to 8% in the current fiscal year if the country emerged from the pandemic.

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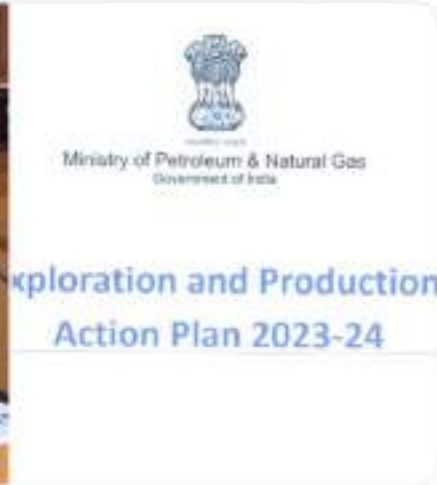
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Min. P&NG @dpradhanbjp reviewed a presentation by @DghIndia on Exploration & Production Action Plan 2023-24. E&P operators and National Oil Companies are working to attain a production level of 40 MMT of oil & 50 BCM of gas by 2023-24.



4:50 AM · Jun 11, 2021 · Twitter for iPhone

## **Shell: “Every LNG Cargo That Could Technically Be Produced In This World Has Been Produced And Has Found A Well Paying Customer”**

Posted: September 20, 2017

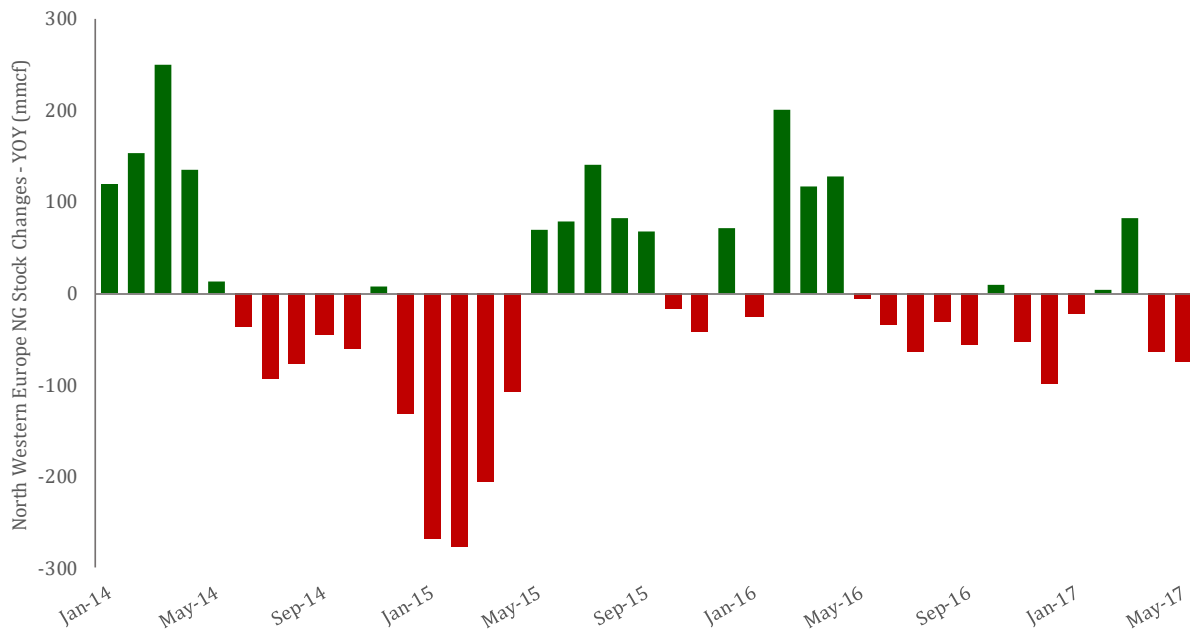
We will be presenting a very bullish outlook for natural gas later today in our webcast for Stream’s 2018 Energy Outlook. The key to our call is that a massive natural gas demand surge has started and will lead to world LNG markets being corrected closer to 2020 than the current conventional wisdom of closer to 2025. One of the reasons we see this happening quickly is we share Shell’s view that global LNG markets, as of mid 2017, are not in an oversupply situation and there is data support (Japan LNG spot prices, NW Europe storage) for this view. Two weeks ago, Shell said *“Actually, over the last 18 months, every LNG cargo that could technically be produced in this world has been produced and has found a well-paying customer”*. Therefore, we have a different starting point than conventional wisdom that says LNG markets are oversupplied in 2017. And if you combine a different starting point with a different view on a massive surge in natural gas demand, then you end up with a much different view of when LNG markets will move to undersupply. We will be posting a blog post today’s webcast on why we see a massive surge in natural gas demand.

A massive surge in natural gas demand has started. Long term readers of Energy Tidbits will likely be surprised by the very bullish natural gas call in this afternoon’s webcast. I was very negative for years, but move to a positive stance a year ago driven by the themes of Floating Storage Gas Regasification Units (FSRUs) and increasing US exports of LNG and to Mexico via pipeline. Those themes are continuing and FSRUs are expanding in their scope. Natural gas has already been on a path of strong demand growth. That path is continuing. But later today, we will be highlighting other major new demand factors that will drive the massive surge in global natural gas demand. This isn’t just an item for investors outside of Canada. Nor is it an item for a couple years down the road. We see these themes impacting Cdn natural gas in 2018. The 2018 Energy Outlook is at 2pm mountain today and can be accessed via [LINK](#).

Shell’s LNG head Maarten Wetselaar says the LNG market is in balance and all LNG cargos have found well paying customers. Two weeks ago, Shell’s LNG head, Maarten Wetselaar (Integrated Gas & New Energies Director) presented to the Australian financial community at Bloomberg’s Sydney Australia office. The presentation and Q&A in particular was excellent, but the presentation was overlooked because it was only available over the Bloomberg terminal and Shell did not post Wetselaar’s presentation. Bloomberg only posted a small portion of their interview with Wetselaar [LINK](#). We prepared a transcript of Wetselaar’s comment on the balanced LNG market. He said *“We have been very pleased to see very strong demand for LNG in the last two years from Asia, particularly from China, but also from new countries that demand LNG in order to make their energy mix go around. There is Pakistan, there is Egypt, and even this year, we see the demand response to the supply increase being very robust so this year we have not seen an oversupply in this product. Actually, over the last 18 months, every LNG cargo that could technically be produced in this world has been produced and has found a well-paying customer. So, this market is in more balance than people perhaps perceive”*.

The key data support to Wetselaar is that NW Europe storage is not seeing surplus LNG cargos looking for a home. In the Q&A, Wetselaar said the data support for his comment that the market is absorbing all of the new LNG supply is to look at NW Europe storage. Wetselaar did not use the description dumping ground, but it is the right term. Webster’s defines “dumping ground” as *“a place to which unwanted people or things are sent”*. He noted that if LNG was in oversupply, there would be surplus LNG cargos looking for a home and these surplus LNG cargos would find their way to NW Europe storage. Shell is not seeing any YoY increase in NW Europe storage. Hence, he is firm in his view that demand was absorbing all the new LNG supply in 2017. We pasted the NW Europe storage data into the below graph and it shows exactly what Wetselaar said – the monthly YoY changes in storage do not show increases in the net storage withdraw/injections, which implies that there isn’t any dumping of surplus LNG cargos in NW Europe storage. We have not been following NW Europe natural gas storage, but now have it on our regular data check list because of Wetselaar’s comments.

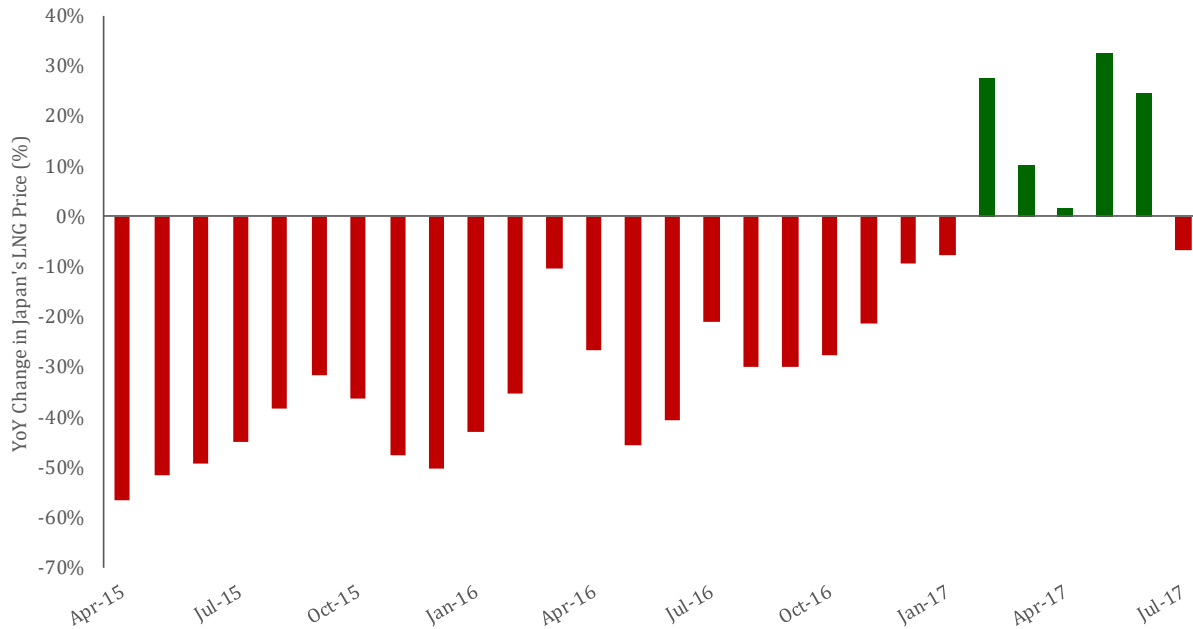
### NW Europe YoY Changes In Monthly Storage Net Injections/Withdraw



Source: Bloomberg, Stream Asset Financial

We also believe Japan LNG spot price indicates that the market is absorbing all new LNG supply. We don't disagree that LNG was oversupplied in 2015 and 2016, but, in addition to the NW Europe storage data, we see other data suggesting that all of this new LNG supply is being absorbed by the market. We regularly track Japan LNG spot monthly prices as published by Japan's Ministry of Economy, Trade and Industry and include our graph below showing the YoY change in Japan monthly LNG spot prices. Japan LNG spot prices went down YoY in 2015 and 2016, which was a clear sign there that LNG supply was exceeding demand. But in H1/2017, the Japan LNG spot prices are higher YoY by about 20%. We look at this data and say it is reflective of a LNG market that is balance or at least where the market is absorbing LNG cargos. If LNG markets were still oversupplied like they were in 2015 and 2016, we wouldn't see Japan spot LNG prices up 20% this year?

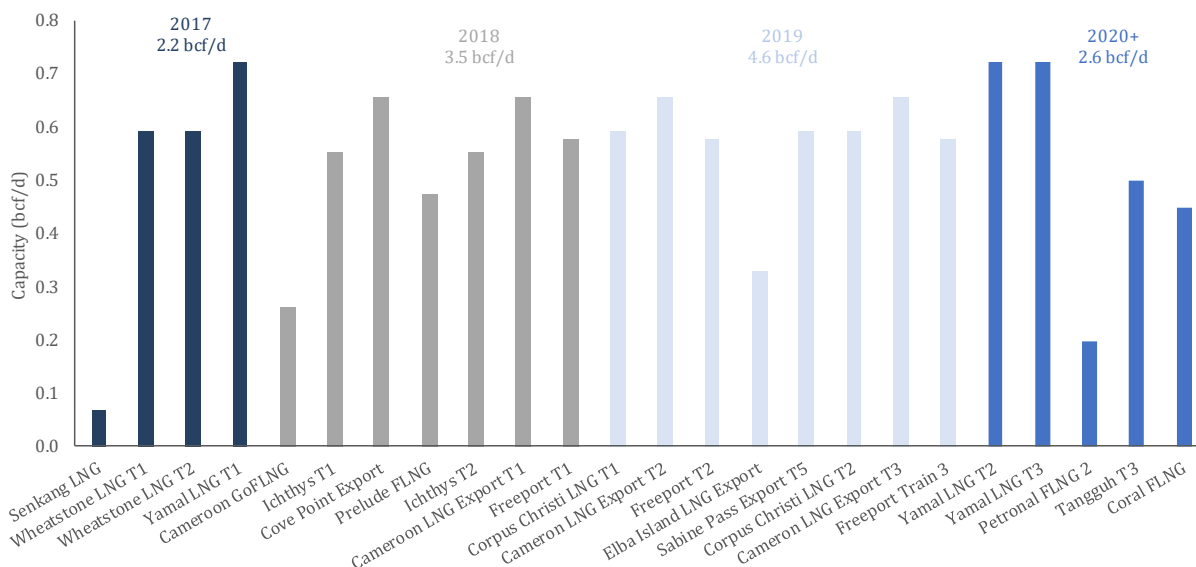
**Japan Spot LNG Prices – YoY Monthly Change**



Source: Japan Ministry of Economy, Trade and Industry, Stream Asset Financial

The big test is coming in 2018/2019 with 8.1 bcf/d of new LNG supply to come on stream. In our webcast, we will be reviewing factors that should lead to additional LNG demand of 3.5 to 4.5 bcf/d per year more than expected. This additional LNG demand may not all kick in right away but certainly in 2019 and 2020. Please note this is additional demand every year, not just a one-shot boost. Even still, this massive test of increasing demand will be tested in 2018 and 2019 with under construction LNG supply projects expected to add 3.5 bcf/d in 2018 and 4.6 bcf/d in 2019. Then new LNG supply goes down to 2.6 bcf/d in 2020. Inevitably there will be delays to the startup for some of these projects. But if not, it will be a big test. It may well be that the timing for the increased surge in natural gas demand may not line up exactly with the timing of the new LNG supply but it means that any oversupply should be temporary and quickly fixed. Below is our running table of the LNG liquefaction projects that are under construction.

**Under Construction LNG Liquefaction Projects**



Source: Company Reports, Stream Asset Financial

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A better starting point moves LNG to undersupply quicker, especially if combined with a massive surge in natural gas demand. We are highlighting the starting point for LNG markets as it makes a big difference to looking ahead to when LNG moves to undersupply. Conventional wisdom is that LNG is oversupplied in 2017, but we are in the Shell camp that LNG is not oversupplied today because the market is absorbing the increasing LNG supply. We don't see the Japan LNG spot prices and NW Europe storage data suggesting a robust market, but supportive of Shell's view. If you combine a different starting point (LNG is not in oversupply right now) with a different view on a massive surge in natural gas demand, then you end up with a much different view of when LNG markets will move to undersupply. Later today, we will be presenting the reasons for why we see a massive surge in natural gas demand that should lead to increased LNG demand of 3.5 to 4.5 bcf/d per year. US HH gas prices continue to be increasingly linked to global gas prices and this will increase with the under construction 4.6 bcf/d of US LNG capacity to be added thru 2020. We see this as a game changer to natural gas prices in the mid term (2019 to 2024), and why HH gas prices could be ~40% above the post 2019 long dated strips. Cdn gas prices should be dragged up with HH but the tone and valuations to Cdn natural gas should reflect this massive global natural gas demand surge in 2018 and 2019.



# ExxonMobil: Permian Leader or Just Another Fracker?

## *Analysis of Permian Oil Production Raises Troubling Questions About ExxonMobil's Investor Disclosures*

### Executive Summary

ExxonMobil has suffered through a disappointing decade. Since 2010, the company's profits have faltered, its free cash flow has regularly failed to cover payments to investors, and its stock price has fallen by more than 10 percent—even as the Standard & Poor's 500-stock index almost quadrupled. Central to ExxonMobil's woes was a string of disappointments in the company's previously world-class global upstream portfolio, culminating in write-downs of Canadian oil sands projects, multibillion-dollar impairments of U.S. natural gas assets, and failed ventures in Russia.

The company has now placed the Permian Basin, the largest oil-producing region in the United States, at the center of its upstream turnaround plans. ExxonMobil has made a series of high-profile Permian acquisitions in recent years, relying on high-tech horizontal drilling and hydraulic fracturing (fracking) to boost oil and gas output from the region. Despite bumpy progress and shifting targets over the last few years, the company continues to tout its technical and financial excellence in the Permian, recently projecting that it will roughly double its Permian production by 2025.

ExxonMobil has invited investors to examine the quality of the company's Permian oil wells as a way of assessing the company's prospects for a financial and operational comeback. In two recent investor presentations, the company highlighted the performance of its wells within the Delaware Basin, a subregion of the Permian straddling western Texas and southeastern New Mexico, as evidence of its industry-leading performance within America's top oil-producing basin.

**The findings of this analysis raise troubling questions about the quality of ExxonMobil's Permian assets.**

IEEFA has undertaken an independent analysis of ExxonMobil's position in the Permian. The findings of this analysis raise troubling questions about the quality of ExxonMobil's Permian assets and their ability to sustain the industry-leading production that the company has been touting to investors.

- Although ExxonMobil has claimed that it occupies a leadership position in the Delaware Basin, the company's actual production per well has slipped since 2018, both absolutely and in comparison with peers.
- In the Midland Basin, ExxonMobil's largest Permian holding, the company's performance is middling, ranking eighth among a peer group of 20, as measured by per-well production.

This analysis raises warning flags for ExxonMobil's Permian ambitions, and highlights the need for the company to provide greater transparency about the operational and financial performance of the company's upstream portfolio in general, and its Permian assets in particular.

At a time when many oil companies and analysts predict that the global economy will gradually reduce its reliance on oil and gas, only the highest-performing oil and gas assets can be developed profitably. ExxonMobil is moving forward with a corporate strategy that places the company's Permian Basin assets at the heart of its operational and financial future. ExxonMobil has touted the exceptional quality of its Permian wells in its drive to reset investor confidence in the company. But IEEFA's analysis suggests that investors should demand greater clarity about the company's ability to sustain profitable, industry-leading development in the Permian.

This year's tumultuous annual meeting, in which shareholders elected three new board members opposed by company management, demonstrated that ExxonMobil's investors demand greater accountability, responsive climate policy, and improved finances. Examining the quality of the ExxonMobil's Permian Basin assets, and their future contribution to the company's finances, should be a key item on the new board's to-do list.

## **I. Background**

This report analyzes production from ExxonMobil's Permian Basin assets, as well as the claims that the company is making to the investment community about its operational excellence and rising oil output in the basin. This analysis takes place against a 10-year financial backdrop of struggling earnings for the company, particularly in the company's U.S. upstream segment, of which the Permian Basin represents a key part. It also takes place after a series of high-profile company investments have underperformed or failed—a noteworthy matter, given ExxonMobil's decades of success with project planning and execution.

### **A. Permian Basin**

The Permian Basin, a region encompassing more than 75,000 square miles in southwest Texas and southeast New Mexico, boasts vast oil and gas reserves.<sup>1</sup> Two subregions within the Permian—the Midland Basin and the Delaware Basin—

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<sup>1</sup> U.S. Energy Information Administration. [Permian Basin oil production and resource assessments continue to increase](#). April 26, 2017. Note that the U.S. Geological Survey describes the Permian as comprising in excess of 86,000 square miles. See, U.S. Geological Survey. [Permian Basin Province \(044\)](#). Undated.

currently produce more than four-fifths of the Permian's oil and gas.<sup>2</sup> (See Figure 1.) The U.S. oil industry drilled its first Permian oil wells in the 1920s, boring thousands of feet into underground reservoirs.<sup>3</sup> But by the 1970s, after 50 years of exploration and drilling, oil output from the basin was thought to have peaked.<sup>4</sup>

**Figure 1: Map of the Permian Basin**



Source: IEEFA.

Yet the region's geology proved well suited to horizontal drilling and hydraulic fracturing (fracking) techniques, which opened a new chapter for the region's oil industry. Since 2010, unconventional oil production has boomed in the Permian, with oil and gas operators drilling nearly 30,000 horizontal wells in just over a decade.<sup>5</sup> Total oil output from the region rose from less than 1 million barrels per day in 2010 to more than 4 million barrels per day in 2020.<sup>6</sup> The Permian now provides about 15% of the nation's natural gas and 40% of its oil, with current production of 4.3 million barrels of oil and 17 billion cubic feet of gas per day.<sup>7</sup>

Large-scale fracking reinvigorated production from the Permian Basin. Yet a persistent oversupply of oil and gas has kept prices down, particularly since 2014, leaving Permian operators with subpar financial performance.

Starting in late 2010, ExxonMobil built out its position in the Permian through a series of acquisitions.<sup>8</sup> The Permian is part of the company's diverse, high-quality global portfolio, and is the company's leading unconventional oil and gas asset. By

<sup>2</sup> IEEFA analysis of IHS Markit data.

<sup>3</sup> Texas State Historical Association. [Permian Basin](#). Undated.

<sup>4</sup> U.S. Energy Information Administration. [Permian Basin: Wolfcamp Shale Play, Geology review](#). November 2018.

<sup>5</sup> IEEFA analysis of IHS Markit data.

<sup>6</sup> U.S. Energy Information Administration. [Permian Region: Drilling Productivity Report](#). April 2021.

<sup>7</sup> Federal Reserve Bank of Dallas. [Permian Basin: Oil Production](#). Undated.

<sup>8</sup> ExxonMobil. [Presentations and Q&A Session: 2012 Analyst Meeting](#). March 8, 2012, p. 32.

2013, the company portrayed itself to investors as a leader in production in the Permian,<sup>9</sup> and it continues to promote its leadership in the basin.<sup>10</sup> In the run-up to its recent annual general meeting, the ExxonMobil management described its “world-class Permian resource base with ability to leverage short cycle flexibility.”<sup>11</sup> The company recently announced that it would prioritize its investments even as the company reduced overall capital expenditures (capex).<sup>12</sup>

### *B. Profits from ExxonMobil’s U.S. Upstream Segment*

The Permian Basin is part of ExxonMobil’s U.S. upstream reporting segment and contributes to the company’s total earnings.<sup>13</sup> ExxonMobil’s upstream U.S. portfolio has made a significant positive contribution to the company’s enterprise-wide earnings in only two years since 2014, and the contribution in one of those years was wholly attributable to changes in U.S. tax laws.<sup>14</sup> (See Table 1.) In the aggregate, from 2014 through 2020, the U.S. upstream portfolio produced negative earnings.<sup>15</sup>

**Table 1: ExxonMobil U.S. Upstream and Companywide Earnings, 2014-2020**

Year	U.S. Upstream Earnings (billion \$USD)	Companywide Earnings (billion \$USD)
2014	\$5.20	\$31.52
2015	-\$1.08	\$16.15
2016	-\$4.15	\$7.85
2017	\$6.66	\$19.71
2018	\$1.74	\$20.84
2019	\$0.54	\$14.34
2020	-\$19.39	-\$22.44
<b>Total</b>	<b>-\$10.49</b>	<b>\$87.97</b>

In a 2012 investor presentation, ExxonMobil described the Permian as an integral part of the company’s U.S. upstream portfolio, capturing unconventional product

<sup>9</sup> ExxonMobil. [Presentations and Q&A Session: 2013 Analyst Meeting](#). March 6, 2013, p. 17.

<sup>10</sup> XTO Energy. [Permian Basin operations](#). July 2, 2019.

<sup>11</sup> Exxon Mobil. [Schedule 14A](#). April 2021, p. 24.

<sup>12</sup> S&P Global Platts. [ExxonMobil slashes 2025 production outlook as it focuses on Permian, Guyana](#). March 3, 2021. S&P Global Platts. [ExxonMobil aims to boost Permian oil output in 2021 despite capex cuts](#). October 3, 2020.

<sup>13</sup> In ExxonMobil’s financial filings, the company subdivides its upstream reporting segment into U.S. Upstream and Non-U.S. Upstream.

<sup>14</sup> In 2017 ExxonMobil declared \$6.6 billion in earnings from its U.S. Upstream portfolio. This positive contribution to earnings was driven by changes in U.S. tax law. Without those changes, ExxonMobil’s U.S. Upstream segment would have posted a loss for the year. See: ExxonMobil. [2017 Form 10-K](#). February 28, 2018, p. 44: “U.S. Upstream earnings were \$6,622 million in 2017, including \$7.6 billion of U.S. tax reform benefits.”

<sup>15</sup> U.S. upstream earnings taken from ExxonMobil 10-Ks for 2015-2021.

and serving to bolster the company's outlook.<sup>16</sup> The prominence of the Permian continues today: Despite companywide capex cutbacks, the Permian Basin remains central to the company's capital allocation strategy.<sup>17</sup> Taken together, the company's Guyana and Permian Basin assets are expected to account for approximately 36% of companywide upstream earnings by 2025—making these two projects the driving factor for the company's upstream earnings growth looking ahead.<sup>18</sup>

### ***C. ExxonMobil's Problematic Large-Scale Upstream Investments***

ExxonMobil built itself over many decades with a long series of large, successful megaprojects, winning the company a reputation as a best-in-class project developer. But over the last 10 years, its image has been tarnished by several high-profile projects that have either failed in the development stage or floundered, depressing the company's profits and share prices.

**Over the last 10 years,  
ExxonMobil's image has  
been tarnished by several  
high-profile projects that  
failed or floundered.**

#### **1. Oil Sands Canada**

ExxonMobil, through its subsidiary Imperial Oil in Canada, made a series of acquisitions to establish 4 billion barrels of reserves in the Canadian oil sands. ExxonMobil's reserve levels have become a point of controversy, starting with its oil sands holdings in 2016 and extending through the present. Currently, development and growth in the Canadian sands is all but frozen due to weak market conditions. IEEFA published a number of analyses on Canadian oil sands development,<sup>19,20</sup> a topic that was central to the material risks identified in IEEFA's October 2016 ExxonMobil report. These reports and the more recent cancellation of Teck Resources' proposed Frontier oil sands mining project remain stubborn facts that raise questions about the validity of ExxonMobil's claim that it held 3.5 billion barrels of oil sands reserves can be economically extracted and delivered to markets.<sup>21</sup>

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<sup>16</sup> ExxonMobil. [Presentations and Q&A Session: 2012 Analyst Meeting](#), p. 32. March 8, 2012. The Permian Basin continued throughout the period 2010 to 2020 to be an increasingly important part of its U.S. Upstream. See, e.g., ExxonMobil. [2015 Analyst Meeting](#). March 4, 2015, pps. 18, 33, and 48-49.

<sup>17</sup> ExxonMobil. [2021 Investor Day](#). March 3, 2021, p. 52.

<sup>18</sup> *Ibid.*

<sup>19</sup> IEEFA and Oil Change International. [Material Risks: How Public Accountability is Slowing Tar Sands Development](#). October 2014.

<sup>20</sup> IEEFA. [Teck Resources: Rough Road on Oil Sands Investments](#). April 2015. See also: IEEFA. [Teck Resources' Frontier Oil Sands Project Shows Reckless Disregard for Financials](#). January 2020.

<sup>21</sup> ExxonMobil. [2019 Form 10-K](#). February 26, 2020, p. 6.

In February 2017, ExxonMobil de-booked 3.5 billion barrels of its oil sands reserves.<sup>22</sup> The events surrounding the de-booking triggered a shareholder lawsuit.<sup>23</sup> ExxonMobil's disclosure at the time suggested that the reserves would be rebooked when market conditions improved. The company did, in fact, rebook the assets with the release of their 2018 annual filing in February 2019.<sup>24</sup> But other companies were eager to exit the oil sands. In August 2019, Koch Industries announced the sale of its oil sands assets for an undisclosed price.<sup>25,26</sup> In February 2020, Teck Resources cancelled its Frontier Oil Sands project due to weak market conditions.<sup>27</sup>

Later in 2020, ExxonMobil raised investor concerns with its failure to declare any impairments in its second quarter filing, at a time when most of the companies in the industry were doing so.<sup>28</sup> Objections focused on the size and value of the company's shale oil and other holdings.<sup>29</sup> The company acknowledged at the time that the potential for a 20 percent write-down in its reserves in 2020 if low prices continue through the second half of the year.<sup>30</sup> Late last year, the company announced that 300 employees would be laid off from its Canadian operations.<sup>31</sup> And with the release of its 2020 10-K annual report, ExxonMobil announced the de-booking of oil sands reserves for a second time, creating deep uncertainty about the actual size of the company's oil reserves.<sup>32</sup>

## 2. XTO and Russia

The Company's ongoing issues with oil sands were compounded as the industry realized that lower oil prices would change the industry's outlook and that the political climate was shifting. In 2009 the company bought XTO, a leading US natural gas producer, paying \$24.6 billion in stock for the company while assuming more than \$10.5 billion in debt.<sup>33</sup> By 2017 the poor performance of the XTO assets forced ExxonMobil to take a write-off of \$2 billion.<sup>34</sup> ExxonMobil took a second, \$17.1

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<sup>22</sup> *Ibid.* See also: Financial Times. [ExxonMobil forced to make cuts to reported oil and gas reserves](#). February 22, 2017.

<sup>23</sup> U.S. District Court for Northern District of Texas. [Ramirez v. ExxonMobil et al. Case No. 3:16-cv-3111](#). November 7, 2016.

<sup>24</sup> IEEFA. [ExxonMobil's Prodigal Reserves Return: Company Rebooks 3.2 Billion Barrels of Previously De-Booked Canadian Oil Sands Reserves](#). March 2019.

<sup>25</sup> Globe and Mail. [Koch Industries sells its oil-sands properties to Paramount](#). August 14, 2019.

<sup>26</sup> Environmental Defence. [Seven oil multinationals that are pulling out of Canada's tar sands](#). March 14, 2017.

<sup>27</sup> Reuters. [Cancelled Teck oil sands project underscores global climate-energy policy tension](#). February 24, 2020.

<sup>28</sup> S&P Global. [More Q2 impairments to come for oil majors; Exxon could be next](#). July 8, 2020.

<sup>29</sup> Wall Street Journal. [ExxonMobil resists write-downs as oil, gas prices plummet](#). June 30, 2020.

<sup>30</sup> ExxonMobil. [Form 10-Q Second Quarter 2020](#). August 5, 2020, p. 21.

<sup>31</sup> ExxonMobil. [ExxonMobil plans to reduce staffing levels in Canada](#). Nov. 25, 2020.

<sup>32</sup> IEEFA. [ExxonMobil's 2020 financial report: "Re-de-booking" raises questions about actual size of reserves](#). March 2, 2021.

<sup>33</sup> ExxonMobil. [2010 Form 10-K](#). February 25, 2011, p. 101.

<sup>34</sup> Reuters. [Exxon boosts capital budget but takes \\$2 billion charge from XTO deal](#). January 31, 2017.



billion impairment of its U.S. upstream assets in 2020, focused on the XTO acquisition.<sup>35</sup>

In 2018 the company announced that its plan to invest \$3.2 billion in Russia—once seen as among the company’s most promising projects—was scrapped due to problems with sanctions against the Russian government.<sup>36</sup>

### 3. Permian Basin

ExxonMobil’s heavy investment in the Permian Basin has yet to meet expectations. IEEFA has published a number of reports that cover ExxonMobil’s efforts in the Permian Basin, including one directly related to the company’s performance and future prospects, and two related to current market issues in the basin.<sup>37,38</sup> IEEFA published a commentary related to a change instituted by the then-newly appointed CEO Darren Woods regarding the strategic significance of the Permian Basin.<sup>39</sup>

**ExxonMobil’s heavy  
investment in the  
Permian Basin has yet  
to meet expectations.**

In early 2017, Woods announced that the Permian would be among the company’s short-cycle cash generators over the next three years. By late 2019, the company had abandoned this quick-cash scenario, and an announcement was made that the Permian Basin was going to be a long-term investment with no precise revenue projections or timeframes. IEEFA noted that the cash had not materialized during the period set out by Woods in his March 2017 announcement.

Despite this underperformance, in 2020 ExxonMobil designated the Permian a “key growth project.”<sup>40</sup> The company currently targets production of 700,000 barrels of oil equivalent per day (boe/d) by 2025—nearly double last year’s level, yet a sharp reduction from a goal the company set in 2019 of producing 1 million boe/d by 2024.<sup>41</sup> Over the past several years, the company has made significant capital investments in the Permian, including the 2017 purchase of Permian assets from the

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<sup>35</sup> ExxonMobil. [2020 Form 10-K](#). February 24, 2021, p. 44. See also: Dallas Morning News. [Exxon Mobil warns of possible \\$30 billion writeoff, mainly on XTO-acquired natural gas fields](#). October 30, 2020.

<sup>36</sup> The New York Times. [Exxon Mobil Scraps a Russian Deal, Stymied by Sanctions](#). February 28, 2018.

<sup>37</sup> IEEFA. [ExxonMobil abandons goal of “quick cash” from Permian fracking](#). November 13, 2019.

<sup>38</sup> IEEFA. [Flaring Burns Texas Economy](#). June 2020. Also see: IEEFA. [Comments to the Texas Railroad Commission](#). April 14, 2020.

<sup>39</sup> IEEFA. [ExxonMobil abandons goal of “quick cash” from Permian fracking](#). November 13, 2019.

<sup>40</sup> ExxonMobil. [2020 Investor Day](#). March 5, 2020.

<sup>41</sup> Exxon’s Permian Basin production goals have been a moving target. In June 2018, the company [projected](#) that it would produce 600,000 barrels of oil equivalent per day (boe/d) by 2025. In [March 2019](#) it boosted its projection to 1 million boe/d by 2024. By February 2021, the company had [downgraded](#) its Permian target to 700,000 boe/d by 2025.

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Bass family for as much as \$6.6 billion.<sup>42</sup> The company has also told investors that it is devoting substantial financial, engineering and technical resources to boosting production in the region.

Still, doubts remain about the value of the company's Permian assets. In January 2021 *The Wall Street Journal* reported that the U.S. Securities and Exchange Commission had launched a probe of the company's Permian reserves, after an internal whistleblower raised warning flags about "unrealistic assumptions" about the pace of future drilling.<sup>43</sup> The Journal had previously reported on an internal dispute among ExxonMobil staff about the value of the company's Permian reserves. Managers initially pegged the value of the company's Delaware holdings at \$60 billion, but some of the company's employees estimated that it was only \$40 billion; the company settled on a final estimate of about \$50 billion.<sup>44</sup>

## **II. ExxonMobil Well Quality in the Permian Basin**

### **1. Methods and Data Sources**

To showcase the company's industry-leading performance in the Permian, ExxonMobil's 2020 and 2021 investor presentations highlight the first-year oil production from the company's wells, measured as the average number of barrels of oil produced per day during the first 365 days of production. We adopt this standard as a starting point for comparing ExxonMobil's oil wells with its competitors'.

In its 2020 and 2021 Investor Day presentations, ExxonMobil cites IHS Markit, an international business data and information provider, as the source of data used in charts depicting first-year oil well production. ExxonMobil adds its analysis to the IHS Markit data.

IEEFA used the IHS Markit Dynamic North America (DNA) oil well database to analyze Permian oil production for ExxonMobil and its competitors within the Permian. For each well in the DNA dataset, HIS Markit calculates "the average daily oil volumes of reported production within the first 12 months of the productive life of a well." This value appears to correlate directly to the standard that ExxonMobil uses to highlight oil well performance in its investor presentations. IEEFA adopted this measure as its main standard for comparing the performance of different companies' portfolios of oil wells.

In its investor presentations, ExxonMobil provides no definition of which specific wells are within the Delaware Basin. IEEFA's review of IHS Markit data shows that ExxonMobil operates in three separate oil "plays," defined as areas in the same geographic region governed by the same geological circumstances, that clearly lie

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<sup>42</sup> ExxonMobil. [ExxonMobil to acquire companies doubling Permian Basin resource to 6 billion barrels](#). January 17, 2017.

<sup>43</sup> The Wall Street Journal. [Exxon Draws SEC Probe Over Permian Basin Asset Valuation](#). January 15, 2021.

<sup>44</sup> The Wall Street Journal. [Exxon Used to Be America's Most Valuable Company. What Happened?](#) September 13, 2020.

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within the Delaware Basin. IHS Markit labels those plays as the Delaware, Wolfcamp Delaware, and Bone Spring. IEEFA aggregates wells from all three of those plays into a single Delaware Basin grouping, and compares ExxonMobil against its peers within that grouping of wells.

We also used the IHS Markit DNA database to analyze oil production in the Wolfcamp Midland, which contains nearly half of the Permian Basin's horizontal oil and gas wells and nearly two-thirds of ExxonMobil's Permian Basin horizontal wells.

In its investor presentations, ExxonMobil provides no definition of its peer range. In this report, IEEFA defines Exxon's peer group as the 20 operators with the most wells that began production within a specified time period in a given region. We do not provide details of each company's performance within the Permian, but in Appendix 1 we list the companies that we included in ExxonMobil's peer range within the Permian in different basins and years.

Unless otherwise indicated, data for IEEFA's analysis of Permian oil well counts and oil production are taken from the IHS Markit Dynamic North America (DNA) database. IEEFA is responsible for all presentations, findings, analyses and conclusions in this report.

In addition to the sources discussed above, this report has relied upon numerous qualitative and quantitative research from the International Energy Agency (IEA), United States Energy Information Administration (EIA), Rystad Energy, and the Texas Railroad Commission.

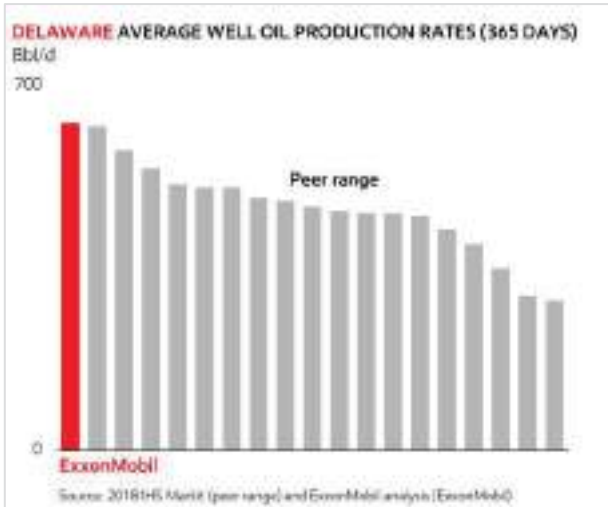
## **2. ExxonMobil Performance in the Delaware Basin<sup>45</sup>**

To bolster the company's claims to being a leader in the Permian, ExxonMobil's [2020 investor presentation](#) highlighted the 365-day average oil production for its wells in the Delaware Basin, a portion of the Permian that straddles southwestern New Mexico and western Texas. In a chart, ExxonMobil presented itself as the Delaware Basin's leader in per-well oil production. (See Figure 2a.)

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<sup>45</sup> Where not otherwise cited, data and figures in this section of the report, and for the two following sections, were derived from an IEEFA analysis of IHS Markit Dynamic North America data.

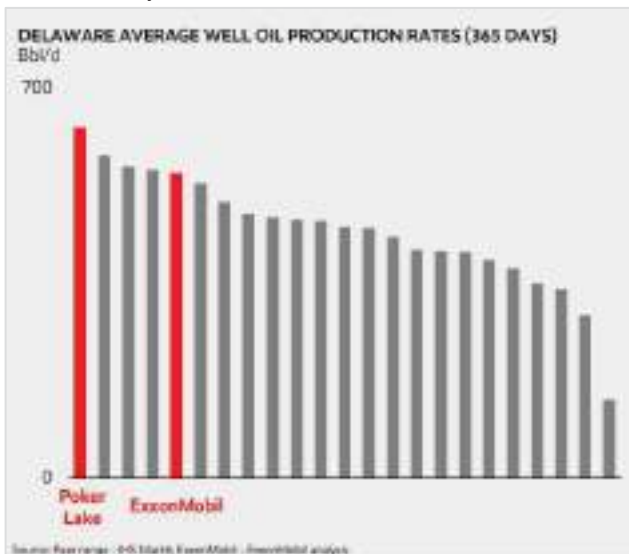
**Figure 2a: Average First-year Oil Production per Well for Delaware Basin Producers, ExxonMobil 2020 Investor Presentation**



Source: ExxonMobil 2020 Investor Presentation.

A year later, the company once again highlighted its Permian successes, describing “industry-leading well performance” in its Poker Lake development within the Delaware Basin.<sup>46</sup> (See Figure 2b.)

**Figure 2b: Average First-year Oil Production per Well for Delaware Basin Producers, ExxonMobil 2021 Investor Presentation**



Source: ExxonMobil 2021 Investor Presentation.

Together, these charts convey a slippage in ExxonMobil’s leadership position in the Delaware. The second chart suggested that Exxon’s overall per-well production in

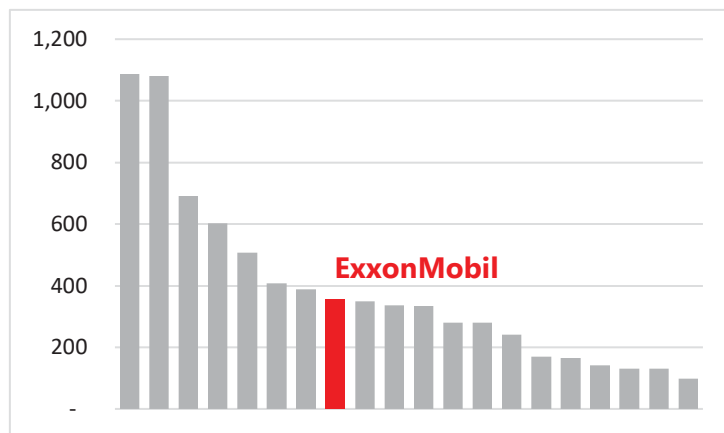
<sup>46</sup> ExxonMobil. *2021 Investor Day*. March 3, 2021.

the Delaware had fallen in absolute terms, and also slipped behind several of the company's peers.

Additional research by IEEFA raises troubling questions about the quality of ExxonMobil's Permian production. IEEFA's analysis suggests that it is difficult to describe ExxonMobil as an oil production leader in the Delaware, or in the Permian as a whole.

To date, Exxon does not stand out as one of the Delaware's largest operators. All told, the oil and gas industry brought 9,278 horizontal wells into production in the Delaware Basin between 2016 and the end of 2020. Of that total, ExxonMobil operates 354 wells—less than 4 percent of the basin's total, ranking No. 8 among oil producers in the Delaware. (See Figure 3.) Several of the company's competitors in the Delaware had two to three times as many wells as ExxonMobil.<sup>47</sup>

**Figure 3: Well Count by Operator in Delaware Basin, 2016-2020**



Source: IEEFA analysis of IHS Markit data.

In 2016 and 2017 ExxonMobil remained a minor player in the Delaware Basin, drilling just 15 horizontal wells in 2016 and 12 in 2017. In 2018, the company quickened its pace, bringing 51 new Delaware Basin horizontal wells into production—more than four times its previous year's total, but still only 2 percent of all new wells in the basin that year. While relatively few in number, these wells produced abundantly, earning ExxonMobil the top spot for first-year oil production per well among the basin's 20 most prolific drillers that year.<sup>48</sup>

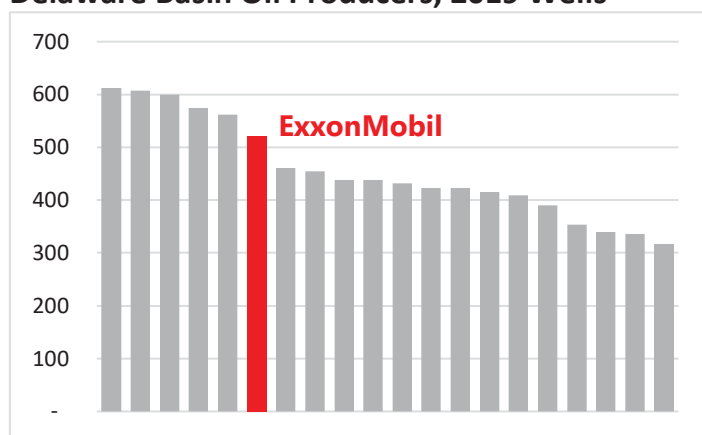
The following year, ExxonMobil picked up its drilling pace once again—but its wells lost ground. ExxonMobil brought 123 Delaware Basin wells into production in 2019, nearly 5 percent of all wells in the basin that year. Yet IEEFA's analysis shows that

<sup>47</sup> Overall, since 2016 ExxonMobil has ranked third or fourth in oil production in the entire Permian Basin. See Appendix 2: ExxonMobil's Rank in the Permian Basin Oil Production.

<sup>48</sup> Listed alphabetically, operators in this peer group include: APA Corporation (formerly Apache Corporation), BP, BTA Oil Producers, Callon Petroleum, Centennial Energy, Chevron, Cimarex Energy, Concho Resources, Devon Energy, Diamondback Resources, EOG Resources, ExxonMobil, Marathon Oil, Matador Resources, Mewbourne Oil, Occidental Petroleum, Pioneer Resources, Resolute Oil, Shell and WPX Energy. See Appendix 1 for notes.

the company's per-well oil production sank to sixth place among the 20 largest Delaware Basin operators that year.<sup>49</sup> First-year oil production fell from an average of 635 barrels per day per well for the company's 2018 wells, down to 521 barrels per day for its 2019 wells. (See Figure 4.)

**Figure 4: Average First-year Production per Well (barrels per day) for Delaware Basin Oil Producers, 2019 Wells**



Source: IEEFA Analysis of IHS Markit data.

In short, both ExxonMobil and IEEFA's assessments reveal that as ExxonMobil drilled more Delaware Basin wells, the performance of its wells deteriorated year-over-year, both absolutely and in comparison with peers.

Early results for 2020, while incomplete, suggest that the company's Delaware wells have continued to fall behind. Full first-year production is only available for wells completed in early 2020. But peak-month oil production, a measure that historically tends to correlate with average first-year well production, shows further declines for ExxonMobil's Delaware Basin wells during 2020—declines that are not reflected in the basin as a whole.<sup>50</sup> Additional data will be required to assess the company's performance for the full year.

<sup>49</sup> Listed alphabetically, operators in this peer group include: APA Corporation, BP, BTA Oil Producers, Callon Petroleum, Centennial Energy, Chevron, Cimarex Energy, Concho Resources, Devon Energy, Diamondback Resources, EOG Resources, ExxonMobil, Marathon Oil, Matador Resources, Mewbourne Oil, Occidental Petroleum, Patriot Resources, Pioneer Resources, Shell and WPX Energy. See Appendix 1 for notes. Note that IEEFA's analysis of ExxonMobil's wells in 2018 and 2019 tracks closely with the charts that ExxonMobil presents in their 2020 and 2021 investor presentations. Differences between IEEFA's analysis and ExxonMobil's may stem from different geographic definitions or peer groups, which ExxonMobil does not define for investors.

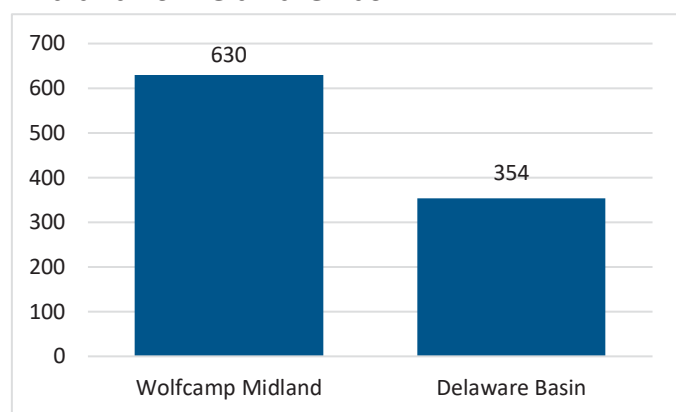
<sup>50</sup> For 2019, Exxon's wells peaked at an average of 132 barrels of oil per 1,000 lateral feet. But for its 2020 wells, the average peak-month production fell to 107 barrels per 1,000 lateral feet—a 17 percent year-over-year decline.



### 3. ExxonMobil in the Wolfcamp Midland

ExxonMobil's investor presentations spotlight the company's Delaware Basin operations. Yet the large majority of the company's Permian horizontal wells lie in the Wolfcamp Midland play, to the east of the Delaware Basin. From 2016 through 2020, ExxonMobil brought 630 Wolfcamp Midland wells into production, compared with just 354 in the Delaware Basin. (See Figure 5.) Over that period, ExxonMobil brought more wells into production in the Wolfcamp Midland than all but two other companies.

**Figure 5: ExxonMobil Wells Entering Production 2016-2020, Wolfcamp Midland vs. Delaware Basin**



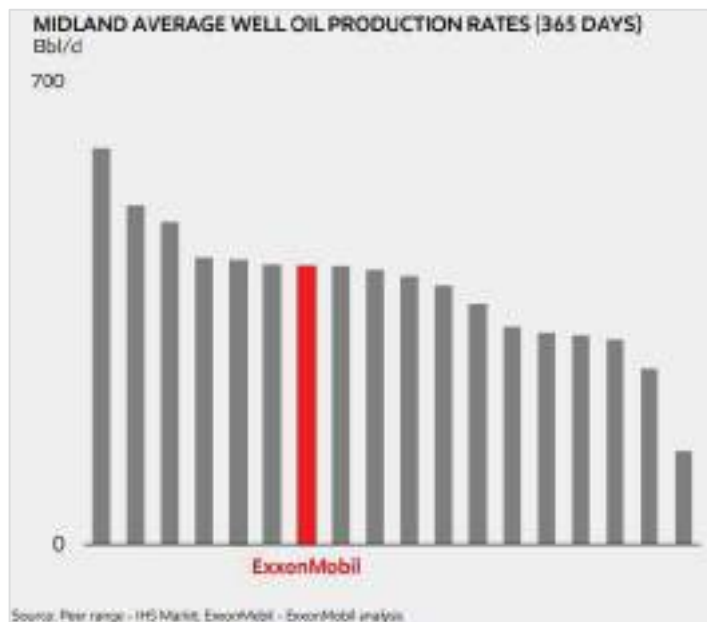
Source: IEEFA analysis of IHS Markit data.

Yet compared with the company's largest peers, ExxonMobil's wells in the Wolfcamp Midland showed undistinguished performance. For wells brought into production from 2016 through 2019, for example, IEEFA's analysis shows that ExxonMobil's wells ranked eighth in first-year production per well among the 20 largest Wolfcamp Midland operators.<sup>51</sup>

The middling performance of ExxonMobil in the Wolfcamp Midland is corroborated by the company's 2021 Investor Day Presentation, which shows that ExxonMobil ranked seventh in first-year production, among an unspecified peer group and during an unspecified timespan. (See Figure 6.) A second chart on the same page the company shows that the company's production performance has been increasing over the past three years in this basin, but does not compare ExxonMobil's trends with those of its competitors.

<sup>51</sup> Listed alphabetically, operators in this peer group include: APA Corporation, Callon Petroleum, Chevron, Concho Resources, CrownQuest Operating, Diamondback Resources, Discovery Energy, Endeavor Energy Resources, ExxonMobil, FDL Operating, Hunt Oil, Laredo Petroleum, Ovintiv, Occidental Petroleum, Pioneer Resources, QEP Resources, RRP Operating, SEM Operating, SM Energy and Surge Energy. See Appendix 1 for notes.

**Figure 6: Average First-year Oil Production per Well for Midland Producers, ExxonMobil 2021 Investor Presentation**



Source: ExxonMobil 2021 Investor Presentation.

#### 4. Normalizing Horizontal Wells for Lateral Length

In communications with investors, publicly-traded companies must balance the need to comply with SEC disclosure rules with a desire to put the company's financial and operational performance in the best possible light. ExxonMobil is no exception. ExxonMobil's most recent investor presentations have highlighted a particular measure of well quality—total first-year production of oil per Delaware Basin well—that played to the company's strengths.

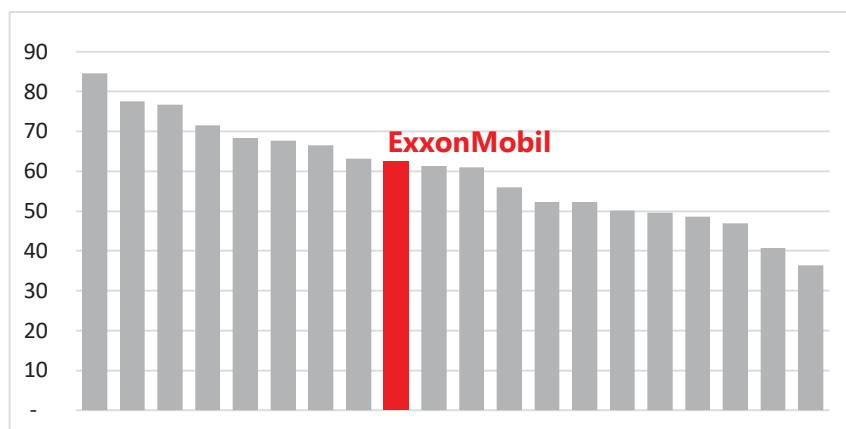
Yet a key reason why ExxonMobil often performs comparatively highly on this metric is that the company drills relatively long wells. In the Delaware Basin, for example, ExxonMobil ranked fourth among the top 20 operators in well length from 2016 through 2020, with wells that were nearly 1,000 feet longer than the median among its peer group.

All else being equal, longer wells tend to produce more oil than shorter ones. They also can yield drilling cost efficiencies.<sup>52</sup> Yet longer wells cost more to drill and represent a larger overall capital investment. In short, higher production per well doesn't necessarily mean more profitable wells; sometimes it just means longer, more expensive wells.

<sup>52</sup> Rystad Energy. [Should well productivity benchmarking take costs into account?](#) November 2019.

To isolate the effect of horizontal well length on production, many oil industry analyses normalize wells to a standard lateral well length.<sup>53</sup> Normalizing production per lateral foot offers an important lens for gauging well quality: Higher oil yields per horizontal foot are often taken as an indicator of higher-quality acreage or more effective drilling and completion practices. For example, by default the IHS Markit DNA database adjusts production per 1,000 feet of lateral length of wells when gauging the both the quality of horizontal wells and of the quality of acreage near already-drilled wells.<sup>54</sup> Similarly, Rystad Energy, a competitor to HIS Markit, notes that: “In benchmarking well productivity, it has become common practice to evaluate wells based on production per lateral foot of perforated length.”<sup>55</sup>

**Figure 7a: First-year Oil Production, Barrels per 1,000 Lateral Feet, 2019 Wells, Delaware Basin**



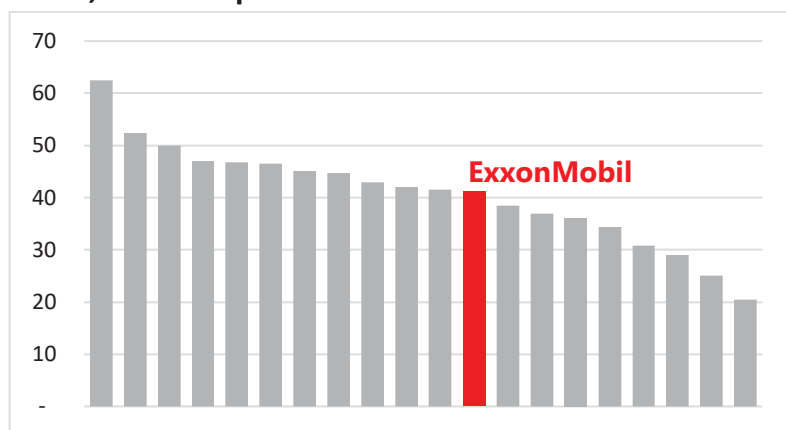
Source: IEEFA analysis of IHS Markit data.

<sup>53</sup> See, *inter alia*: IHS Markit Reservoir Engineering Solutions. [Episode #25 - Normalize Type Well by Lateral Length](#). July 29, 2019. National Energy Technology Laboratory. [Evaluation of Shale Gas Production Drivers by Predictive Modeling on Well Completion, Production, and Geologic Data](#). August 20, 2018. See also: Battlecat Oil & Gas. [A Scientific Approach to Developing Eagle Ford Acreage: Presentation to the Society of Petroleum Engineers](#). November 8, 2016. See also: Hart Energy. [Leveraging Statistical Analysis for Economic Efficiencies](#). June 1, 2018. See also: BTU Analytics. [Changes in Permian Spacing to Strand DUCs?](#) Undated.

<sup>54</sup> IHS Markit. [Dynamic North America: Glossary](#). Undated.

<sup>55</sup> Rystad Energy. [Should well productivity benchmarking take costs into account?](#). November 2019.

**Figure 7b: First-year Oil Production, Barrels per 1,000 Lateral Feet, 2019 Wells, Wolfcamp Midland**



Source: IEEFA Analysis of IHS Markit data.

IEEFA’s analysis shows that, when normalized per 1,000 feet of lateral well length, ExxonMobil’s 2019 Delaware wells ranked ninth in productivity among the top 20 companies in the Delaware Basin—suggesting middling performance on this metric.<sup>56</sup> (See Figure 7a.) On the same metric, ExxonMobil ranked 12<sup>th</sup> among its top 20 Wolfcamp Midland peers during 2019.<sup>57</sup> (See Figure 7b.) So, when adjusted for well length, ExxonMobil’s wells show middling performance among its large peers in both the Delaware and Wolfcamp Midland.

This middling production profile may not translate into middling economic performance. ExxonMobil may still excel at optimizing well economics if it is able to drill more cheaply than its competitors or take advantage of efficiencies that are unavailable to other companies. Still, ExxonMobil’s middling performance on this metric raises questions about the valuation and durability of the company’s competitive position versus its peers.

<sup>56</sup> Listed alphabetically, operators in this peer group include: APA Corporation, BP, BTA Oil Producers, Callon Petroleum, Centennial Energy, Chevron, Cimarex Energy, Concho Resources, Devon Energy, Diamondback Resources, EOG Resources, ExxonMobil, Marathon Oil, Matador Resources, Mewbourne Oil, Occidental Petroleum, Patriot Resources, Pioneer Resources, Shell and WPX Energy. See Appendix 1 for notes.

<sup>57</sup> Listed alphabetically, operators in this peer group include: APA Corporation, Birch Resources, Callon Petroleum, Chevron, Concho Resources, CrownQuest Operating, DE3 Operating, Diamondback Resources, Discovery Energy, Earthstone Energy, Endeavor Energy Resources, ExxonMobil, FDL Operating, Hunt Oil, Laredo Petroleum, Ovintiv, Pioneer Resources, QEP Resources, SM Energy and Surge Energy. See Appendix 1 for notes.

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## Conclusion

Collectively, these findings raise questions about the quality of ExxonMobil's disclosures to investors about its upstream portfolio, particularly about its Permian operations.

The majority vote by shareholders on recent climate and lobbying resolutions, and their election of three new directors over management objections, suggest the start of a new period of heightened investor scrutiny for the company. Questions about the Permian Basin's status go to the heart of the company's valuation, governance, and its future prospects as an oil and gas producer in a declining market.

ExxonMobil's equity investors lack detailed, transparent access to the company's operational and financial results. Instead, they must rely on the company itself to present a fair and accurate portrayal of its future prospects. ExxonMobil has chosen to tell its investors that it is a clear leader in the Permian Basin, a large-scale development venture that will serve as the linchpin for long-term leadership among U.S. oil producers. ExxonMobil bases this claim on a relative handful of wells in 2018 and 2019.

Yet by the company's own preferred standards—first-year production per well—ExxonMobil's Delaware assets show a troubling year-over-year decline in performance from 2018 to 2019. Early data shows further declines in 2020. The middling performance of the Midland basin, ExxonMobil's largest holdings in the Permian, raises further questions about the quality of the company's Permian position and its expected economic returns.

Overall, IEEFA's findings do not reveal evidence that ExxonMobil stands out as a Permian leader. Instead, the company appears to be just another fracker: A mid-tier company with a mixed track record in an industry that has suffered through a decade of disappointing results.

ExxonMobil has offered investors a shifting narrative about the role of the Permian in its long-term strategy. The company has projected short-term cash generation that did not materialize. It has projected longer-term future robust cash flows from its Permian assets but, as for most other fracking-focused enterprises, those returns remain speculative. Meanwhile, the company has decreased its overall production targets and timelines in the Permian.

**Instead of standing out as  
a Permian Basin leader,  
ExxonMobil appears to  
be just another fracker.**

Yet through these shifts, the company has steadfastly portrayed its Permian assets as central to the company's long-term financial and operational plans. Ultimately, however, ExxonMobil's investors care more about profits and cash generation more

than they care about oil and gas production volumes; the two are not synonymous.<sup>58</sup> Most fracking-focused companies have never been able to simultaneously boost production and produce robust cash flows.<sup>59</sup>

ExxonMobil's confidence in robust financial results from its Permian operations might be justified if the company's Delaware and Midland assets consistently outperformed its peers in well productivity. Since a close analysis raises questions about ExxonMobil's claims of industry-leading oil well performance in the Permian, investors have reason to question whether ExxonMobil can produce the financial returns it has promised from its Permian operations.

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<sup>58</sup> The Wall Street Journal. [Wall Street Tells Frackers to Stop Counting Barrels, Start Making Profits](#). December 13, 2017.

<sup>59</sup> Institute for Energy Economics and Financial Analysis. [In a Tumultuous 2020, Shale Firms Slashed Capex to Generate Cash](#). March 21, 2021.



Original WSJ story at [https://www.wsj.com/articles/exxon-draws-sec-probe-over-permian-basin-asset-valuation-11610716622?mod=hp\\_lead\\_pos3](https://www.wsj.com/articles/exxon-draws-sec-probe-over-permian-basin-asset-valuation-11610716622?mod=hp_lead_pos3)

Bloomberg@TheTerminal posting  
Exxon Draws SEC Probe Over Permian Basin Asset Valuation  
2021-01-15 13:17:02.477 GMT

By Christopher M. Matthews and Emily Glazer

(Dow Jones) -- The Securities and Exchange Commission launched an investigation of Exxon Mobil Corp. after an employee filed a whistleblower complaint last fall alleging that the energy giant overvalued one of its most important oil and gas properties, according to people familiar with the matter.

Several people involved in valuing a key asset in the Permian Basin, currently the highest-producing U.S. oil field, complained during an internal assessment in 2019 that employees were being forced to use unrealistic assumptions about how quickly the company could drill wells there to arrive at a higher value, according to a copy of the complaint, which was reviewed by The Wall Street Journal.

At least one of the employees who complained was fired last year, according to a person familiar with the matter. The Journal previously reported that there had been internal disagreements over the valuation.

The SEC began investigating the claims after receiving the complaint, people familiar with the matter said. The current status of the investigation is unknown. A SEC spokesman declined to comment.

Exxon spokesman Casey Norton declined to comment on the existence of an investigation. He said that if asked by authorities about the 2019 assessment, Exxon would provide information that shows Exxon's actual performance exceeded the drilling estimates. Mr. Norton also said Exxon doesn't comment on employees' performance.

"We cannot comment on the reasons for an unnamed employee's separation from the company," Mr. Norton said.

Under the SEC whistleblower program, individuals who provide information that results in a penalty can receive a share of the monetary penalty.

The investigation might now fall to an appointee of the incoming Biden administration, which is expected to choose Gary Gensler, a former financial regulator and Goldman Sachs Group Inc. executive, to head the SEC, the Journal reported Tuesday.

Exxon endured one of its worst-ever financial performances in 2020, posting billions of dollars in losses following an unprecedented decline in fossil-fuel demand as the coronavirus spread around the globe.

In November, Exxon pulled back from an ambitious plan by Chief Executive Darren Woods to boost its overall oil and gas production by one million barrels a day by 2025. The company said it would cut billions of dollars from its capital expenditures over the next five years and invest only in its best assets. Still, Exxon has said the Permian Basin, in West Texas and New Mexico, remains essential to its plans.

As the Journal previously reported, Mr. Woods's Permian growth plans dismayed some Exxon employees, who viewed them as unrealistic.

In March 2019, Mr. Woods said Exxon would increase oil and gas production in the Permian to one million barrels a day as early as 2024, up from previous estimates of 600,000 by 2025. The new target would amount to roughly 25% of Exxon's overall production before the Covid-19 pandemic. It hasn't updated its production targets there since announcing budget cuts in November.

"No one I knew in the organization thought this was possible; the pressure to deliver on Woods's promise to the market permeated the organization," the whistleblower said in the complaint.

Key to Mr. Woods's goal was ramping up production on Permian acreage Exxon acquired in 2017 for \$6.6 billion in an area called the Delaware Basin. Exxon has regularly touted the asset as its most promising area in the Permian.

"For our largest resource, which is in the Delaware Basin, we're only just about to unleash the hounds," said Neil Chapman, who heads Exxon's oil and gas division, during the company's annual investor day last March.

As the Journal previously reported, some Exxon managers in 2018 had initially pegged the net present value of the Delaware Basin at about \$60 billion. But some employees involved in Exxon's annual development planning estimated during the summer of 2019 that the area's net present value was closer to \$40 billion.

According to the whistleblower complaint, the lower estimate reflected, in part, that it took longer than expected to drill wells in 2018. After employees delivered the new number to the Delaware development manager, she allegedly asked them to "claw back" some of the lost value, according to the complaint, by using different assumptions, including a more optimistic "learning curve" that estimated the rate at which they would improve drilling times.

Some employees objected to using the new learning curve, which they viewed as unrealistic, and one employee submitted the revised estimates in a file named "This is a Lie," according to the complaint. The development planners ultimately estimated that the net present value was \$50 billion.

Exxon previously told the Journal that it was common for disagreements during planning processes and that the company's performance in the Permian has exceeded expectations.

While the company has never publicly disclosed the Delaware Basin valuation, it has made pronouncements about its progress there. In March, Mr. Chapman said the company had steadily improved drilling times and costs.

"What we're drilling is more efficiently every year," Mr. Chapman said in March. "In fact, we're drilling more efficiently every month. If I thought that we were operating inefficiently, I will be the first to pull back."

--Dave Michaels contributed to this article.

Write to Christopher M. Matthews at [christopher.matthews@wsj.com](mailto:christopher.matthews@wsj.com) and Emily Glazer at [emily.glazer@wsj.com](mailto:emily.glazer@wsj.com)

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NewsJan. 15, 2021

## ExxonMobil issues statement on Wall Street Journal report

IRVING, Texas – ExxonMobil issued the following statement in response to a report in today’s Wall Street Journal regarding the valuation of assets in the Permian Basin.

The claims made by an alleged whistleblower, and reported by The Wall Street Journal, are demonstrably false. Actual and provable performance exceeded drilling plans for the Permian, and such performance has been accurately represented to the investment community. The Wall Street Journal has been aware of these facts since September.

The company stands by its statements to investors, and, if the company were to be asked about this matter by authorities, it would provide information that shows the accuracy of its valuation of the company’s Permian assets, and that actual drilling performance exceeded the plans.

ExxonMobil has an extensive and rigorous planning and budgeting process that considers many sensitivities and ranges of outcomes. It takes into account thousands of inputs including hundreds of drilling curves over a seven-month period. Learning curves were developed as a collaborative effort between the drilling team executing the work, who had the most expertise with current drilling performance, and the development team, who leveraged data from demonstrated learning curve performance in other unconventional projects. There were multiple learning curves considered and evaluated throughout the process.

It is obvious that the employees who are alleged to have made the false claims lack the breadth and depth of experience to understand how and why drilling curves **are routinely revised** as technologies improve and understanding of the resource base expands. Historically, the company’s unconventional drilling performance has increased in short timeframes as engineers and planners gather more data in basins across its portfolio.

### About ExxonMobil

ExxonMobil, one of the largest publicly traded international energy companies, uses technology and innovation to help meet the world’s growing energy needs. ExxonMobil holds an industry-leading inventory of resources, is one of the largest refiners and marketers of petroleum products, and its chemical company is one of the largest in the world. To learn more, visit [exxonmobil.com](https://www.exxonmobil.com) and the [Energy Factor](#).

<https://www.tcenergy.com/announcements/2021-06-09-tc-energy-confirms-termination-of-keystone-xl-pipeline-project/>

## **TC Energy confirms termination of Keystone XL Pipeline Project**

June 9, 2021

*Focus remains on continuing to meet the evolving energy demand today and in the future*

CALGARY, Alberta, June 09, 2021 (GLOBE NEWSWIRE) — TC Energy Corporation (TSX, NYSE: TRP) (TC Energy or the Company) confirmed today that after a comprehensive review of its options, and in consultation with its partner, the Government of Alberta, it has terminated the Keystone XL Pipeline Project (the Project).

Construction activities to advance the Project were suspended following the revocation of its Presidential Permit on January 20, 2021. The Company will continue to coordinate with regulators, stakeholders and Indigenous groups to meet its environmental and regulatory commitments and ensure a safe termination of and exit from the Project.

Following is a statement from TC Energy's President and Chief Executive Officer, François Poirier:

*We value the strong relationships we've built through the development of this Project and the experience we've gained. We remain grateful to the many organizations that supported the Project and would have shared in its benefits, including our partners, the Government of Alberta and Natural Law Energy, our customers, pipeline building trade unions, local communities, Indigenous groups, elected officials, landowners, the Government of Canada, contractors and suppliers, industry associations and our employees.*

*Through the process, we developed meaningful Indigenous equity opportunities and a first-of-its-kind, industry leading plan to operate the pipeline with net-zero emissions throughout its lifecycle. We will continue to identify opportunities to apply this level of ingenuity across our business going forward, including our current evaluation of the potential to power existing U.S. assets with renewable energy.*

TC Energy's infrastructure plays a critical role in powering the North American economy, delivering the energy people need every day, safely and responsibly. The Company continues to progress \$20 billion of secured growth projects, \$7 billion of projects under development, and numerous additional initiatives aligned with its risk preferences and return criteria across its business lines and geographies.

Looking forward, there is tremendous opportunity for TC Energy in the energy transition with its irreplaceable asset footprint, financial strength and organizational capabilities positioning it to capture further significant and compelling growth. The Company will continue to build on its 70-year history of success and leverage its diverse businesses in natural gas and liquids transportation along with storage and power generation to continue to meet the growing and evolving demand for energy across the continent.

# COVID-19 UPDATE

Walk-in 1<sup>st</sup> Dose Vaccinations are available at MacDonald Island June 9 – 11, 9:30am – 3:30pm.

**RMWB Case Outcomes: 222 Active Cases 6713 Resolved Cases 12 Deceased Cases**



## Local Statistics

- **Fort McMurray**
  - 11 New Cases
  - 33 New Recoveries
  - 190 Active Cases (-23)
  - 12 Fatalities (+1)
  - 1st Dose Vaccination **60.1%**
  - 2nd Dose Vaccination **8.4%**
- **Rural RMWB**
  - 0 New Cases
  - 1 New Recovery
  - 32 Active Cases (-1)
  - 0 Fatalities (no change)
  - 1st Dose Vaccination **41.3%**
  - 2nd Dose Vaccination **14.8%**



## Provincial Data

- **Alberta**
  - 313 New Cases
  - 535 New Recoveries
  - 4204 Active Cases (-227)
  - 83 ICU (-2)
  - 329 Hospitalizations (-7)
  - 1st Dose Vaccinations **67.2%**
  - 2nd Dose Vaccinations **15.7%**
- **Canada**
  - 20,407 Active Cases (-1132)
  - 1.39M Cases Ever
  - 25,840 deaths (+49)



## News

- **RMWB State of Local Emergency Ends**
- Alberta enters Stage 2 of "Open for Summer" plan tomorrow, June 10, 2021
- Provincial Masking Requirement remains in effect, **RMWB Face Covering Bylaw** will be debated at the June 22nd Council Meeting

### Stage 1 - 50% Vaccinated, Under 800 Hospitalizations - June 1

- Places of Worship 15%
- Outdoor Social Gatherings up to 10 people
- Outdoor physical activity with restrictions
- Personal Wellness by appointment
- Restaurant Patios (Household Only - 4 per table)

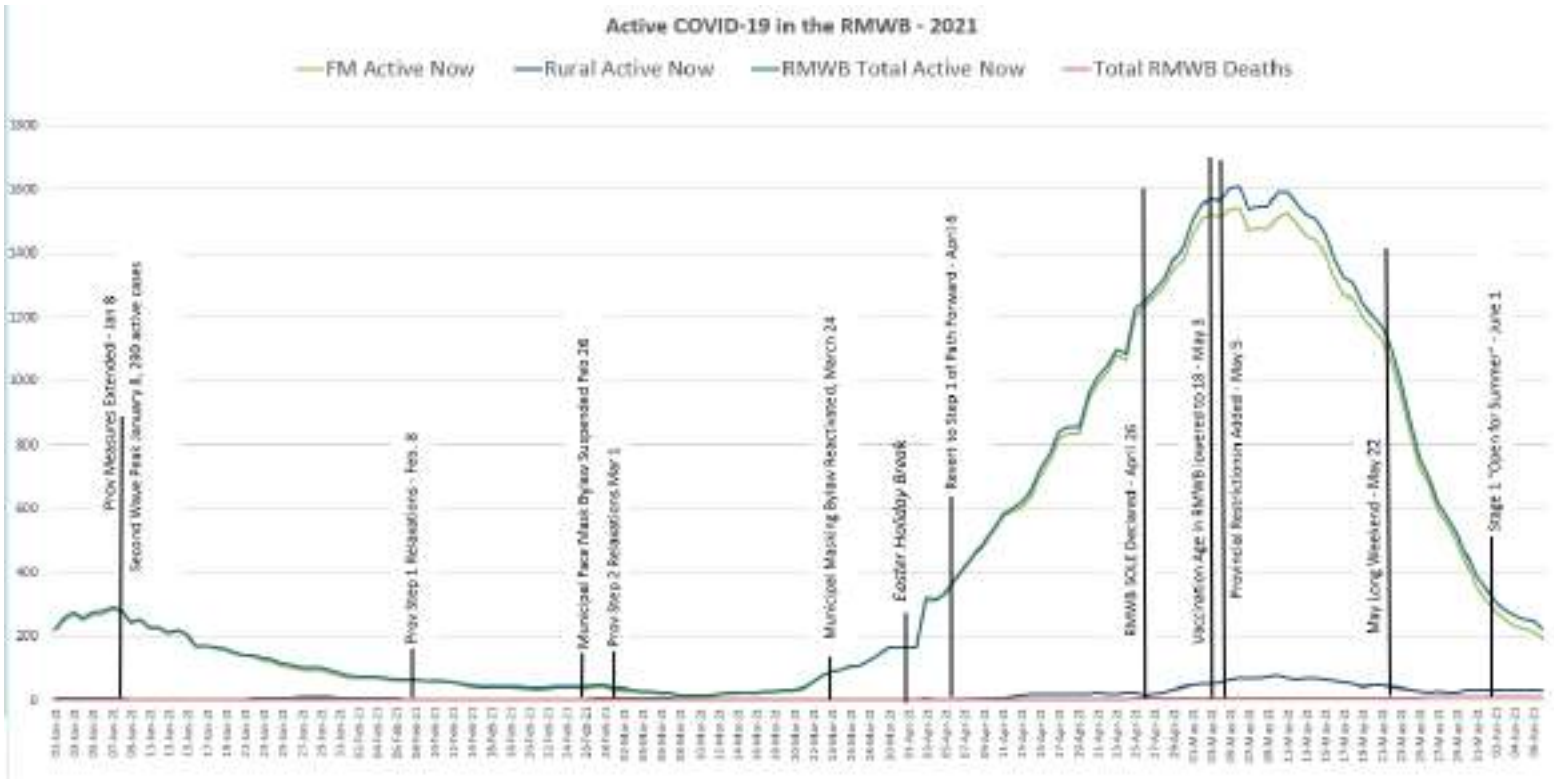
### Stage 2 - 60% Vaccinated, Under 500 Hospitalizations Starts Tomorrow, June 10th

- Outdoor gatherings up to 20 people
- Restaurants indoor/outdoor up to 6 people
- Indoor recreation, entertainment settings at 1/3 fire code
- Indoor Fitness - open for solo, class and drop-in activities
- Youth Camps, Youth and Adult Sports with restrictions

### Stage 3 - 70% Vaccination

- All restrictions lifted, including ban on indoor social gatherings.
- Isolation requirements for confirmed cases of Covid-19 and some protective measures in continuing care settings remain.

# COVID-19 UPDATE



## Outbreaks in RMWB

### Industrial:

- MEG Energy
- CNRL Horizon
- CNRL Albion
- Kearl Lake
- Civeo Lynx Lodge
- Civeo McClelland Lake
- Wapasu Creek Lodge
- Civeo Athabasca
- Cenovus Sunrise Lodge
- Suncor Base Plant
- Suncor Firebag
- Suncor Fort Hills
- Suncor Mackay River
- Syncrude Mildred Lake
- Syncrude Aurora
- CNOOC Long Lake
- Oilsands Industrial Lodge - Fort McKay

## Outbreaks in RMWB

### Other:

- Chez Madame Piccolo/Ecole Boreal
- Salvation Army Shelter
- Centre of Hope
- Walmart

## Schools

### Outbreak 10+ Cases:

- St. Martha Catholic School

### Outbreak 5-9 Cases:

- Thickwood Heights School
- Sister Mary Phillips

### Alert 2-4 Cases: none

## Variants Identified in the AHS North Zone

B.1.1.7 (UK)	5854
B.1.351 (SA)	4
B.1.617 (India)/Delta 2	
P.1 (Brazil)	701
<b>Total:</b>	<b>6561</b>

<b>AHS NZ Recovered:</b>	<b>6561</b>
<b>AHS NZ Deceased:</b>	<b>28</b>
<b>AHZ NZ Active:</b>	<b>446</b>





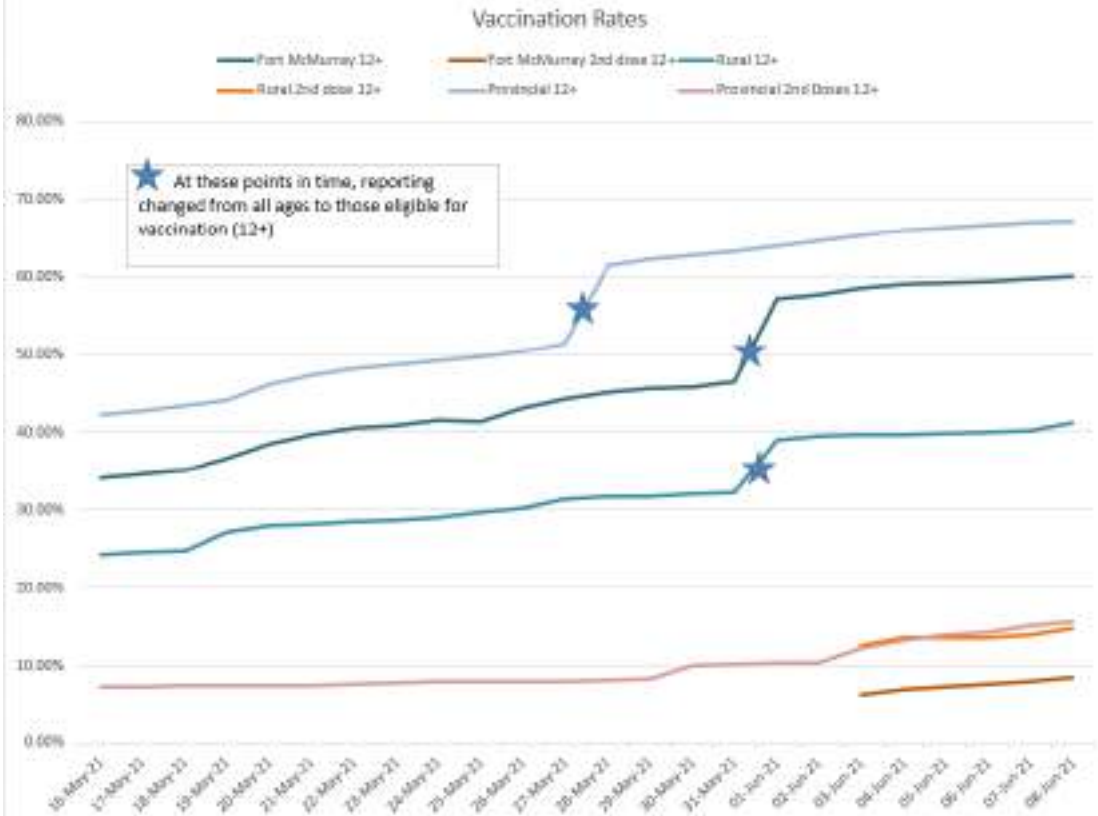
# COVID-19 UPDATE

## New vaccination information:

First Dose	Book
March	Now
April	June 14
May	June 28

Where possible, AHS and participating pharmacies who administered your first dose will contact you when you are eligible for your second dose. You do not need to wait to be contacted to book an appointment once you are eligible and you can choose where to go to get your second dose.

[More information on Vaccinations can be found here.](#)



## Second Dose:

Every Albertan should get their second dose when they're eligible. A single dose of COVID-19 vaccine offers at least 80% protection against severe outcomes, including hospitalization and death. However, second doses are needed to get the best and most long-lasting protection.

The following information was presented regarding 2<sup>nd</sup> doses.

- Alberta will have sufficient supply of each vaccine to provide 2<sup>nd</sup> doses
- Anyone who received 1<sup>st</sup> dose of AstraZeneca in April or later can book second dose (either AstraZeneca or mRNA) at least 8 weeks after the 1<sup>st</sup> dose.
- Fact Sheet for Albertans who got AstraZeneca for first dose available [here](#).
- Quarantine rules have changed for people who are fully immunized:
  - People with 2 doses no longer need to quarantine if they are exposed to someone with Covid-19 if they have no symptoms.
  - People with 1<sup>st</sup> dose have shorter quarantine requirements

## Vaccine Efficacy:

Vaccine	After 1 <sup>st</sup> Dose	After 2 <sup>nd</sup> Dose
Moderna	82%	93%
Pfizer	73%	90%
B.1.1.7 UK Variant	73%	91%
P.1 Brazilian Variant	75%	89%

Statistical information is not yet available on variations of the AstraZeneca vaccine and 2<sup>nd</sup> doses of mRNA, or on the other two variants of concern.

Exxon Beaumont Lockout of Union Workers Enters Sixth Week  
2021-06-10 20:32:26.293 GMT

By Barbara Powell

(Bloomberg) -- Exxon Mobil Corp. and union workers at its Beaumont refinery on the Texas Gulf Coast continue sporadic talks with no agreement reached as a lockout imposed by Exxon enters a sixth week.

\* Each side has rejected the other's proposals; a meeting this week ended without agreement and another one is expected to occur next week

\* "We continue to meet and bargain in good faith with the union," spokeswoman Julie King says

\*\* "No additional proposals were exchanged in today's meeting"

\* Beaumont, which is set to become America's largest oil refinery, has been running with temporary workers since May 1

\* United Steelworkers Local 13-243's six-year work agreement with the oil giant expired Feb. 1 without a new collective bargaining agreement in place for the refinery and blending and packaging plant

\* The Beaumont refinery can process 359k b/d a day of crude

\*\* Beaumont is preparing to add a third crude unit that would expand capacity by 250k b/d

To contact the reporter on this story:

Barbara Powell in Houston at [bpowell4@bloomberg.net](mailto:bpowell4@bloomberg.net)

To contact the editors responsible for this story:

Jasmina Kelemen at [jkelemen2@bloomberg.net](mailto:jkelemen2@bloomberg.net)

Carlos Caminada

To view this story in Bloomberg click here:

<https://blinks.bloomberg.com/news/stories/QUI53ADWRGG7>

# Oil Market Highlights

## Crude Oil Price Movements

Spot crude prices experienced firm gains in the month of May, rising on average about 6% month-on-month (m-o-m), settling at multi-month highs, amid stronger physical oil market fundamentals. Refiners in most regions showed increases in buying interest on the expectation of a further oil demand recovery with the approach of the summer driving season. The OPEC Reference Basket (ORB) increased by \$3.67, or 5.8%, m-o-m in May to average \$66.61/b, the highest since May 2019. Year-to-date, the ORB was up 56.8%, averaging \$62.16/b, compared to \$39.65/b on average over the first five months of 2020. Crude oil futures prices rose in May, with ICE Brent increasing \$2.98, or 4.6%, to average \$68.31/b, and NYMEX WTI gaining \$3.45, or 5.6%, to an average of \$65.16/b. Consequently, the Brent-WTI spread narrowed 47¢ to average \$3.15/b in May. The market structure of all three major oil benchmarks remained in sustained backwardation. Hedge funds and other money managers reduced their net long positions for crude futures and options in May, mainly for Brent.

## World Economy

The global economic growth forecast for 2021 remains unchanged at 5.5%, although the forecast continues to be impacted by uncertainties including the spread of COVID-19 variants and the speed of the global vaccine rollouts. In addition, sovereign debt levels in many regions, inflationary pressures and central bank responses remain key factors to monitor. US economic growth in 2021 is revised up slightly to stand at 6.4%, following a contraction of 3.5% in 2020. The economic growth forecast for the Euro-zone in 2021 is lowered slightly to stand at 4.1%, following a contraction of 6.7% last year. Similarly, Japan's economic growth forecast is lowered to 2.8% for 2021, following a contraction of 4.7% in 2020. After growth of 2.3% in 2020, China's economic growth forecast in 2021 remains at 8.5%. Given the ongoing COVID-19 related challenges, India's 2021 economic growth forecast is revised down slightly to 9.5%, following the contraction of 7.0% in 2020. Brazil's growth forecast for 2021 remains unchanged at 3.0%, following a contraction of 4.1% in 2020. Russia's forecast for 2021 remains at 3.0%, following a contraction of 3.1% in 2020.

## World Oil Demand

World oil demand is now estimated to have declined by 9.3 mb/d in 2020, a slight improvement of 0.1 mb/d on last month's estimate, mainly reflecting the most up-to-date data for both the OECD and non-OECD regions. Total global oil demand is expected to average 90.6 mb/d. For 2021, world oil demand growth is kept unchanged at 6.0 mb/d, with total oil demand standing at 96.58 mb/d. OECD demand is revised slightly lower on an annualized basis, mainly reflecting lower-than-expected data from OECD Americas and Europe in 1Q21. However, initial data for April in both regions, as well as positive mobility developments given easing restriction measures and border openings, encouraged an upward revision to 2Q21 data. This offset most of the 1Q21 downward revision. In the non-OECD, oil demand was revised slightly higher, mainly due to positive 2Q21 data from the Middle East.

## World Oil Supply

Non-OPEC liquids supply in 2020 is estimated to average 62.9 mb/d, representing a y-o-y contraction of 2.5 mb/d. For 2021, non-OPEC liquids supply is revised up by 0.1 mb/d from last month's assessment, and is now forecast to grow by 0.8 mb/d to average 63.7 mb/d. This is mainly due to a faster-than-expected recovery in US liquids production of 2.5 mb/d in March. Additionally, the supply forecast for Norway, China, and Indonesia is also revised up, while the supply forecast in the UK, Brazil and Colombia is revised down. The main drivers for 2021 supply growth are anticipated to be Canada, Brazil, China and Norway, while US liquids supply is now expected to only grow by a marginal 0.03 mb/d y-o-y. US crude oil is actually forecast to decline y-o-y by 0.1 mb/d to 11.2 mb/d. OPEC NGLs are forecast to grow by 0.1 mb/d y-o-y in 2021 to average 5.2 mb/d, following an estimated contraction of 0.2 mb/d in 2020. OPEC crude oil production in May increased m-o-m by 0.39 mb/d, to average 25.46 mb/d, according to available secondary sources to date.

### Product Markets and Refining Operations

Refinery margins showed diverging trends in May. Margins increased in the US Gulf Coast (USGC) were supported by unplanned refinery outages which limited the stronger recovery in run rates and kept product output relatively suppressed. In contrast, Europe and Asia margins performed negatively as refining economics showed losses. Pressure came mainly from the top and bottom-sections of the barrel, reflecting rising product output rates. Global capacity offline fell considerably in May, with trends indicating the end of peak refinery turnaround season, and hence run rates are expected to be strong over the coming months.

### Tanker Market

Dirty tanker rates saw mixed movement in May, although they remain at low levels. Improving US market supported rates on the UK-US route, while very low rates on the Mideast-Asia Pacific route edged-up amid anticipation of the end of seasonal maintenance. Meanwhile, clean rates were largely steady. There has been a slight improvement in sentiment for the outlook for dirty tanker rates in 2H21, although scrapping will still need to pickup to better balance tonnage supply with demand for cargoes.

### Crude and Refined Products Trade

Preliminary data shows US crude imports rose 0.2 mb/d in May to average 6.0 mb/d, the highest in 11 months. US crude exports dipped again, averaging 2.8 mb/d in May, amid lower buying from the Asian region. With the start of the driving season and a pick-up in economic activity, US crude and product trade flows will provide a key support for the market in the coming months, together with OECD Europe. Tracking data shows a steady increase in OECD Europe crude imports since February and crude exports declined, amid lower production and improving demand in 2Q21 given the easing of lockdown measures. China's crude imports dropped to just below 10 mb/d in April, amid planned refinery maintenance, with a further decline in May to a five-month low of 9.65 mb/d seen in preliminary data. China's crude imports are expected to remain low in 2Q21, before picking up again in 3Q21. Stricter oversight of refinery activities and the end of a tax loophole is likely to weigh on both product imports and exports in the coming few months. Meanwhile, India's crude imports recovered from a five-month low in April to average 4.5 mb/d. The vicious surge in COVID-19 cases which reached record levels in May will likely weigh on demand for crude imports for May and June, with local refiners expecting the situation to improve in July. Constrained domestic consumption could free up product for exports over the period.

### Commercial Stock Movements

Preliminary data shows that total OECD commercial oil stocks fell m-o-m by 6.4 mb in April. At 2,962 mb, inventories were 160 mb lower than the same month a year ago, 25 mb below the latest five-year average, and around 34 mb higher than the 2015–2019 average. Within the components, crude stocks fell m-o-m by 13.6 mb, while product stocks rose 7.2 mb. OECD crude stocks stood at 1,475 mb in April, which is 36 mb less than the latest five-year average and 8 mb lower than the 2015–2019 average. Product stocks stood at 1,487 mb, which represents a surplus of 11 mb compared to the latest five-year average and 43 mb higher than the 2015–2019 average. In terms of days of forward cover, OECD commercial inventories declined m-o-m by 0.9 days in April to stand at 66.0 days. This is 12.3 days lower than the year-ago level, some 0.5 days above the latest five-year average, and 3.9 days above the 2015–2019 average.

### Balance of Supply and Demand

Demand for OPEC crude in 2020 is revised up by 0.2 mb/d from last month's assessment to stand at 22.7 mb/d, which is 6.6 mb/d lower than in 2019. For 2021, demand for OPEC crude is forecast to stand at 27.7 mb/d, unchanged from last month's assessment and around 5.0 mb/d higher than in 2020.

## Feature Article

### World oil market prospects for 2H2021

Global economic recovery has been delayed due to the resurgence of COVID-19 infections and renewed lockdowns in key economies, including the Euro-zone, Japan and India, which kept growth rates low in 1H21. However, the ongoing vaccination efforts, growing share of recovered cases leading to increasing herd immunity, and the easing of lockdown restrictions lend optimism that the pandemic could be contained in the few months to come.

These developments, combined with broad-based stimulus measures, high savings rates in advanced economies, and pent-up demand following the lockdowns, are expected to add momentum to the economic rebound towards the end of 2Q21. Consumption is forecast to improve, particularly in the contact-intensive sectors, and investment is anticipated to rise, with the stabilization of crude oil markets expected to add further upside in some producer countries, including the US. Consequently, GDP growth rates in 2H21 are forecast to significantly exceed that of 1H21 (**Graph 1**). The ongoing fiscal stimulus in the US, amounting to almost \$3 trillion, or more than 3% of global GDP, is one very important supporting factor, as is China's

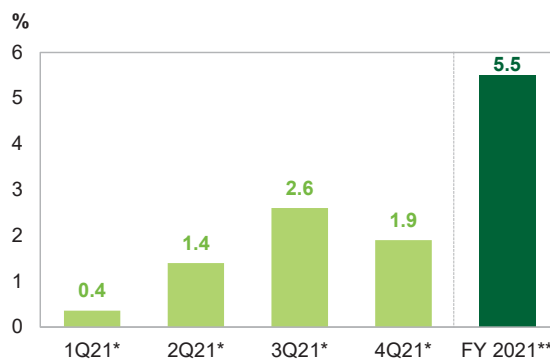
successful containment of COVID-19 and the country's consequent swift economic recovery. However, numerous challenges remain. New virus variants and/or mutations could diminish, or even neutralize, ongoing containment strategies. Moreover, a strong recovery could lead to rising inflation and a necessary reduction of monetary stimulus, resulting in higher interest rates. Moreover, very high sovereign debt levels amid rising interest rates could pose a burden on the fiscal health of many economies.

Turning to the oil market, global oil demand is also anticipated to pick up pace in 2H21, reaching 99.0 mb/d, compared to 94.1 mb/d in 1H21, with improving mobility in major economies supporting gasoline and on-road diesel demand. Improvements in pandemic containment efforts and seasonal summer demand will allow for positive expectations for 2H21. On a regional basis, OECD oil demand is anticipated to grow by 3.1 mb/d in 2H21 y-o-y, as oil demand gains traction, especially in OECD Americas, the largest contributor to oil demand growth in 2021. However, oil demand in the region is not expected to fully recover from the 2020 contraction. Transportation fuels, mainly gasoline, as well as light and middle distillates are assumed to support the oil demand recovery going forward. In the non-OECD, oil demand is estimated to grow by 3.0 mb/d in 2H21 y-o-y, driven by China, India and Other Asia. A healthy rebound in economic momentum is anticipated to stimulate industrial fuel demand, while demand for petrochemical feedstock is also projected to support demand growth in 2021.

Following an estimated growth of 1.1 mb/d in 1H21 compared with 2H20, non-OPEC oil supply, including OPEC NGLs, is forecast to grow by 2.1 mb/d in 2H21 compared with 1H21, which is up by 3.2 mb/d y-o-y. For the entire year, non-OPEC liquids supply is forecast to grow by 0.84 mb/d y-o-y (**Graph 2**). On a regional basis, some 1.6 mb/d out of total incremental production of 2.1 mb/d in 2H21 is expected to come from the OECD region, mainly from the US with 1.1 mb/d and the rest from Canada and Norway. At the same time, liquids supply growth from the non-OECD regions is forecast at only 0.4 mb/d in 2H21.

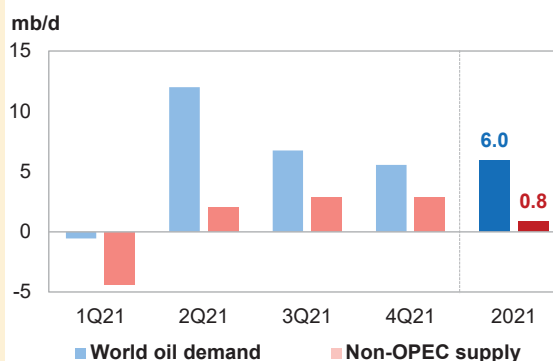
Overall, the recovery in global economic growth, and hence oil demand, are expected to gain momentum in 2H21. At the same time, the successful efforts of the DoC have substantially led the way towards a market rebalance. This foresight, along with an ongoing joint vigilant monitoring of developments, continues to support the oil market, in tandem with the expected recovery in the various economic sectors.

**Graph 1: World GDP growth**



Note: \* q-o-q and \*\* y-o-y. Source: OPEC.

**Graph 2: World oil demand and Non-OPEC supply, y-o-y changes**



Note: 2021 = Forecast. Source: OPEC.

## World Oil Demand

World oil demand is anticipated to have declined by 9.3 mb/d in 2020, some 0.1 mb/d higher than last month's report, mainly to reflect updated data in both the OECD and non-OECD regions. Total global oil consumption for last year is expected to average 90.6 mb/d.

For 2021, world oil demand growth was kept unchanged at around 6.0 mb/d with total oil demand at 96.6 mb/d. OECD demand was revised slightly lower, on an annualized basis, mainly to reflect lower-than-expected data from OECD Americas and Europe in 1Q21. However, initial data for April in both regions and the positive developments in mobility due to easing COVID-19 restrictions, as well as the opening of borders encouraged upward revisions of 2Q21 data and offset most of the 1Q21 downward revisions. In the non-OECD, oil demand was revised marginally higher on annualized basis, offsetting all of the OECD downward revisions, mainly due to positive 2Q21 data from the Middle East.

OECD oil demand is anticipated to increase by 2.7 mb/d in 2021 with most of the gains accruing in 2H21. OECD Americas, led by the US, is projected to be the largest contributor to oil demand growth in 2021, supported by rebounding transportation fuels, mainly gasoline, and healthy light- and middle-distillate requirements. However, 2021 oil demand in the region is not anticipated to fully recover to pre-pandemic levels.

Non-OECD oil demand is estimated to rise by 3.3 mb/d in 2021 with growth largely focused in China, followed by India and Other Asia. A healthy rebound in economic momentum is expected to stimulate industrial fuel demand. Demand for petrochemical feedstocks is also projected to support growth in 2021.

## World oil demand in 2020 and 2021

Table 4 - 1: World oil demand in 2020, mb/d

World oil demand	2019	1Q20	2Q20	3Q20	4Q20	2020	Change 2020/19	
							Growth	%
<b>Americas</b>	25.65	24.35	20.01	22.72	23.16	22.56	-3.09	-12.05
<i>of which US</i>	20.86	19.67	16.38	18.67	19.04	18.44	-2.42	-11.60
<b>Europe</b>	14.25	13.34	11.01	12.87	12.51	12.43	-1.82	-12.75
<b>Asia Pacific</b>	7.79	7.75	6.54	6.70	7.29	7.07	-0.72	-9.24
<b>Total OECD</b>	<b>47.69</b>	<b>45.44</b>	<b>37.56</b>	<b>42.29</b>	<b>42.97</b>	<b>42.07</b>	<b>-5.63</b>	<b>-11.80</b>
<b>China</b>	13.48	11.34	13.25	13.87	14.28	13.19	-0.29	-2.18
<b>India</b>	4.91	4.84	3.81	4.24	5.15	4.51	-0.40	-8.20
<b>Other Asia</b>	9.04	8.30	7.79	8.11	8.33	8.13	-0.91	-10.06
<b>Latin America</b>	6.59	6.11	5.61	6.20	6.12	6.01	-0.58	-8.83
<b>Middle East</b>	8.20	7.88	6.91	7.73	7.65	7.55	-0.66	-8.00
<b>Africa</b>	4.43	4.37	3.76	3.94	4.27	4.08	-0.35	-7.85
<b>Russia</b>	3.61	3.44	3.04	3.40	3.59	3.37	-0.24	-6.69
<b>Other Eurasia</b>	1.24	1.07	0.99	1.01	1.23	1.07	-0.16	-13.04
<b>Other Europe</b>	0.76	0.71	0.55	0.64	0.69	0.65	-0.12	-15.33
<b>Total Non-OECD</b>	<b>52.27</b>	<b>48.04</b>	<b>45.71</b>	<b>49.15</b>	<b>51.31</b>	<b>48.56</b>	<b>-3.71</b>	<b>-7.10</b>
<b>Total World</b>	<b>99.97</b>	<b>93.48</b>	<b>83.27</b>	<b>91.43</b>	<b>94.28</b>	<b>90.63</b>	<b>-9.34</b>	<b>-9.34</b>
<b>Previous Estimate</b>	99.98	93.51	83.08	91.21	94.20	90.51	-9.48	-9.48
<b>Revision</b>	-0.02	-0.02	0.19	0.23	0.08	0.12	0.14	0.13

Note: Totals may not add up due to independent rounding. Source: OPEC.



Table 4 - 2: World oil demand in 2021\*, mb/d

World oil demand	2020	1Q21	2Q21	3Q21	4Q21	2021	Change 2021/20	
							Growth	%
<b>Americas</b>	22.56	23.21	24.58	24.74	24.75	24.33	1.77	7.84
<b>of which US</b>	18.44	19.15	19.96	20.24	20.45	19.96	1.51	8.21
<b>Europe</b>	12.43	11.96	12.78	13.61	13.71	13.02	0.59	4.73
<b>Asia Pacific</b>	7.07	7.61	7.18	7.17	7.51	7.37	0.30	4.23
<b>Total OECD</b>	<b>42.07</b>	<b>42.77</b>	<b>44.54</b>	<b>45.52</b>	<b>45.97</b>	<b>44.72</b>	<b>2.65</b>	<b>6.31</b>
<b>China</b>	13.19	12.95	14.27	14.93	15.05	14.30	1.11	8.43
<b>India</b>	4.51	4.94	4.52	4.91	5.61	5.00	0.49	10.82
<b>Other Asia</b>	8.13	8.34	8.96	8.57	8.59	8.62	0.48	5.96
<b>Latin America</b>	6.01	6.15	6.16	6.46	6.40	6.29	0.28	4.68
<b>Middle East</b>	7.55	7.92	7.67	8.24	7.97	7.95	0.41	5.41
<b>Africa</b>	4.08	4.39	3.96	4.16	4.48	4.25	0.16	4.03
<b>Russia</b>	3.37	3.57	3.37	3.57	3.74	3.56	0.19	5.77
<b>Other Eurasia</b>	1.07	1.18	1.19	1.14	1.28	1.20	0.12	11.43
<b>Other Europe</b>	0.65	0.71	0.62	0.68	0.74	0.69	0.04	6.36
<b>Total Non-OECD</b>	<b>48.56</b>	<b>50.16</b>	<b>50.72</b>	<b>52.65</b>	<b>53.85</b>	<b>51.86</b>	<b>3.30</b>	<b>6.79</b>
<b>Total World</b>	<b>90.63</b>	<b>92.93</b>	<b>95.26</b>	<b>98.18</b>	<b>99.82</b>	<b>96.58</b>	<b>5.95</b>	<b>6.57</b>
<b>Previous Estimate</b>	90.51	93.29	94.79	97.90	99.74	96.46	5.95	6.58
<b>Revision</b>	0.12	-0.36	0.47	0.28	0.08	0.12	0.00	-0.01

Note: \* 2021 = Forecast. Totals may not add up due to independent rounding. Source: OPEC.

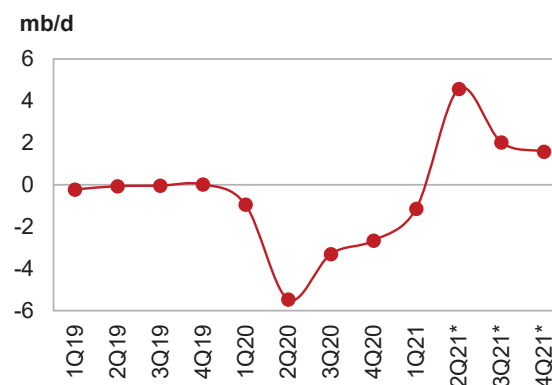
## OECD

### OECD Americas

#### Update on the latest developments

The latest monthly data from **OECD Americas** shows oil demand rising by 0.7 mb/d y-o-y in **March 2021**, after decreasing by around 3.5 mb/d y-o-y in February. However, due to the low baseline in 2020, demand remained significantly lower than pre-pandemic consumption levels and was lower by more than 1.0 mb/d compared with March 2019. The y-o-y increases in March 2021 were mainly attributed to gasoline rebounding from the March 2020 slump due to the onset of COVID-19 and its impact on mobility and transportation fuels. The US was the only country posting a y-o-y increase in March 2021, while Canada, Mexico and Chile all showed declines of around 0.2 mb/d y-o-y, collectively. Unlike previous months, demand for lighter distillates, which are mainly petroleum products utilized as feedstocks for the petrochemical sector, declined, particularly in the US. Light distillates demand increased in Mexico and Canada, slightly offsetting the US declines.

Graph 4 - 1: OECD Americas oil demand, y-o-y change



Note: \* 2Q21-4Q21 = Forecast. Source: OPEC.

The latest monthly data from the US Energy Information Administration (EIA) shows oil demand rising by 0.9 mb/d y-o-y in March 2021, after posting a decline of 2.4 mb/d y-o-y in February. Demand fell by nearly 1.0 mb/d compared with March 2019. However, noticeable developments were recorded in gasoline, diesel and fuel oil demand in light of easing COVID-19 restrictions in various states, leading to a m-o-m rise in vehicle miles travelled and improvements in industrial activity that supported growth for those fuels. Vehicle miles travelled rose nearly 19.0%, y-o-y, in March 2021, according to the Federal Highway Administration, following a decline of 12.1%, y-o-y, in February and a drop of 18.9%, y-o-y, in March 2020. Additionally, total auto sales posted strong y-o-y gains in March 2021, increasing by 58.7% y-o-y compared with a decline of 5.6% y-o-y in February and 34.6% y-o-y decline in March 2019. Diesel demand posted growth only for the second time since

## World Oil Demand

the beginning of 2019. March 2021 diesel data showed an increase of more than 0.1 mb/d y-o-y after declining by around 0.1 mb/d y-o-y in February.

**Table 4 - 3: US oil demand, mb/d**

By product	Mar 21	Mar 20	Change 2021/20	
			mb/d	%
LPG	3.04	3.13	-0.09	-2.8
Naphtha	0.17	0.19	-0.03	-13.4
Gasoline	8.58	7.78	0.80	10.2
Jet/kerosene	1.16	1.39	-0.23	-16.8
Diesel	4.03	3.91	0.12	3.1
Fuel oil	0.29	0.11	0.18	167.0
Other products	2.23	2.05	0.17	8.3
<b>Total</b>	<b>19.49</b>	<b>18.57</b>	<b>0.92</b>	<b>5.0</b>

Note: Totals may not add up due to independent rounding. Sources: EIA and OPEC.

## Near-term expectations

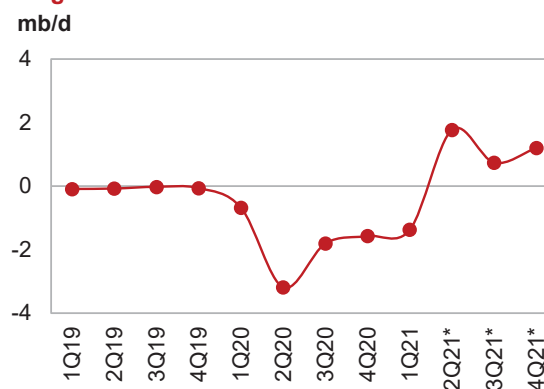
Oil demand in OECD Americas will be largely directed by the US, particularly with regard to transportation fuels. With a successful vaccination campaign and the large fiscal stimulus that was endorsed in March, positive oil demand performance is expected over the short term. Traffic has stabilized at 94% on the US on the back of vaccination rollouts in many states that allowed mobility restrictions to be reduced and lifted in some states. The pace of this development is projected to have a positive impact on oil demand in 2Q21 and 2H21. Further support is projected to stem from the petrochemical sector, supported by strong end-user demand for plastic products. The US aviation sector remained at around 60% of 2019 levels in May with some improvement in domestic routes. Going forward, the sector is projected linger below 2019 levels and will show positive growth on annualized basis in 2021.

## OECD Europe

### Update on the latest developments

European oil demand declined in **March 2021**, falling by 0.6 mb/d y-o-y, after dropping by around 2.0 mb/d y-o-y in February. Oil demand posted hefty declines when compared to normal consumption and was 1.6 mb/d below March 2019 with most of the declines attributed to the poor performance of the middle part of the barrel, primarily transportation fuels. Most of the decline improvements in March 2021 was attributed to strong y-o-y naphtha demand, a continuation of the healthy trend registered in recent months. Demand for petrochemical feedstocks was supported by healthy naphtha cracking margins and strong appetite for the feedstock to fulfil increasing end-user demand.

**Graph 4 - 2: OECD Europe's oil demand, y-o-y change**



Note: \* 2Q21-4Q21 = Forecast. Source: OPEC.

Gasoline also posted y-o-y gains, increasing by nearly 0.1 mb/d y-o-y, compared to large decline in February of 0.4 mb/d y-o-y. Improvements in mobility across the region's main economies supported gasoline demand coupled with historical declines in March 2020 gasoline consumption. The mobility index in March was higher m-o-m in a number of countries – such as in Germany, France, the UK and Spain – while mobility in Italy was lagging, according to Google and Apple mobility data. Additionally, based on initial figures from the Association des Constructeurs Européens d'Automobiles (ACEA), March 2021 new vehicle registrations in the EU increased by a massive 91.7%, y-o-y, compared with a decline of 19.3% y-o-y, in February. New passenger car registrations dropped by around 65.9% y-o-y, in March 2020. Increases in the industrial production index supported fuel oil and diesel demand, reducing the level of y-o-y decreases. Fuel oil was flat y-o-y for two consecutive months while diesel recorded a decline of 0.3 mb/d y-o-y in March, compared with a drop of 0.8 mb/d in February. Industrial production, which excludes construction, posted an increase of 10.7% y-o-y, compared to 1.1% drop in February, according to the Statistical Office of the European Communities (Eurostat) and Haver Analytics.

**Table 4 - 4: Europe's Big 4\* oil demand, mb/d**

By product			Change 2021/20	
	Mar 21	Mar 20	mb/d	%
LPG	0.40	0.44	-0.04	-9.0
Naphtha	0.61	0.49	0.12	23.7
Gasoline	0.98	0.96	0.02	2.2
Jet/kerosene	0.36	0.58	-0.22	-38.2
Diesel	3.04	3.13	-0.09	-3.0
Fuel oil	0.16	0.13	0.02	17.3
Other products	0.44	0.39	0.05	12.9
<b>Total</b>	<b>5.97</b>	<b>6.12</b>	<b>-0.15</b>	<b>-2.4</b>

Note: \* Germany, France, Italy and the UK. Totals may not add up due to independent rounding.

Sources: JODI, UK Department for Business, Energy & Industrial Strategy, Unione Petrolifera and OPEC.

## Near-term expectations

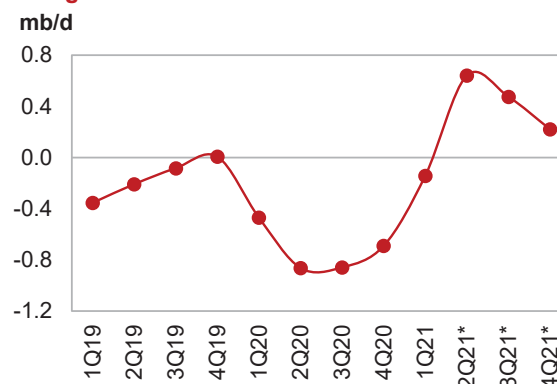
Oil demand is projected to show healthy performance towards later part of 2Q21 following the easing of mobility and travel restrictions in many European countries in the second half of May. Gasoline, diesel and jet fuel are expected to pick up pace as travel and tourism activity gradually improves across the region. Some preliminary data indicates positive oil demand developments across Europe. UK fuel sales for the month of May, for example, reached the highest level since the start of the pandemic in 2020, according to various sources. Furthermore, latest toll roads data in countries such as France, Italy and Spain recorded higher use and almost matched pre-pandemic levels. Portugal and the Netherlands opened up travel, and the UK allowed tourists to travel to certain destinations. The outlook for the region's oil demand in 2021 is in line with last month's projections, with some downward revisions in 1Q21, taking into consideration the most recent data. The acceleration of vaccination programmes and an easing of travel restrictions provide some upside potential to the forecast. On the other hand, unforeseen developments related to COVID-19 due to emergence of new variants could possibly tilt the outlook to the downside going forward.

## OECD Asia Pacific

### Update on the latest developments

March 2021 data shows **OECD Asia Pacific oil demand** increasing y-o-y for the first time since December 2019. Oil demand edged higher by more than 0.1 mb/d y-o-y, following a decline of more than 0.2 mb/d y-o-y, in February. When compared with March 2019, demand remained steeply in negative territory, falling by more than 0.5 mb/d. Naphtha demand led the increase during March, rising by more than 0.2 mb/d y-o-y, posting the first y-o-y increase since August 2019. The return of naphtha crackers from planned and unplanned maintenance in both Japan and South Korea lifted demand for petrochemical feedstocks. Additionally, robust naphtha cracking margins allowed steam cracker operators to keep utilization rates at high levels.

**Graph 4 - 3: OECD Asia Pacific oil demand, y-o-y change**



Note: \*2Q21-4Q21 = Forecast. Source: OPEC.

Gasoline demand also posted y-o-y gains for the first time since October 2019, rising by 0.04 mb/d, after recording a similar decline in February. M-o-m improvements in mobility supported gasoline requirements in almost all countries of the region. In Japan and South Korea, mobility improved from 92 and 78, respectively, in February to 108 and 83 in March, according to Google Maps and Apple mobility data using January 2020 as a reference.

Diesel demand edged slightly higher in March after gaining around 0.1 mb/d y-o-y in February. Industrial production in both Japan and South Korea rose y-o-y. In Japan, industrial production recorded a 0.9% y-o-y increase for the first time since January 2019, after declining by more than 3% in February as reported by Ministry of Economy, Trade and Industry (METI) and Haver Analytics. Similarly, industrial production improved

## World Oil Demand

in South Korea, rising 5.7% y-o-y, in March compared with 4.4% y-o-y, in February, as reported by Statistics Korea and Haver Analytics.

Preliminary METI data for April 2021 shows Japanese oil demand increasing by around 0.2 mb/d y-o-y, marking the second consecutive monthly increase. Oil demand growth mainly recovered from the huge decline in April 2020 (-0.7 mb/d) and the slower-than-expected recovery in the transportation sector mainly due to increases in COVID-19 infection cases. Most of the petroleum product category requirements grew, notably gasoline, naphtha and diesel.

**Table 4 - 5: Japan's oil demand, mb/d**

By product	Apr 21	Apr 20	Change 2021/20	
			mb/d	%
LPG	0.31	0.35	-0.04	-12.8
Naphtha	0.69	0.64	0.05	7.7
Gasoline	0.77	0.66	0.11	17.2
Jet/kerosene	0.32	0.31	0.01	4.6
Diesel	0.75	0.70	0.05	6.7
Fuel oil	0.20	0.22	-0.01	-6.0
Other products	0.20	0.20	0.00	0.4
<b>Total</b>	<b>3.25</b>	<b>3.08</b>	<b>0.17</b>	<b>5.5</b>

*Note: Totals may not add up due to independent rounding. Sources: JODI, METI and OPEC.*

### Near-term expectations

Oil demand is projected to remain pressured by some challenges related to the resurgence in COVID-19 cases, particularly in Japan. This has led to localized lockdown measures, which could especially hinder transportation fuel demand. On the other hand, the upcoming Summer Olympics could provide some upside potential to transportation fuel requirements and the robustness of the petrochemical sector could furthermore support light distillate demand. For the whole of 2021, oil demand is projected to increase for the first time since 2017 on the back of low demand registered in 2020, the improving petrochemical sector and the generally healthy economy. As with other regions globally, however, uncertainties are skewed to the downside in line with COVID-19 pandemic developments. In terms of products, jet fuel demand is not anticipated to reach pre-pandemic levels and will remain under pressure throughout the year.

## Non-OECD

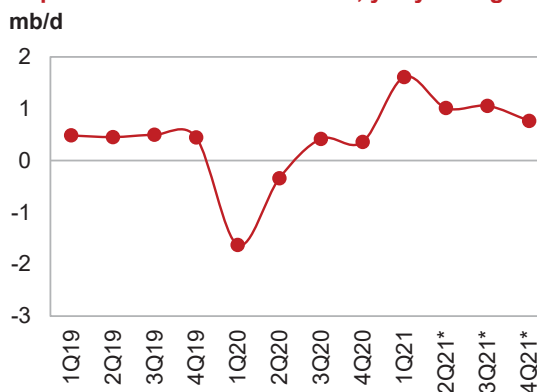
### China

#### Update on the latest developments

In April 2021, **China's oil demand** increased by 1.6 mb/d y-o-y, after posting stronger gains in **March**, of more than 2.1 mb/d y-o-y. China's demand is trending comfortably above March 2019 levels by more than 0.3 mb/d, making it the only country so far with consumption exceeding pre-pandemic levels. Oil demand remains focused on transportation fuels recovering strongly from the low base of consumption in 2020 and some support for LPG demand from the petrochemical sector. Diesel fuel demand also increased, though at a lower growth pace than previous months. Gasoline consumption followed a similar trend in the last two months, increasing by more than 0.6 mb/d. Both mobility and passenger car sales indexes are showing positive signs. Mobility reached 100 in April, according to the Google and Apple mobility indexes, up from 87 in March. While motor vehicle sales posted a 9.9% rise in April 2021 compared with an increase of 4.12% in April 2020, according to the China Association for Automobile Manufacturers (CAAM) and Haver Analytics. In April 2021, sales of vehicles exceeded 2.4 million units for the first in 2021 and matched similar sales recorded in May 2018.

Consumption of jet/kerosene grew strongly in April 2021, rising by nearly 0.7 mb/d y-o-y, after increasing by 0.5 mb/d y-o-y in March 2021. Aviation data suggests an uptick in domestic flights with more limited improvements in international passenger travel. Diesel demand was higher by around 0.1 mb/d compared with April 2020, after rising by more than 0.5 mb/d y-o-y in March. China's Manufacturing PMI retracted to 51.1 in April 2021 after posting 51.9 in March but remained in the expansion territory. LPG demand increased by 0.1 mb/d y-o-y in April 2021 following an increase of more than 0.3 mb/d y-o-y in March, supported by steady requirements from propane dehydrogenation (PDH) plants.

**Graph 4 - 4: China's oil demand, y-o-y change**



Note: \* 2Q21-4Q21 = Forecast. Source: OPEC.

**Table 4 - 6: China's oil demand\*, mb/d**

By product	Apr 21	Apr 20	Change 2021/20	
			mb/d	%
LPG	1.81	1.71	0.10	5.8
Naphtha	1.17	1.16	0.02	1.3
Gasoline	3.36	2.74	0.63	22.8
Jet/kerosene	0.88	0.19	0.69	371.1
Diesel	2.83	2.75	0.08	2.7
Fuel oil	0.69	0.68	0.02	2.7
Other products	2.05	2.00	0.04	2.3
<b>Total</b>	<b>12.79</b>	<b>11.22</b>	<b>1.57</b>	<b>14.0</b>

Note: \* Apparent oil demand. Totals may not add up due to independent rounding.

Sources: Argus Global Markets, China OGP (Xinhua News Agency), Facts Global Energy, JODI, National Bureau of Statistics China and OPEC.

### Near-term expectations

Positive macroeconomic indicators are expected to continue to be buoyed by a surge in exports and respectable improvement in manufacturing, which in turn will support oil demand going forward. Total consumption in the country has exceeded the 2019 average annual consumption level and is projected to gain further momentum in 2H21 with support from strong petrochemical capacity additions. The well-contained COVID-19 situation, the fiscal and monetary stimulus programmes and new capacity additions of PDH plants are assumed to encourage demand over the short term. On the other hand, rising trade tensions with the US pose some downside risks to the forecast. All sectors are expected to gain momentum with transportation being supported by road traffic and healthy passenger sales, while the industrial sector is projected to receive support from healthy economic activities in China and globally. Moreover, demand for light distillates for the petrochemical sector is projected to drive demand growth in the current year.

## India

### Update on the latest developments

India's oil demand rose by more 1.9 mb/d y-o-y, in April 2021 compared with around 0.7 mb/d y-o-y rise in March. However, when contrasted with March 2019, demand fell by 0.4 mb/d. Demand was mainly driven by improved mobility before deteriorating towards the end to the month, but also by historical distortion to the baseline. Looking at the performance of products, gasoline demand led the gains, adding a considerable 0.4 mb/d y-o-y, almost making up all of April 2020 losses amid substantial declines in miles travelled in April last year. The gains came amid increased use of private two wheelers in lieu of public transportation and despite lower mobility data as COVID-19 cases surged towards the end of the month. According to Google Maps and Apple, the mobility index posted a drop from 108 in March to 83 in April.

Diesel demand increased by 0.8 mb/d compared with the same period in 2020 due to improvements in industrial activity and rising agricultural demand during the harvest season. India's Manufacturing PMI was at 55.5 in April compared with 55.4 in March, suggesting a respectable improvement in the sector. On the other hand, the services PMI dropped to 54.0 from 54.6 and recorded the weakest pace of expansion in the sector since January 2021. Naphtha demand showed strong gains, supported by rising demand from the petrochemical sector and healthy petrochemical margins.

**Table 4 - 7: India's oil demand, mb/d**

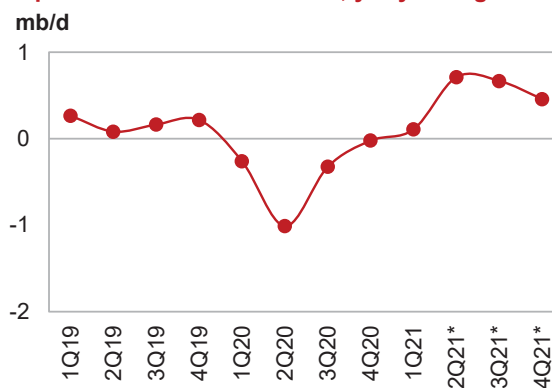
By product			Change 2021/20	
	Apr 21	Apr 20	mb/d	%
LPG	0.86	0.86	0.00	0.1
Naphtha	0.45	0.31	0.14	43.6
Gasoline	0.68	0.28	0.40	144.5
Jet/kerosene	0.15	0.07	0.08	110.2
Diesel	1.67	0.83	0.84	101.2
Fuel oil	0.23	0.18	0.06	31.3
Other products	0.53	0.16	0.37	235.0
<b>Total</b>	<b>4.57</b>	<b>2.69</b>	<b>1.88</b>	<b>70.1</b>

Note: Totals may not add up due to independent rounding. Sources: JODI, Petroleum Planning and Analysis Cell of India and OPEC.

### Near-term expectations

Daily new COVID-19 cases increased in May, forcing states to implement lockdowns and other restrictions that led to steep decline in mobility. The decline in transportation fuel demand was already a factor in 2Q21 data and the recovery will be slower as compared to initial expectations. As COVID-19 cases come under control and restrictions are eased towards 3Q21, oil demand, led by transportation fuel, is projected to show solid gains throughout the remainder of year. That said, uncertainty will remain high mainly related to a possible new wave of COVID-19 or the emergence of new variants, in addition to the pace of vaccinations in the country. Moreover, high retail prices and the government excise tax policy add uncertainty going forward. Oil demand growth is anticipated to pick up pace in 2H21, driven by the low baseline and uptick in gasoline and diesel demand in transportation, construction and agriculture.

**Graph 4 - 5: India's oil demand, y-o-y change**



Note: \*2Q21-4Q21 = Forecast. Source: OPEC.

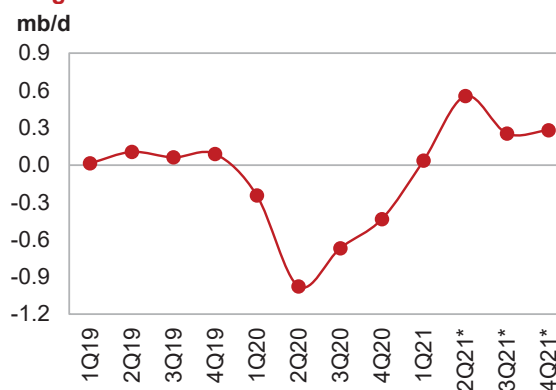


## Latin America

### Update on the latest developments

With **March 2021** oil demand data now complete, **oil demand in Latin America** posted y-o-y increase of more than 0.3 mb/d, compared with March 2020. February 2021 indicated a decline of more than 0.1 mb/d y-o-y and when comparing March 2021 oil data with March 2019, demand fell by around 0.1 mb/d. Most products grew steadily y-o-y with the exceptions of jet/kerosene, which lagged in light of poor air traffic data, especially on international routes, compared with historical norms. Diesel increased the most followed by gasoline and the heavy part of the barrel. Diesel was higher y-o-y in response to improving overall economic momentum in the region and the steep decline experienced in March 2020. In Brazil, industrial production increased to the highest level since June 2010, recording 10.5% growth y-o-y, lending support to diesel.

**Graph 4 - 6: Latin America's oil demand, y-o-y change**



Note: \* 2Q21-4Q21 = Forecast. Source: OPEC.

The latest available data for Brazil indicate an increase of more than 0.4 mb/d, y-o-y in April, as recovery in industrial fuels and tucking activity supported this increase. Transportation fuels, led by gasoline, also contributed to this rise. Reduction in Covid-19 cases in April drove the improvement in mobility in cities such as Sao Paulo and Rio de Janeiro, but increase in cases towards the end of the month may have affected May's consumption.

**Table 4 - 8: Brazil's oil demand\*, mb/d**

By product			Change 2021/20	
	Apr 21	Apr 20	mb/d	%
LPG	0.23	0.24	-0.01	-2.6
Naphtha	0.14	0.15	0.00	-2.0
Gasoline	0.57	0.48	0.10	19.8
Jet/kerosene	0.05	0.02	0.03	182.9
Diesel	1.07	0.84	0.23	27.0
Fuel oil	0.10	0.10	0.00	0.9
Other products	0.45	0.39	0.06	16.6
<b>Total</b>	<b>2.61</b>	<b>2.20</b>	<b>0.41</b>	<b>18.6</b>

Note: \* = Inland deliveries. Totals may not add up due to independent rounding.

Sources: JODI, Agencia Nacional do Petroleo, Gas Natural e Biocombustiveis and OPEC.

### Near-term expectations

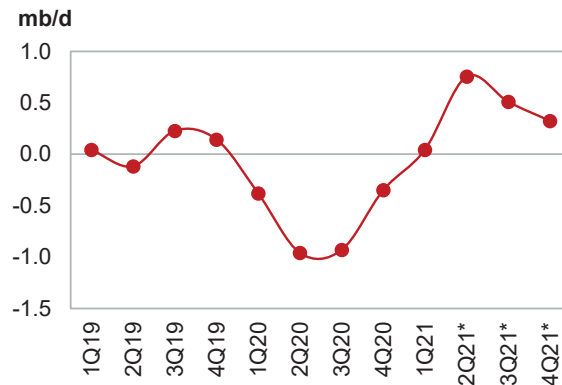
2Q21 oil demand is projected to be pressured by rising COVID-19 cases in the region's main economies. As a result, the pace of recovery – particularly for transportation fuels led by gasoline and jet fuel – will face challenges. Diesel and fuel oil demand are projected to improve towards the 2H21 in light of the positive economic outlook. Generally, 2H21 is anticipated to show positive demand development amid a recovering economy and low baseline of comparison in 2020. However, the considerable uncertainties will remain skewed to the downside, particularly due to issues related to COVID-19 cases, vaccination programmes and the possible emergence of new COVID-19 variants.

## Middle East

### Update on the latest developments

**Middle East oil demand** data for **March 2021** show a firm increase led by recovering demand for transportation and power generation fuels from Saudi Arabia and Iraq. Data indicate growth of nearly 0.6 mb/d y-o-y, compared to a drop of more than 0.3 mb/d y-o-y in February. The historical decline in consumption during March 2020 remains a central factor. However, as compared to March 2019, oil demand still showed a decline of 0.4 mb/d. Gasoline, fuel oil and diesel posted increases and led oil demand growth in March 2021. Gasoline increased by around 0.2 mb/d y-o-y, with steady gains in Saudi Arabia and Iraq supported by increased mobility. Easing COVID-19 restrictions allowed for mobility to improve compared to earlier months and hence supported gasoline requirements.

**Graph 4 - 7: Middle East's oil demand, y-o-y change**



Note: \*2Q21-4Q21 = Forecast. Source: OPEC.

Fuel oil and diesel also posted gains y-o-y, growing by around 0.2 mb/d and 0.1 mb/d y-o-y, respectively, following y-o-y declines in the first two months of 2021. Increases mainly resulted from improvements in the industrial sector in various countries as well as an uptick in bunker fuel demand. Moreover, power generation in Saudi Arabia encouraged additional demand for fuel oil while fuel oil demand in Iraq, Kuwait and the UAE also rose due to improved industrial and trading activity.

In Saudi Arabia, the latest available data for April 2021 indicates a strong rebound in oil demand of more than 0.4 mb/d y-o-y, mostly credited to increases in gasoline demand. Gasoline consumption was higher by 0.2 mb/d y-o-y as COVID-19 measures were eased and led to improved mobility generally. Jet/kerosene also flipped into growth, adding marginal y-o-y volume on the back of improved domestic air traffic and slower demand during April 2020. Additionally, heavy distillates rose solidly, with fuel oil and crude oil for the use in power generation each increasing by around 0.1 mb/d y-o-y.

### Near-term expectations

Oil demand is expected to gradually recover and post steady gains in 2H21. However, this will largely depend on COVID-19 developments, which is assumed to be limited as the situation seems to be well controlled. The resumption of international flights in Saudi Arabia towards the end of May will support jet fuel requirements throughout the remainder of the year. On the economic front, infrastructure spending along with an improving industrial sector are expected to lend support to industrial fuels, whereas power generation demand will seasonally pick up pace during 3Q21. In terms of products, middle distillates are projected to return to solid growth.

## World Oil Supply

Non-OPEC liquids supply for 2020 shows a minor downward revision of 15 tb/d and is estimated to have declined by 2.54 mb/d y-o-y to average 62.89 mb/d. The largest declines were seen in Russia, falling by 1.0 mb/d, and in the US at 0.8 mb/d. Moreover, production also declined in Canada, Colombia, Kazakhstan, Malaysia, the UK and Azerbaijan, while oil supply is estimated to have increased in Norway, Brazil, China and Guyana.

Non-OPEC liquids supply in 2021 has been revised up this month by 0.13 mb/d to average 63.73 mb/d. This is mainly on the back of a faster than expected recovery of 2.5 mb/d in US crude oil and NGLs from the February winter disruption, with growth now forecast at 0.84 mb/d y-o-y. The higher oil supply forecast in Norway, China and Indonesia also supported this revision, although on the flip side there were downward revisions for the UK, Brazil and Colombia. The main drivers for 2021 supply growth are expected to be Canada, Brazil, China, and Norway.

Started frac operations in US shale surged by 26% between December 2020 and January 2021. Following the plunge in February, frac jobs have remained broadly flat at 840 over the next three months. This has led to an increase in the number of completed wells, also due to a strong draw in the number of DUCs from inventory to raise the number of started new wells in May to the pre-COVID level of around 850. Despite the current recovering trend in US crude oil production, particularly in the Permian Basin, and the expected exit rate at 11.6 mb/d in December 2021, average US crude production in 2021, will remain lower by 0.12 mb/d, y-o-y, at 11.2 mb/d.

Following two years of declining OPEC NGLs production in 2019 and 2020 by 0.08 mb/d and 0.17 mb/d respectively, growth of 0.14 mb/d is expected in 2021, to average 5.19 mb/d.

OPEC crude oil production in May was up by 0.39 mb/d m-o-m to average 25.46 mb/d, according to secondary sources. Non-OPEC liquids output including OPEC NGLs in May was up by 0.24 mb/d m-o-m to average 68.21 mb/d, a rise of 4.30 mb/d, y-o-y. As a result, world oil supply is estimated to have grown m-o-m in May by 0.63 mb/d to average 93.67 mb/d, up by 5.63 mb/d y-o-y.

## Main monthly revisions and key drivers of growth and declines

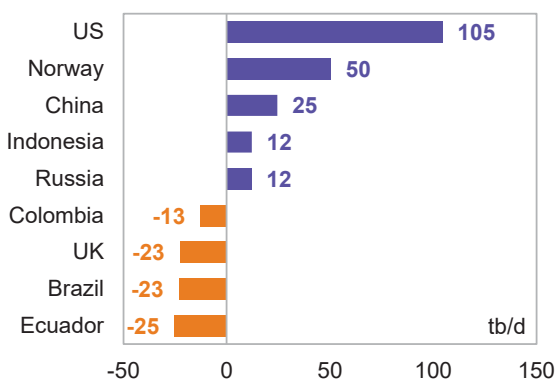
**Non-OPEC liquids absolute supply in 2021** has been revised up by 0.13 mb/d to average 63.73 mb/d. It is now forecast to grow by 0.84 mb/d (including processing gains of 0.13 mb/d). Oil supply growth forecasts were revised up in the US (105 tb/d), Norway (50 tb/d), China (25 tb/d), but revised down in Ecuador (25 tb/d), Brazil (23 tb/d) and the UK (23 tb/d).

**Liquids supply in non-OPEC countries in 2020** has been revised down this month by 15 tb/d. It is now estimated to have declined by 2.54 mb/d, mainly in Russia, the US, Canada, Colombia, Kazakhstan, the UK, Malaysia, Azerbaijan, India and Thailand.

**OPEC NGLs production growth** in 2020 has been revised down by 51 tb/d to decline by 0.17 mb/d. For 2021, the forecast has been revised up by 62 tb/d to show y-o-y growth of 0.14 mb/d.

For **2021**, oil supply is expected to grow by 0.84 mb/d and the **key drivers for growth** are Canada, Norway, China and Brazil, while oil production mainly in the UK, Sudans, Egypt and Colombia is forecast to decline.

**Graph 5 - 1: Annual liquids production changes for selected countries in 2021\*, MOMR Jun 21/May 21**



Note: \* 2021 = Forecast. Source: OPEC.

## Non-OPEC liquids production in 2020 and 2021

Table 5 - 1: Non-OPEC liquids production in 2020, mb/d

Non-OPEC liquids production	2019	1Q20	2Q20	3Q20	4Q20	2020	Change 2020/19	
							Growth	%
<b>Americas</b>	25.77	26.60	23.55	24.10	24.65	24.73	-1.05	-4.07
<i>of which US</i>	18.43	19.05	16.81	17.34	17.30	17.62	-0.80	-4.35
<b>Europe</b>	3.71	4.05	3.89	3.79	3.89	3.90	0.19	5.21
<b>Asia Pacific</b>	0.52	0.53	0.54	0.54	0.52	0.53	0.01	1.61
<b>Total OECD</b>	<b>30.01</b>	<b>31.18</b>	<b>27.98</b>	<b>28.43</b>	<b>29.06</b>	<b>29.16</b>	<b>-0.85</b>	<b>-2.82</b>
<b>China</b>	4.04	4.13	4.12	4.13	4.08	4.12	0.07	1.76
<b>India</b>	0.82	0.79	0.76	0.76	0.76	0.77	-0.06	-6.74
<b>Other Asia</b>	2.69	2.61	2.47	2.46	2.49	2.50	-0.18	-6.84
<b>Latin America</b>	6.09	6.35	5.83	6.14	5.91	6.06	-0.03	-0.51
<b>Middle East</b>	3.20	3.19	3.20	3.15	3.17	3.17	-0.03	-0.83
<b>Africa</b>	1.51	1.46	1.43	1.40	1.37	1.42	-0.09	-6.10
<b>Russia</b>	11.61	11.68	10.38	10.01	10.31	10.59	-1.02	-8.78
<b>Other Eurasia</b>	3.07	3.16	2.92	2.73	2.85	2.91	-0.16	-5.13
<b>Other Europe</b>	0.12	0.12	0.12	0.11	0.11	0.12	0.00	-3.27
<b>Total Non-OECD</b>	<b>33.16</b>	<b>33.47</b>	<b>31.22</b>	<b>30.89</b>	<b>31.05</b>	<b>31.66</b>	<b>-1.50</b>	<b>-4.52</b>
<b>Total Non-OPEC production</b>	63.16	64.65	59.20	59.32	60.12	60.82	-2.35	-3.71
<b>Processing gains</b>	2.26	2.15	1.85	2.15	2.15	2.07	-0.19	-8.47
<b>Total Non-OPEC liquids production</b>	<b>65.43</b>	<b>66.80</b>	<b>61.05</b>	<b>61.47</b>	<b>62.26</b>	<b>62.89</b>	<b>-2.54</b>	<b>-3.88</b>
<b>Previous estimate</b>	65.42	66.77	61.07	61.48	62.27	62.89	-2.52	-3.86
<b>Revision</b>	0.01	0.02	-0.02	-0.02	-0.01	0.00	-0.02	-0.02

Note: \* Totals may not add up due to independent rounding. Source: OPEC.

Table 5 - 2: Non-OPEC liquids production in 2021\*, mb/d

Non-OPEC liquids production	2020	1Q21	2Q21	3Q21	4Q21	2021	Change 2021/20	
							Growth	%
<b>Americas</b>	24.73	24.11	24.64	25.43	26.03	25.06	0.33	1.35
<i>of which US</i>	17.62	16.64	17.52	17.97	18.46	17.66	0.03	0.19
<b>Europe</b>	3.90	3.95	3.74	4.03	4.10	3.95	0.05	1.26
<b>Asia Pacific</b>	0.53	0.51	0.56	0.55	0.55	0.54	0.01	1.92
<b>Total OECD</b>	<b>29.16</b>	<b>28.57</b>	<b>28.93</b>	<b>30.01</b>	<b>30.68</b>	<b>29.55</b>	<b>0.39</b>	<b>1.35</b>
<b>China</b>	4.12	4.25	4.26	4.23	4.20	4.23	0.12	2.86
<b>India</b>	0.77	0.76	0.76	0.75	0.74	0.75	-0.01	-1.54
<b>Other Asia</b>	2.50	2.55	2.50	2.48	2.47	2.50	-0.01	-0.30
<b>Latin America</b>	6.06	5.96	6.11	6.31	6.51	6.23	0.17	2.79
<b>Middle East</b>	3.17	3.20	3.20	3.23	3.24	3.22	0.04	1.36
<b>Africa</b>	1.42	1.38	1.33	1.34	1.32	1.34	-0.07	-5.24
<b>Russia</b>	10.59	10.47	10.71	10.66	10.66	10.63	0.03	0.32
<b>Other Eurasia</b>	2.91	2.96	2.95	2.98	2.98	2.97	0.05	1.84
<b>Other Europe</b>	0.12	0.11	0.11	0.11	0.11	0.11	-0.01	-6.92
<b>Total Non-OECD</b>	<b>31.66</b>	<b>31.64</b>	<b>31.93</b>	<b>32.09</b>	<b>32.23</b>	<b>31.97</b>	<b>0.32</b>	<b>1.00</b>
<b>Total Non-OPEC production</b>	60.82	60.21	60.86	62.10	62.90	61.53	0.71	1.17
<b>Processing gains</b>	2.07	2.20	2.20	2.20	2.20	2.20	0.13	6.17
<b>Total Non-OPEC liquids production</b>	<b>62.89</b>	<b>62.41</b>	<b>63.06</b>	<b>64.30</b>	<b>65.10</b>	<b>63.73</b>	<b>0.84</b>	<b>1.33</b>
<b>Previous estimate</b>	62.89	62.37	63.13	63.98	64.88	63.60	0.70	1.12
<b>Revision</b>	0.00	0.04	-0.06	0.32	0.22	0.13	0.13	0.21

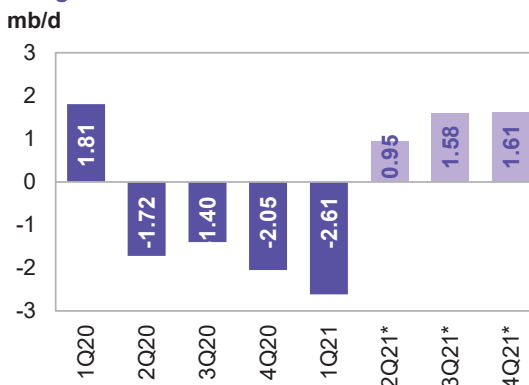
Note: \* 2021 = Forecast. Totals may not add up due to independent rounding. Source: OPEC.

## OECD

**OECD liquids production in 2020** is estimated to have declined by 0.85 mb/d y-o-y to average 29.16 mb/d.

For **2021**, OECD liquids production growth is forecast at 0.39 mb/d to average 29.55 mb/d. This is an upward revision of 0.12 mb/d m-o-m.

**Graph 5 - 2: OECD quarterly liquids supply, y-o-y changes**



Note: \* 2Q21-4Q21 = Forecast. Source: OPEC.

**Table 5 - 3: OECD liquids supply changes by region, mb/d**

OECD	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21*	3Q21*	4Q21*
Americas	1.51	-2.06	-1.62	-2.00	-2.49	1.09	1.33	1.37
Europe	0.22	0.31	0.24	0.00	-0.10	-0.15	0.23	0.21
Asia Pacific	0.08	0.03	-0.02	-0.05	-0.02	0.02	0.02	0.03
<b>Total OECD</b>	<b>1.81</b>	<b>-1.72</b>	<b>-1.40</b>	<b>-2.05</b>	<b>-2.61</b>	<b>0.95</b>	<b>1.58</b>	<b>1.61</b>

Note: \* 2Q21-4Q21 = Forecast. Source: OPEC.

## OECD Americas

### US

**US liquids production in 2020** is estimated to have declined by 0.80 mb/d to average 17.62 mb/d, unchanged m-o-m. Crude oil output and non-conventional liquids, particularly ethanol fell y-o-y by 0.92 mb/d and 0.20 mb/d, to average 11.32 mb/d and 1.15 mb/d, respectively. However, NGLs production from unconventional sources gained 0.34 mb/d y-o-y, to average 5.16 mb/d.

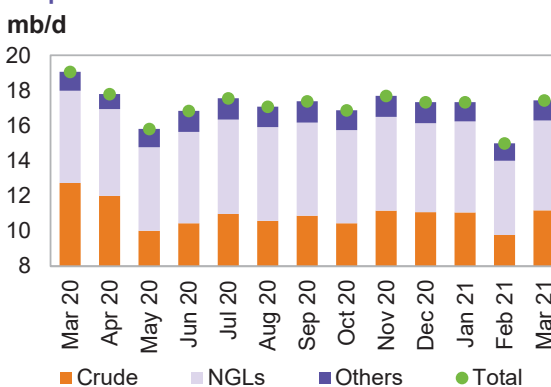
**US liquids production in March 2021** saw a robust recovery of 2.45 mb/d m-o-m, following the drastic February drop on the back of winter storms and freezing temperatures, to average 17.44 mb/d, lower by 1.63 mb/d y-o-y.

**Crude and condensate output** in March was up m-o-m by 1.40 mb/d to average 11.18 mb/d, down by 1.55 mb/d compared to a year earlier. The US EIA had estimated production at 10.94 mb/d in the May issue of its Short Term Energy Outlook (STEO).

**NGLs production** in March recovered by 901 tb/d m-o-m to average 5.12 mb/d, albeit lower than January levels by 72 t/d.

**Other non-conventional liquids**, mainly ethanol, were up by 150 tb/d m-o-m to average 1.14 mb/d.

**Graph 5 - 3: US monthly liquids output by key component**



Source: OPEC.

US crude and field condensate production surprised to the upside in March. The main increase was in Texas, which added by 990 tb/d m-o-m – primarily the Permian Basin – to average 4.75 mb/d, albeit down by 0.69 mb/d y-o-y. New Mexico oil output also recovered from February’s disruptions, adding 172 tb/d m-o-m to average 1.16 mb/d, and higher by 44 tb/d, y-o-y. Texas and New Mexico production as of March is now 0.15 mb/d higher than it was in January. Crude oil and condensate production also increased m-o-m in the Gulf of Mexico (GoM) and Oklahoma by 107 tb/d and 87 tb/d, to average 1.87 mb/d and 0.40 mb/d, respectively. Oil production in North Dakota witnessed a minor m-o-m increase of 6 tb/d to average 1.02 mb/d, while production in Colorado (PADD 4) declined by a minor 3 tb/d to average 0.37 mb/d.

**Table 5 - 4: US crude oil production by state, tb/d**

State	Change		
	Feb 21	Mar 21	Mar 21/Feb 21
Oklahoma	317	404	87
Colorado	371	368	-3
Alaska	457	453	-4
North Dakota	1,013	1,027	14
New Mexico	983	1,155	172
Gulf of Mexico (GoM)	1,763	1,870	107
Texas	3,755	4,745	990
<b>Total</b>	<b>9,783</b>	<b>11,184</b>	<b>1,401</b>

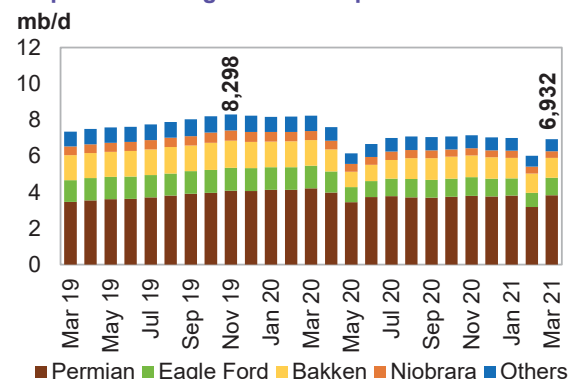
Sources: EIA and OPEC.

Crude oil production in March saw a large increase as previously curtailed volumes from February were brought back as the February winter crisis abated. The EIA notes that **US onshore conventional crude oil production** increased by 389 tb/d in March to average 2.38 mb/d, following a m-o-m decline of 280 tb/d in February. The March level is 109 tb/d higher than January. The EIA’s monthly report also sees tight crude production recovering by 905 tb/d in March, but this is still 67 tb/d below the January level.

Taken together, US crude and condensate production, including growth of 107 tb/d in the GoM, rose m-o-m by 1.40 mb/d to average 11.18 mb/d in March 2021.

Following a major drop of 972 tb/d in February 2021, **US tight crude production in March** recovered by 905 tb/d to average 6.93 mb/d, according to the EIA. This is down by 1.30 mb/d y-o-y.

**Graph 5 - 4: US tight crude output breakdown**



Sources: EIA, Rystad Energy and OPEC.

The March production recovery, when compared to January levels, sees a decline of 68 tb/d. It should be noted that March Permian production was actually up by 30 tb/d on January levels to average 3.8 mb/d. The Eagle Ford also saw minor higher output of 2 tb/d, compared to January, to average 964 tb/d. Declines in March were seen in the Bakken, dropping by 38 tb/d versus January to average 1,096 tb/d, and the Niobrara, with output dropping by 14 tb/d to average 373 tb/d versus January levels. Declines were also witnessed in other shale plays, estimated at 47 tb/d, to average 658 tb/d.

Despite the return of 1.4 mb/d m-o-m in March, **US crude oil production in 2021** is forecast to decline by 0.12 mb/d y-o-y to average 11.2 mb/d. Production from the GoM is expected to grow by 0.15 mb/d to average 1.81 mb/d, while onshore conventional crude is estimated to decline by 0.14 mb/d to average 2.24 mb/d, largely due to mature oil fields.

**Table 5 - 5: US liquids production breakdown, mb/d**

US liquids	Change		Change		Change	
	2019	2019/18	2020	2020/19	2021*	2021/20
Tight crude	7.74	1.24	7.28	-0.46	7.15	-0.14
Gulf of Mexico crude	1.90	0.14	1.66	-0.24	1.81	0.15
Conventional crude oil	2.61	-0.09	2.38	-0.24	2.24	-0.14
<b>Total crude</b>	<b>12.25</b>	<b>1.28</b>	<b>11.31</b>	<b>-0.94</b>	<b>11.20</b>	<b>-0.12</b>
Unconventional NGLs	3.92	0.46	4.26	0.33	4.41	0.15
Conventional NGLs	0.90	-0.01	0.90	0.00	0.86	-0.04
<b>Total NGLs</b>	<b>4.82</b>	<b>0.46</b>	<b>5.16</b>	<b>0.34</b>	<b>5.27</b>	<b>0.11</b>
Biofuels + Other liquids	1.35	0.00	1.15	-0.20	1.19	0.04
<b>US total supply</b>	<b>18.43</b>	<b>1.74</b>	<b>17.62</b>	<b>-0.80</b>	<b>17.66</b>	<b>0.03</b>

Note: \* 2021 = Forecast. Sources: EIA, OPEC and Rystad Energy.



For **tight crude production in 2021**, based on actual March crude output and the updated drilling and completion (D&C) metrics, a y-o-y contraction of 0.14 mb/d to average 7.15 mb/d is anticipated.

**Table 5 - 6: US tight oil production breakdown, mb/d**

US tight oil	Change		Change		2021*	Change
	2019	2019/18	2020	2020/19		
Permian tight	3.72	0.88	3.85	0.14	3.98	0.13
Bakken shale	1.42	0.16	1.18	-0.23	1.11	-0.07
Eagle Ford shale	1.24	0.05	1.05	-0.18	1.07	0.02
Niobrara shale	0.51	0.07	0.45	-0.06	0.42	-0.03
Other tight plays	0.86	0.08	0.74	-0.12	0.56	-0.18
<b>Total</b>	<b>7.74</b>	<b>1.24</b>	<b>7.28</b>	<b>-0.46</b>	<b>7.15</b>	<b>-0.14</b>

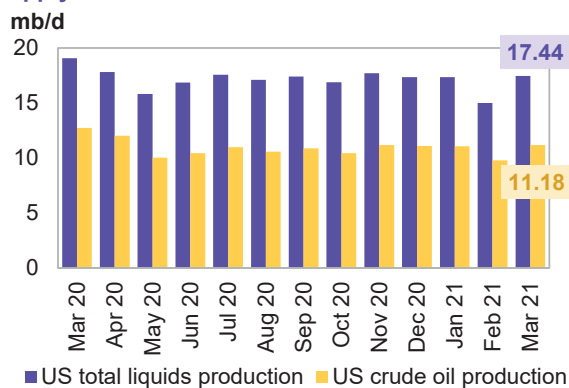
Note: \* 2021 = Forecast. Source: OPEC.

**US NGLs production in 2021** is expected to grow by 0.11 mb/d y-o-y to average 5.27 mb/d, which is below the robust growth of 0.34 mb/d y-o-y in 2020.

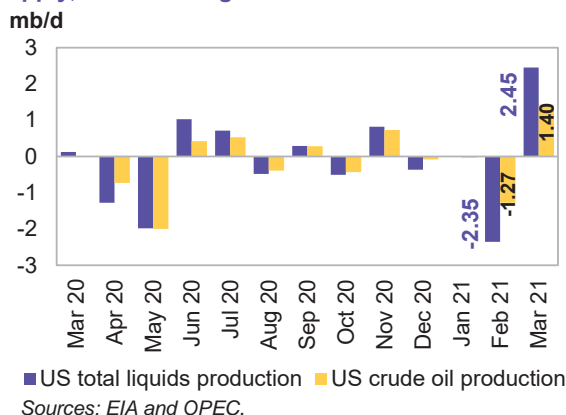
**Biofuels and other non-conventional liquids** are forecast to increase by 0.04 mb/d y-o-y in 2021, to average 1.19 mb/d.

**US liquids production** is projected to rise by a minor 0.03 mb/d y-o-y in 2021 to average 17.66 mb/d. This has been revised up by 0.11 mb/d, following the robust and speedy recovery of 2.5 mb/d in March. According to the new assessment, based on the US monthly crude oil and liquids production forecast model, it is estimated that crude oil output and total liquids will reach 11.60 mb/d and 18.70 mb/d in December 2021, respectively.

**Graph 5 - 5: US monthly crude oil and total liquids supply**



**Graph 5 - 6: US monthly crude oil and total liquids supply, m-o-m changes**



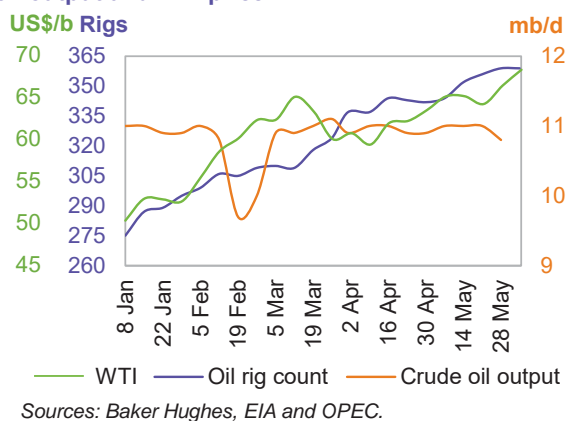
## US rig count, spudded, completed, DUC wells and fracking activity

Total **US active drilling rigs** rose by 16 units m-o-m to 456 rigs, according to the Baker Hughes' weekly survey on 4 June. This includes 442 active onshore rigs, 13 offshore and one rig in inland waters.

The **US oil rig count** increased by 17 units to 359 rigs since the last MOMR for the week ended 4 June, higher by 153 oil rigs y-o-y. The **gas rig count** reached 97 rigs, higher by one rig m-o-m, and up by 21 units compared to a year ago.

Despite no w-o-w change in the US horizontal rig count for both oil and gas in the latest Baker Hughes' report at 415, the overall drilling outlook remains healthy. Onshore operators are expected to add oil rigs over the coming weeks and months to position for a stronger 2022, amid a steady oil price recovery.

**Graph 5 - 7: US weekly rig count, US weekly crude oil output and WTI price**



In terms of **trajectory, active drilling rigs for horizontal wells** in both oil and gas were up y-o-y from 253 units to 415. In terms of the major basins, in the week ended 4 June, 232 oil rigs were active in the Permian Basin, up by 8 rigs vs the end of April, and up by 91 rigs y-o-y. For the same period, the number of active oil rigs in the Eagle Ford Basin was at 33, up by 20 y-o-y. The Williston Basin reported 16 active oil rigs, but this was still down by four y-o-y, and six units were reported in the DJ-Niobrara Basin, up by one on a year ago.

With regard to **spudding, completion and started wells** in all US shale plays, March crude oil production saw a large increase, as previously curtailed volumes from February returned. An increase was also observed for completions activity, which bounced back to the highest level witnessed over the past year, at 782 completed wells, although preliminary data shows lower completions in April and May, as reported by Rystad Energy. It should be noted that the number of started new wells saw a robust increase in May to reach 851, surpassing the pre-COVID level of January-March 2020.

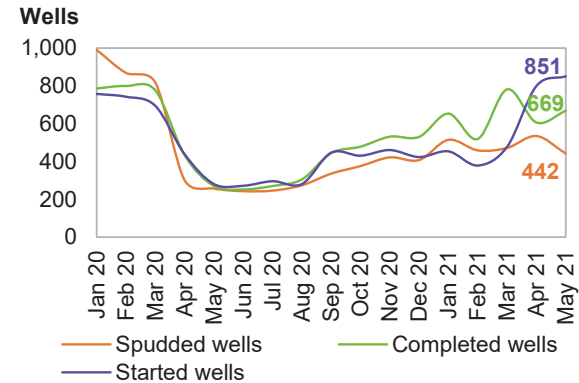
Nevertheless, the number of spudded and completed wells in May, according to preliminary data, shows a lower level compared with the end of March 2020, when D&C activities plunged. The numbers are down by 46% and 14%, respectively.

In terms of **US oil and gas identified started fracking operations** by region, Rystad Energy reported that 841 wells started fracking operations in the US in May. This preliminary number, based almost exclusively on analysis of high-frequency satellite data, is almost flat m-o-m. "US fracking activity increased rapidly in the beginning of 2021, driven by a combination of structural reactivations, and a rush to complete drilled but uncompleted (DUC) wells", Rystad Energy said and went on to reprot "The number of frac starts in January touched 860, a jump of 26% from December. The total plunged by 28% in February as frigid weather conditions halted operations across much of Texas and parts of New Mexico. March saw a 36% surge, at 844 starts, but that was largely driven by operators racing to make up for the previous month's loss and clear the backlog".

According to Rystad Energy estimates, April had 839 frac starts and as already noted, May had 841. Rystad further reported that "The Permian Basin saw a particularly strong start to the month, with around 457 jobs already identified, corresponding to the average seen in March and April. Outside of the Permian, frac counts are building up quickly in south Texas' Eagle Ford and it is possible that the region will see its count touch the triple digits for the first time since the start of the Covid-19-induced downturn".

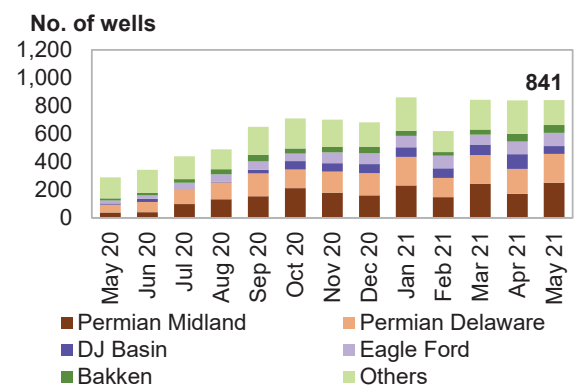
Increased fracking would likely help sustain US onshore production as operators bring online their **DUC wells**. With the strong rebound in US oil fracking activity since the winter slowdown in February, the DUC inventory in major tight oil regions (Permian, Eagle Ford, Bakken, Niobrara and Anadarko) saw another months of strong declines in March, April, and May by 144, 191, and 518, respectively. The total horizontal DUCs inventory in oil regions fell to about 2,100 wells in May, as fracking outpaced drilling.

**Graph 5 - 8: Spudded, completed and started wells in the US shale plays**



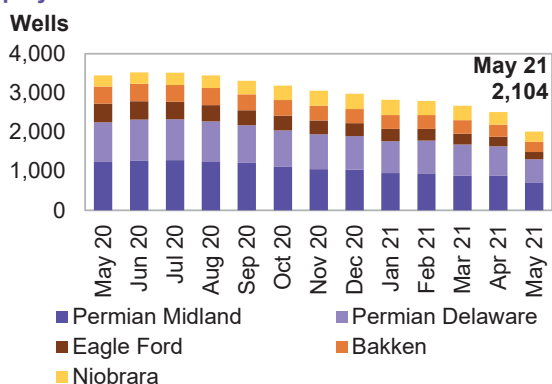
Sources: Rystad Energy and OPEC.

**Graph 5 - 9: Fracked wells count per month**



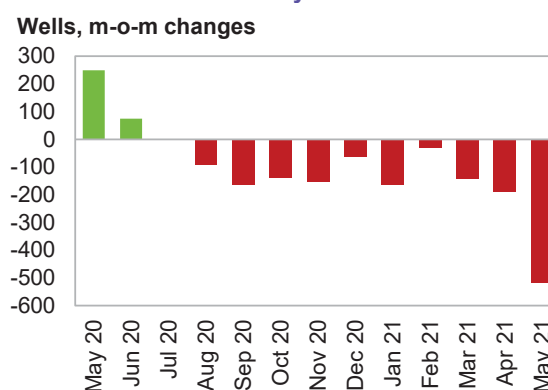
Sources: Rystad Energy Shale Well Cube and OPEC.

**Graph 5 - 10: US horizontal DUC count by shale play**



Sources: Rystad Energy and OPEC.

**Graph 5 - 11: Withdrawal of uncompleted wells from DUC inventories since July 2020**



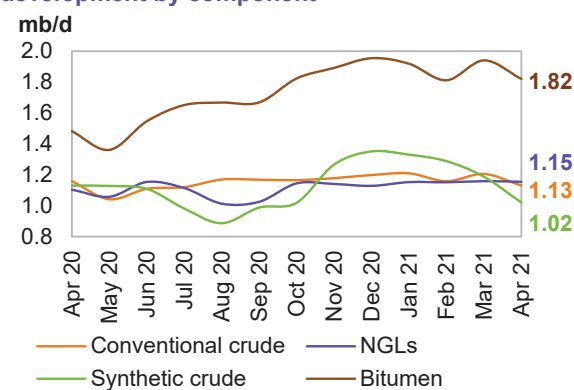
Sources: Rystad Energy and OPEC.

## Canada

Canada's liquids production in April dropped by 0.37 mb/d m-o-m to average 5.16 mb/d, on the back of planned maintenance. Conventional crude oil production is estimated to have declined by 75 tb/d m-o-m to average 1.13 mb/d, while oil sands production declined by 286 tb/d m-o-m to average 2,841 tb/d. NGLs output in February is pegged at 1.15 mb/d, according to official data, and production is expected to have remained flat in March and April.

According to the Alberta Energy Regulator, the production of crude bitumen dropped by 0.12 mb/d m-o-m in April to average 1.82 mb/d, up by 0.34 mb/d y-o-y, while synthetic crude production declined by 0.17 mb/d m-o-m to average 1.02 mb/d, down by 0.11 mb/d y-o-y.

**Graph 5 - 12: Canada monthly liquids production development by component**



Sources: National Energy Board and OPEC.

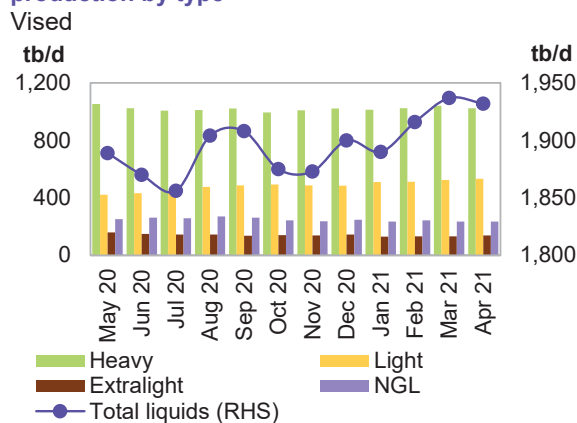
Production outages in Canada due to heavy and extended maintenance are expected to continue to October, with cumulative outages during April-October expected at around 1.42 mb/d. Hence, total liquids production is forecast to be at 5.2 mb/d, 5.5 mb/d, and 5.6 mb/d in 2Q21, 3Q21 and 4Q21, respectively. Based on this forecast, average production in 2021 is expected to grow by 0.28 mb/d to average 5.46 mb/d.

## Mexico

Mexico's liquids output in April was down by a minor 5 tb/d m-o-m to average 1.93 mb/d. Crude oil output fell by 4 tb/d, to average 1.69 mb/d, down by 10 tb/d y-o-y, according to Pemex. NGLs production was flat at 234 tb/d (including condensate).

In 2021, crude oil production from new projects is estimated to average 26 tb/d, all located in offshore. The largest of the fields is Esah, where production is expected to peak at 23 tb/d in 4Q21. Production from Ichalkil, Pokoch, and Teekit is expected to average 13 tb/d, 10 tb/d, and 7 tb/d, respectively, in 4Q21. Production from two other small projects – Suuk and Tetl – will also add some minor volumes in 2021. Mexico's liquids supply growth has been revised up by 9 tb/d and is expected to grow by 0.02 mb/d in 2021, to average 1.93 mb/d.

**Graph 5 - 13: Mexico's monthly liquids and crude production by type**



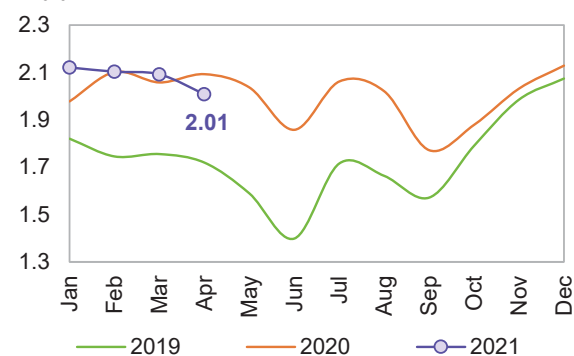
Sources: PEMEX and OPEC.

## OECD Europe

### Norway

**Norwegian liquids production in April 2021** fell by 84 tb/d m-o-m to average 2.01 mb/d, down by the same amount y-o-y. The April production decline was lower than the total forecast outage of 119 tb/d, which was assumed for planned maintenance and outages related to accidental damage. Crude oil production declined by 50 tb/d m-o-m to average 1.73 mb/d, lower by 0.03 mb/d y-o-y. NGLs and condensate output dropped by a minor 34 tb/d to average 0.28 mb/d, lower by 0.05 mb/d y-o-y, according to official data from the Norwegian Petroleum Directorate (NPD). The NPD announced that “Oil production in April is 3.2% higher than the NPD’s forecast, and 0.7% higher than the forecast so far this year”.

**Graph 5 - 14: Norway's monthly liquids production**  
mb/d

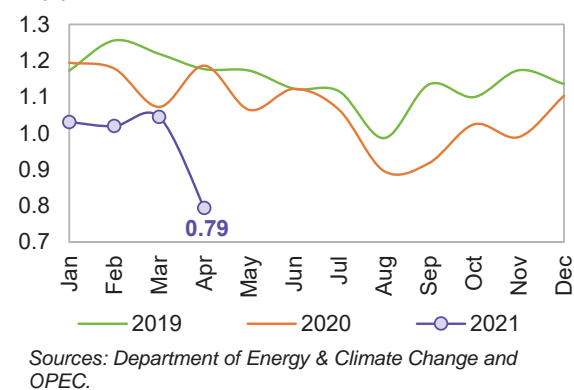


**Norway's oil supply in 2020** is estimated to have grown by 0.27 mb/d to average 2.00 mb/d, while in **2021**, the growth forecast has been revised up by 0.05 mb/d m-o-m, based on lower outages than those expected last month. Production is now expected to average 2.12 mb/d, with growth of 0.12 mb/d y-o-y. In terms of new projects for 2021, Martin Linge is planned for a July and production is expected to reach 53 tb/d. Production from Johan Sverdrup phase-1, which passed the 500 tb/d level in January 2021, is expected to reach 535 tb/d in July and then continue at this level until the end of year. The output of liquids has been affected by maintenance in 2Q21 and production is expected to be lower by 0.11 mb/d vs 1Q21. However, output is anticipated to be higher in 3Q21 by 0.06 mb/d vs 1Q21 to average 2.17 mb/d. This is due to higher production ramp ups from new projects, more than offsetting outages due to maintenance.

### UK

**UK liquids production in April** was hit by a large outage of 0.25 mb/d, with production dropping to average 0.79 mb/d. The outage was due to early summer maintenance at Troll and the Forties Pipeline system that brought a seasonal dip in April's volume, which is expected to continue into May and June. In fact, maintenance is expected to continue into 3Q21, albeit with more minor outages. Crude oil production in April fell by 216 tb/d m-o-m to average 700 tb/d, while NGLs output was down by 35 tb/d to average 60 tb/d.

**Graph 5 - 15: UK's monthly liquids production**  
mb/d



In **2021**, the main projects where production is ramping up are Mariner, with average production at 44 tb/d, higher by 21 tb/d y-o-y, and Clair Ridge, averaging 45 tb/d, up by 10 tb/d y-o-y. There are no

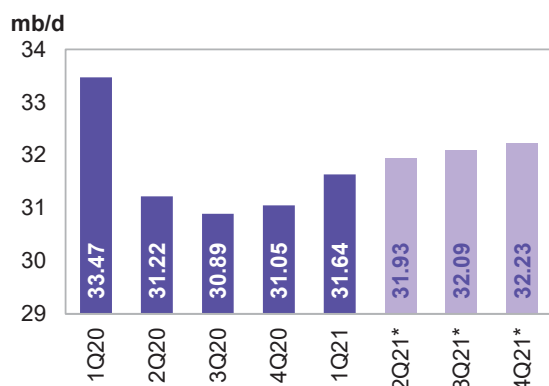
new projects to start up in 2021, and natural declines are expected to outpace current production. UK liquids supply is forecast to decline by 0.07 mb/d to average 0.99 mb/d, revised down by 23 tb/d m-o-m. Moreover, the upstream sector in the UK is facing a new emission policy of 'net zero', known as the North Sea Transitional Deal.

“The North Sea Transition Deal unveiled at the end of March aims to set the scene for how the UK's offshore oil and gas sector and the government will work together to successfully embrace energy transition and meet greenhouse gas emission reduction targets” according to Rystad Energy. “In 2019, total emissions for the UK Continental Shelf upstream operations amounted to 13.1 million tonnes of CO<sub>2</sub>. Almost 30% of total emissions came from the top ten emitting assets, with platforms such as Ninian, Beryl, Elgin, Britannia and Buzzard heading the list. The UK is the first major economy to pass new laws to reduce emissions to net zero by 2050, but it has been criticized over the lack of detail on how this would be achieved”, Rystad Energy highlighted in its analysis.

## Non-OECD

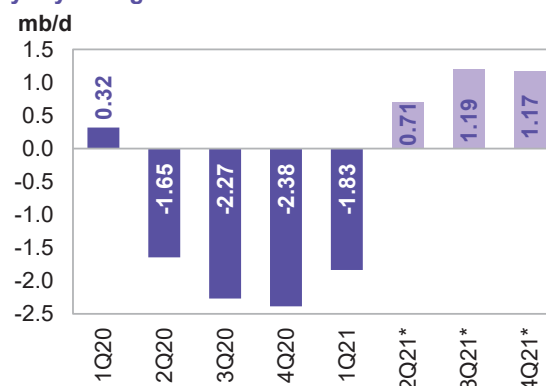
**Non-OECD liquids production for 2020** is estimated to have declined by 1.50 mb/d y-o-y. This has been revised down by 0.01 mb/d, due to downward revisions in Africa and Other Asia, to average 31.66 mb/d.

**Graph 5 - 16: Non-OECD quarterly liquids supply**



Note: \* 2Q21-4Q21 = Forecast. Source: OPEC.

**Graph 5 - 17: Non-OECD quarterly liquids supply, y-o-y changes**



Note: \* 2Q21-4Q21 = Forecast. Source: OPEC.

For **2021**, liquids production in non-OECD countries is forecast to grow by 0.32 mb/d y-o-y. This has been revised up by 0.01 mb/d to average 31.97 mb/d.

**Table 5 - 7: Non-OECD liquids supply y-o-y changes by region, mb/d**

Non-OECD	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21*	3Q21*	4Q21*
China	0.08	0.05	0.09	0.06	0.12	0.14	0.10	0.12
India	-0.06	-0.07	-0.05	-0.05	-0.03	0.00	-0.01	-0.01
Other Asia	-0.11	-0.28	-0.15	-0.19	-0.06	0.03	0.02	-0.02
Latin America	0.51	-0.09	-0.09	-0.46	-0.39	0.28	0.18	0.60
Middle East	-0.01	0.00	-0.05	-0.04	0.01	0.00	0.08	0.08
Africa	-0.05	-0.08	-0.10	-0.13	-0.08	-0.10	-0.07	-0.05
Russia	-0.03	-1.15	-1.58	-1.31	-1.21	0.33	0.65	0.35
Other Eurasia	-0.01	-0.02	-0.33	-0.27	-0.20	0.03	0.25	0.13
Other Europe	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01	-0.01
<b>Total Non-OECD</b>	<b>0.32</b>	<b>-1.65</b>	<b>-2.27</b>	<b>-2.38</b>	<b>-1.83</b>	<b>0.71</b>	<b>1.19</b>	<b>1.17</b>

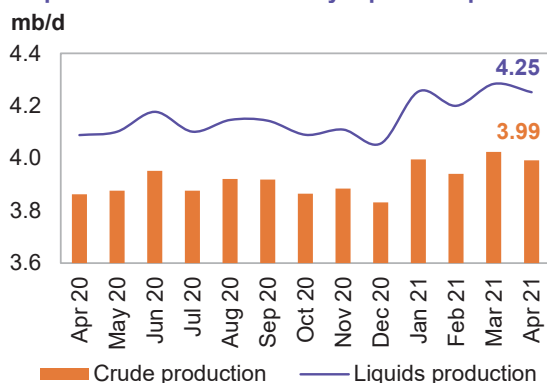
Note: \* 2Q21-4Q21 = Forecast. Source: OPEC.

## China

**China's crude oil production in April** was down by 32 tb/d m-o-m to average 3.99 mb/d, but up by 0.13 mb/d y-o-y, according to official data. Production of NGLs and other non-conventional liquids was mainly flat in April vs March, at 20 tb/d and 240 tb/d, respectively. Liquids output in 1Q21 increased q-o-q by 0.17 mb/d to average 4.25 mb/d, while crude oil output increased by 126 tb/d over the same period. Liquids production in 2Q21 should be at least flat from 1Q21, but as no new large projects are expected to come online in the coming months, lower production is expected for 2H21. Higher NGLs output of 14 tb/d in 1Q21, to average 0.2 mb/d, and increasing non-conventional liquids such as ethanol, biodiesel, and CTLs, which totalled 0.24 mb/d in 1Q21, have contributed to higher China liquids output in 2021 vs 2020.

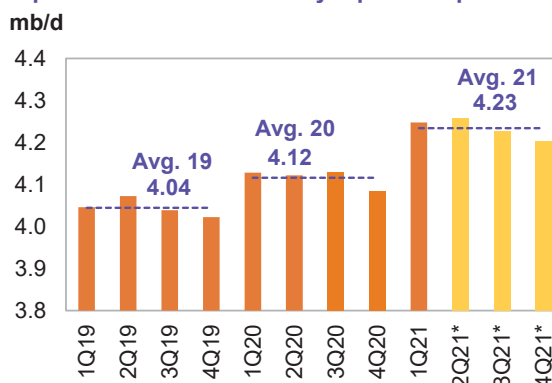
Offshore projects such as, Lihua 16-2, Lihua 4-1-1 and to some extent, Jinzhou 24-1, have been the most supportive fields for China's annual growth in 2021, from which production is expected to grow by around 42 tb/d. Onshore filed production in the current year is anticipated to see y-o-y growth, but at slower rate than last year. The main growth comes from the Changqing, with output expected to reach an average 66 tb/d in 2021.

**Graph 5 - 18: China's monthly liquids output**



Sources: CNPC and OPEC.

**Graph 5 - 19: China's monthly liquids output**



Note: \* 2Q21-4Q21 = Forecast. Sources: CNPC and OPEC.

## Latin America

**Latin America's total liquids supply in April** was up by 0.09 mb/d m-o-m to average 6.03 mb/d, mainly on the back of increasing production in Brazil. Liquids output was up by 0.26 mb/d y-o-y.

For **2021**, oil production is revised down by 0.05 mb/d m-o-m and projected to grow by 0.17 mb/d y-o-y to average 6.23 mb/d. Oil production in Brazil, Guyana, Ecuador, Argentina and Peru is forecast to increase, while declines are expected in Colombia and other countries of the region. Production in Ecuador is projected to recover by 0.03 mb/d from outages seen in 2020 to average 0.52 mb/d, albeit revised down by 0.03 mb/d m-o-m. Oil production is likely to decline in Colombia by 0.03 mb/d, which has been revised down by 0.02 mb/d m-o-m. Exxon Mobil reduced crude output at its offshore Liza-1 project in Guyana to 30 tb/d from 13 to 20 April, down from 120 tb/d. This was due to a mechanical problem with the offshore platform's gas compressor, but it has since begun to slowly ramp up oil production to 100-110 tb/d. In Argentina, oil production is forecast to grow by 0.02 mb/d to average 0.68 mb/d. This is mainly tight crude from Vaca Muerta, which is expected to grow by 29 tb/d in 2021, to average 137 tb/d. However, possible higher natural declines in mature fields may impact anticipated overall growth for the year.

## Brazil

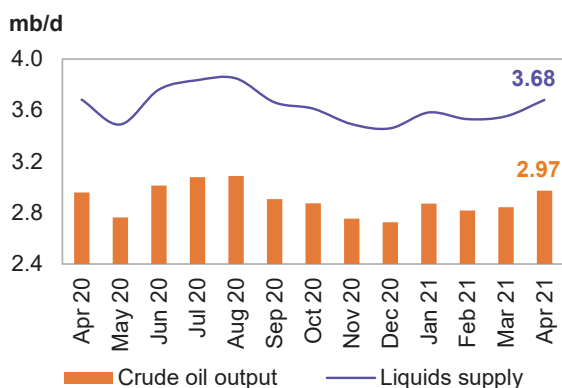
**Brazil's crude oil production in April** was up by 128 tb/d m-o-m to average 2.97 mb/d, and up by 13 tb/d y-o-y. Based on preliminary production data, and fewer outages due to lower maintenance and other unplanned outages, May crude production indicates further m-o-m growth of more than 50 tb/d.

The initial production forecast for this year has been impacted by the mandated health protection measures initiated by Petrobras on its platforms. Production was temporarily reduced at the Marlim Sul offshore field due to COVID-19-related safety measures, as well as prolonged and unforeseen maintenance weighing on oil production in 1Q21. However, crude oil production is expected to increase in the coming quarters, mainly due to the ramp-up of the Atapu, Berbigao, and Sururu fields within the BM-S-11A block, as well as the start-up of production from the offshore Sepia field. Brazil's oil production will be boosted through the FPSO Carioca, which is estimated to come online in 2H21 at the Sepia field. The FPSO Carioca will be installed at a water depth of 2,140 m and has a capacity to produce 180 tb/d of crude oil and 212 mscf/d of gas.

In terms of liquids, **total output in April** was up by 0.13 mb/d to average 3.68 mb/d, amid flat production of NGLs and biofuels at 95 tb/d and 614 tb/d, respectively.

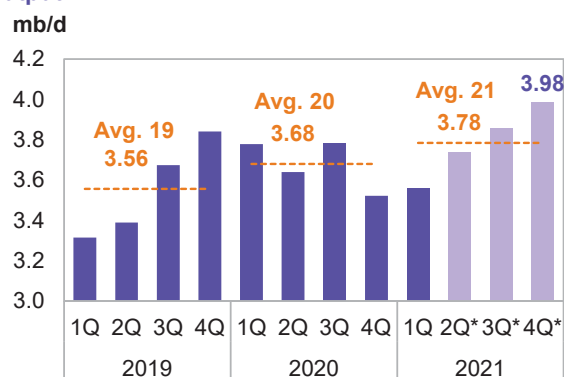


Graph 5 - 20: Brazil's crude oil and liquids output



Sources: ANP, Petrobras and OPEC.

Graph 5 - 21: Brazil's quarterly and annual liquids output



Note: \* 2Q21-4Q21 = Forecast. Sources: ANP and OPEC.

For **2021**, the production ramp up from fields located in the Santos Basin is expected to increase output from 1.94 mb/d to an average 2.1 mb/d, a y-o-y growth of 0.16 mb/d, according to Petrobras' plan at the beginning the year. However, heavy natural decline in production in the Campos Basin will partially offset the expected growth in Santos. Apart from the production ramp up in the BM-S-11A block (consisting of the Atapu, Berbigao, and Sururu fields) in the Santos Basin, production at the Buzios field (X-Franco) is expected to reach an annual of average 547 tb/d, a y-o-y growth of 31 tb/d (it is expected to peak at 574 tb/d in 2Q21). Clara, Lapa, Bauna/Piracaba and Sapinhola are other offshore fields anticipated to see higher output come on stream in 2021, compared to a year ago. Brazilian oil and gas giant Petrobras has revealed that the first production from its Mero 1, through the FPSO Guanabara, has been postponed due to delays in FPSO construction.

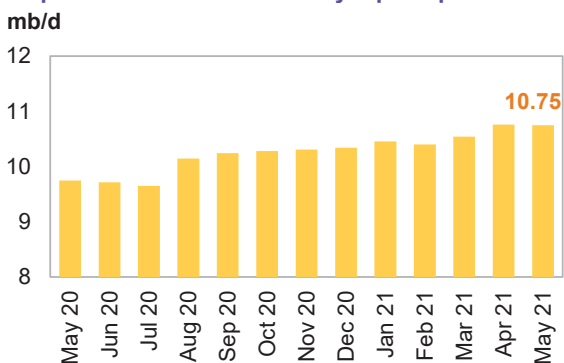
For 2021, liquids supply is forecast to grow by 0.10 mb/d, if all fields are fully ramped up, and average 3.81 mb/d. This has been revised down by 0.03 mb/d y-o-y.

## Russia

Russia's liquids production in April increased m-o-m to average 10.76 mb/d, as per data provided by Nefte Compass. This was higher by 0.21 mb/d m-o-m and higher by 0.06 mb/d y-o-y. Preliminary liquids production for May is estimated at 10.75 mb/d. With this, Russia's liquids production in 2Q21 has been revised up by 49 tb/d to average 10.71 mb/d, while the liquids supply forecast remains unchanged at 10.66 mb/d for 2H21. The forecast is based on the voluntary crude oil production adjustments under the DoC and expected NGLs and condensate production.

Russia's liquids supply in **2021**, following a decline of 1.02 mb/d in 2020, is expected to see growth of 0.03 mb/d in 2021 to average 10.63 mb/d. This has been revised up by 12 tb/d m-o-m, amid higher-than-expected liquids output in 1H21.

Graph 5 - 22: Russia's monthly liquids production



Sources: Nefte Compass, The Ministry of Energy of the Russian Federation and OPEC.

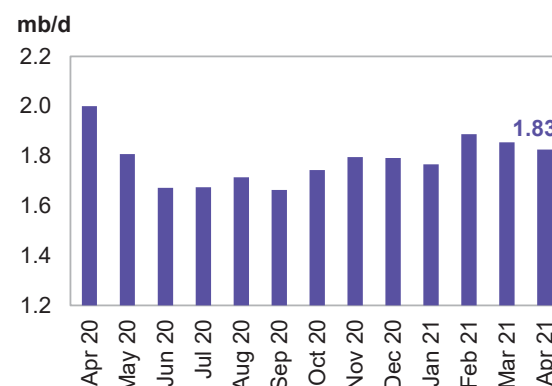
## Caspian

### Kazakhstan

Kazakhstan's liquids production in April fell m-o-m by 0.03 mb/d to average 1.83 mb/d. In April, NGLs and condensate output declined m-o-m by 35 tb/d to average 0.33 mb/d, but output is expected to come back in May.

Kazakhstan's liquids production in 2020 is estimated to have declined by 0.10 mb/d to average 1.83 mb/d, while for 2021, production is forecast to grow by a minor 0.01 mb/d.

Graph 5 - 23: Kazakhstan monthly crude and total liquids output



Sources: Nefte Compass and OPEC.

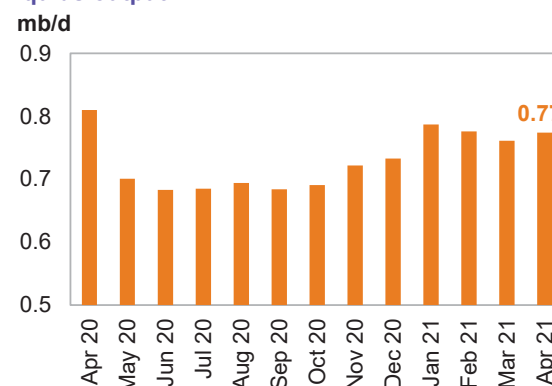
### Azerbaijan

Azerbaijan's liquids supply in April was slightly up m-o-m by 0.01 mb/d to 0.77 mb/d. It is expected to have seen further expansion of another 10 tb/d m-o-m in May. If so, the 2Q21 will see growth by 0.01 mb/d q-o-q to average 0.78 mb/d.

Condensate and NGLs output from gas-condensate offshore fields is forecast to have remained flat at 0.18 mb/d in April and May.

Liquids supply in Azerbaijan in 2020 declined y-o-y by 0.06 mb/d to average 0.73 mb/d. For 2021, y-o-y growth of 0.06 mb/d is anticipated, amid developments of the Shah-Deniz field.

Graph 5 - 24: Azerbaijan monthly crude and total liquids output



Sources: Nefte Compass and OPEC.

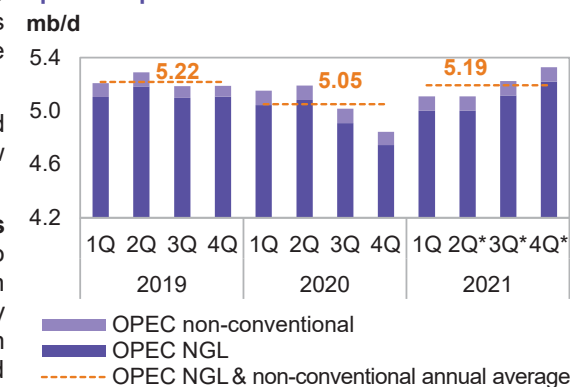
## OPEC NGL and non-conventional oils

Production of OPEC NGLs and non-conventional liquids in 2021, following two years of declines in 2019 and 2020 of 0.08 mb/d and 0.17mb/d, respectively, is forecast to see growth of 0.14 mb/d to average 5.19 mb/d.

OPEC NGLs production in 2020 has been revised down m-o-m by 51 tb/d to average 4.94 mb/d. It is now estimated to have declined by 0.18 mb/d y-o-y.

At the same time, OPEC non-conventional liquids has seen an upward revision of 8 tb/d in 2020 to average 0.11 mb/d. It is now estimated to have grown by 0.01 mb/d y-o-y. 1Q21 is expected to grow by 0.27 mb/d to average 5.11 mb/d, and remain flat in 2Q21, before growing to 5.22 mb/d in 3Q21 and 5.33 mb/d in 4Q21.

Graph 5 - 25: OPEC NGLs and non-conventional liquids output



Note: \* 2Q21-4Q21 = Forecast. Source: OPEC.

Table 5 - 8: OPEC NGL + non-conventional oils, mb/d

OPEC NGL and non-conventional oils	Change		Change		1Q21	2Q21	3Q21	4Q21	2021	Change 21/20
	2019	19/18	2020	20/19						
OPEC NGL	5.12	-0.07	4.94	-0.18	5.00	5.00	5.12	5.22	5.08	0.14
OPEC non-conventional	0.09	0.00	0.11	0.01	0.11	0.11	0.11	0.11	0.11	0.00
<b>Total</b>	<b>5.22</b>	<b>-0.08</b>	<b>5.05</b>	<b>-0.17</b>	<b>5.11</b>	<b>5.11</b>	<b>5.22</b>	<b>5.33</b>	<b>5.19</b>	<b>0.14</b>

Note: 2Q21-4Q21 = Forecast. Source: OPEC.

## OPEC crude oil production

According to available secondary sources to date, total **OPEC-13 crude oil production** averaged 25.46 mb/d in May 2021, up by 0.39 mb/d m-o-m. Crude oil output increased mainly in Saudi Arabia, Venezuela and IR Iran, while production decreased primarily in Nigeria and Angola.

OPEC crude oil production based on direct communication is shown in **Table 5 – 10**.

Table 5 - 9: OPEC crude oil production based on secondary sources, tb/d

Secondary sources	2019	2020	3Q20	4Q20	1Q21	Mar 21	Apr 21	May 21	Change May/Apr
Algeria	1,022	897	840	857	871	871	871	882	12
Angola	1,401	1,248	1,209	1,164	1,134	1,139	1,138	1,079	-60
Congo	324	289	287	273	271	274	267	256	-11
Equatorial Guinea	117	115	112	112	107	101	116	109	-7
Gabon	208	195	191	191	185	189	196	177	-19
IR Iran	2,356	1,987	1,948	2,001	2,206	2,328	2,413	2,455	42
Iraq	4,678	4,049	3,697	3,817	3,881	3,914	3,934	3,967	33
Kuwait	2,687	2,434	2,245	2,293	2,327	2,328	2,326	2,359	32
Libya	1,097	367	121	911	1,172	1,195	1,133	1,155	23
Nigeria	1,786	1,578	1,462	1,434	1,410	1,443	1,460	1,388	-72
Saudi Arabia	9,771	9,182	8,766	8,962	8,445	8,101	8,121	8,466	345
UAE	3,094	2,802	2,617	2,515	2,610	2,609	2,613	2,640	28
Venezuela	796	500	362	408	512	525	486	531	45
<b>Total OPEC</b>	<b>29,337</b>	<b>25,642</b>	<b>23,857</b>	<b>24,937</b>	<b>25,132</b>	<b>25,018</b>	<b>25,073</b>	<b>25,463</b>	<b>390</b>

Notes: Totals may not add up due to independent rounding, given available secondary sources to date. Source: OPEC.

Table 5 - 10: OPEC crude oil production based on direct communication, tb/d

Direct communication	2019	2020	3Q20	4Q20	1Q21	Mar 21	Apr 21	May 21	Change May/Apr
Algeria	1,023	899	843	862	874	870	867	891	24
Angola	1,373	1,271	1,253	1,186	1,136	1,138	1,177	1,125	-52
Congo	329	300	296	285	275	274	264	268	4
Equatorial Guinea	110	114	115	106	104	103	98	105	7
Gabon	218	207	201	178	183	183	184	171	-13
IR Iran	..	..	..	..	..	..	..	..	..
Iraq	4,576	3,997	3,625	3,796	3,846	3,865	3,930	3,879	-51
Kuwait	2,678	2,438	2,245	2,293	2,327	2,327	2,327	2,355	28
Libya	..	389	128	972	1,214	1,283	1,168	1,227	59
Nigeria	1,737	1,493	1,352	1,301	1,404	1,429	1,372	1,344	-28
Saudi Arabia	9,808	9,213	8,813	8,975	8,473	8,138	8,134	8,544	410
UAE	3,058	2,779	2,526	2,501	2,610	2,608	2,613	2,641	28
Venezuela	1,013	569	406	463	533	578	452	582	130
<b>Total OPEC</b>	<b>..</b>	<b>..</b>	<b>..</b>	<b>..</b>	<b>..</b>	<b>..</b>	<b>..</b>	<b>..</b>	<b>..</b>

Notes: .. Not available. Totals may not add up due to independent rounding. Source: OPEC.

## Commercial Stock Movements

Preliminary April data sees total OECD commercial oil stocks down by 6.4 mb m-o-m. At 2,962 mb, they were 159.9 mb lower than the same time one year ago, 25.2 mb lower than the latest five-year average, but around 34 mb above the 2015-2019 average. Within the components, crude stocks were lower by 13.6 mb, while products stocks rose m-o-m by 7.2 mb. At 1,475 mb, OECD crude stocks stood 35.8 mb below the latest five-year average and 8.3 mb below the 2015-2019 average. At 1,487 mb, OECD product stocks exhibited a surplus of 10.7 mb over the latest five-year average and were 42.6 mb above the 2015-2019 average.

In terms of days of forward cover, OECD commercial inventories in April declined m-o-m by 0.9 days to stand at 66.0 days. This is 12.3 days lower than the year-ago level, some 0.5 days above the latest five-year average and 3.9 days above the 2015-2019 average.

Preliminary data for May showed that total US commercial oil stocks fell m-o-m by 2.1 mb to stand at 1,278 mb. This is 147.7 mb lower than the same month a year ago and 50.4 mb below the latest five-year average. Crude stocks fell by 5.8 mb, while product stocks rose by 3.8 mb.

## OECD

Preliminary April data sees **total OECD commercial oil stocks** down by 6.4 mb m-o-m. At 2,962 mb, they were 159.9 mb lower than the same time one year ago and 25.2 mb lower than the latest five-year average.

Within the components, crude stocks were lower by 13.6 mb, while products stocks rose m-o-m by 7.2 mb. Total commercial oil stocks in April rose in OECD Asia Pacific and OECD Europe, while they fell in OECD Americas.

OECD **commercial crude stocks** fell in April by 13.6 mb to stand at 1,475 mb. This is 96.6 mb lower than the same time a year ago and 35.8 mb below the latest five-year average. Compared with the previous month, OECD Americas and OECD Europe registered stock draws of 16.8 mb and 3.4 mb, respectively, while OECD Asia Pacific saw a stock build of 6.6 mb.

In contrast, **total product inventories** rose by 7.2 mb m-o-m in April to stand at 1,487 mb. This is 63.0 mb less than the same time a year ago, but 10.7 mb above the latest five-year average.

Within the OECD regions, product stocks in OECD Americas fell by 1.0 mb, while OECD Europe and OECD Pacific rose by 3.9 mb and 4.3 mb, respectively.

In terms of **days of forward cover**, OECD commercial stocks fell m-o-m by 0.9 days in April to stand at 66.0 days. This is 12.3 days below April 2020 levels, but 0.5 days above the latest five-year average. OECD Americas and OECD Asia Pacific were below the latest five-year averages: the Americas by 1.3 days at 62.9 days and Asia Pacific by 2.8 days at 51.4 days. OECD Europe, however, showed a surplus of 6.0 days at 79.8 days.

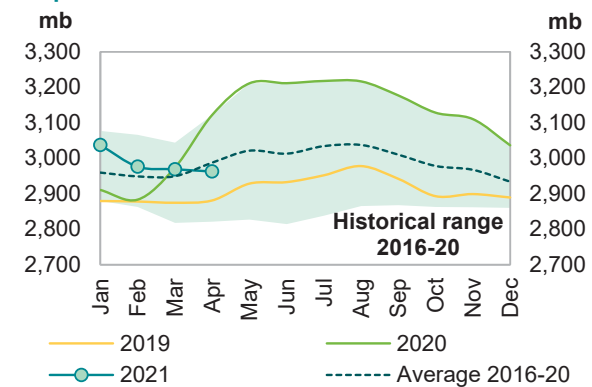
**Table 9 - 1: OECD's commercial stocks, mb**

OECD stocks	Apr 20	Feb 21	Mar 21	Apr 21	Change Apr 21/Mar 21
Crude oil	1,572	1,475	1,489	1,475	-13.6
Products	1,550	1,501	1,480	1,487	7.2
<b>Total</b>	<b>3,122</b>	<b>2,976</b>	<b>2,968</b>	<b>2,962</b>	<b>-6.4</b>
<b>Days of forward cover</b>	<b>78.3</b>	<b>68.3</b>	<b>66.9</b>	<b>66.0</b>	<b>-0.9</b>

Note: Totals may not add up due to independent rounding.

Sources: Argus, EIA, Euroilstock, IEA, METI and OPEC.

**Graph 9 - 1: OECD commercial oil stocks**



Sources: Argus, EIA, Euroilstock, IEA, METI and OPEC.

## OECD Americas

**OECD Americas total commercial stocks** fell m-o-m by 17.8 mb in April to settle at 1,574 mb. This is 104.3 mb less than the same month last year and 15.2 mb lower than the latest five-year average.

**Commercial crude oil stocks** in OECD Americas fell m-o-m by 16.8 mb in April to stand at 843 mb, which is 47.2 mb lower than in April 2020, but 8.0 mb above the latest five-year average. The stock draw came on the back of higher crude runs in April.

**Total product stocks** in OECD Americas fell m-o-m by 1.0 mb in April to stand at 714 mb. This was 57.0 mb lower than the same month one year ago and 23.2 mb below the latest five-year average. Higher consumption in the region was behind the stock draw.

## OECD Europe

**OECD Europe total commercial stocks** rose m-o-m by 0.5 mb in April to settle at 1,040 mb. This is 35.8 mb less than the same month last year, but 23.6 mb higher than the latest five-year average.

OECD Europe's **commercial crude stocks** in April fell m-o-m by 3.4 mb to end the month at 438 mb, which is 28.0 mb lower than one year ago and 4.3 mb below the latest five-year average. The drop in crude oil inventories came despite lower m-o-m refinery throughputs in the EU-14 plus the UK and Norway, which declined by around 150 tb/d to 8.7 mb/d.

In contrast, OECD Europe's **commercial product stocks** rose m-o-m by 3.9 mb to end April at 602 mb. This is 7.8 mb lower than a year ago, but 27.9 mb above the latest five-year average.

## OECD Asia Pacific

**OECD Asia Pacific's total commercial oil stocks** rose m-o-m by 10.9 mb in April to stand at 366 mb. This is 19.8 mb lower than a year ago, and 33.5 mb below the latest five-year average.

OECD Asia Pacific's **crude inventories** rose by 6.6 mb m-o-m to end April at 194 mb, which is 21.6 mb lower than one year ago, and 39.5 mb below the latest five-year average.

OECD Asia Pacific's **total product inventories** rose by 4.3 mb m-o-m to end April at 172 mb. This is 1.8 mb higher than the same time a year ago, and 5.9 mb above the latest five-year average.

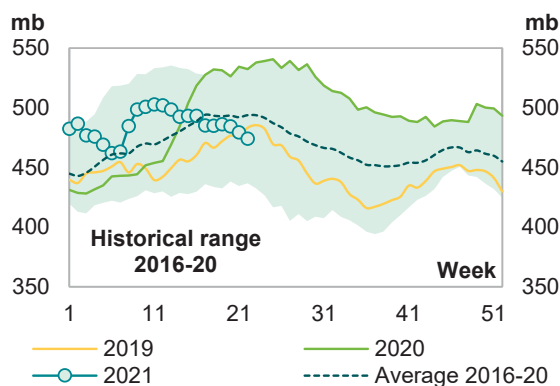
## US

Preliminary data for May showed that **total US commercial oil stocks** fell m-o-m by 2.1 mb to stand at 1,278 mb. This is 147.7 mb, or 10.4%, lower than the same month a year ago, and 50.4 mb, or 3.8%, below the latest five-year average. Crude stocks fell by 5.8 mb, while product stocks rose by 3.8 mb.

**US commercial crude stocks** in May fell m-o-m by 5.8 mb to stand at 479 mb. This is 41.7 mb, or 8.0%, lower than the same month last year, and 13.7 mb, or 2.8%, below the latest five-year average. The stock draw came on the back of higher crude runs, which increased m-o-m by 220 t/d to stand at 15.72 mb/d.

In contrast, **total product stocks** in May rose m-o-m by 3.8 mb to stand at 799 mb. This is 106.0 mb, or 11.7%, below May 2020 levels, and 36.7 mb, or 4.4%, lower than the latest five-year average. The build was mainly driven by higher refinery output.

**Graph 9 - 2: US weekly commercial crude oil inventories**



Sources: EIA and OPEC.

**Gasoline stocks** in May fell m-o-m by 1.8 mb to settle at 234 mb. This is 24.3 mb, or 9.4%, below the same month last year, and 10.6 mb, or 4.3%, lower than the latest five-year average. The monthly stock draw came mainly on the back of higher gasoline consumption.

**Distillate stocks** fell m-o-m by 3.4 mb in May to stand at 132.8 mb. This is 43.1 mb, or 24.5%, lower than a year ago, and 13.3 mb, or 9.1%, lower than the latest five-year average. The draw in distillate stocks can be attributed to higher distillate consumption.

In contrast, **residual fuel oil stocks** rose m-o-m in May, increasing by 1.1 mb. At 32.7 mb, this was 6.7 mb, or 16.9%, lower than a year ago, and 3.0 mb, or 8.5%, below the latest five-year average.

**Jet fuel** rose m-o-m by 2.5 mb, ending May at 42.3 mb. This is 1.9 mb, or 4.8%, higher than the same month last year, and 0.2 mb, or 0.5%, above the latest five-year average.

**Table 9 - 2: US commercial petroleum stocks, mb**

US stocks	May 20	Mar 21	Apr 21	May 21	Change May 21/Apr 21
Crude oil	521.0	501.9	485.1	479.3	-5.8
Gasoline	258.2	237.6	235.8	234.0	-1.8
Distillate fuel	175.9	145.5	136.2	132.8	-3.4
Residual fuel oil	39.4	30.9	31.6	32.7	1.1
Jet fuel	40.4	39.0	39.8	42.3	2.5
Total products	904.5	799.8	794.8	798.6	3.8
Total	1,425.5	1,301.7	1,279.9	1,277.8	-2.1
SPR	648.3	637.8	633.4	627.8	-5.6

Sources: EIA and OPEC.

## Japan

In Japan, **total commercial oil stocks** in April rose m-o-m by 10.9 mb to settle at 126.2 mb. This is 15.1 mb, or 10.7%, lower than the same month last year, and 13.5 mb, or 9.7%, below the latest five-year average. Crude and products stocks rose m-o-m by 6.6 mb and 4.3 mb, respectively.

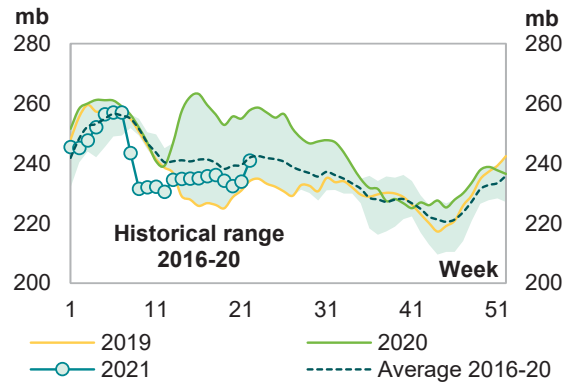
Japanese **commercial crude oil stocks** rose in April to stand at 66.6 mb. This is 15.2 mb, or 18.5%, below the same month a year ago, and 15.9 mb, or 19.3%, lower than the latest five-year average. The build came on the back of higher crude imports, which increased by 309 tb/d m-o-m, or 13.2%, to stand at 2.65 mb/d. Lower crude throughput, which fell m-o-m by 34 tb/d, or 1.4%, to stand at 2.43 mb/d, also contributed to the crude oil stock build.

Japan's **total product inventories** rose m-o-m by 4.3 mb to end April at 59.6 mb. This is 0.1 mb, or 0.2%, higher than the same month last year, and 2.4 mb, or 4.2 %, above the latest five-year average.

**Gasoline stocks** rose m-o-m by 0.5 mb to stand at 13.0 mb. This was 0.2 mb, or 1.6%, lower than a year ago, but 11.3 mb, or 1.7%, above the latest five-year average. Lower domestic gasoline sales, which fell by 2.4%, were behind the build in gasoline stocks.

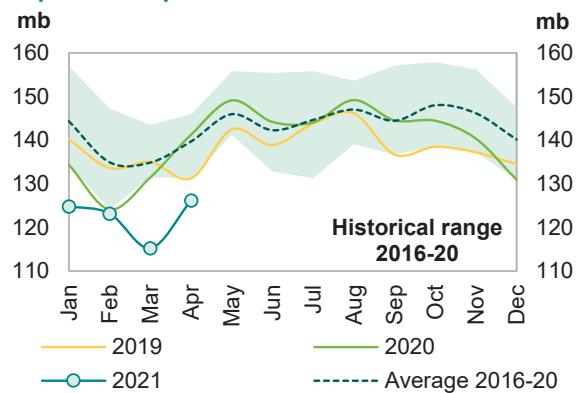
**Distillate stocks** rose by 1.6 mb m-o-m to end March at 24.6 mb. This is 0.1 mb, or 0.4%, higher than the same month a year ago, and 0.9 mb, or 3.8%, above the latest five-year average. Within distillate components, **jet fuel and gasoil stocks** rose m-o-m by 15.6% and 13.2%, respectively, while kerosene stocks were down by 3.2%.

**Graph 9 - 3: US weekly gasoline inventories**



Sources: EIA and OPEC.

**Graph 9 - 4: Japan's commercial oil stocks**



Sources: METI and OPEC.



## Commercial Stock Movements

**Total residual fuel oil stocks** rose by 1.0 mb in April to stand at 12.2 mb. This is 0.3 mb, or 2.4% lower than the same month last year, and 0.8 mb, or 5.8%, below the latest five-year average. Within components, fuel oil A and fuel oil B.C stocks rose by 4.0% and 11.8%, respectively.

**Table 9 - 3: Japan's commercial oil stocks\*, mb**

Japan's stocks	Apr 20	Feb 21	Mar 21	Apr 21	Change Apr 21/Mar 21
<b>Crude oil</b>	<b>81.8</b>	<b>63.3</b>	<b>60.0</b>	<b>66.6</b>	<b>6.6</b>
Gasoline	13.2	13.1	12.5	13.0	0.5
Naphtha	9.3	9.2	8.6	9.8	1.2
Middle distillates	24.5	25.7	23.0	24.6	1.6
Residual fuel oil	12.5	11.9	11.3	12.2	1.0
<b>Total products</b>	<b>59.5</b>	<b>59.9</b>	<b>55.3</b>	<b>59.6</b>	<b>4.3</b>
<b>Total**</b>	<b>141.2</b>	<b>123.2</b>	<b>115.2</b>	<b>126.2</b>	<b>10.9</b>

Note: \* At the end of the month. \*\* Includes crude oil and main products only.

Sources: METI and OPEC.

## EU-14 plus UK and Norway

Preliminary data for April showed that **total European commercial oil stocks** rose slightly m-o-m by 0.5 mb to stand at 1,151.9 mb. At this level, they were 22.3 mb, or 1.9%, below the same month a year ago, and 12.2 mb, or 1.1%, higher than the latest five-year average. Crude stocks went down by 3.4 mb, while product stocks rose by 3.9 mb.

European **crude inventories** fell in April to stand at 477.0 mb. This is 24.3 mb, or 4.8%, lower than the same month a year ago, and 14.1 mb, or 2.9%, lower than the latest five-year average. The drop in crude oil inventories came despite lower m-o-m refinery throughputs in the EU-14 plus UK and Norway, which declined by around 150 tb/d to 8.7 mb/d.

In contrast, **total European product stocks** rose m-o-m by 3.9 mb to end April at 675.0 mb. This is 2.0 mb, or 0.3%, higher than the same month a year ago, and 26.3 mb, or 4.1%, above the latest five-year average.

**Gasoline stocks** fell m-o-m by 0.3 mb in April to stand at 119.7 mb. This is 5.6 mb, or 4.5%, lower than the level registered the same time a year ago, and in line with the latest five-year average.

**Naphtha stocks** fell by 0.7 mb m-o-m in April, ending the month at 30.5 mb. This is 2.7 mb, or 8.1%, below April 2020 levels, but 1.9 mb, or 6.6%, higher than the latest five-year average.

In contrast, **distillate stocks** rose m-o-m by 3.3 mb in April to stand at 457.6 mb. This is 14.5 mb, or 3.3%, higher than the same month last year, and 26.2 mb, or 6.1%, above the latest five-year average.

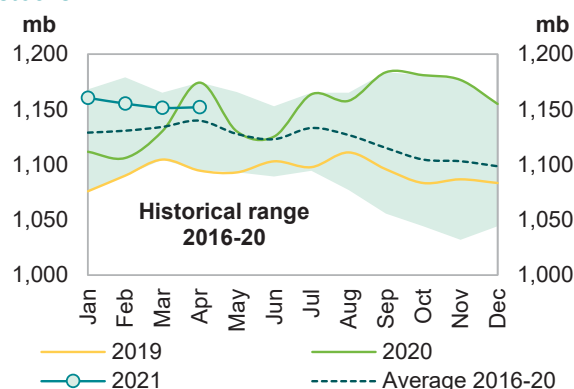
**Residual fuel stocks** rose m-o-m by 1.6 mb in April to 67.2 mb. This is 4.2 mb, or 5.9%, lower than the same month one year ago, and 1.8 mb, or 2.6%, below the latest five-year average.

**Table 9 - 4: EU-14 plus UK and Norway's total oil stocks, mb**

EU stocks	Apr 20	Feb 21	Mar 21	Apr 21	Change Apr 21/Mar 21
<b>Crude oil</b>	<b>501.2</b>	<b>476.8</b>	<b>480.4</b>	<b>477.0</b>	<b>-3.4</b>
Gasoline	125.3	124.2	120.0	119.7	-0.3
Naphtha	33.2	29.5	31.2	30.5	-0.7
Middle distillates	443.1	458.8	454.3	457.6	3.3
Fuel oils	71.4	65.9	65.5	67.2	1.6
<b>Total products</b>	<b>673.0</b>	<b>678.4</b>	<b>671.1</b>	<b>675.0</b>	<b>3.9</b>
<b>Total</b>	<b>1,174.2</b>	<b>1,155.2</b>	<b>1,151.5</b>	<b>1,151.9</b>	<b>0.5</b>

Sources: Argus, Euroilstock and OPEC.

**Graph 9 - 5: EU-14 plus UK and Norway's total oil stocks**



Sources: Argus, Euroilstock and OPEC.

## Singapore, Amsterdam-Rotterdam-Antwerp (ARA) and Fujairah

### Singapore

In April, **total product stocks in Singapore** remained unchanged m-o-m at 50.6 mb. This is 2.4 mb, or 4.5%, lower than the same month a year ago.

**Light distillate stocks** fell m-o-m by 2.0 mb in April to stand at 12.2 mb. This is 3.5 mb, or 22.5%, lower than the same month one year ago.

**Middle distillate stocks** fell by 0.2 mb in April to stand at 13.1 mb. This is 1.6 mb, or 11.1%, lower than a year ago.

In contrast, **residual fuel oil stocks** rose by 2.1 mb, ending April at 25.3 mb, which is 2.8 mb, or 12.3%, higher than in April 2020.

### ARA

**Total product stocks in ARA** fell for the second consecutive month in April, down by 2.9 mb to 46.9 mb. This is 1.1 mb, or 2.2%, lower than the same month a year ago.

**Gasoline stocks** in April fell m-o-m by 0.9 mb to stand 10.2 mb, which is 0.1 mb, or 0.6%, lower than the same month one year ago.

**Gasoil stocks** fell m-o-m by 1.4 mb in April to stand at 16.2 mb, which is 1.5 mb, or 8.6%, lower than in April 2020.

**Residual fuel stocks** fell m-o-m by 1.8 mb to end April at 9.8 mb. This is 0.5 mb, or 5.3%, less than the level registered one year ago.

In contrast, **jet oil stocks** rose m-o-m by 0.7 mb to end April at 7.7 mb. This is 2.1 mb, or 37.4%, above the level seen one year ago.

### Fujairah

During the week ending 31 May 2021, **total oil product stocks in Fujairah** rose by 3.31 mb w-o-w to stand at 23.69 mb, according to data from FEDCom and S&P Global Platts. At this level, total oil stocks were 7.02 mb lower than the same time a year ago. Within products, all the products witnessed a stock build w-o-w.

**Light distillate stocks** rose by 0.1 mb w-o-w to stand at 5.23 mb, which is 3.32 mb lower than the same period a year ago. **Middle distillate stocks** rose by 0.43 mb to stand at 3.82 mb, which is 2.18 mb lower than a year ago. **Heavy distillate stocks** rose by 2.78 mb to stand at 14.65 mb, which is 1.51 mb lower than the same time last year.

## Oil Market Report - June 2021

### Report extract

## Highlights

- Global oil demand is set to return to pre-pandemic levels by the end of 2022, rising 5.4 mb/d in 2021 and a further 3.1 mb/d next year. The OECD accounts for 1.3 mb/d of 2022 growth while non-OECD countries contribute 1.8 mb/d. Jet and kerosene demand will see the largest increase (+1.5 mb/d y-o-y), followed by gasoline (+660 kb/d y-o-y) and gasoil/diesel (+520 kb/d y-o-y).
- World oil supply is expected to grow at a faster rate in 2022, with the US driving gains of 1.6 mb/d from producers outside the OPEC+ alliance. That leaves room for OPEC+ to boost crude oil production by 1.4 mb/d above its July 2021-March 2022 target to meet demand growth. In 2021, oil output from non-OPEC+ is set to rise 710 kb/d, while total oil supply from OPEC+ could increase by 800 kb/d if the bloc sticks with its existing policy.
- Global refinery throughput in 2021 is expected to recover half of the 7.4 mb/d fall in 2020, lagging behind demand growth for refined products as surplus inventories are drawn down. In 2022, refining activity is forecast to increase by 2.4 mb/d. 3.8 mb/d of new capacity coming on line over 2021-22 will be partially offset by 2.3 mb/d of announced closures or conversions to bio-refineries.
- OECD industry stocks held relatively steady in April, at 2 926 mb, but fell 1.6 mb below the pre-Covid 2015-19 average for the first time in more than a year. May preliminary data for the US, Europe and Japan show that industry stocks rose by a combined 17.2 mb. Crude oil held in short-term floating storage declined by 6.8 mb to 99.4 mb in May, its lowest since February 2020.
- Crude prices rose on bullish oil fundamentals and financial markets over the past month, while backwardation steepened on both benchmark crude futures contracts reflecting anticipation of tighter markets ahead. North Sea Dated rose \$3.95/bbl in May to \$68.54/bbl and reached \$69.84/bbl in the first week of June. Tanker freight costs remained weak overall during May.

### Recovery stays the course

Our first detailed look at 2022 balances confirms earlier expectations that OPEC+ needs to open the taps to keep the world oil markets adequately supplied. Global oil demand will continue to recover and, in the absence of further policy changes, by end-2022 reach 100.6 mb/d. Non-OPEC+ production is also set to rise, but gains are nowhere near the levels needed to prevent further stockdraws. In April, OECD total industry stocks fell 61.3 mb below their 2016-2020 average. The pace at which the OPEC+ cuts can be unwound will depend not only on the success in containing the spread of the virus and demand growth but also the timing of the eventual return of Iranian barrels to the market.

Following a record decline of 8.6 mb/d in 2020, global oil demand is forecast to rebound by 5.4 mb/d in 2021 and a further 3.1 mb/d next year, to average 99.5 mb/d. By end-2022, demand

should surpass pre-Covid levels. The recovery will be uneven not only amongst regions but across sectors and products. While the end of the pandemic is in sight in advanced economies, slow vaccine distribution could still jeopardise the recovery in non-OECD countries. The aviation sector will be the slowest to recover as some travel restrictions are likely to stay in place until the pandemic is brought firmly under control. Gasoline demand is also expected to lag pre-Covid levels, as continued teleworking practices and a rising share of electric and more efficient vehicles provide an offset to increased mobility. Petrochemicals will be boosted by robust demand for plastics, while global trade supports bunker demand.

Meeting the expected demand growth is unlikely to be a problem. Even after boosting oil production by around 2 mb/d over the May-July period, OPEC+ will have 6.9 mb/d of effective spare capacity. If sanctions on Iran are lifted, an additional 1.4 mb/d could be brought to market in relatively short order. As for those producers outside the alliance, output growth is set to accelerate from 700 kb/d in 2021 to 1.6 mb/d next year. The US leads 2022 gains, adding more than 900 kb/d to total supply, followed by Canada, Brazil and Norway. That leaves non-OPEC+ output well above 2019 levels. By contrast, even if OPEC+ producers were to fill the gap created by demand growth, the bloc's output would still be more than 2 mb/d below the 2019 average.

The refining sector, meanwhile, is expected to remain under pressure. In 2022, demand for refined products will still be below 2017 levels. Following net capacity additions of 3.3 mb/d over the 2017-20 period, a further 1.5 mb/d of new net crude distillation capacity will come online in 2021-22. This means that global average utilisation rates reach 78%, limiting any rebound in refinery margins from the depressed 2020-21 levels.

The forecast also highlights the challenges outlined in the IEA's recently released Net Zero by 2050 - A Roadmap for the Global Energy Sector. This roadmap notes that most pledges by countries are not yet underpinned by near-term policies and measures. In the meantime, oil demand looks set to continue to rise, underlining the enormous effort required to get on track to reach stated ambitions.

## IEA World Oil Supply and Demand Forecasts: Summary (Table)

2021-06-11 08:00:00.2 GMT

By Kristian Siedenburg

(Bloomberg) -- Following is a summary of world oil supply and demand forecasts from the International Energy Agency in Paris:

	4Q	3Q	2Q	1Q	4Q	3Q	2Q	1Q	2021	2021	2021	2021	2021	2021
	2022	2022	2022	2022	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021
Demand														
Total Demand	100.6	100.3	98.6	98.3	99.3	99.0	98.9	99.3	99.5	99.4				
Total OECD	46.2	46.8	45.8	45.5	46.3	45.9	44.4	43.3	46.1	46.8				
Americas	25.2	25.7	25.2	24.6	25.3	25.3	24.4	22.8	25.2	24.4				
Europe	13.5	13.8	13.5	13.1	13.4	13.5	13.1	11.9	13.4	13.0				
Asia Oceania	7.7	7.2	7.1	7.8	7.7	7.2	7.0	7.6	7.5	7.4				
Non-OECD countries	54.4	53.5	52.8	52.8	53.0	53.0	54.4	56.0	53.4	52.6				
FSU	5.1	5.0	4.6	4.8	5.0	4.9	4.6	4.6	4.9	4.8				
Europe	0.8	0.8	0.7	0.7	0.8	0.8	0.7	0.7	0.7	0.7				
China	15.7	15.4	15.6	15.3	15.3	15.3	15.1	14.7	15.5	15.0				
Other Asia	14.4	13.7	14.1	14.2	13.9	13.0	12.8	13.5	14.1	13.3				
Americas	6.2	6.3	6.9	6.9	6.0	6.0	5.7	5.8	6.1	5.9				
Middle East	8.3	8.4	7.9	7.9	7.9	8.4	7.6	7.6	8.1	7.9				
Africa	4.1	4.0	3.9	4.1	4.0	3.9	3.9	4.0	4.0	3.9				
Supply														
Total Supply	n/a	n/a	n/a	n/a	n/a	n/a	n/a	92.4	n/a	n/a				
Non-OPEC	66.1	66.2	65.8	64.8	65.0	65.0	63.7	62.0	65.7	63.9				
Total OECD	29.5	29.5	29.1	29.1	28.9	28.5	27.7	27.4	29.4	28.1				
Americas	25.7	25.4	25.1	24.9	24.7	24.5	24.0	23.3	25.3	24.1				
Europe	3.6	3.5	3.5	3.7	3.6	3.5	3.2	3.6	3.6	3.5				
Asia Oceania	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.6				
Non-OECD	30.9	30.6	30.8	30.8	30.9	30.9	30.7	30.3	30.8	30.7				
FSU	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.8	13.7	13.6				
Europe	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1				
China	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1				
Other Asia	2.6	2.9	2.9	2.9	2.9	3.0	2.9	3.0	2.9	3.0				
Americas	5.7	5.6	5.6	5.5	5.6	5.6	5.4	5.3	5.6	5.5				
Middle East	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2				
Africa	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2				
Processing Gains	2.4	2.4	2.4	2.4	2.4	2.4	2.2	2.1	2.4	2.3				
Total OPEC	n/a	n/a	n/a	n/a	n/a	n/a	n/a	30.5	n/a	n/a				
Crude	n/a	n/a	n/a	n/a	n/a	n/a	n/a	25.2	n/a	n/a				
Natural gas														
Liquids	5.8	5.5	5.5	5.5	5.3	5.3	5.3	5.2	5.5	5.3				
Call on OPEC crude and stock change =	28.9	28.6	27.6	27.9	29.0	27.6	25.9	26.1	28.3	27.2				

NOTE: Figures are in million of barrels per day. (\*) equals total demand minus non-OPEC supply and OPEC natural gas liquids.

IEA changed the way it measures OPEC supply, adopting the industry-standard approach of counting most of Venezuela's Orinoco heavy oil as "crude oil."

SOURCE: International Energy Agency

To contact the reporter on this story: Kristian Siedenburg in Vienna at [ksiedenburg@bloomberg.net](mailto:ksiedenburg@bloomberg.net)

## IEA: May Crude Oil Production in OPEC Countries (Table)

2021-06-11 08:00:00.4 GMT

By Kristian Siedenburg

(Bloomberg) -- Following is a summary of oil production in OPEC countries from the International Energy Agency in Paris:

	May	Apr	May
	2021	2021	MoM
Total OPEC	25.43	25.06	0.37
Total OPEC10	23.36	23.02	0.34
Algeria	0.09	0.07	0.02
Angola	1.33	1.38	-0.05
Congo	0.27	0.27	0.00
Equatorial Guinea	0.33	0.32	0.01
Gabon	0.18	0.19	-0.01
Iran	3.96	3.95	0.01
Kuwait	2.38	2.32	0.06
Nigeria	1.34	1.37	-0.03
Saudi Arabia	6.48	6.34	0.14
OPEC	2.64	2.63	0.01
Trinidad	2.40	2.40	0.00
Libya	1.34	1.34	0.00
Venezuela	0.53	0.50	0.03

NOTE: Figures are in million of barrels per day. Monthly level change calculated by Bloomberg.

OPEC10 excludes Iran, Libya and Venezuela.

SOURCE: International Energy Agency

To contact the reporter on this story: Kristian Siedenburg in Vienna at [ksiedenburg@bloomberg.net](mailto:ksiedenburg@bloomberg.net)

## IEA REPORT WRAP: World Oil Demand to Fill Virus Gap by End-2022

2021-06-11 08:30:43.745 GMT

By Stephen Voss

(Bloomberg) -- Summary including stories from IEA's monthly Oil Market Report on Friday:

\* IEA says global oil demand to reach pre-virus levels next year

\*\* World oil demand 2021 kept little changed at 96.4m b/d

\*\*\* Revised up in 1H and revised down in 2H 2021

\*\* Agency issues first forecast for 2022, at 99.5 m b/d

\*\* Demand growth seen at 5.4m b/d in 2021, 3.1m b/d in 2022

\*\*\* That follows decline in 2020 of 8.6m b/d

\*\* "Room" for OPEC+ to boost supply above its planned targets

\*\* Click here for summary of key IEA supply/demand forecasts

\* OPEC output rose 1.5% in May amid Saudi supply boost: IEA

\*\* See full table of May production; total OPEC +370k b/d m/m

\*\* Compliance with pledged cutbacks in May:

\*\*\* OPEC 124%; non-OPEC 94%; combined OPEC+ 114%

\*\*\* Saudi Arabia 143%, Russia 94%

\* Iran's oil output could rise to more than 3m b/d by yr-end

\* U.S. shale to dominate non-OPEC+ output growth in 2021-22

\* Russia accounts for about 10% of OPEC+ spare capacity

\* Norway oil production to show strong growth in 2H 2021

\* India herd immunity from virus unlikely until late 2022

\* Chance of higher oil refining margins next year is limited

\* Gasoline, jet to lead strong 3Q demand growth in OECD Americas

\* European oil demand to stay below pre-Covid levels in 2022

\* Teleworking could cut gasoline demand by up to 350k b/d

\* IEA Table: World Supply, Demand Forecasts by Quarter

\* NOTE: OPEC published its own monthly report on Thursday, in which it anticipates a further recover in global demand in 2H

\*\* NOTE: The 23-nation OPEC+ coalition led by Saudi Arabia and Russia have restored almost 40% of the production they shuttered a year ago and will gather on July 1 to consider reviving the remainder

--With assistance from Grant Smith, Sherry Su, Kristian Siedenburg, Brian Wingfield, Rachel Graham, Dina Khrennikova, Jack Wittels, Amanda Jordan, Julian Lee and Prejula Prem.

To contact the reporter on this story:

Stephen Voss in London at [sev@bloomberg.net](mailto:sev@bloomberg.net)

To contact the editors responsible for this story:

Stephen Voss at [sev@bloomberg.net](mailto:sev@bloomberg.net)

Christopher Sell

To view this story in Bloomberg click here:

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## Global Oil Demand to Hit Pre-Virus Level Next Year, IEA Says (2)

2021-06-11 09:18:58.391 GMT

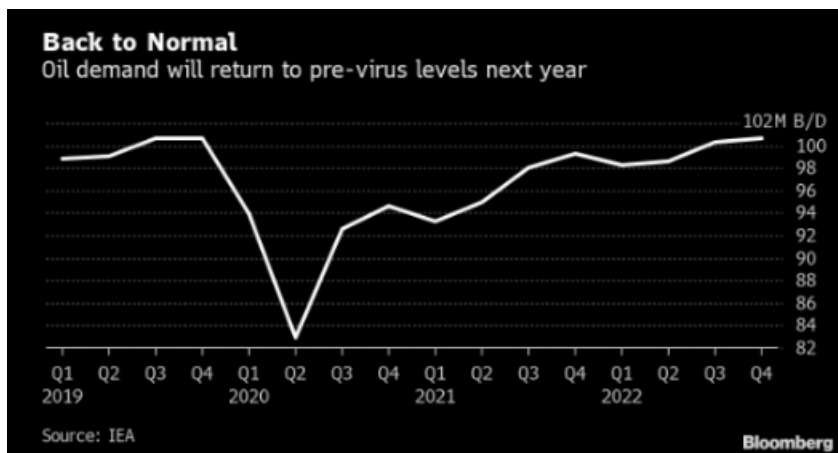
By Grant Smith

(Bloomberg) -- Global oil demand will recover to pre-pandemic levels late next year, the International Energy Agency predicted, urging OPEC and its allies to keep markets balanced by tapping their plentiful spare production capacity.

World consumption will once again reach 100 million barrels a day in the second half of 2022 as developed economies bring the virus under control, the agency said, in its first detailed outlook for the year ahead. At some point before the end of the year, demand will surpass pre-Covid levels, it said.

The forecast counters speculation that oil use -- and the resulting planet-warming emissions -- may have already peaked as a result of social changes in the wake of the pandemic. The IEA itself sees consumption reaching a plateau in the 2030s, but hasn't predicted a peak in demand.

Oil prices have rebounded to a two-year high above \$70 a barrel as motorists take to the roads and economic activity picks up with the easing of lockdowns. The report -- which paints a slightly more bullish picture than the agency's last outlook -- underscores that the market's next move is in the hands of Russia and Saudi Arabia.



The Paris-based IEA made a direct plea to the OPEC+ alliance, which is led by those two countries, to continue restoring the output it cut when demand collapsed last year.

“OPEC+ needs to open the taps to keep the world oil markets adequately supplied,” said the agency, which advises most major economies. Satisfying demand growth is “unlikely to be a problem” if the 23-nation coalition acts because only a fifth of its spare capacity is needed to keep the market in balance, it said.

IEA Executive Director Fatih Birol has warned of a further

price surge if extra supplies aren't forthcoming. However, Saudi Arabian Energy Minister Prince Abdulaziz bin Salman has said he'll wait until consumption is tangible before responding.

#### Goal Achieved

The Organization of Petroleum Exporting Countries and its partners have already achieved their primary market goal, having cleared the enormous inventory glut that amassed during the pandemic, the report showed. The group's next step ought to be straightforward, according to the IEA.

OPEC+ will need to add about 1.4 million barrels a day -- or less if fellow member Iran clinches a deal to remove U.S. sanctions -- leaving it with another 5.5 million a day off-line, according to IEA estimates. Bloomberg calculations suggest the buffer isn't quite as generous.

Tehran could add 1.4 million barrels of exports if it concludes a nuclear agreement with Washington that removes U.S. barriers on its oil trade, the IEA estimates -- equivalent to the amount the entire OPEC+ coalition needs to add. The group will meet on July 1 to consider its next move.

The alliance has, perhaps unintentionally, made its job easier. By making massive production cuts last year and supporting prices, the group has encouraged investment by U.S. shale drillers and other rivals, the report showed.

Non-OPEC+ supply will rebound by 1.6 million barrels a day in 2022, satisfying half of the anticipated 3.1 million-barrel jump in demand. Even if OPEC+ did ramp up output enough to meet the increase in demand, its production would remain a substantial 2 million barrels a day below 2019 levels.

On a full-year basis, world oil consumption will remain slightly below 2019 levels next year, at 99.5 million barrels a day. The recovery in consumption will also be uneven.

While demand for gasoline and diesel fuels will jump next year, it will still be about 1% short of pre-Covid levels due to the growth of remote working and popularity of electric vehicles, the IEA said. Purchases of jet fuel will also surge, yet remain 11% below prior levels because of limits on air travel.

And with countries outside the developed world still battered by new waves of the virus, the recovery may also prove patchy on a regional basis.

"While the end of the pandemic is in sight in advanced economies, slow vaccine distribution could still jeopardize the recovery in non-OECD countries," the IEA said.

To contact the reporter on this story:

Grant Smith in London at [gsmith52@bloomberg.net](mailto:gsmith52@bloomberg.net)

To contact the editor responsible for this story:

James Herron at [jherron9@bloomberg.net](mailto:jherron9@bloomberg.net)

To view this story in Bloomberg click here:

<https://blinks.bloomberg.com/news/stories/QUJ577DWX2PS>

## IEA World Oil Supply/Demand Key Forecasts

2021-06-11 08:00:00.5 GMT

By Kristian Siedenburg

(Bloomberg) -- World oil demand 2022 forecast at 99.5m b/d in Paris-based Intl Energy Agency's latest monthly report.

\* 2021 world demand was unrevised at 96.4m b/d

\* Demand growth in 2022 est. 3.2% y/y or 3.1m b/d

\* Non-OPEC supply 2022 estimated at 65.7m b/d

\* Call on OPEC crude 2022 estimated at 28.3m b/d

\* Call on OPEC crude 2021 was revised to 27.2 m b/d from 27.3m b/d

\*\* OPEC crude production in May rose by 370k b/d to 25.43m b/d

\* Detailed table: FIFW NSN QUIXZMT0AFBC <GO>

\* NOTE: Forecasts based off IEA's table providing one decimal point

To contact the reporter on this story:

Kristian Siedenburg in Vienna at [ksiedenburg@bloomberg.net](mailto:ksiedenburg@bloomberg.net)

To contact the editors responsible for this story:

Joshua Robinson at [jrobinson37@bloomberg.net](mailto:jrobinson37@bloomberg.net)

Mark Evans

To view this story in Bloomberg click here:

<https://blinks.bloomberg.com/news/stories/QUIY1UDWLU69>

## OPEC Output Rose 1.5% in May Amid Saudi Supply Boost, IEA Says

2021-06-11 08:00:00.19 GMT

By Amanda Jordan

(Bloomberg) -- OPEC's May crude output rose 370k b/d from April to 25.43m b/d as the group eased production curbs and Saudi Arabia began to phase out its extra voluntary cut, the IEA said in its monthly market report.

\* Saudi Arabia pumped 8.48m b/d last month, up from 8.14m b/d in April

\* Crude output in Iraq edged up to 3.96m b/d, 50k b/d above its slightly higher May quota

\* UAE production climbed 30k b/d to 2.64m b/d, just below its

higher target

\* Kuwaiti output inched higher to 2.36m b/d

\* In Africa, Nigerian production slipped to 1.34m b/d; Algerian supply rose to 890k b/d; **Angolan output dropped to 1.13m b/d -- around a 16-year low -- and may fall further in June amid scheduled maintenance**

\* For those countries exempt from OPEC+ cuts, production was unchanged in Iran and Libya, and rose slightly in Venezuela

\* READ: OPEC Sees Oil Demand Recovery Gaining Strength in Second Half

To contact the reporter on this story:

Amanda Jordan in London at [ajordan11@bloomberg.net](mailto:ajordan11@bloomberg.net)

To contact the editors responsible for this story:

James Herron at [jherron9@bloomberg.net](mailto:jherron9@bloomberg.net)

Rakteem Katakey

To view this story in Bloomberg click here:

<https://blinks.bloomberg.com/news/stories/QUIYQ3DWRGG0>

## **Iran's Oil Output Could Rise to More Than 3M B/d By Yr-End: IEA**

2021-06-11 08:00:00.20 GMT

By Rachel Graham

(Bloomberg) -- **Iran's crude oil production could increase to about 3.15m b/d by the end of the year**, the IEA said in its monthly report, as talks continue on reinstating the JCPOA nuclear agreement.

\* **If a nuclear deal is reached, it could take another month for U.S. sanctions to be lifted, allowing production and exports to increase in 3Q**

\*\* Iran will probably offer competitive pricing to recapture market share, **and will move to clear an overhang of 75m bbl of crude and condensate stored on tankers as quickly as possible**

\*\* **Oil exports this year averaged 660k b/d**

\* **Sustainable crude production capacity could rise to 3.8m b/d by mid-2022**

\* See IRAN TANKER TRACKER: Exports Stay Hidden; Impounded Tanker Freed

\* READ: (June 9) Iran Plots Oil Output Hike as It Sees Nuclear Talks Progress

To contact the reporter on this story:

Rachel Graham in London at [rgraham13@bloomberg.net](mailto:rgraham13@bloomberg.net)

To contact the editors responsible for this story:

Alaric Nightingale at [anightingal1@bloomberg.net](mailto:anightingal1@bloomberg.net)

Christopher Sell

To view this story in Bloomberg click here:

<https://blinks.bloomberg.com/news/stories/QUIXE6DWLU6A>

## U.S. Shale to Dominate Non-OPEC+ Output Growth in 2021-22: IEA

2021-06-11 08:00:00.21 GMT

By Julian Lee

(Bloomberg) -- The U.S. shale patch will provide most of the production growth outside OPEC+ until the middle of 2022, with the devastating financial impact of Covid-19 on E&P firms reflected by the modest amount of new conventional oil expected in the short term, the IEA said in its monthly Oil Market Report.

\* U.S. light tight oil production will “continue to creep upwards,” reaching 7.6m b/d by year-end and 8.2m b/d by the end of 2022

\* Higher oil prices have encouraged private operators, who account for about 25% of light tight oil production, to boost drilling, even as listed companies maintain spending discipline

\* Elsewhere, several new conventional projects have been pushed back from original plans due to Covid-19, either by outbreaks delaying operations, or decisions to delay startup in the face of weak demand

\* New conventional startups in non-OPEC+ countries “will contribute 100k b/d by end-2021 and 830k b/d by end-2022”

\* Biggest contribution to come from Sepia and Mero fields off Brazil, due to start in 3Q21 and 1Q22, each with plateau production target of 180k b/d

\* Liza Phase 2 off Guyana will deliver 220k b/d at peak, with first production due in 2Q22

\* 3 new projects due to start up in 2022 in the Gulf of Mexico, with combined plateau production of 300k b/d

\* 6 fields to come on stream in Norway this year and next, with a combined capacity of 127k b/d

To contact the reporter on this story:

Julian Lee in London at [jlee1627@bloomberg.net](mailto:jlee1627@bloomberg.net)

To contact the editors responsible for this story:

Alaric Nightingale at [anightingal1@bloomberg.net](mailto:anightingal1@bloomberg.net)

Brian Wingfield

To view this story in Bloomberg click here:

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## Russia Accounts for About 10% of OPEC+ Spare Capacity: IEA

2021-06-11 08:00:00.1 GMT

By Dina Khrennikova

(Bloomberg) -- Russia makes up about 10% of the spare capacity in OPEC+, or the same as the UAE and Iraq each, the IEA says in its monthly market report.

\* IEA estimates the effective OPEC+ spare capacity at 6.9m b/d by July

\* Russia's compliance with the OPEC+ deal in May grew to 94% vs. 91% in April

\* IEA estimates Russia's crude-only production in May at 9.52m b/d, some 100k b/d above the nation's target for the month

\* NOTE: Russian oil producers pumped around 10.45m b/d of crude oil and condensate in May, according to preliminary data from the Energy Ministry's CDU-TEK unit, which doesn't provide a breakdown between the two types of oil

To contact the reporter on this story:

Dina Khrennikova in Moscow at [dkhrennikova@bloomberg.net](mailto:dkhrennikova@bloomberg.net)

To contact the editors responsible for this story:

James Herron at [jherron9@bloomberg.net](mailto:jherron9@bloomberg.net)

Lars Paulsson

To view this story in Bloomberg click here:

<https://blinks.bloomberg.com/news/stories/QUIVZYDWLU6F>

## Norway Oil Production to Show Strong Growth in 2H 2021: IEA

2021-06-11 08:00:00.6 GMT

By Sherry Su

(Bloomberg) -- Norway is expected to show "strong growth" in 2H 2021 of about 130k b/d higher vs 1H amid increased output from Johan Sverdrup and other smaller projects, said IEA in its monthly Oil Market Report.

\* Johan Sverdrup pumps at around 535k b/d and other smaller projects, delayed due to the pandemic, expected to come online

\*\* Equinor's Martin Linge field, originally slated for first oil in 2014 should start up in the middle of this year and ramp up to 40k b/d

\*\* Also due online this year and next are the Yme, Balder X, Fenja, Duva, Nova fields and the Njord redevelopment

\* "These will see Norway's output rise 80k b/d in 2022, following a 120k b/d rise in 2021," IEA said

To contact the reporter on this story:

Sherry Su in London at [lsu23@bloomberg.net](mailto:lsu23@bloomberg.net)



To contact the editors responsible for this story:  
Alaric Nightingale at [anightingal1@bloomberg.net](mailto:anightingal1@bloomberg.net)  
Fred Pals

To view this story in Bloomberg click here:  
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### **India Herd Immunity From Virus Unlikely Until Late 2022: IEA** 2021-06-11 08:00:00.27 GMT

By Brian Wingfield  
(Bloomberg) -- India “unlikely to reach herd immunity until late in 2022, meaning that new Covid-outbreaks could occur in 2H21 or 2022,” the IEA says in its latest monthly report, citing an estimate for achieving 60% immunity.  
\* “Most African countries have not ordered enough jabs to reach the 60% threshold at all in 2021 or 2022”  
\* Israel likely to have 60% of population vaccinated by June; U.S. and U.K. by July; EU by August  
\*\* “In practice immunity will be even higher in all regions including the number of people who have caught the virus”  
\* Uneven vaccine distribution could jeopardize non-OECD oil demand recovery

To contact the reporter on this story:  
Brian Wingfield in London at [bwingfield3@bloomberg.net](mailto:bwingfield3@bloomberg.net)  
To contact the editors responsible for this story:  
Alaric Nightingale at [anightingal1@bloomberg.net](mailto:anightingal1@bloomberg.net)  
Christopher Sell

To view this story in Bloomberg click here:  
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### **Chance of Higher Oil Refining Margins Next Year Is Limited: IEA** 2021-06-11 08:00:00.23 GMT

By Rachel Graham  
(Bloomberg) -- Growth in global refinery throughput in 2022 will probably almost match the increase in demand for refined products, keeping pressure of margins, the IEA said in its monthly oil market report.  
\* That’s a change from this year, when growth in refinery throughput will lag demand for refined products, which will result in a reduction of surplus product stockpiles from 2020  
\* “Global average utilization rates only reach 78% of capacity

in 2022, limiting the possibility of an increase in refinery margins from the depressed 2020-2021 levels,” with more capacity closures likely

\* Global crude throughput is forecast to rise by 2.4m b/d to 80.2m b/d next year; the increase this year is 3.6m b/d

To contact the reporter on this story:

Rachel Graham in London at [rgraham13@bloomberg.net](mailto:rgraham13@bloomberg.net)

To contact the editors responsible for this story:

Alaric Nightingale at [anightingal1@bloomberg.net](mailto:anightingal1@bloomberg.net)

Rakteem Katakey

To view this story in Bloomberg click here:

<https://blinks.bloomberg.com/news/stories/QUIYXVDWX2PX>

### **Strong 3Q Demand Growth on Gasoline, Jet in OECD Americas: IEA**

2021-06-11 08:00:00.22 GMT

By Jack Wittels

(Bloomberg) -- Oil demand will maintain a “robust pace of growth” in OECD Americas in the coming quarter, the IEA said in its monthly oil market report.

\* In the third quarter, demand for gasoline and jet fuel both up by 280k b/d from a year earlier

\*\* “Northern hemisphere summer incentivizes travel amid a high vaccination count in much of North America”

\* Next year, OECD Americas gasoline demand to rise by 270k b/d y/y, and jet/kerosene by 330k b/d y/y

\*\* By the end of 2022, demand for all fuels should be at or above pre-pandemic levels, except for jet fuel/kerosene

\*\* Jet fuel/kerosene “will maintain a roughly 180k b/d shortfall explained largely by reduced international travel”

To contact the reporter on this story:

Jack Wittels in London at [jwittels1@bloomberg.net](mailto:jwittels1@bloomberg.net)

To contact the editors responsible for this story:

Alaric Nightingale at [anightingal1@bloomberg.net](mailto:anightingal1@bloomberg.net)

Lars Paulsson

To view this story in Bloomberg click here:

<https://blinks.bloomberg.com/news/stories/QUIZIEDWRGGD>

### **European Oil Demand to Stay Below Pre-Covid Levels in 2022: IEA**

2021-06-11 08:00:32.853 GMT

By Prejula Prem

(Bloomberg) -- European oil consumption is expected average 850k b/d below pre-pandemic levels in 2022 due to a more pronounced impact in the region from factors including strict carbon goals and electric vehicle penetration, the IEA said in its monthly market report.

\* European oil deliveries to gain 420k b/d y/y in 2022, however, diesel, gasoline and jet fuel demand is expected to remain below pre-covid levels due to higher vehicle efficiency, shift to EVs and reduced work mobility among other factors

\*\* Naphtha demand to remain stagnant through next year

\* Europe's oil demand to rise by 540k b/d overall in 2021, recouping only 30% of the volume lost due to the pandemic

\* Consumption to climb by 470k b/d q/q in 3Q21, driven mainly by a rise in jet fuel demand by 240k b/d q/q and gasoil/diesel by 160k b/d

To contact the reporter on this story:

Prejula Prem in London at [pprem1@bloomberg.net](mailto:pprem1@bloomberg.net)

To contact the editors responsible for this story:

Alaric Nightingale at [anightingal1@bloomberg.net](mailto:anightingal1@bloomberg.net)

Christopher Sell

To view this story in Bloomberg click here:

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## Teleworking Could Cut Gasoline Demand By Up to 350K B/d: IEA

2021-06-11 08:00:00.33 GMT

By Jack Wittels

(Bloomberg) -- Teleworking could reduce the world's demand for gasoline by 300k-350k b/d, the IEA says in its monthly Oil Market Report, citing a set of assumptions including the ability to work from home.

\* IEA estimates that gasoline demand makes up 20%-30% of the total share of commuting in OECD countries

\*\* Also estimates that 20%-40% of commuting staff can work from home

\*\* Assumes employees will spend 1-2 days at home

\*\* "Few non-OECD countries are likely to experience a surge in teleworking"

\* In OECD Americas, IEA sees teleworking among factors weighing on the region's gasoline demand growth in 2022

To contact the reporter on this story:

Jack Wittels in London at [jwittels1@bloomberg.net](mailto:jwittels1@bloomberg.net)

To contact the editors responsible for this story:

Alaric Nightingale at [anightingal1@bloomberg.net](mailto:anightingal1@bloomberg.net)

Brian Wingfield

To view this story in Bloomberg click here:

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SAF created transcript of excerpt from Gulf Intelligence New Silk Road Podcast May 5, 2021  
<https://soundcloud.com/user-846530307/demf-may-5>

Items in *“italics”* are SAF created transcript

Richard Redoglia, CEO Matrix Global Holdings, at 6:10am mark. *““Never in history have we had a point in time where OPEC controls supply in real time, ever. Up here they did through the first move to a \$115 they controlled it. But now, they are not only controlling supply, they’re controlling supply relative to demand. And no time in history, again James I refer to, he has my history as well, has a market ever had demand fall year over year and a market trade in backwardation. So I would argue what we are going to see gong forward, maybe we can come back four years from now and see what this chart looks like. I would argue that the range we came out of here in 2018, 2019 is going to look like that for the next 4 to 5 years. and if you go back to the volatility chart, its going to trend lower. and all of these different pieces are coming together, information, calculating demand in real time, adjusting supply in real time, are going to lead to a market that might just kind of look like the past”.*

At 7:40 min mark, Question *“.. the sustainability of the OPEC ability to manage this supply in real time as you call it, that is ultimately, A, what is propping up this market and, B, I supposed the surprise. I might take a little bit of challenge on the historical reference in the sense that in 1999 when prices went down to \$10, under \$10 a barrel, OPEC did meet, literally went into a similar kind of attempt at that real time management, month every two months I think there was a meeting, but they were unable to sustain it. on this occasion, the house of cards rests on their (OPEC) ability to sustain this position?”.* Richard Redoglia *“I don’t want to take too much time here but I would argue back then Kpler didn’t exist so you couldn’t track a cargo coming out of someone where MBS could call someone on the phone let me get this straight, you’re selling another cargo. I think its an information, I think its this acceleration of information.”*

9 June 2021 - 15:35

- News Code: 317217

## NIOC Prepared for Speedy Resumption of Iran Oil Production

TEHRAN (Shana) -- The deputy director of production at the National Iranian Oil Company (NIOC) said: "Precise planning has been done to restore oil production to the pre-sanctions levels in one-week, one-month and three-month intervals, and if the sanctions are lifted, most of the country's oil production will be revived within a month."

In an interview with Shana, Farrokh Alikhani added: "After the re-imposition of sanctions against Iran and the development of a production control scenario, the production recovery scenario was also put on the agenda and plans were made to revive production at one-week, one-month and three-month intervals."

He said: "Although we have considered the time required for the full restoration of production to be a quarter, based on the plans and preparations that have been provided, we anticipate that the main targeted production capacity will be revived within a month."

The official continued: "Our approach has always been to be fully prepared so that whenever maximum oil production is demanded, we can restore production in the shortest possible time. For this purpose, the fields have been studied well by well, and it is natural that some young and energetic wells return to the production level more quickly, while others will need more operations for restoration of production levels."

"Our plan is not limited to restoring previous production capacity, and in the second step, we plan to increase oil production capacity even further," he said.

He said: "The average daily production of Iranian oil in the post-JCPOA period was 3.38 million barrels per day and the National Iranian Oil Company plans to return pre-sanctions production levels in the first step if sanctions are lifted. In the next step, increasing production capacity to more than 4 million barrels is targeted."



06/09/2021 09:47:13 [BN] Bloomberg News

### Libya Oil Production Picks Up After Pipeline Leak Fixed (1)

- **Waha Oil output briefly reduced; Sharara production also down**
- **Libya struggling with upkeep and war in keeping oil flowing**

By Salma El Wardany and Hatem Mohareb

(Bloomberg) -- Libya's oil output is picking up again after a pipeline leak that caused a brief reduction was fixed.

Production at the OPEC member's Waha Oil Co. is gradually rising following repairs on the main pipeline between the Samah oil field and the Es Sider port, according to two people with direct knowledge of the situation who asked not to be identified because they weren't authorized to speak to the media.

Output is likely to return to normal later today after the company earlier cut it by about half to 140,000 barrels a day, they said. Libya began reducing production at fields operated by Waha over the last two days because of leaks, Mustafa Sanalla, chairman of the country's National Oil Co., said in an online conference.

At Sharara, the country's biggest oil field, production has also dropped by about 50,000 barrels a day over the past two weeks, Sanalla added, without saying when it might be restored. The combined outages briefly totaled more than 200,000 barrels a day, or almost 20 percent of Libya's production.

Libya holds Africa's largest crude reserves, but it's struggled to pump a fraction of the oil it produced under late dictator Moammar Qaddafi. Fighting between rival factions has put the country's oil fields, ports and workers in the firing line, and faltering sales have starved the nation of the income needed to rebuild its infrastructure. Freeing up access to investment would help expand the country's output beyond previous levels, Sanalla said.

#### 'Tremendous Challenges'

"The NOC is facing tremendous challenges in the rehabilitation and restoration of oil installations," Sanalla said. "The lack of funds needed for the projects" and the country's fragile security situation hurt its ability to complete needed work and upgrades, he said.

That means the country is missing out on taking full advantage of oil prices that have surged by 40% this year. Production cuts by the Organization of Petroleum Exporting Countries and partners like Russia have pushed crude to about \$70 a barrel as economies exit coronavirus-linked lockdowns and energy demand recovers.

Libya pumped 1.14 million barrels a day in May, according to data compiled by Bloomberg. The country wants to boost production capacity to 2.1 million barrels a day over the next few years but faces enormous obstacles to that aim, Sanalla said. Analysts surveyed by Bloomberg estimate the country can pump at most 1.3 million barrels daily.

(Updates with repair of pipeline leak.)

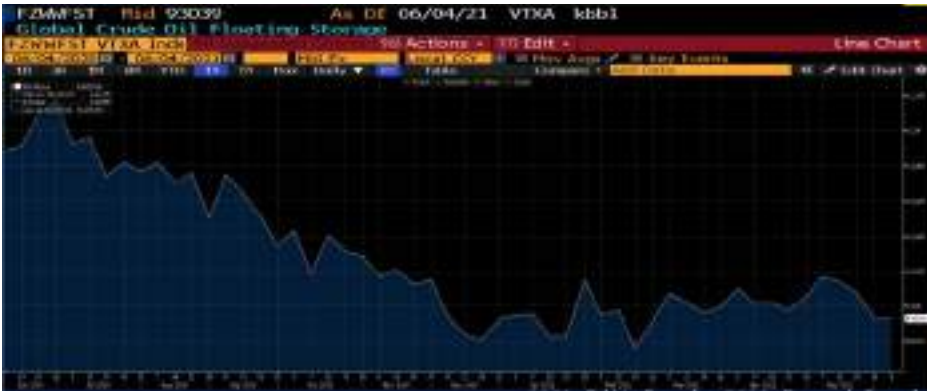
Related ticker:

3018373Z LY (National Oil Co of Libya)

To contact the reporters on this story:

Salma El Wardany in Cairo at selwardany@bloomberg.net;  
Hatem Mohareb in Cairo at hmohareb@bloomberg.net

To contact the editors responsible for this story:  
Emma Ross-Thomas at erosstomas@bloomberg.net  
Anthony Di Paola, Brian Wingfield



Crude Oil in Floating Storage 47% Lower Than Year Ago: Vortexa  
 2021-06-07 07:00:01.260 GMT

By Bloomberg Automation

(Bloomberg) -- The amount of crude oil held around the world on tankers that have been stationary for at least 7 days rose to 93.04m bbl as of June 4, Vortexa data show.

\* That's up 0.3% from 92.73m bbl on May 28

\* Asia Pacific down 2% w/w to 59.91m bbl; lowest since February

\* Middle East up 21% w/w to 8.30m bbl

\* Europe up 61% w/w to 7.25m bbl

\* North Sea up 434% w/w to 4.40m bbl

\* West Africa down 38% w/w to 1.84m bbl

\* U.S. Gulf Coast down 30% w/w to 1.44m bbl

\* Company Exposure:

\*\* Asia: Cosco Shipping Energy Transportation Co., HMM Co. Ltd., Mitsui O.S.K. Lines Ltd., Nippon Yusen KK

\*\* Europe: Euronav NV, Frontline, Vopak

\*\* U.S.: DHT Holdings, International Seaways, Nordic American Tankers, Teekay Tankers, Tsakos Energy Navigation

\* NOTE:

\*\* Vortexa data exclude FPSO units, oil products and Iranian condensate

\*\* Crude oil transferred by STS isn't included until that volume has been stationary on receiving vessel for 7 days

\*\* Data don't include vessels booked for floating storage until they are actually stationary for the minimum period

\*\* See VTXA or DATA FLOAT for more data, which is subject to revisions, and see NI TANTRA for all tanker-tracking stories

\*\* See SPOT FREIGHT for freight rate assessments using shipbroker data

To contact Bloomberg News for this story:

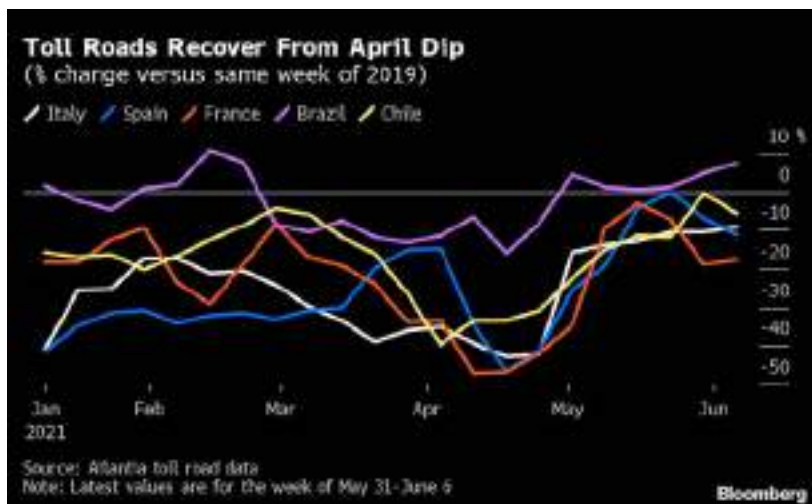
+1-212-617-2000 or [newsauto@bloomberg.net](mailto:newsauto@bloomberg.net)



Motorway data for continental Europe is more mixed, according to Atlantia Group, which manages about 13,000 kilometers (8,000 miles) of toll motorways worldwide. Over the span of the past four or five weeks, when comparing toll road traffic to the equivalent period of 2019, Italy has steadily improved, recovering from a slump in March and April when renewed lockdowns forced many drivers to stay home, while Spain and France made gains then fell back.

Atlantia also collects data in Latin America. The information shows a steady improvement in traffic flow in Brazil and Chile while Mexico has remained a few percentage points above 2019 for several weeks now.

Poland's road activity has also increased, with passenger car movements hovering 8% below the equivalent period of 2019 in data collected by the General Directorate for National Roads and Motorways for the week ended June 6. That figure had improved from -20% on April 11 to as much as +1% on May 16. Heavy goods vehicle activity recovered quicker and stronger than car usage in Poland, a trend that's been repeated across most countries with observable data.



Indian fuel sales worsened in May versus April, according to people familiar with preliminary data from the country's three biggest retailers. That's as might be expected in a country currently at the epicenter of coronavirus infections. Even so, the decline was not markedly worse than the situation seen in consumption data covering only the first-half of May. Compared with the equivalent period of 2019, diesel sales in the full month were down 30%, compared with a 29% decline when measuring just the first 15 days of May. April sales of the fuel were only 10% lower than April 2019.

Gasoline sales in India dipped to the lowest level in a year, following a similar pattern to diesel, with the wave of Covid-19 infections keeping many Indian states in various degrees of lockdown.

### Planes in European Skies

In air travel, there's been a noticeable -- and long-awaited -- uptick in European activity, gaining 34% over the past month, according to data compiled by traffic management agency Eurocontrol. That still leaves the European air zone as a whole some 54% lower than the equivalent period of 2019 while the number of global commercial flights, as measured by FlightRadar24 is down only 31%. European flights are climbing again as some restrictions are eased. On Tuesday, the U.S. loosened its travel warnings for dozens of nations including France, Canada and Germany.

China and the U.S. remain the standout places where air travel is nearest to normal, with both countries having benefited from large and fully functioning domestic markets even with international leisure and business travel stymied. One measure that shows this is seat capacity estimates from OAG Aviation: the latest weekly figure for China was down less than 1% from the equivalent week of 2019 and the U.S. down was 20% while the U.K., which relies heavily on intercontinental voyages, was still reduced by 79%

The Bloomberg weekly oil-demand monitor uses a range of high-frequency data series to help identify trends that may become clearer later in more comprehensive monthly figures.

Following are the latest indicators, in the four tables below. The first two show fuel demand and mobility, the next shows air travel globally and the last is refinery activity:

Measure	Location	% y/y	% vs 2019	% m/m	Freq.	Latest as of Date	Latest Value	Source
Gasoline demand	U.S.	+7.3	-14	-3.6	w	June 4	8.48m b/d	EIA
Distillates demand	U.S.	+3.4	-22	-14	w	June 4	3.41m b/d	EIA
Jet fuel demand	U.S.	+45	-42	-20	w	June 4	1.03m b/d	EIA
Total oil products demand	U.S.	+0.8	-16	+1.3	w	June 4	17.7m b/d	EIA
All vehicles miles traveled	U.S.		-0.5		w	May 30	16.5b miles	DoT
Passenger car VMT	U.S.		-2		w	May 30	n/a	DoT
Truck VMT	U.S.		+15		w	May 30	n/a	DoT
All motor vehicle use index	U.K.	+46	-1	+6.5	d	June 7	99	DfT
Car use	U.K.	+51	-5	+8	d	June 7	95	DfT
Heavy goods vehicle use	U.K.	+25	+9	-0.9	d	June 7	109	DfT



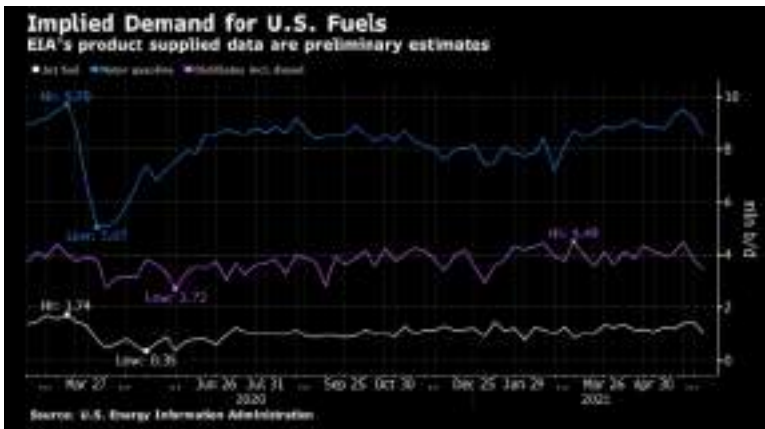
Gasoline (petrol) avg sales per filling station	U.K.	+69	-2.1	+6.7	w	May 30	7,112 liters/d	BEIS
Diesel avg sales per station	U.K.	+59	-3.5	+2.8	w	May 30	10,069 liters/d	BEIS
Total road fuels sales per station	U.K.	+63	-2.9	+4.4	w	May 30	17,181 liters/d	BEIS
Gasoline	India	+13	-28	-16	2/m	May 1-31	1.79m tons	Bberg
Diesel	India	+1.4	-30	-17	2/m	May 1-31	4.89m tons	Bberg
Jet fuel	India	+131	-61	-35	2/m	May 1-31	249k tons	Bberg
Total Products	India	-1.5	-21	-11	m	May 2021	15.11m tons	PPAC
Passenger car traffic	Poland	+12	-8	+15	w	June 6	24,175	GDDKiA
Heavy goods traffic	Poland	+13	+4	-5.6	w	June 6	4,002	GDDKiA
Toll roads volume	France	+21	-18		w	May 31- June 6	n/a	Atlantia
Toll roads volume	Italy	+34	-9.3		w	May 31- June 6	n/a	Atlantia
Heavy vehicle traffic	Italy	+23		+1.6	m	May	n/a	Anas
Gasoline	Portugal	+112	-18	+16	m	April	75k tons	ENSE
Diesel	Portugal	+62	-10	+5.1	m	April	380k tons	ENSE
Jet fuel	Portugal	+301	-74	+43	m	April	33k tons	ENSE

The frequency column shows d for data updated daily, w for weekly, 2/m for twice a month and m for monthly.

\* In DfT U.K. data, the column showing versus 2019 is actually showing the change versus the first week of February 2020, to represent the pre-Covid era.

\*\* In BEIS U.K. data, the column showing versus 2019 is actually showing the change versus the average of Jan. 27-March 22, 2020, to represent the pre-Covid era.

\*\*\* Polish GDDKiA weekly data is compared against appropriate prior-year weeks that also contained the Corpus Christi national holiday.

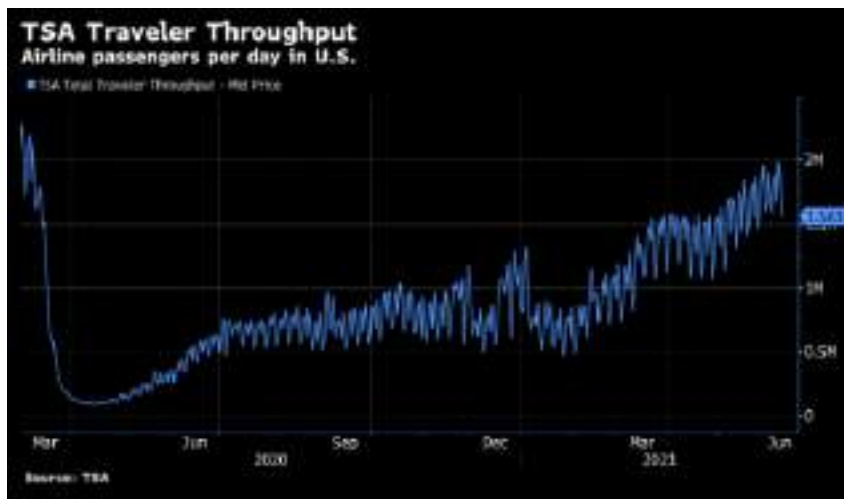


Measure	Location	% chg vs 2019	% chg m/m	June 7	May 31	May 24	May 17	May 10	May 3	Apr. 26	Apr. 19	Apr. 12
			(June 7)	Minutes of congestion at 8am local time								
Congestion	Tokyo	-27	-2	27	26	29	31	28	7	32	30	28
Congestion	Mumbai	-89	+133	4	2	2	3	2	1	2	2	2
Congestion	New York	-27	+19	23	2	20	17	19	20	20	20	18
Congestion	Los Angeles	-42	+10	20	3	21	19	19	20	18	20	16
Congestion	London	+6	-3	40	3	41	40	41	2	44	38	25
Congestion	Rome	+1	+24	49	24	38	34	40	29	37	37	41
Congestion	Madrid	-24	+13	27	22	23	19	24	1	28	20	23
Congestion	Paris	-5	+37	42	37	3	32	31	29	23	13	19
Congestion	Berlin	-16	+18	28	26	3	25	24	23	28	26	23
Congestion	Mexico City	-51	+67	24	22	23	23	14	20	23	20	20
Congestion	Sao Paulo	-39	+19	26	28	23	22	22	24	22	22	19
Congestion	Shanghai	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	45	57
Congestion	Beijing	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	49	50

Source: TomTom. Note: M/m comparison is June 7 vs May 10. TomTom is unable to provide Chinese data for April 5 or from April 26 onwards. The Pentecost Monday holiday may have reduced traffic levels in Paris and Berlin on May 24, while the Memorial Day/Spring Bank Holiday culled traffic activity in New York, Los Angeles and London on May 31.

## Air Travel:

Measure	Location	% chg y/y	% chg vs 2019	% chg m/m	Freq.	Latest as of Date	Latest Value	Source
Airline passenger throughput	U.S.	+361	-42	+18	d	June 8	1.56m people	TSA
Commercial flights	Worldwide	+97	-31	+6.1	d	June 8	82,094	FlightRadar24
Air traffic (flights)	Europe		-54	+34	d	June 8	14,628	Eurocontrol
Seat capacity	Worldwide	+83	-41		w	June 7	68.36m	OAG
Seat cap.	China	+27	-0.7		w	June 7	15.80m	OAG
Seat cap.	U.S.	+164	-20		w	June 7	18.67m	OAG
Seat cap.	India	+54	-54		w	June 7	1.83m	OAG
Seat cap.	Japan	-17	-60		w	June 7	1.62m	OAG
Seat cap.	Australia	+468	-38		w	June 7	1.23m	OAG
Seat cap.	Brazil	+433	-46		w	June 7	1.35m	OAG
Seat cap.	France	+336	-62		w	June 7	943k	OAG
Seat cap.	Germany	+150	-73		w	June 7	915k	OAG
Seat cap.	U.K.	+198	-79		w	June 7	807k	OAG



**Refineries:**

Measure	Location	y/y chg	m/m chg	Latest as of Date	Latest Value	Source
Crude intake	U.S.	+18%	+6%	June 4	15.9m b/d	EIA
Utilization	U.S.	+18 ppt	+5.2 ppt	June 4	91.3 %	EIA
Utilization	Gulf Coast U.S.	+15 ppt	+4.6 ppt	June 4	92.9 %	EIA
Utilization	East Coast U.S.	+38 ppt	+10 ppt	June 4	89.7 %	EIA
Utilization	Midwest U.S.	+15 ppt	+6.2 ppt	June 4	90.9 %	EIA
Apparent Oil Demand	China	+9.7%	-0.5%	April 2021	12.958m b/d	NBS
Indep. refs run rate	Shandong, China	-8.3 ppt	+2.2 ppt	June 4	68.1 %	SCI99
State refs run rate	East China	+3.1 ppt	+0.9 ppt	May 27	76.3 %	SCI99
State refs run rate	South China	+3.4 ppt	+9.1 ppt	May 27	86.8 %	SCI99

NOTE: All of the refinery data is weekly, except for SCI99 state refineries, which is twice per month, and the NBS apparent demand, which is usually monthly.

--With assistance from Julian Lee.

To contact the reporter on this story:

Stephen Voss in London at [sev@bloomberg.net](mailto:sev@bloomberg.net)

To contact the editors responsible for this story:

Stephen Voss at [sev@bloomberg.net](mailto:sev@bloomberg.net)

John Deane

# TSA surpasses 2 million daily travelers screened

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Highest screening volume since pandemic began

National Press Release

*Saturday, June 12, 2021*

WASHINGTON—The Transportation Security Administration (TSA) surpassed the 2 million threshold for travelers screened in one day on Friday, June 11, when 2,028,961 people were screened at airport security checkpoints. It marked the first time that more than 2 million individuals were screened since March 2020. This milestone represents 74% of travel volume versus the same day in 2019 and 1.5 million more travelers than [the same day in 2020](#).

“The growing number of travelers demonstrates this country’s resilience and the high level of confidence in COVID-19 counter measures, to include ready access to vaccines,” said Darby LaJoye, Senior Official Performing the Duties of the TSA Administrator. “TSA stands ready to provide a safe and secure screening process as part of the overall travel experience.”

Prior to the pandemic, TSA screened, on average, 2 to 2.5 million travelers per day. The lowest screening volume was on April 13, 2020, when just 87,534 individuals were screened at airport security checkpoints. By mid-May of 2021, TSA’s average daily volume for screenings was approximately 65% of pre-pandemic levels. As the busy summer season approaches, TSA advises passengers to arrive at the airport with sufficient time to accommodate increased screening times as traveler volumes approach, and in some cases surpass, pre-pandemic levels at certain airports.

A mask mandate remains in place through September 13 for all passengers traveling on planes, buses, trains and other forms of public transportation traveling into, within, or out of the United States, and in U.S. transportation hubs such as airports and stations. For more information about COVID-19 guidance, please visit the [CDC website](#). For the latest procedures on airport security screening, please visit [www.tsa.gov/coronavirus](http://www.tsa.gov/coronavirus).

# Executive Summary

*The world economy is experiencing an exceptionally strong but highly uneven recovery. Global growth is set to reach 5.6 percent in 2021—its strongest post-recession pace in 80 years—in part underpinned by steady but highly unequal vaccine access. Growth is concentrated in a few major economies, with most emerging market and developing economies (EMDEs) lagging behind: while about 90 percent of advanced economies are expected to regain their pre-pandemic per capita income levels by 2022, only about one-third of EMDEs are expected to do so. In low-income countries, the effects of the pandemic are reversing earlier gains in poverty reduction and compounding food insecurity and other long-standing challenges. The global outlook remains highly uncertain, with major risks around the path of the pandemic and the possibility of financial stress amid large debt loads. Controlling the pandemic at the global level will require more equitable vaccine distribution, especially for low-income countries. In addition to the necessary efforts to pursue widespread vaccination, policy makers face a difficult balancing act as they seek to nurture the recovery through efficiently allocated fiscal support while safeguarding price stability and fiscal sustainability. Policy makers can also help entrench a lasting recovery by undertaking growth enhancing reforms and steering their economies onto a green, resilient, and inclusive development path. Prominently among the necessary policies are efforts to lower trade costs so that trade can once again become a robust engine of growth.*

**Global outlook.** The global economy is set to expand 5.6 percent in 2021—its strongest post-recession pace in 80 years. This recovery is uneven and largely reflects sharp rebounds in some major economies—most notably the United States, owing to substantial fiscal support—amid highly unequal vaccine access. In many emerging market and developing economies (EMDEs), elevated COVID-19 caseloads, obstacles to vaccination, and a partial withdrawal of macroeconomic support are offsetting some of the benefits of strengthening external demand and elevated commodity prices. By 2022, global output will remain about 2 percent below pre-pandemic projections, and per capita income losses incurred last year will not be fully unwound in about two-thirds of EMDEs. The global outlook remains subject to significant downside risks, which include the possibility of large COVID-19 waves in the context of new virus variants and financial stress amid high EMDE debt levels. Controlling the pandemic at the global level will require more equitable vaccine distribution, especially for low-income countries. The legacies of the pandemic exacerbate the challenges facing policy makers as they balance the need to support the recovery while safeguarding price stability and fiscal sustainability. As the recovery becomes more entrenched,

policy makers also need to continue efforts toward promoting growth-enhancing reforms and steering their economies onto a green, resilient, and inclusive development path.

**Regional Prospects.** The recovery in all EMDE regions is expected to be insufficient to reverse the damage from the pandemic. By 2022, output in all regions is expected to remain below pre-pandemic projections, weighed down by the ongoing pandemic and its legacies, which include higher debt loads and damage to many of the drivers of potential output. The recovery in small, tourism-dependent economies is expected to be particularly weak as some travel restrictions will remain in place until the pandemic is brought under control. The pace of vaccine rollout varies across countries, with low-income countries lagging considerably. The recovery is expected to be strongest in East Asia and the Pacific, primarily due to strength in China. In South Asia, India's recovery is being hampered by the largest outbreak of any country since the beginning of the pandemic. In the Middle East and North Africa and Latin America and the Caribbean, the pace of growth in 2021 is expected to be less than the magnitude of the contraction in 2020, while the tepid recovery in Sub-Saharan Africa will make little progress in



reversing the increase in extreme poverty caused by the pandemic. In most regions, risks to the outlook are tilted to the downside. All regions remain vulnerable to renewed outbreaks of COVID-19, which could feature variant strains of the virus; financial stress amplified by elevated debt levels; deeper-than-expected scarring from the pandemic; and rising social unrest, potentially triggered by rising food prices.

This edition of *Global Economic Prospects* also includes analytical chapters on policy options for reducing trade costs, so that trade can once again become an engine of growth, and on prospects for inflation as an exceptionally fast global rebound is associated with growing price pressures.

**High Trade Costs: Causes and Remedies.** As the global economy rebounds from the COVID-19-induced global recession, the accompanying strength in global trade offers an opportunity to jumpstart the recovery in EMDEs. Lowering cross-border trade costs could help revive trade growth. Trade costs are high: on average, they double the cost of internationally traded goods over domestic goods. Tariffs account for only one-fourteenth of average trade costs; the bulk of trade costs are incurred in shipping and logistics as well as cumbersome trade procedures and processes at and behind the border. Despite a decline since 1995, trade costs remain almost one-half higher in EMDEs than in advanced economies; about one-third of the gap may be accounted for by higher shipping and logistics costs and another one-third by trade policy. A comprehensive reform package to lower trade costs would include trade facilitation measures; deeper trade liberalization; efforts to streamline trade processes and clearance requirements; better transport infrastructure; more competition in

domestic logistics, retail, and wholesale trade; and less corruption. Some of these measures could yield large dividends: Among the worst-performing EMDEs, a hypothetical reform package to improve logistics performance, maritime connectivity, and border processes to those of the best-performing EMDEs is estimated to halve trade costs.

#### **Emerging Inflation Pressures: Cause for Alarm?**

After declining in the first half of 2020, global inflation has rebounded quickly on recovering activity. While global inflation is likely to continue rising in the remainder of this year, inflation is expected to remain within target bands in most inflation-targeting countries. Among EMDEs where recent price pressures may raise inflation above their target ranges, they may not warrant a monetary policy response—provided they are temporary and inflation expectations remain well-anchored. However, higher inflation may complicate the policy choices of EMDEs that are in danger of persistently breaching their inflation targets while also relying on expansionary policies to ensure a durable recovery. Measures to strengthen central bank credibility can help anchor inflation expectations in these economies. Unless risks from record-high debt are addressed, EMDEs remain vulnerable to financial market stress should investor risk sentiment deteriorate as a result of actual or perceived inflation pressures in advanced economies. Low-income countries are likely to experience rising aggregate and food price inflation in the remainder of this year, exacerbating food insecurity and threatening to increase poverty. Attempts to control food prices through price subsidies in many countries, or the re-emergence of protectionist policies could drive global prices higher and prove to be self-defeating.

*The global economy is set to expand 5.6 percent in 2021—its strongest post-recession pace in 80 years. This recovery is uneven and largely reflects sharp rebounds in some major economies—most notably the United States, owing to substantial fiscal support—amid highly unequal vaccine access. In many emerging market and developing economies (EMDEs), elevated COVID-19 caseloads, obstacles to vaccination, and a partial withdrawal of macroeconomic support are offsetting some of the benefits of strengthening external demand and elevated commodity prices. By 2022, global output will remain about 2 percent below pre-pandemic projections, and per capita income losses incurred last year will not be fully unwound in about two-thirds of EMDEs. The global outlook remains subject to significant downside risks, which include the possibility of large COVID-19 waves in the context of new virus variants and financial stress amid high EMDE debt levels. Controlling the pandemic at the global level will require more equitable vaccine distribution, especially for low-income countries. The legacies of the pandemic exacerbate the challenges facing policy makers as they balance the need to support the recovery while safeguarding price stability and fiscal sustainability. As the recovery becomes more entrenched, policy makers also need to continue efforts toward promoting growth-enhancing reforms and steering their economies onto a green, resilient, and inclusive development path.*

## Summary

Following a 3.5 percent contraction caused by the COVID-19 pandemic in 2020, global economic activity has gained significant momentum; however, it remains well below pre-pandemic projections (figure 1.1.A). Moreover, the recovery is uneven, passing over many poorer countries, and there is considerable uncertainty about its durability.

The ongoing pandemic continues to shape the path for global economic activity, with severe outbreaks continuing to weigh on growth in many countries. The most recent wave of COVID-19 is now centered in some emerging market and developing economies (EMDEs), where more transmissible and virulent strains are spreading and where vaccine access remains limited (figure 1.1.B). Vaccination remains especially feeble in low-income countries (LICs). In contrast, advanced economies have generally seen substantial vaccination progress, which has helped limit the spread of COVID-19.

Amid continued vaccination, economic activity is firming across major advanced economies—most notably in the United States, where the recovery is being powered by substantial fiscal support.

Growth in China remains solid but has moderated as authorities have shifted their focus from buttressing activity to reducing financial stability risks. Many other countries, primarily EMDEs, are experiencing subdued pickups alongside surges of COVID-19 cases, even if recent waves of infections appear to be less disruptive to economic activity than previous ones. Recoveries in fragile and conflict-affected LICs are particularly weak, as the pandemic has exacerbated underlying challenges. Whereas global manufacturing activity has firmed, with industrial production surpassing its pre-pandemic level, services activity—especially travel and tourism—remains soft.

Global financial conditions have tightened somewhat, partly reflecting a rise in U.S. bond yields amid increased inflation pressures. Nevertheless, they remain generally supportive, reflecting continued extraordinary policy accommodation by major central banks. Commodity prices have increased markedly, owing to the improving global outlook as well as commodity-specific supply factors. The recovery in global activity and in commodity prices is contributing to an increase in inflation, especially in some EMDEs that have experienced currency depreciation.

Against this backdrop, global output growth is projected to strengthen to 5.6 percent in 2021—its strongest post-recession pace in 80 years (figure 1.1.C). The recovery is underpinned by steady but highly uneven global vaccination and the associated gradual relaxation of pandemic-control

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*Note:* This chapter was prepared by Carlos Arteta, Justin-Damien Guénette, Patrick Kirby, and Collette Wheeler, with contributions from Lucia Quaglietti, Sergiy Kasyanenko, Gene Kindberg-Hanlon, Peter Nagle, Cedric Okou, and Ekaterine Vashakmadze.

**TABLE 1.1 Real GDP<sup>1</sup>**

(Percent change from previous year)

Percentage point  
differences from  
January 2021 projections

	2018	2019	2020e	2021f	2022f	2023f	2021f	2022f
<b>World</b>	<b>3.2</b>	<b>2.5</b>	<b>-3.5</b>	<b>5.6</b>	<b>4.3</b>	<b>3.1</b>	<b>1.5</b>	<b>0.5</b>
<b>Advanced economies</b>	<b>2.3</b>	<b>1.6</b>	<b>-4.7</b>	<b>5.4</b>	<b>4.0</b>	<b>2.2</b>	<b>2.1</b>	<b>0.5</b>
United States	3.0	2.2	-3.5	6.8	4.2	2.3	3.3	0.9
Euro area	1.9	1.3	-6.6	4.2	4.4	2.4	0.6	0.4
Japan	0.6	0.0	-4.7	2.9	2.6	1.0	0.4	0.3
<b>Emerging market and developing economies</b>	<b>4.6</b>	<b>3.8</b>	<b>-1.7</b>	<b>6.0</b>	<b>4.7</b>	<b>4.4</b>	<b>0.8</b>	<b>0.4</b>
East Asia and Pacific	6.5	5.8	1.2	7.7	5.3	5.2	0.3	0.1
China	6.8	6.0	2.3	8.5	5.4	5.3	0.6	0.2
Indonesia	5.2	5.0	-2.1	4.4	5.0	5.1	0.0	0.2
Thailand	4.2	2.3	-6.1	2.2	5.1	4.3	-1.8	0.4
Europe and Central Asia	3.5	2.7	-2.1	3.9	3.9	3.5	0.6	0.1
Russian Federation	2.8	2.0	-3.0	3.2	3.2	2.3	0.6	0.2
Turkey	3.0	0.9	1.8	5.0	4.5	4.5	0.5	-0.5
Poland	5.4	4.7	-2.7	3.8	4.5	3.9	0.3	0.2
Latin America and the Caribbean	1.8	0.9	-6.5	5.2	2.9	2.5	1.4	0.1
Brazil	1.8	1.4	-4.1	4.5	2.5	2.3	1.5	0.0
Mexico	2.2	-0.2	-8.3	5.0	3.0	2.0	1.3	0.4
Argentina	-2.6	-2.1	-9.9	6.4	1.7	1.9	1.5	-0.2
Middle East and North Africa	0.6	0.6	-3.9	2.4	3.5	3.2	0.3	0.3
Saudi Arabia	2.4	0.3	-4.1	2.4	3.3	3.2	0.4	1.1
Iran, Islamic Rep. <sup>3</sup>	-6.0	-6.8	1.7	2.1	2.2	2.3	0.6	0.5
Egypt, Arab Rep. <sup>2</sup>	5.3	5.6	3.6	2.3	4.5	5.5	-0.4	-1.3
South Asia	6.4	4.4	-5.4	6.8	6.8	5.2	3.6	3.0
India <sup>3</sup>	6.5	4.0	-7.3	8.3	7.5	6.5	2.9	2.3
Pakistan <sup>2</sup>	5.5	2.1	-0.5	1.3	2.0	3.4	0.8	0.0
Bangladesh <sup>2</sup>	7.9	8.2	2.4	3.6	5.1	6.2	2.0	1.7
Sub-Saharan Africa	2.7	2.5	-2.4	2.8	3.3	3.8	0.0	-0.2
Nigeria	1.9	2.2	-1.8	1.8	2.1	2.4	0.7	0.3
South Africa	0.8	0.2	-7.0	3.5	2.1	1.5	0.2	0.4
Angola	-2.0	-0.6	-5.2	0.5	3.3	3.5	-0.4	-0.2
<b>Memorandum items:</b>								
<b>Real GDP<sup>1</sup></b>								
High-income countries	2.3	1.6	-4.7	5.3	4.0	2.2	2.1	0.5
Developing countries	4.7	3.9	-1.4	6.3	4.8	4.5	0.8	0.4
EMDEs excluding China	3.2	2.4	-4.3	4.4	4.2	3.7	1.0	0.6
Commodity-exporting EMDEs	2.0	1.8	-4.0	3.6	3.3	3.1	0.6	0.0
Commodity-importing EMDEs	6.0	4.9	-0.6	7.3	5.4	5.0	1.0	0.6
Commodity-importing EMDEs excluding China	4.9	3.2	-4.7	5.4	5.3	4.5	1.6	1.2
Low-income countries	4.7	4.3	0.7	2.9	4.7	5.6	-0.5	-0.7
BRICS	5.8	4.9	-0.3	7.5	5.2	4.7	1.1	0.6
World (PPP weights) <sup>4</sup>	3.6	2.8	-3.2	5.7	4.5	3.5	1.4	0.6
<b>World trade volume<sup>5</sup></b>	<b>4.2</b>	<b>1.2</b>	<b>-8.3</b>	<b>8.3</b>	<b>6.3</b>	<b>4.4</b>	<b>3.3</b>	<b>1.2</b>
<b>Commodity prices<sup>6</sup></b>								
Oil price	29.4	-10.2	-32.8	50.3	0.0	0.9	42.2	-13.6
Non-energy commodity price index	1.7	-4.2	3.0	22.5	-2.5	-2.7	20.1	-3.8

Source: World Bank.

1. Headline aggregate growth rates are calculated using GDP weights at average 2010-19 prices and market exchange rates. The aggregate growth rates may differ from the previously published numbers that were calculated using GDP weights at average 2010 prices and market exchange rates.

2. GDP growth rates are on a fiscal year basis. Aggregates that include these countries are calculated using data compiled on a calendar year basis. Pakistan's growth rates are based on GDP at factor cost. The column labeled 2019 refers to FY2018/19.

3. GDP growth rates are on a fiscal year basis. Aggregates that include these countries are calculated using data compiled on a calendar year basis. The column labeled 2018 refers to FY2018/19.

4. World growth rates are calculated using average 2010-19 purchasing power parity (PPP) weights, which attribute a greater share of global GDP to emerging market and developing economies (EMDEs) than market exchange rates.

5. World trade volume of goods and nonfactor services.

6. Oil price is the simple average of Brent, Dubai, and West Texas Intermediate prices. The non-energy index is the weighted average of 39 commodity prices (7 metals, 5 fertilizers, 27 agricultural commodities). For additional details, please see <https://www.worldbank.org/commodities>.

Note: e = estimate; f = forecast. World Bank forecasts are frequently updated based on new information. Consequently, projections presented here may differ from those contained in other World Bank documents, even if basic assessments of countries' prospects do not differ at any given date. Country classifications and lists of EMDEs are presented in table 1.2. BRICS include: Brazil, the Russian Federation, India, China, and South Africa. Due to lack of reliable data of adequate quality, the World Bank is currently not publishing economic output, income, or growth data for Turkmenistan and República Bolivariana de Venezuela. Turkmenistan and República Bolivariana de Venezuela are excluded from cross-country macroeconomic aggregates.

measures in many countries, as well as rising confidence. A substantial share of this rebound is due to major economies, with many EMDEs lagging behind (figure 1.1.D). The United States and China are each expected to contribute over one-quarter of global growth in 2021, with the U.S. contribution nearly triple its 2015-19 average. Vaccination progress is a key determinant of near-term forecast revisions (figure 1.1.E). Despite the strong pickup, the level of global GDP in 2021 is expected to be 3.2 percent below pre-pandemic projections.

The recovery is envisioned to continue into 2022, with global growth moderating to 4.3 percent. Still, by 2022, global GDP is expected to remain 1.8 percent below pre-pandemic projections. Compared to recoveries from previous global recessions, the current cycle is notably uneven, with per capita GDP in many EMDEs remaining below pre-pandemic peaks for an extended period (figure 1.1.F).

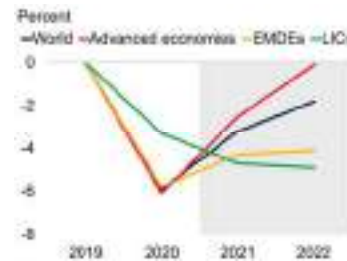
In advanced economies, the rebound is expected to accelerate in the second half of 2021 as a broader set of economies pursue widespread vaccination and gradually reopen, with growth forecast to reach 5.4 percent this year—its fastest pace in nearly five decades. Growth is projected to moderate to 4 percent in 2022, partly as fiscal support in the United States begins to recede absent additional legislation.

Aggregate EMDE growth is forecast to reach 6 percent in 2021, as the effects of the pandemic gradually wane and as EMDEs benefit from elevated commodity prices and improving external demand. Nevertheless, the strength of the rebound this year mainly reflects robust pickups in a few large economies. In many other EMDEs, recoveries are expected to be dampened by elevated COVID-19 caseloads and obstacles to vaccine procurement and uptake, as well as by a partial withdrawal of monetary and, especially, fiscal support (figure 1.2.A). Aggregate EMDE growth is projected to moderate to 4.7 percent next year, owing to the continued unwinding of fiscal support and subdued investment, leaving EMDE output 4.1 percent below pre-pandemic projections in 2022. Among LICs, growth is

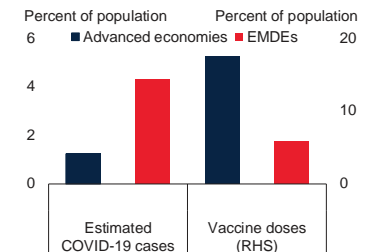
**FIGURE 1.1 Global prospects**

*Global output is rebounding but remains below pre-pandemic projections, with more subdued recoveries in poorer countries. Vaccination has helped limit the spread of the virus, but progress is highly unequal and concentrated in advanced economies. Compared to previous global recoveries, the current cycle is strong but uneven, and primarily reflects rebounds in some major economies. With the pandemic and limited vaccination in many emerging market and developing economies (EMDEs) contributing to downward revisions to growth, per capita income in a majority of EMDEs is expected to remain below pre-pandemic peaks for an extended period.*

**A. Deviation of output from pre-pandemic projections**



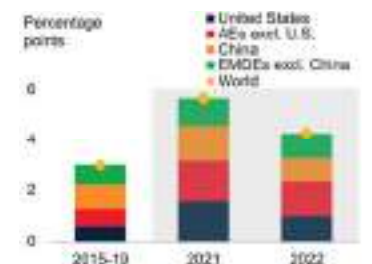
**B. Distribution of COVID-19 cases and vaccine doses from mid-April to mid-May**



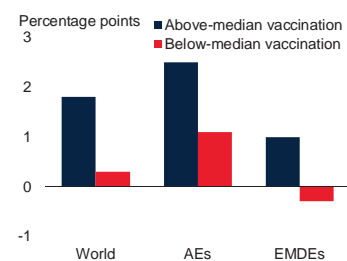
**C. Global recoveries after recessions**



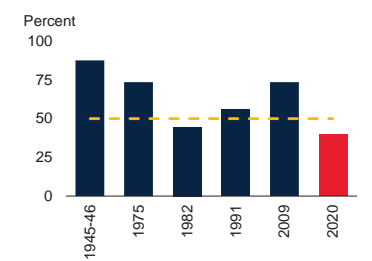
**D. Contributions to global growth**



**E. Forecast revisions to global growth in 2021, by vaccination progress**



**F. Share of EMDEs exceeding pre-global-recession peaks in per capita output after 2 years**



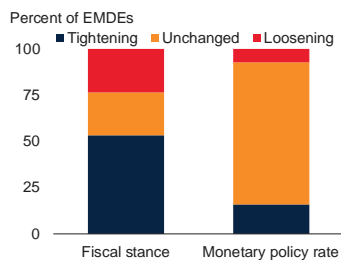
Sources: Bolt et al. (2018); Kose, Sugawara, and Terrones (2020); Our World in Data (database); World Bank.  
 Note: AEs = advanced economies; EMDEs = emerging market and developing economies; LICs = low-income countries. Unless otherwise denoted, aggregates are calculated using real U.S. dollar GDP weights at average 2010-19 prices and market exchange rates.  
 A. Figure shows percent deviation between the levels of June 2021 and January 2020 baseline World Bank projections. Shaded area indicates forecasts.  
 B. Figure shows the one-month accumulation of COVID-19 cases in AEs and EMDEs over April 17-May 17, 2021, as estimated by the Institute for Health Metrics and Evaluation (IHME), and vaccinations as a share of the population. Sample includes 36 advanced economies and 120 EMDEs.  
 C. Lines show global recessions, with "t" as their final year. Data for 2021-23 used in the "2020" episode are forecasts.  
 D. Figure shows contributions to global growth forecast for 2021 and 2022 compared to average contributions to growth in 2015-2019 period. Shaded area indicates forecasts.  
 E. GDP-weighted forecast revisions for all countries above and below each aggregate's median share of population that has received at least one COVID-19 vaccine dose as of June 1, 2021. Sample includes 36 advanced economies and 132 EMDEs.  
 F. Data for 2021-22 used in the "2020" episode are baseline forecasts.



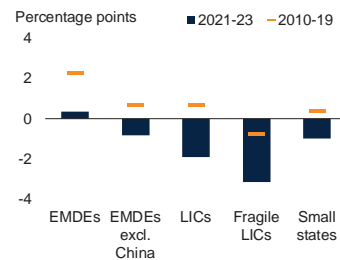
## FIGURE 1.2 Global risks and policy challenges

In many emerging market and developing economies (EMDEs), the recovery will be constrained by elevated COVID-19 caseloads, obstacles to vaccination, and a partial withdrawal of macroeconomic support. In many EMDEs, the pandemic has slowed or reversed progress at per capita income catch-up with advanced economies. Inflation is expected to exceed targets in about half of inflation-targeting EMDEs, which could trigger monetary tightening and potentially result in financial stress. Bolstering a green, resilient, and inclusive recovery will necessitate the efficient use of historic increases in debt, the promotion of investments in education and environmental sustainability, and the reduction of trade costs.

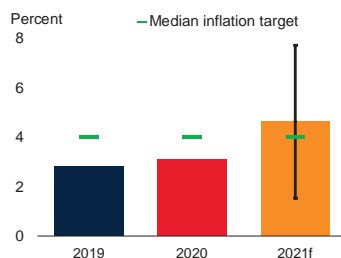
### A. Fiscal and monetary policy stance in 2021



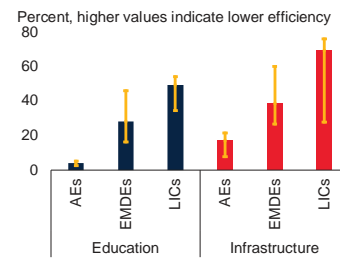
### B. Per capita income growth relative to advanced economies



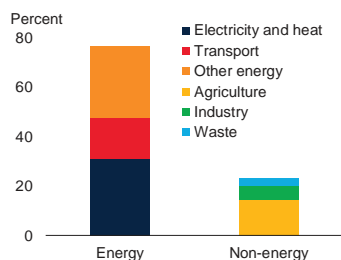
### C. Forecast for EMDE inflation



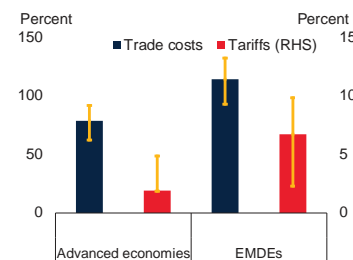
### D. Inefficiencies in public spending



### E. Global greenhouse gas emissions



### F. Trade costs and tariff rates



Sources: Comtrade (database); Consensus Economics; ESCAP-World Bank Trade Cost Database; Haver Analytics; International Monetary Fund; World Bank; World Resources Institute.

Note: AEs = advanced economies; EMDEs = emerging market and developing economies; LICs = low-income countries; Fragile LICs = fragile and conflict-affected LICs.

A. The threshold for fiscal loosening/tightening is a fiscal impulse of +/- 0.5 percentage point of potential GDP. Fiscal impulse is the negative change in the cyclically-adjusted primary balance from the previous year. Monetary policy stance shows whether countries have had net policy rate hikes/cuts this year. Sample includes 30 EMDEs for fiscal balance and 70 EMDEs for monetary policy rate.

B. Relative per capita income growth is computed as a difference in per capita GDP growth between respective EMDE groups and advanced economies. For more information on "Small states," see: <https://www.worldbank.org/en/country/smallstates/overview>.

C. Based on median inflation in 125 EMDEs and inflation target in 30 inflation-targeting EMDEs. 2021 EMDE inflation forecast described in chapter 4. Vertical line indicates 16-84 confidence bands.

D. Figure shows median efficiency gap: The difference between a country's spending efficiency and that of best performers. Yellow whiskers show interquartile ranges. Sample includes 34 advanced economies, 139 EMDEs, and 24 LICs. See figure 1.23.E notes for more detail.

E.F. Data are for 2018.

F. Blue bars show average trade costs expressed as ad valorem (tariff) equivalent of the value of traded goods. Red bars show average tariffs for all products. Trade costs aggregated using bilateral country export shares. Yellow whiskers show interquartile ranges.

expected to pick up to an average of 3.8 percent in 2021-22—well below the average pace of 5.1 percent in the 2010-19 period, and leaving the 2022 level of output 4.9 percent below pre-pandemic projections.

Notwithstanding these projected recoveries, the pandemic has had a devastating effect on per capita income growth, poverty, and inequality, which will linger for a protracted period. Although per capita income growth in EMDEs is projected to be 4.9 percent this year, it will be essentially zero in LICs. As a result, per capita income catch-up with advanced economies could slow or even reverse in many poorer countries (figure 1.2.B). Moreover, per capita income losses incurred in 2020 will not be fully unwound by 2022 in about two-thirds of EMDEs, including 75 percent of fragile and conflict-affected LICs. By the end of this year, it is expected that about 100 million people across EMDEs will have fallen back into extreme poverty. The pandemic's impact on poverty could reverberate for a prolonged period due to its scarring effects on long-term growth prospects. The pandemic has also exacerbated inequality as it has disproportionately affected vulnerable groups—including women, children, and unskilled and informal workers.

Moreover, the global outlook is clouded by uncertainty and subject to various risks (box 1.1). The continued spread of COVID-19 shows that repeated outbreaks are still possible, especially in light of the emergence of new variants that are more virulent, deadly, and resistant to vaccines. Elevated debt levels make the financial system vulnerable to a sudden increase in interest rates, which could stem from a rise in risk aversion, inflation, or expectations of faster monetary tightening. A spike in bankruptcies could damage the banking system, restrict the flow of credit, and trigger credit crunches.

The near- and longer-term consequences of the COVID-19 crisis pose enormous policy challenges. The immediate priority continues to be pandemic control, including overcoming obstacles in procuring and distributing vaccines. International cooperation is needed to help ensure timely and equitable vaccine distribution—

particularly in LICs, where inoculation continues to be very slow. As the pandemic is brought under control, policy actions will also be needed to address its adverse legacies, which will require balancing competing priorities.

In many economies, central banks will need to carefully weigh the continued weakness of domestic demand against near-term inflation pressures. Model-based forecasts and inflation expectations point to an increase in inflation in 2021 that will exceed target ranges in about one-half of inflation-targeting EMDEs (chapter 4; figure 1.2.C). Although this may not warrant an aggressive policy response, additional inflation pressure across EMDEs may risk de-anchoring inflation expectations and could trigger monetary tightening despite subdued recoveries, which in some cases could also result in financial stress.

Similarly, many EMDEs will need to be careful to avoid a premature withdrawal of fiscal support, while still keeping a steady eye on medium-term debt sustainability. Given the historic increase in sovereign debt, it will be essential to improve the efficiency of public spending (figure 1.2.D). Strengthening domestic revenue mobilization and medium-term fiscal frameworks can help widen fiscal space and bolster policy credibility. Global cooperation, including private sector participation, is needed to provide debt relief to the world's poorest countries and fund the investments needed to boost growth and lower greenhouse gas emissions (figure 1.2.E).

Notwithstanding the expected near-term recovery, EMDE output is likely to remain below its pre-pandemic trend for a prolonged period, as many fundamental drivers of growth have been scarred by the pandemic. A comprehensive set of policies will be required to promote a strong recovery that mitigates inequality and enhances environmental sustainability, ultimately putting economies on a path of green, resilient, and inclusive development (GRID). For example, labor market reforms and improved social safety nets can bolster labor productivity by facilitating the movement of labor toward high-growth sectors while protecting vulnerable groups. Productivity can also be boosted by efforts to increase access to digital

connectivity and reduce trade costs, which are particularly elevated in EMDEs (figure 1.2.F). Increasing investments in learning infrastructure and education will also be required to boost human capital and arrest recent declines in associated budgets, while expanding green investment can enhance climate resilience.

## Global context

*COVID-19 continues to spread, particularly in many emerging market and developing economies (EMDEs) amid unequal vaccine deployment. Although world trade is benefiting from the global recovery, it is being constrained by supply bottlenecks and travel restrictions. Financial conditions, while still benign, have tightened somewhat as global yields have risen due in part to higher inflation expectations. Almost all commodity prices have been boosted by the global recovery, with some prices further lifted by supply factors.*

## Pandemic developments

The pandemic continues to exact a heavy toll, particularly across EMDEs (figure 1.3.A). Since COVID-19 started to spread, it has infected at least 160 million people and caused more than 3 million deaths. Hundreds of thousands of new cases are being reported every day, and the number of unreported cases is estimated to be substantial, particularly in South Asia (figure 1.3.B; Bhattacharyya et al. 2020). Global outbreaks of the virus have come in several waves, each cresting at a higher daily infection rate than the one before. Recent outbreaks have disproportionately affected India and, to a lesser extent, some other large EMDEs such as Brazil.

Vaccination campaigns are gathering pace in many advanced economies and a number of EMDEs, with about 9 percent of the global population having received at least one vaccine dose. Nevertheless, this average conceals enormous regional and income disparities—especially the paltry rate of vaccination in the poorest countries. Countries that have administered vaccines to a greater share of their population are seeing a far slower accumulation of caseloads than the sizable share of EMDEs that have so far administered



<https://www.linkedin.com/pulse/spirit-shell-rise-challenge-ben-van-beurden>

# The spirit of Shell will rise to the challenge

**Ben van Beurden**

Ben van Beurden

*Chief Executive Officer at Shell*

Published Jun 9, 2021

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*How does Shell respond to a court ruling in The Hague to reduce its carbon emissions even faster than planned? In this article, I set out how I believe we should rise to the challenge.*

Should a court single out an energy company to reduce its carbon emissions? On Wednesday 26 May, the District Court in The Hague ruled that by 2030 Shell must reduce its net carbon emissions by 45%, compared to its 2019 level. And not just for its business in the Netherlands, but worldwide.

My first response was surprise. After all, Shell has set the pace in our industry by taking responsibility for reducing all our carbon emissions: not just those we produce ourselves, but also those produced when our customers use the energy products we sell, for example, to drive their cars, power their businesses and heat their homes. Over 90% of the emissions we are responsible for come from the use of the products we sell.

I also questioned the ruling and its implications. We are carefully reviewing the court's judgment and the challenges it presents, and we expect to appeal. Some two weeks on, I still feel disappointed that Shell is being singled out by a ruling that I believe does not help reduce global CO2 emissions.

But, along with my colleagues, I feel something else: a determination to rise to the challenge.

If we look beyond this court case, it's clear we all have the same goal – Milieudefensie (the Dutch wing of Friends of the Earth), who brought the case to court, Shell, and everyone else who cares about the future of our planet. We all know we must urgently tackle climate change and achieve the goal of the Paris Agreement for countries to limit global warming to 1.5 degrees Celsius. The court ruling has not changed the fact that Shell is more determined than ever to play its part and lead in this global challenge.

The court has said its decision applies immediately and should not be suspended pending an appeal.

For Shell, this ruling does not mean a change, but rather an acceleration of [our strategy](#). We have a clear target to become a net-zero emissions business by 2050, in step with society's progress towards achieving the goal of the Paris Agreement. We have set rigorous, short-term reduction targets along the way to make sure we achieve net zero.

But now we will seek ways to reduce emissions even further in a way that remains purposeful and profitable. That is likely to mean taking some bold but measured steps over the coming years.

In April this year we published our detailed [Energy Transition Strategy](#). And in May, we became the first energy company to put its energy transition strategy to a vote of shareholders at our Annual General Meeting. It won 89% support. We will give our shareholders a chance to vote on our progress every year. The court did not consider this because the hearing that led to the ruling took

place several months before we published this strategy and, of course, before major investors demonstrated their support at the AGM.

Our strategy shows how we will expand on the billions of dollars we have already invested in lower-carbon energy over recent years, including providing our customers with electric vehicle charging, hydrogen, power from wind and solar energy, and biofuels. We believe our total absolute carbon emissions will come down from their 2018 level and that our oil production peaked in 2019.

Still, for a long time to come we expect to continue providing energy in the form of oil and gas products both to meet customer demand, and to maintain a financially strong company. We need this financial strength to keep attracting investment in Shell. So we can deliver the energy the world needs, invest in lower-carbon energy and support livelihoods in communities where we operate, as well as those of our customers, employees and contractors.

So, we have a pathway to become a net-zero emissions business, a detailed strategy to get there and actions that show we are on our way. But we need one more thing, now more than ever if we're to accelerate our strategy. The energy transition is far too big a challenge for one company to tackle. No one country or even one continent could pull this off. We need to work together, with society, governments and our customers to achieve real, meaningful change in the worldwide energy system. And this change must address the demand for carbon-based energy, not just its supply.

To mention one, perhaps extreme scenario, imagine Shell decided to stop selling petrol and diesel today. This would certainly cut Shell's carbon emissions. But it would not help the world one bit. Demand for fuel would not change. People would fill up their cars and delivery trucks at other service stations.

Society needs to take urgent action on climate change. But a court ordering one energy company to reduce its emissions – and the emissions of its customers – is not the answer. I believe Shell should work with our customers and their sectors to help them find their own pathways to achieve net-zero emissions. This will help grow demand for new low-carbon products. For companies to invest successfully, they also need bold, clear, and consistent government policies and regulations. Greater collaboration between governments, companies and customers will allow us and others to build up our low-carbon energy businesses in the fastest way.

Nevertheless, a court has ordered us to go even faster. Shell is a great company with a long history of rising to the most difficult challenges. We may disagree with this order, but we will continue to embrace the leading role we must play in helping to develop a low-carbon energy system. This is another challenge we will rise to.

Jun. 11, 2021

# Skilled Manufacturing Key to the Future

[PresentationHydrogenInnovation](#)

Through the accumulation of skills and technologies over many years, manufacturing has been creating new options. Toyota intends to continue generating new possibilities through manufacturing.

Toyota would like to share with you the essence of manufacturing and open the way to the future together with everyone. To find out more, we invite you to view the presentation from Chief Production Officer Masamichi Okada as below.

[Click here for the presentation material](#)

Hello. I'm Masamichi Okada of Toyota Motor Corporation.

Thank you for taking time out of your busy schedules to join us.

I would like to talk about how interesting the world created by manufacturing is, and about how manufacturing is helping to develop this country.

At the same time, manufacturing's existence and strengths, which have been built up over many years, are not to be taken for granted. Once lost, they can never be recovered.

By sharing the essence of such manufacturing with everyone and cherishing manufacturing, we hope you will accept our invitation to open the way to the future together!

That is why Toyota has arranged this occasion.

We look forward to your cooperation and understanding.

First, let me raise the following as the first issue.

Does this country need manufacturing?

Is manufacturing appealing?

Some people think that manufacturing is old-fashioned.

Shown here are examples of Toyota creations for providing people freedom of mobility and joy.

Even by looking at just a few examples from Toyota, you can see that manufacturing has the power to create happiness, smiles, and joy.

Next, on to the second issue.

Can manufacturing survive in earthquake-prone Japan?

Isn't a series of disasters a sign of merging weakness?

Isn't Japan no longer a country in which manufacturing is viable?

I think that such questions are misguided.

From long ago, Japanese manufacturing has always leveraged trials and tribulations, overcome them and become stronger.

When the Great East Japan Earthquake struck in 2011, plants and equipment unexpectedly suffered extensive damage, and recovery took a considerable amount of time.

In overcoming that ordeal, we have learned how to take equipment-related measures and appropriate initial actions to minimize damage as much as possible even in emergencies.

Last year, when COVID-19 spread and production became impossible, we started to produce masks, face shields, and foot-operated disinfectant application devices and to voluntarily support the production of medical gowns. Our initial response to such emergencies has become more prompt and proactive.

In terms of disaster recovery support immediately after the 2011 earthquake, our parts procurement and equipment manufacturing teams brilliantly coordinated to achieve the feat of producing equipment in only two months, compared to the usual seven months.

That was the result of no one doing it for oneself and of working with the united purpose of protecting Japan's manufacturing.

Just as we have long said, making things means making people.

I think it is safe to say that Japan, which turns hardships into strengths, is an optimal place for manufacturing.

This brings me to the third issue.

Can manufacturing, which is often called old-fashioned, create new solutions?

Let's take the example of whether it is possible to make cars that do not emit CO<sub>2</sub>, other than battery electric vehicles.

Ten years ago, it was kind of like this: "Impossible. The most that can be one is to reduce CO<sub>2</sub> emissions using hybrids," or "I've heard of fuel cells, but..."

Well, how about now?

As evidenced by comments like "The Mirai is in its second generation", and, with people talking about a hydrogen-powered car, something few had heard about 10 years ago, having completed a 24-hour endurance race, things have changed.

What new creations will come about over the next 10 years?

New creations will sure come to life even beyond that.

That's truly something to look forward to.

Manufacturing is, without a doubt, a field of growth that creates new possibilities.

Willful passion and action can change the landscape of the future.

From here, I would like to share with you real-life, Toyota stories about the possibilities created by manufacturing with willful passion and action.

- 1. Creating vehicle performance at production worksites**
- 2. Hydrogen engine the result of combined challenges**
- 3. Advanced manufacturing for a new era**

I will proceed as shown here.

## **1. Creating vehicle performance at production worksites**

First of all, I would like to talk about "building in" a car's driving performance at the production site.

### **1. Car-making supervised by a master driver (Morizo) and professional drivers**

During the development of the GR Yaris, Master Driver Morizo, or President Toyoda, and professional drivers requested various settings for the car.

This point ties in with the "flavor" of cars.

Master Driver Morizo, is, so to speak, the executive chef of a high-class restaurant.

He prepares his offerings while paying attention to the taste before the customer arrives, the taste during the meal, and the taste after the meal.

To evaluate beyond the limits of a car means bringing out the hidden secret sauce and ultimate dashi (or "soup stock").

Drive until it breaks. When a broken part is made stronger, the next weakest part breaks. The repetition of this and sharpened sensors in the body of a master driver create a taste that cannot be measured by measuring instruments or only conscientiously created by design.

This is about an exceptional product that could never be served in a restaurant without an executive chef, that is to say, a master driver.

Now, returning to the point...

The master driver made requests during the development of the GR Yaris.

However, the car was not to be a kind of "one-dish" race car.

We're talking about a mass-produced car.

The development team, production engineers, and technicians worked together to figure out how to make this car a reality on the mass production line, and the challenge of creating driving performance during the process began.

Let me show you what we were able to accomplish on the GR Yaris production line at the Motomachi Plant.

## **2. Achievement of Motomachi Plant & the GR Yaris via a mass-produced vehicle**

Sports cars require a high level of body rigidity.

To achieve this, more welding points are used than usual, and adhesives are carefully applied.

Neither is possible with ordinary mass-produced cars.

But this is how a high level of rigidity was achieved.

The GR Yaris is the first step in changing the way cars are made, and we are now entering the challenging phase of applying this approach further in mass production.

Here are some processes that go into building a well-balanced car.

Elaborate technologies are used to pre-measure manufacturing deviances and to assemble in unison optimal combinations of parts.

This ensures the best possible accuracy in the finished vehicle.

This how the driving performance of a car can be "built in" on a production line.

## **2. Hydrogen engine the result of combined challenges**

Next, I would like to touch on how the much talked about hydrogen engine was created through a combination of steady challenges.

### **1. Thoughts and difficulties of the development & prototyping team**

Replacing gasoline with hydrogen gave rise to various difficulties. The engine engineers and prototype technicians worked hard to overcome those difficulties one by one.

Hydrogen tanks require a completely different level of safety than is needed in the case of gasoline. The injectors, which are parts used to inject gasoline into the cylinders of a gasoline engine, were of no use as they were.

These are just a couple of examples of the obstacles that stood in the way.

Such obstacles were overcome through the strengths of manufacturing.

### **2. Supplier challenges**

We were also supported by our suppliers.

The technology that had been cultivated in machining engine parts was applied to achieve micron-level hole drilling by way of special machining.



For fuel injectors, we used materials and machining technology to overcome the challenges that arise when gasoline, a liquid, is replaced by hydrogen, a gas.

### **3. Toyota's challenges**

Next are the challenges that were faced within Toyota.

Machining technology for "building in" fuel efficiency, electric motor assembly technology for creating a high level of efficiency, and hydrogen tank manufacturing technology for ensuring safety were all originally developed by refining their respective power units and accumulating the related know-how.

And through these challenges and efforts, the hydrogen engine was created by combining FCEV and engine manufacturing technologies.

President Toyoda, a.k.a. Morizo, drove in a 24-hour endurance race in the hydrogen-powered car created in this way and was able to demonstrate to the world the potential of the hydrogen engine.

By expanding the options for electrified vehicles, Toyota has opened the door to the possibility of making customers who need engines smile and protecting the jobs of the people who make engines, while being carbon neutral.

It can be said that this has opened the door to possibilities not only for cars but for all vehicles and equipment with internal combustion engines and devices that involve combustion, in other words, the whole of industry.

### **3. Advanced manufacturing for a new era**

Next, let's talk about advanced manufacturing for a new era.

#### **1. Path toward green plants**

**We are striving to achieve green factories.**

**Carbon neutrality provides us with an opportunity to fundamentally rethink manufacturing.**

**Toyota will take on a variety of challenges to make its factories carbon neutral by 2035.**

#### **2. Development of technologies that embody new ideas**

One of them is the development of technologies that make full use of new ideas.

First, I would like to introduce our painting, or coating, technologies.

If you compare the left and right images, the difference is obvious.

By combining the concepts of static electricity and rotation, we aimed to achieve maximum application efficiency with minimum paint.

The equipment is compact and power consumption has been greatly reduced.

The next technology is for completing resin molding and paint coating within the metal mold used for resin molding.

This is a technology undergoing verification that might make it possible to eliminate the need for the painting process, such as the one mentioned earlier, altogether.

Next is a technology that replaces painting with adhesive film.

Adhesive film can be customized to make it special, and it can also be replaced for fun.

There is a car subscription service called KINTO, and the service is trying out renovating used KINTO cars and offering them as cars that excite.

We would like to contribute to a recycling-oriented society while providing customers with their own, unique cars by offering textures that are unlike used cars, or appearances and interiors that cannot be found anywhere else.

The recently announced GR Yaris "Morizo Selection" indicates that the functionality of cars will go on to be updated, as well.

### **3. *Karakuri* for non-powered devices**

Next, I would like to introduce the use of *karakuri*.

A *karakuri* mechanism is a device that moves without power by combining gears and shafts.

At Toyota's Honsha Plant, there is a basic Toyota Production System (or "TPS") line that uses wisdom and ingenuity to create automated machines that do not use sensors or control devices by going back to mechanical-action *karakuri*.

The use of *karakuri* develops human sensibilities and equipment because, for example, a *karakuri* mechanism must properly work for the next action to occur, and because such mechanisms make it easy to detect problems without relying on sensors.

This is an actual piece of *karakuri*-based equipment.

It is an example of an ultimate carbon-neutral piece of equipment that is capable of unmanned operation, as it uses non-powered operation to replace pallets, which contain production parts, and is combined with an automated conveyance cart.

### **4. Collaboration between the latest technologies and TPS**

Lastly, I would like to talk about collaboration between the latest technologies and TPS.

The first is about automated conveyance. At Toyota, transporting, itself, is considered wasteful. The starting point is trying to not transport at all. But, as that can often not be done, if something needs to be transported from point A to point B, as shown in the diagram (in the middle of the screen), the layout is changed to reduce the distance, and the base units of measure, such as cargo volume, are also reduced. And then what remains is automated.

This concept will also be applied to the underground logistics and others of Woven City.

The second is automated inspection using AI. There are many examples in the world of automated inspection of defective products using machine learning to reduce the amount of needed human labor. But our goal is to use the vast amount of data we are collecting from this process to make essential improvements that will prevent defects from occurring in the first place.

The third has to do with digital transformation and IoT. Toyota believes that there is meaning in attaching sensors to be able to see the status of equipment.

However, Toyota also believes that people should not be turned into machine-keepers. To that end, we aim to simplify equipment and create equipment that does not break down.

By combining this thinking with digital transformation and IoT, we hope to create the next generation of advanced production lines.

By the way, the line shown here is a vehicle production line that was built in Mexico in XX.

Finally, we have the era of carbon neutrality.

Having options for vehicle electrification has opened the door to possibilities not only for cars but also for all of industry.

A wide variety of options responds to the well-being of the earth and people, and at the same time, it trains manufacturing technology and fosters human resources.

A wide variety of options can provide happiness for the Earth and the people who live on it and, at the same time, lead to the refinement of manufacturing technologies and the development of human resources.

Through manufacturing, together with the people who work hard at manufacturing every day, as well as with the children who will jump forward with shining eyes, we want to open the way to a future rich in creativity.

Thank you very much for your kind attention.

# Skilled Manufacturing Key to the Future

## 1. Creating vehicle performance at production worksites

- 1) Car-making supervised by a master driver (Morizo) and professional drivers
- 2) Achievement of Motomachi Plant & the GR Yaris via a mass-produced vehicle

## 2. Hydrogen engine the result of combined challenges

- 1) Thoughts and difficulties of the development & prototyping team
- 2) Supplier challenges
- 3) Toyota's challenges

## 3. Advanced manufacturing for a new era

- 1) Path toward green plants
- 2) Development of technologies that embody new ideas
- 3) *Karakuri* for non-powered devices
- 4) Collaboration between the latest technologies and TPS

2. Hydrogen engine the result of combined challenges

1) Thoughts and difficulties of the development & prototyping team

Mirai hydrogen tank

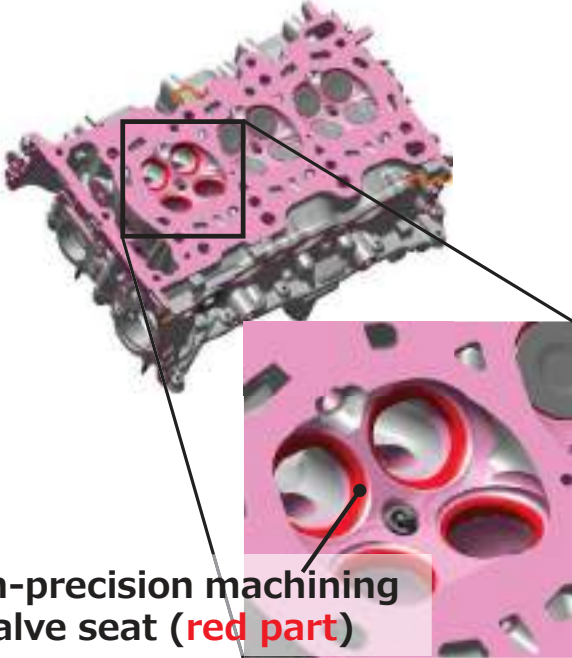


Fit as many tanks as safely possible within limited space



Mirai tank variations

Changing materials and machining to suit hydrogen



High-precision machining of valve seat (red part)

Hydrogen direct-injection injector



“From liquid gasoline to gaseous hydrogen”—Challenging the unknown

2. Hydrogen engine the result of combined challenges

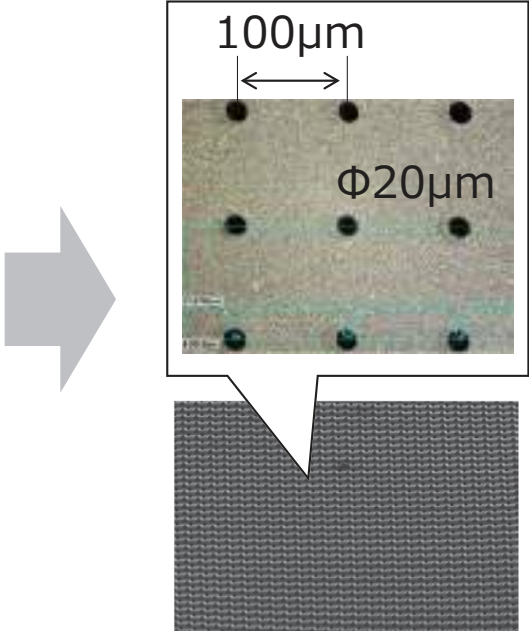
2) Supplier challenges

Ex. 1: Production & equipment manufacturers focused on engine parts

Engine machining technology



Micro-mold processing technology



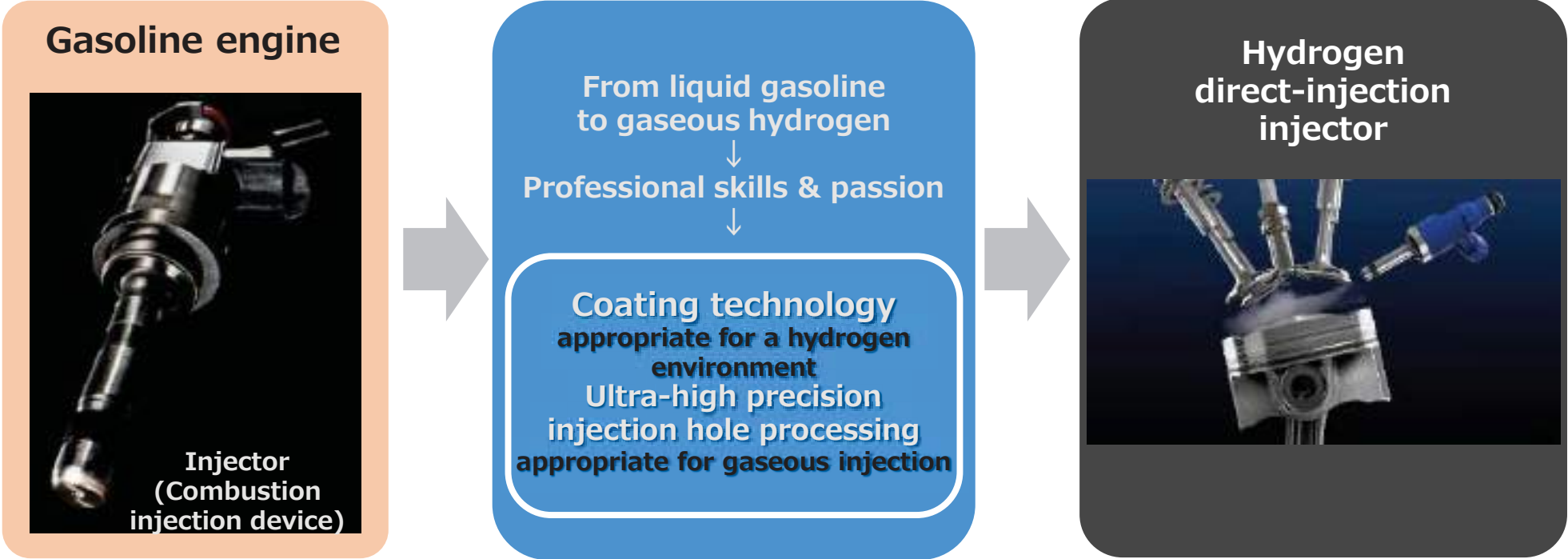
Refining core machining technologies into specialized machining technologies



2. Hydrogen engine the result of combined challenges

2) Supplier challenges

**Ex. 2: Gasoline engine injectors → Hydrogen engine injectors**  
(Combustion injection device)



**Hydrogen engine injectors the result of skills and technologies cultivated via gasoline engines**

2. Hydrogen engine the result of combined challenges

3) Toyota's challenges

Round-bore technology for engines



High-speed assembly technology for electric motors



FCEV hydrogen tank production equipment



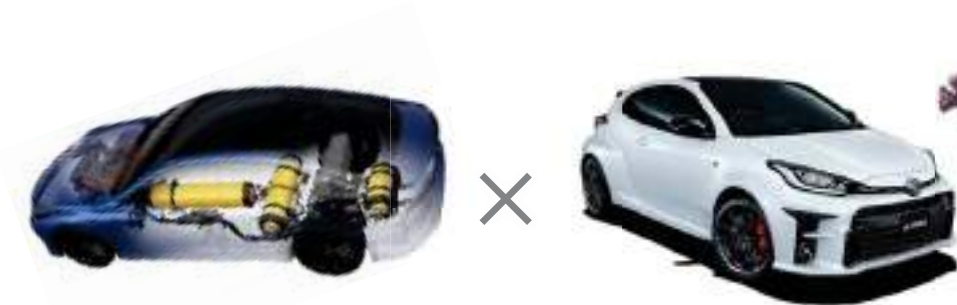
Refined via various power units

2. Hydrogen engine the result of combined challenges

### 3) Toyota's challenges



**FCEV  
technologies**



**Engine  
technologies**



**Hydrogen engine built using FCEV & engine manufacturing technologies**

2. Hydrogen engine the result of combined challenges

# First step toward expanding options (for carbon neutral) fuels for the future

May 23  
Super Taikyu  
Series race



Proved the possibilities



A variety of options



Door opened to new future for engines and industry overall

# Skilled Manufacturing Key to the Future

## 1. Creating vehicle performance at production worksites

- 1) Car-making supervised by a master driver (Morizo) and professional drivers
- 2) Achievement of Motomachi Plant & the GR Yaris via a mass-produced vehicle

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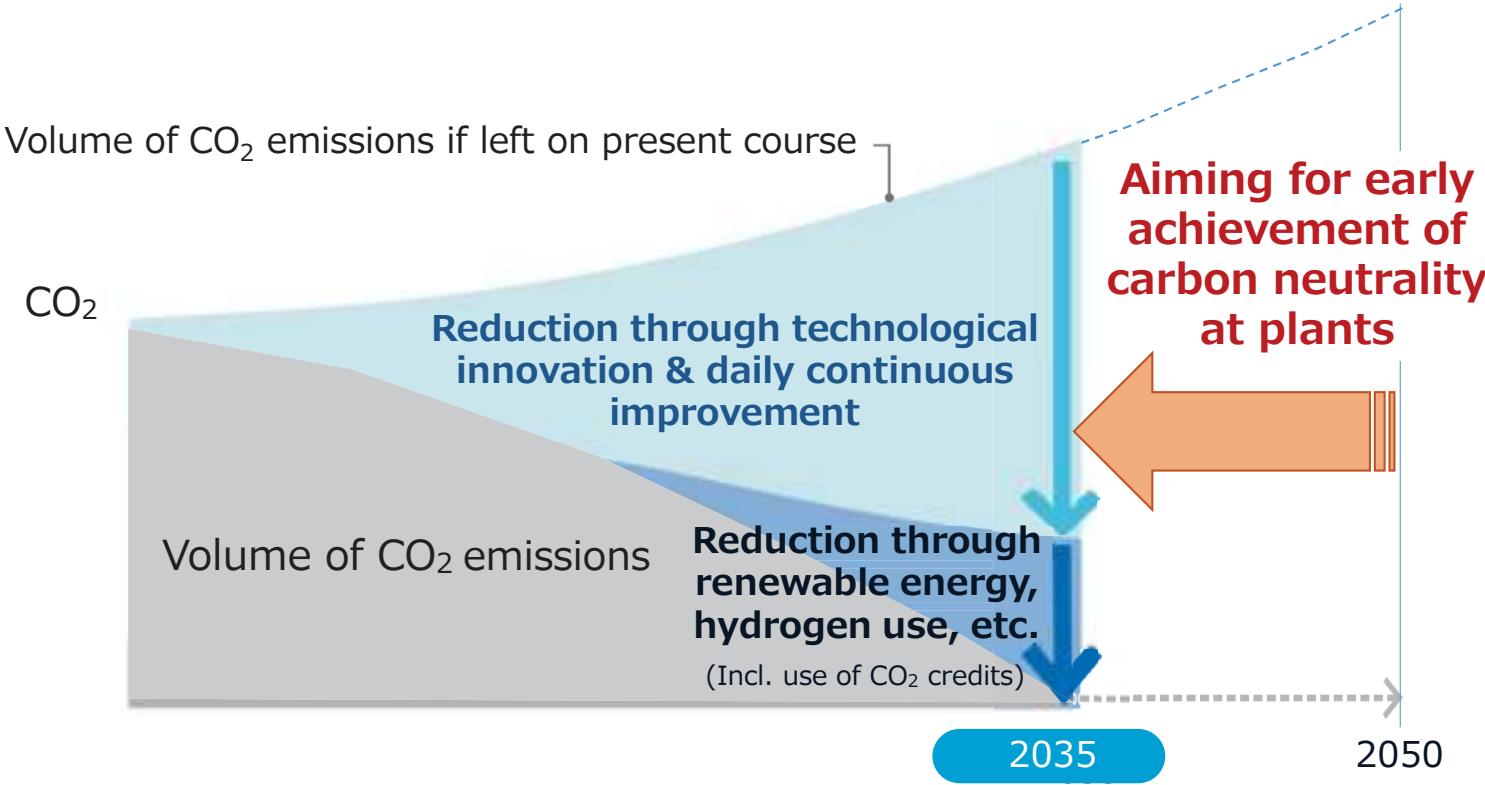
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## 3. Advanced manufacturing for a new era

- 1) Path toward green plants
- 2) Development of technologies that embody new ideas
- 3) *Karakuri* for non-powered devices
- 4) Collaboration between the latest technologies and TPS

3. Advanced manufacturing for a new era

1) Path toward green plants



**Striving for carbon neutrality presents an opportunity to fundamentally innovate manufacturing**



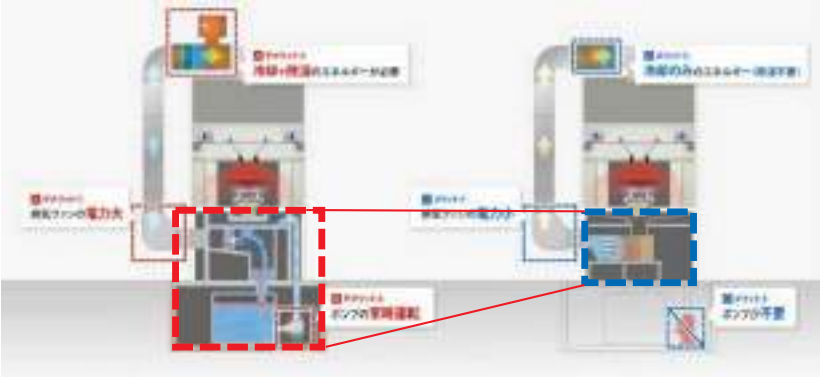
3. Advanced manufacturing for a new era

2) Development of technologies that embody new ideas

**Ex. 1: Splatter-free painting**



(Coating efficiency: 70%) (Coating efficiency: 95%)



Paint booth

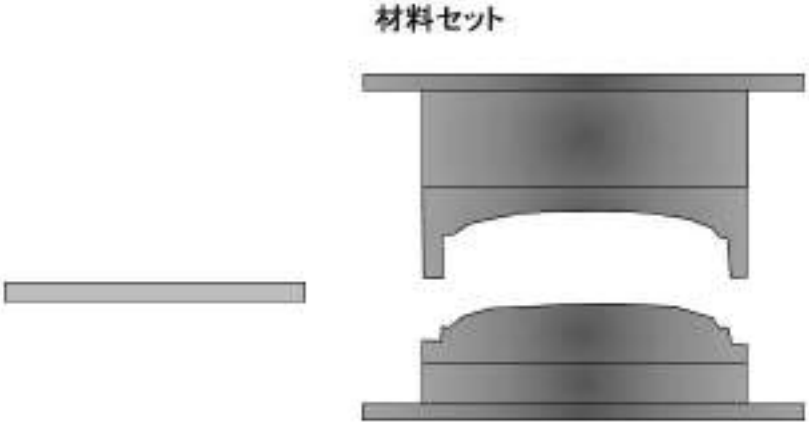
**Achieving maximum coating efficiency with minimum amount of paint**

3. Advanced manufacturing for a new era

2) Development of technologies that embody new ideas

Ex. 2: Elimination of paint process (in-press coloring)

Point : **Press molding + In-mold coloring = In-mold coating**



Using combinatorial technologies to inject paint into the mold, thus eliminating the painting process

## Excerpt SAF Group May 23, 2021 Energy Tidbits Memo

### **Energy Transition – New G7 commitments = less oil & gas capex/more supply risk**

Believe it or not, there was a more significant immediate emissions consideration this week than the IEA's Net Zero pathway – the new G7 30-pg communique on Friday that includes new commitments by G7 policymakers. They may not be laws yet, but they are what the G7 policymakers are committed to enact as laws/regulations. These G7 policymakers new commitments should be considered by oil and gas companies right now. We haven't seen any other views yet with similar concerns so we don't know if analysts will share our concerns on the G7's new energy transition commitments outlined in the 30-pg communique on Friday. (i) We believe the new commitments will cause companies to re-evaluate and reconsider capital allocation to major oil and gas capital expenditures in US and Canada. This is why we believe the G7 30-pg communique is more significant to oil and gas companies in 2021 than the IEA outlining the scenario of what is required to get to Net Zero. (ii) It is also significant to oil and gas investors as it increases the probability, some like us say expectation, for an oil and gas supply crunch in the 2020s. Less capital being reallocated means less future supply capacity. (iii) Even before we look at the specific new commitments on emissions, the G7's warning on the risk to stranding high carbon assets is enough to reduce capex. The communique is all about accelerating progress towards Paris emissions targets. And the G7 is saying they recognize there will be casualties (stranded assets) by this accelerated push towards Paris. The big clear warning to oil and gas is that the G7 is openly "*recognising the risk of stranded assets associated with high carbon investments*" with their work to accelerate progress towards Paris. That's a clear warning that they realize their actions will strand high carbon assets. Here is the critical full sentence "*To accelerate progress towards achieving our Paris Agreement goals, we need to harness the significant opportunities for sustainable development – including green jobs and sustainable, resilient growth – by making investments in the recovery from COVID-19 that are aligned with pathways towards our respective enhanced Nationally Determined Contributions (NDCs) and 2050 net zero commitments, recognising the risk of stranded assets associated with high carbon investments.*" (iii) How can boards approve major oil and gas capex projects knowing the government has committed to accelerating progress toward Paris and is saying there is risk of stranding oil and gas assets? Maybe its okay in Europe for any countries that are part of the Energy Charter Treaty (see our Feb 28, 2021 Energy Tidbits) that deals with compensation in this type of scenario but we aren't aware of any such compensation plan in Canada or the US. (iv) Shouldn't this cause boards to at least consider stranded assets without compensation in their economic valuation for a project? Without compensation, that would cause some reduction in expected longer term cash flows and in terminal valuation.

### **Energy Transition – And the new G7 commitments raise oil & gas capital concerns**

In addition to the G7 warning on risk to stranding assets noted above, there are many specifics in the 30-pg G7 communique that should cause additional reasons for oil and gas companies to at least take a second look at capex allocation. This reinforces why we believe the G7 new commitments are more impactful in 2021 than the IEA outlining the scenario to reach Net Zero. (i) There is a lot to digest in the G7's Friday 30-pg communique on new commitments from the G7 countries (Canada, France, Germany, Italy, Japan, UK, US and also the EU). It is not an easy read and we suspect that is why most will only read the short press release. (ii) The initial headlines were almost all about stopping financing for coal starting in 2021. Its understandable that the headline come from the press release and most didn't read the 30 page communique. Its why yesterday morning, we tweeted [LINK](#) on the coal headline. No question the G7 want to get rid of coal power but it is disappointing their press release wasn't accurate compared to the detailed communique. Release says G7 will end all new finance for coal power by the end of 2021. The communique details this but all references are for unabated coal ie. where coal doesn't have CCS or other potential abatements. (iii) These G7 commitments are a reminder that the Liberals of items to expect as the Liberals accelerate their emissions actions in the run up to COP-26 Glasgow in Nov. Most still don't appreciate how setting 2030 targets and the Liberals making it law to stay on track to emissions means the Liberals have no choice (in their minds) but to step up climate change actions. (iv) Note the G7 says "*We reaffirm our commitment to the elimination of inefficient fossil fuel subsidies by 2025 and encourage all countries to adopt this commitment*". How broadly will this be interpreted? Does it mean basic items like CCA deductions for natural gas plant be gone? (v) There is a clear push away from natural gas as a long term transition fuel. Again remember, Canada is committing to this. The communique says "*We recognise that natural gas may still be needed during the clean energy transition on a time-limited basis and we will work to abate related emissions towards overwhelmingly decarbonised power systems in the 2030s.*" This fits to Liberals latest goal for 90% electricity with no emissions. Also means that CCS will ultimately be needed for natural gas production. If CCS is needed, what parts of the western Cdn natural gas can't do this? (vi) The G7 don't say that the emissions reduction past 2030 relies on massive quick adoption of emerging, still costly technologies like CCS and hydrogen, but kind of hint around that. The communique says "*We also recognise the need to accelerate innovation this decade to meet our net zero goal by 2050 or sooner. This includes scaling up demonstrations and the early deployment of zero and negative carbon technologies*". (vii) It may not jump out, but it seems like a bias away from nuclear. This has to be the European emphasis away from nuclear. The nuclear industry will be annoyed by the G7 calling its "*low carbon energy*". The communique says "*Those countries that opt to use it reaffirmed the role of nuclear energy in their energy mix. Those countries recognise its potential to provide affordable low carbon energy and contribute to the security of energy supply as a baseload energy source.*" Whereas the Nuclear Energy Institute (and all others) say "*Nuclear is carbon-free. It is the largest source of carbon-free*

*electricity in the United States and protects our air quality by generating electricity without other harmful pollutants like nitrogen oxide, sulfur dioxide, particulate matter or mercury.”* We know the 30-pg communique is a grind but there is much more in it than in the short press release. Our Supplemental Documents package includes the G7 release and the first 18 pages from the 30-pg communique.

## G7 Climate and Environment: Ministers' Communiqué

**Published 21 May 2021**

### **Joint commitments**

We, the G7 Ministers responsible for Climate and Environment, met virtually on 20 -21 May 2021.

As we continue to address the ongoing pandemic, we acknowledge with grave concern that the unprecedented and interdependent crises of climate change and biodiversity loss pose an existential threat to nature, people, prosperity and security. We recognise that some of the key drivers of global biodiversity loss and climate change are the same as those that increase the risk of zoonoses, which can lead to pandemics. We highlight that urgent and concrete action is needed to move towards global sustainability, further mitigate and adapt to climate change, as well as halt and reverse biodiversity loss and environmental degradation. We recognise that climate change and the health of the natural environment are intrinsically linked and will ensure that the actions we take maximise the opportunities to solve these crises in parallel.

We will do this by building back better from the pandemic, and we stress our determination to put climate, biodiversity, and the environment at the heart of our COVID-19 recovery strategies and investments. In doing so, we will transform our economies to promote sustainable development, deliver decent green jobs and build resilience. We will also accelerate the clean energy transition, improve resource efficiency, including by reducing food loss and waste and promoting a circular economic approach, transition to sustainable supply chains and mainstream nature, including biodiversity, and climate into economic decision-making. We will help set the world on a nature positive and climate-resilient pathway to bend the curve of biodiversity loss by 2030 and to keep a limit of 1.5°C temperature rise within reach by making our 2030 ambitions consistent with the aim of achieving net zero emissions as soon as possible and by 2050 at the latest.

We recognise these are global challenges which require urgent and ambitious global action at all levels. We reaffirm our commitment to international cooperation and multilateralism, and will work collectively to implement fully our national and international commitments. In this critical year of action we

recognise the need to increase global ambition and enhance collaboration, underpinned by the most ambitious sub-national, national and international action. We call on all countries to join us in action.

The COVID-19 crisis has reinforced the importance of science and evidence in government policies and decision-making. Recent assessments by the Intergovernmental Panel on Climate Change (IPCC), the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), the International Resource Panel (IRP), and the UN Environment Programme (UNEP) have documented that rapid and far-reaching transformations across all sectors of society and the economy are necessary to tackle climate change, environmental degradation and biodiversity loss. Recalling the outcomes of previous G7 meetings on Earth observation systems, we recognise the important role of research and systematic observation to provide information on the state of the planet and support and guide action to address climate change and conserve, protect and restore essential and biodiverse ecosystems. We will ensure our domestic action and international commitments are informed by the best available science and will support others wishing to enhance their evidence-based policy-making processes by sharing our experiences and best practices.

### **Tackling the twin crises of Climate Change and Biodiversity Loss**

We recognise the critical role the ocean and seas play for biodiversity and in regulating the Earth's climate, absorbing over 90 percent of all excess heat in the Earth's system and between 20-30 percent of all anthropogenic carbon dioxide emissions since the 1980s, providing a home to up to 80 percent of all life on Earth, and a healthy ocean is central to the livelihoods of more than three billion people. We therefore commit to increase efforts at international, regional and national level, to conserve and sustainably use the ocean, thus increasing its resilience.

We recognise the critical role of our world's forests as home to most of the world's terrestrial biodiversity, reducing our vulnerability to climate change impacts, improving our adaptability and resilience, and acting as key carbon sinks with tropical forests capturing and storing up to 1.8 GtCO<sub>2</sub> from the atmosphere every year. We recognise deforestation and forest degradation as a significant cause of climate change. We commit to urgent action to conserve, protect and restore natural ecosystems including forests and habitat connectivity and promote sustainable forest management. We also commit to implement



decarbonisation pathways that do not cause further biodiversity loss or deforestation.

We recognise the crucial role of Nature-based Solutions in delivering significant multiple benefits for climate mitigation and adaptation, biodiversity, and people and thereby contributing to the achievement of various Sustainable Development Goals (SDGs). Such benefits include, among others, improving air quality, water quality and availability, soil health, storm and flood protection, disaster risk reduction, and alleviating and preventing land degradation. Nature-based Solutions can also provide sustainable livelihoods through protecting and supporting a wide range of ecosystem services on which the world's most vulnerable and poorest people disproportionately rely. We therefore commit to strengthen their deployment and implementation. We stress that Nature-based Solutions do not replace the necessity for urgent decarbonisation and reduction of emissions, but are needed alongside these efforts. In addition to action on the ocean and forests, we commit to take urgent action across ecosystems, including soils, grasslands, savannah, drylands, wetlands, coral reefs, rivers, lakes, coastal dunes, peatland, seagrass beds, mangroves and saltmarshes, whilst ensuring that relevant safeguards are in place.

We reiterate that achieving our collective ambitions will require all sources of finance: public and private, domestic and international, including innovative sources. We commit to using all relevant sources, tools and approaches, including Official Development Assistance and other sources of finance, to support and accelerate global action to tackle climate change and conserve, protect, restore and sustainably manage nature and the environment. We underscore the importance of a predictable investment environment and clear public policies and strategies in facilitating the alignment of global and national financial flows with these objectives, and as such, welcome the UK's incoming United Nations Framework Convention on Climate Change (UNFCCC) COP26 Presidency's ambitious efforts as they relate to mobilising private and public finance. We are each working intensively to increase the quantity of finance for climate mitigation and adaptation actions, including for Nature-based Solutions, and are committed to increasing its effectiveness, accessibility, and where possible its predictability, and call on others to join us in these efforts. In conjunction with these efforts, we are working intensively towards increasing the quantity of finance to nature and Nature-based Solutions. We reaffirm our commitment to the collective developed country climate finance goal to jointly mobilise US\$100 billion annually by 2020 through to 2025 from a wide variety of

**sources**, and welcome the commitments already made by some of the G7 to increase climate finance and look forward to new commitments from others well ahead of COP26 in Glasgow. We will promote enabling environments to mobilise private finance towards these efforts while also enhancing action from the international community to support the poorest and those most vulnerable to climate change, biodiversity loss, and environmental degradation. We are committed to further enhance synergies between finance for climate and biodiversity and to promote funding that has co-benefits for climate and nature.

We call upon Multilateral Development Banks (MDBs), bilateral Development Finance Institutions (DFIs), multilateral funds, public banks, and export credit agencies to ensure that financial flows from these institutions are aligned with the goals of the Paris Agreement and support the objectives of international biodiversity conventions including the Convention on Biological Diversity (CBD) and the post-2020 global biodiversity framework, **by increasing finance for nature and climate, and leveraging further private capital, in particular for developing countries and emerging markets**. We call on MDBs, bilateral DFIs and other support providers to mobilise finance at scale by delivering on their climate finance objectives and targets, and nature finance objectives, making them more ambitious, and mainstreaming climate and nature into their analysis, policy advice, decision-making and financing. **We further call on all MDBs to publish, before the UNFCCC COP26, a plan and date by which their operations will be aligned with and support the goals of the Paris Agreement**, and encourage them to sign a joint statement committing them to mainstream nature across their operations as appropriate. We also urge the MDBs to commit their private sector arms to pilot and scale up private finance programmes for nature and climate, in particular in under-funded sectors like adaptation and resilience and Nature-based Solutions.

In the context of building back better and achieving a global green recovery from COVID-19, we acknowledge the particularly significant impacts faced by developing countries and that increasing debt burdens can constrain fiscal space and the ability to provide stimulus for a green recovery alongside other development objectives, including access to clean and sustainable energy for all. We recognise that macro and fiscal policies, a free, fair and rules-based multilateral trading system, international initiatives and domestic efforts to create an enabling environment to mobilise private finance, offer a powerful tool to both transforming and revitalising economies. We thank Professor Lord Stern for his work and note with interest his paper on “G7 Leadership for Sustainable,

Resilient and Inclusive Growth and Recovery” as commissioned by the UK G7 Presidency. We welcome the discussions of Finance Ministers on supporting a global recovery and their role in enabling a smooth transition to net zero, addressing biodiversity loss, and mobilising the private sector.

### **Leaving no-one behind**

We recognise the disproportionate impacts of climate change, biodiversity loss, and environmental degradation on the most vulnerable communities, people living in poverty and those already facing intersecting inequalities and discrimination, including women and girls, Indigenous Peoples, people with disabilities and other marginalised groups. We will increase our efforts to address environmental justice issues in order to make their voices heard and support their full, equal and meaningful participation in decision-making, recognising their critical role as leaders and agents of change, and adapting new and existing policies to support social justice, economic empowerment and achieving gender equality. We further recognise the need to protect the rights of Indigenous Peoples, as acknowledged in national law and international instruments, and respect and value their knowledge and leadership in tackling climate change and biodiversity loss. We are steadfastly committed to addressing barriers to accessing finance for climate and nature faced by women, marginalised people, and underrepresented groups and increasing the gender-responsiveness and inclusivity of finance. We reaffirm our commitment to implementing the 2030 agenda for sustainable development and its associated SDGs and taking action in support of the UNFCCC, CBD and the UN Convention to Combat Desertification (UNCCD) Gender Action Plans.

We will ensure that the transition to a net zero emissions and nature positive economy happens in a fair and inclusive way. This transition must go hand in hand with policies and support for a just transition for affected workers, and sectors so that no person, group or geographic region is left behind.

## **Climate change**

### **A G7 committed to accelerating progress under the Paris Agreement**

We reaffirm our strong and steadfast commitment to strengthening implementation of the Paris Agreement and to unleashing its full potential. To this end **we will make ambitious and accelerated efforts to reduce emissions to keep a limit of 1.5°C temperature rise within reach**, strengthen adaptation to the impacts of climate change, scale-up finance and support, protect, restore and

sustainably manage nature, and enhance inclusive and gender-responsive action. We affirm our commitment to work with these objectives in mind towards a successful COP26 in Glasgow and beyond.

### **A net zero G7 leading a step change in mitigation**

There is a global imperative to pursue efforts to limit the increase in the global average temperature to 1.5°C above pre-industrial levels, recognising that the avoided climate impacts are greater at 1.5°C than 2°C, as stated in the IPCC's 2018 Special Report on Global Warming of 1.5°C. This will require meaningful action by all countries, in particular the major emitting economies, pursuant to continuous improvement in climate and environmental action to align with a pathway that keeps 1.5°C within reach. We, G7 members, will lead by example and each commit to achieve net zero greenhouse gas (GHG) emissions as soon as possible and by 2050 at the latest.

We affirm the importance of taking domestic action to phase down hydrofluorocarbons (HFCs) and of pursuing further actions to enhance the benefits of the Montreal Protocol in ozone layer protection and tackling climate change, and call upon all countries who have not already done so to ratify the Kigali Amendment to the Montreal Protocol.

### **Short-term action – building back better and more resilient through a net zero pathway**

Accelerating the transformation of the global economy towards a net zero pathway will depend upon securing a green, sustainable, resilient, inclusive and gender-responsive recovery from COVID-19 in a manner consistent with the 2030 Agenda for Sustainable Development, leaving no one behind. To accelerate progress towards achieving our Paris Agreement goals, we need to harness the significant opportunities for sustainable development – including green jobs and sustainable, resilient growth – by making investments in the recovery from COVID-19 that are aligned with pathways towards our respective enhanced Nationally Determined Contributions (NDCs) and 2050 net zero commitments, recognising the risk of stranded assets associated with high carbon investments.

### **Medium and long-term action – guided by net zero aligned NDCs and LTSs**

We highlight with deep concern the findings from the IPCC Special Report 2018, and recognise the need to reduce the global level of annual GHG emissions to

25-30 Gt of carbon dioxide equivalent or lower by 2030 to put the world on track to limit global warming to 1.5°C above pre-industrial levels, in order to reduce the risk of catastrophic consequences of climate change. We commit to submitting long-term strategies (LTSs) that set out concrete pathways to net zero GHG emissions by 2050 as soon as possible, making utmost efforts to do so by COP26. We commit to updating them regularly, including to reflect on the latest science, as well as technological and market developments. We also note with concern the initial version of the NDC Synthesis Report prepared by the UNFCCC Secretariat which highlights that many parties are yet to submit new and updated NDCs. NDCs communicated by 2020 collectively fall far short of the ranges found in pathways identified by the IPCC, which limit global warming to 1.5°C or well below 2°C. We welcome the significantly enhanced ambition reflected in 2030 targets announced by all G7 members, which put us on clear and credible pathways towards our respective 2050 net zero GHG emission reduction targets. We note the important contribution these commitments make towards keeping 1.5°C within reach and in providing an unequivocal direction of travel for business, investors and society at large. Those of us who have not already done so commit to submitting our enhanced NDCs to the UNFCCC as soon as possible ahead of COP26.

The G7 members cannot tackle climate change alone. The G7 calls on all countries, in particular other major emitting economies, to join the growing numbers that have made 2050 net zero commitments, to present specific and credible strategies for achieving them – including LTSs – and to enhance their NDCs accordingly to keep 1.5°C within reach, highlighting the importance of parties who have not already done so submitting their increased ambition NDCs to the UNFCCC as soon as possible ahead of COP26.

We reaffirm our commitment that our successive NDCs will represent a progression and reflect the highest possible level of ambition, in alignment with the Paris Agreement. Both our NDCs and LTSs will remain informed by the global stocktake outcomes and the best available science – particularly IPCC reports (including the forthcoming 6th Assessment Report), as well as IPBES reports. In preparing and implementing our NDCs, we reaffirm our commitment to public participation. We highlight the important and active role of all levels of government as well as businesses, workers, local communities, non-governmental organisations (NGOs), academia, Indigenous Peoples, youth and other non-state actors in driving ambitious climate action, including in a gender-responsive manner. We call for an enhanced Marrakech Partnership for Global



Climate Action (MPGCA) to accelerate and broaden climate ambition and action in this regard, with improved tracking of its initiatives. We recognise the benefits of enhanced international collaboration in driving action in all sectors as part of an economy-wide effort.

### **More people protected from climate impacts**

We acknowledge with grave concern the impacts of climate change already being experienced worldwide, particularly by those most vulnerable to them. **We commit to enhance, accelerate and scale up adaptation actions, including Nature-based Solutions, and to support the most vulnerable to adapt to and cope with the impacts of climate change** and biodiversity loss, identified by plans at local, national and sub-national levels, including ambitious National Adaptation Plans (NAPs). We reaffirm our commitment to Article 9.4 of the Paris Agreement, which calls for the provision of scaled-up financial resources to aim to achieve a balance between adaptation and mitigation, taking into account country-driven strategies. This includes continuing to scale-up finance contributing to adaptation action. We highlight the important role of businesses, workers, investors, cities, women, Indigenous Peoples and civil society in mobilising action to support vulnerable communities. Finally, we call on all states and non-state actors to cooperate to enhance adaptation and resilience, including through the Adaptation Action Coalition, InsuResilience Global Partnership, and National Adaptation Plans Global Network, and for non-state actors to join the Race to Resilience Campaign to strengthen the resilience of 4 billion people in vulnerable communities by 2030, and to participate in the adaptation activities undertaken within the Marrakech Partnership for Global Climate Action. Recognising the importance of adaptation in our own national planning, we G7 members commit to submitting Adaptation Communications as soon as possible, and if feasible by COP26. We further affirm our commitment to a diverse and inclusive, gender-responsive, participatory and fully transparent approach, taking into consideration vulnerable groups, communities and ecosystems in the delivery of adaptation policies, plans, strategies and actions. As Climate and Environment Ministers, we acknowledge and fully support the work of the Foreign and Development Ministers' track to increase action on adaptation and protect more people from climate impacts, including the commitment to continue scaling up finance contributing to adaptation action.

### **Mobilising and aligning finance to support the green recovery**



We, the G7, reaffirm our commitment to the collective developed country goal of jointly mobilising US\$100 billion annually through to 2025, from a wide variety of sources, public and private, bilateral and multilateral and in the context of meaningful mitigation actions and transparency on implementation. We welcome the commitments already made by some of the G7 to increase climate finance and look forward to new commitments from others well ahead of COP26 in Glasgow. We underline G7 commitments to further strengthen the Green Climate Fund (GCF) as an effective tool in implementing the Paris Agreement. Further, we highlight the Paris Agreement's recognition that mobilising finance requires a global effort. In this context, we encourage all potential contributors of official finance, including emerging economies, to join existing providers in supporting climate action in developing countries. We underline the urgent need to scale up efforts to mobilise the private sector if we are to achieve a global green recovery and net zero emissions by 2050, recognising the critical role that innovative financing vehicles, bilateral and multilateral finance institutions, blended finance, policies, risk pools and enabling environments play in this regard.

We affirm the crucial importance of making finance flows consistent with a pathway towards low GHG emissions and climate-resilient development, as reflected in Article 2.1.c of the Paris Agreement and in line with the SDGs. As part of our efforts towards this objective, we commit to making official finance flows consistent with the goals of the Paris Agreement and call on all countries, as well as MDBs, DFIs, multilateral funds, public banks and export credit agencies to join us in this effort. We emphasise the transformative role of the policies and actions of all governments, but also public and private stakeholders in creating the right enabling environments to support climate action and in integrating climate change into economic and financial decision-making processes. We also urge businesses and investors to join the Race to Zero, align their portfolios with the goals of the Paris Agreement and set science-based net zero targets of 2050 at the latest.

We recognise the potential of carbon markets and carbon pricing to foster cost-efficient reductions in emission levels, drive innovation and boost the breakthrough of technologies that enable a transformation to net zero. We affirm the fundamental importance of environmental integrity and sustainable development in the design of high integrity carbon market mechanisms, including those used for voluntary purposes, which should be based on robust rules and accounting that ensure avoidance of all forms of double counting. They should require the use of conservative emissions and emissions reductions estimations

and assumptions, as well as safeguards to mitigate carbon leakage risks, avoid negative social and biodiversity impacts, and to address potential reversals. We further note that such mechanisms can mobilise private finance and help to close the ambition gap for limiting global warming to 1.5°C.

### **Unleashing the full potential of the Paris Agreement**

We are steadfast in our commitment to achieving an ambitious set of outcomes from COP26 in line with the objectives set out above. We emphasise the importance of finalising the outstanding mandates relating to the Paris Rulebook – including the adoption of common tables and formats for the enhanced transparency framework, decisions on cooperative approaches (Article 6), and common time frames for NDCs – in a manner that promotes transparency and accountability and ensures environmental integrity. **We will address mandates and deliver on our commitments across the three pillars of the Paris Agreement – on mitigation, adaptation, and support – and enhance international collaboration to accelerate global implementation ahead of COP26 and beyond.** We will have a continued focus on supporting those most vulnerable to the impacts of climate change and will continue to support developing country partners as they pursue green, sustainable, resilient, inclusive and gender-responsive recoveries from COVID-19. This includes providing support with the preparation and implementation of national plans and commitments (including NDCs, LTSs, NAPs and Adaptation Communications) bilaterally, through our contributions to multilateral funds and through the NDC Partnership and other such initiatives. We welcome the creation by the OECD of the ‘International Programme for Action on Climate’ as part of the ‘Horizontal Project on Climate and Economic Resilience in the Transition to a Low Carbon Economy’, and look forward to its possible contribution to climate action.

### **Supporting the transition to a net zero economy**

We recognise that the transition to net zero will depend upon developing the skilled workforce necessary to deliver it, in a way that leaves no one behind, by building on the skills and knowledge in transitioning sectors, developing new labour markets for decent work and quality green jobs, as well as investing in pioneering clean and sustainable industries and technologies. We will address the challenges workers face by ensuring that they have the appropriate skills and training to build back greener, alongside a long-term plan for skills needed for a net zero economy, in a gender-responsive way. **This will support the creation of green jobs, a diverse workforce, and will support workers in high carbon sectors**

to gain skills and knowledge to implement more sustainable practices and green technologies. We reaffirm our commitment under the Equal by 30 Campaign to work towards equal pay, leadership and opportunities for women in the clean energy sector by 2030. We agree to deepen efforts to advance gender equality and diversity in the energy sector, including under the Equal by 30 Campaign by adopting a set of strengthened commitments. This will support our commitment to make diversity and gender equality central to the global energy sector's recovery efforts and help build a more inclusive and equitable energy future. We acknowledge the need for specific support for all workers as part of a clean energy transition.

We recognise that delivering and accelerating the transition to a net zero global economy will require scaled-up international collaboration. The institutional architecture to enable this should be structured and strengthened appropriately where needed, utilising synergies with existing initiatives to ensure net zero emissions are achieved on an economy-wide basis. We will convene to review the pace of the transition required in each sector to meet the Paris Agreement goals, and the international landscape of institutions and sectoral fora to decarbonise major emitting sectors, with a view to strengthening collaboration in key sectors up to COP26 and beyond.

We recognise the importance of working closely with city, state and regional governments in driving the transition to a net zero economy, and the vital role of national governments to support such actions. We highlight the role of cities in piloting a future with net zero emissions, through innovative and sustainable energy solutions. Local governments and sub-national actors, including businesses, workers, communities and civil society, are central to taking ambitious action on high-emitting sectors and should implement solutions that curb emissions while ensuring equitable and inclusive development for citizens and communities. We will implement a range of measures to encourage and empower citizens, business, communities and regions to decarbonise, including supporting the development of local strategies and plans, encouraging investments for the implementation of model projects for low carbon urban infrastructure, encouraging behavioural change, utilising information systems to promote the transparency of local actions and achievements, and disseminating good practices of concrete actions.

## **Net zero energy**

We recognise the key contribution of energy efficiency as “the first fuel” to emissions reduction, energy security, economic growth, sustainable development, alleviating energy poverty, and job creation. We therefore note with concern the decline in the global rate of energy efficiency improvements and commit to strengthen our efforts to deliver improvements in buildings, industry and transport. We continue to emphasise the need for stronger international exchanges to learn about best practices in this policy space. We stress the importance of strengthening and coordinating international collaboration in developing policy frameworks for new business models and to ensure the necessary investments in energy efficiency measures in all sectors. We therefore welcome the establishment of the Energy Efficiency Hub, hosted at the International Energy Agency, as a key international forum for global collaboration on energy efficiency. We welcome the Super-Efficient Equipment and Appliance Deployment (SEAD) initiative. We further endorse its goal of doubling the efficiency of four key energy-using products sold globally by 2030: lighting, cooling, refrigeration, and motor systems, and will contribute to that end using the full policy toolkit at our disposal.

We affirm the fundamental role of renewable energy sources. We welcome the rapid growth, decreasing cost and increasing value of renewable energy technologies around the world. We stress the need for their further integration in the systems, and we recognise that renewables are a major driver of economic growth, jobs, and increased access to affordable energy. We recognise that the significant progress made in the development and deployment of renewable energy has been driven by a virtuous circle of technological development, a supportive regulatory and policy environment including innovative market designs, and industry-led cost reductions. We affirm our commitment to supporting the development and deployment of renewable energy globally, particularly for developing countries, as well as accelerating the development and deployment of renewable heating and cooling, where a step change in progress is urgently required. We recognise the importance of promoting clean energy transitions in islands, as well as in remote and rural communities, through innovative renewable energy solutions, fostering self-determination and community ownership of resources.

We recognise the role of energy storage as an enabling technology to support the transformation of the global economy towards a net zero pathway. We commit to drive energy storage technology innovation and accelerate its commercialisation and deployment by supporting the private sector in reducing

the cost and increasing the performance of energy storage technologies, through policies and tools supportive of energy storage market adoption, including regulatory frameworks and market structures.

Recognising that coal power generation is the single biggest cause of global temperature increases, we commit now to rapidly scale-up technologies and policies that further accelerate the transition away from unabated coal capacity and to an overwhelmingly decarbonised power system in the 2030s, consistent with our 2030 NDCs and net zero commitments. In doing so, we reaffirm the importance of national energy security and resilience and underscore the importance of providing support for affected workers, regions and communities. We welcome with appreciation the work of the Energy Transition Council in supporting the new economic opportunities and sustained quality job creation offered by a transition to clean energy in developing countries. We commit to exploring further ways that we can accelerate global progress towards net zero power, including leading by example as the G7, and working with collaborative initiatives and institutions. We note that several G7 members participate in the Powering Past Coal Alliance. We will convene by COP26 to lay the groundwork for further joint action by G7 members.

In line with Article 2.1.c of the Paris Agreement, we commit to aligning official international financing with the global achievement of net zero GHG emissions no later than 2050 and deep emissions reductions in the 2020s. We commit to promoting the increased international flow of public and private capital toward Paris Agreement-aligned investments and away from high-carbon power generation to support the clean energy transition in developing countries. In this context, we will phase out new direct government support for carbon intensive international fossil fuel energy, except in limited circumstances at the discretion of each country, in a manner that is consistent with an ambitious, clearly defined pathway towards climate neutrality in order to keep 1.5°C within reach, in line with the long-term objectives of the Paris Agreement and best available science. Consistent with this overall approach and recognising that continued global investment in unabated coal power generation is incompatible with keeping 1.5°C within reach, we stress that international investments in unabated coal must stop now and commit to take concrete steps towards an absolute end to new direct government support for unabated international thermal coal power generation by the end of 2021, including through Official Development Assistance, export finance, investment, and financial and trade promotion support. We commit to reviewing our official trade, export and development finance policies towards

**these objectives.** We further call on other major economies to adopt these commitments. We welcome the support provided and mobilised by DFIs and multilateral funds, including the GCF, to support the energy transition. In particular, we note the recent Climate Investment Funds board decision to launch new sector specific funds, including those to accelerate coal transitions, and support renewable energy deployment in emerging economies.

We reaffirm the need to take into account the imperative of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities, as reflected in the Paris Agreement. Recalling the SDGs, we commit ourselves to a people-centred transition, that will work to create decent employment in the low carbon economy while making energy more accessible, affordable, and cleaner for all communities. We support reskilling workers across industries and communities and developing the industries of the future, as the clean energy transition continues to gather momentum. We welcome the substantial economic opportunities inherent in a people-centred transition, including alleviating energy poverty for people and communities, removing barriers to employment, especially for marginalised populations, which will in turn lead to substantial and equitable economic growth and prosperity for all.

We recognise that inefficient fossil fuel subsidies encourage wasteful consumption, reduce energy security, impede investment in clean energy sources, and undermine efforts to deal with the threat of climate change. **We reaffirm our commitment to the elimination of inefficient fossil fuel subsidies by 2025 and encourage all countries to adopt this commitment.** We encourage greater international action to meet this commitment and we support calls for greater transparency.

We recognise the importance of ambitious and urgent action to reduce emissions and leakage of methane (fossil and biogenic) from the energy sector, as well as waste and agricultural sectors, and of other potent warming substances, such as black carbon, in order to slow global warming. This will require improved measurement and reporting to better locate and quantify these emissions.

**We recognise the importance of maintaining energy security as we transform our energy systems and the need for energy markets that are open, flexible, transparent, competitive, stable, sustainable, reliable and resilient.** We reaffirm the need for investment to ensure energy supply and demand remain balanced throughout energy transitions, recognising the need for energy demand to be met



by sources that align with our Paris Agreement and net zero objectives. We commit to developing strategies and actions that enhance our focus on the security of innovative, clean, safe, and sustainable energy technologies. This includes resilience in the face of cyber security threats, the system integration of variable renewable energy, energy storage, flexible power plants, hydrogen, as well as demand side management, smart grids, and related infrastructure including the accommodation of sustainable biofuels and hydrogen. We recognise the important role of electricity interconnection in market integration, flexibility and promoting decarbonisation, alongside supporting security of supply and system security. We recognise that natural gas may still be needed during the clean energy transition on a time-limited basis and we will work to abate related emissions towards overwhelmingly decarbonised power systems in the 2030s. We also note the importance of ensuring secure, safe and sustainable clean energy supply chains, including with regards to critical minerals and critical renewables components.

We affirm that access to secure affordable, reliable, sustainable, clean and modern energy is a key enabler of the SDGs. We welcome progress made to increase energy access and eradicate energy poverty worldwide, while noting that the world remains off-track to meet our SDG for access to energy. We note the essential role of gender equality in achieving sustainable energy access and welcome synergies with the work of the G7 Gender Equality Advisory Council. We stress the importance of achieving universal, equitable and sustainable access in driving forward a global and inclusive clean energy transition that addresses the disproportionate impact of energy poverty on vulnerable and marginalised populations, both in developing countries and in more mature economies. We welcome the UN commitment to address progress on SDG7 within the High-Level Energy Dialogue.

Those countries that opt to use it reaffirmed the role of nuclear energy in their energy mix. Those countries recognise its potential to provide affordable low carbon energy and contribute to the security of energy supply as a baseload energy source.

### **Net zero mobility**

We stress the urgent need to promote sustainable mobility and reduce GHG emissions from the transport sector to help achieve net zero emissions by 2050. We recognise that this will require dramatically increasing the pace of the global decarbonisation of the road transport sector throughout the 2020s and beyond,

consistent with the goals of the Paris Agreement and our respective 2030 NDCs and net zero commitments. In this regard, and as part of this effort, we welcome and support the Zero Emission Vehicle Transition Council and will work with other global partners to accelerate the deployment of zero emission vehicles for passengers and freight, including exploring ways to support developing countries in making the transition. We further recognise the commitments of some states to the target of sales of passenger cars being zero emission by 2040 or earlier. Furthermore, we also need to promote decarbonising the entire life cycle of vehicles. We commit to support transitioning our industrial bases and providing ambitious investment to research, further develop, and scale up the technologies needed to support a rapidly growing global market for sustainable mobility. We will intensify our efforts in enhancing the offer of more sustainable transport modes in urban and rural areas, including public transport, shared mobility, cycling and walking, and supporting inter-modal transport with investment in rail and waterborne infrastructure.

We further recognise the urgent need for effective efforts to reduce emissions from the international aviation and maritime sectors to put both sectors on a pathway of emissions reduction consistent with the mitigation goals of the Paris Agreement. We commit to supporting the development and adoption of ambitious mid- and long-term measures at the International Maritime Organization (IMO) and to building a global consensus on strengthening the levels of ambition in the initial IMO strategy on reduction of GHG emissions from ships in the context of its forthcoming revision, with the aim of contributing to the Paris Agreement temperature goal. We will also support the development and adoption of an ambitious long-term global goal at the International Civil Aviation Organization in line with our vision for decarbonising the aviation sector.

### **Net zero innovation**

We recognise clean energy innovation as a driver of sustainable and inclusive growth to create jobs, an enabler of a resilient economic recovery. We also recognise the need to accelerate innovation this decade to meet our net zero goal by 2050 or sooner. This includes scaling up demonstrations and the early deployment of zero and negative carbon technologies while ensuring negative impacts on the environment and human wellbeing are avoided. This must be enabled by mechanisms and clear signals, including an increased focus on ESG (environmental, social and governance) performance, that incentivise private sector investment to fast-track innovations to the market. To accelerate the pace of industry decarbonisation, we commit to launch the G7 Industrial

Decarbonisation Agenda to complement and support the activities of existing key initiatives and amplify ambition, while plugging critical gaps in the landscape wherever they exist.

For the G7, we commit to increasing clean energy innovation investments to a level in line with our net zero ambition. We support the launch of a second phase of Mission Innovation as a global platform to strengthen international cooperation that will continually promote increased clean energy innovation ambition and concrete actions for clean energy technical innovation. We support the commencement of Clean Energy Ministerial's third phase as a global platform to share experience, raise ambition, and implement cooperative action for clean energy deployment, including innovative policy, regulatory and market measures. We encourage closer alignment between Mission Innovation and the Clean Energy Ministerial to better coordinate efforts from innovation all the way through to the deployment of clean and sustainable energy technologies including through energy efficiency and from renewable energy sources. We will design appropriate pull mechanisms to accelerate the innovation and scaling up of clean energy and net zero technologies across G7 members and to support the green transition in developing countries. We also acknowledge that the successful deployment of clean energy technologies requires further investment in a skilled, technologically advanced and diverse workforce.

Innovation that supports net zero industries can help existing sectors through the transition, as well as creating additional value with the birth of new industries. We will work together in the lead up to COP26, building on existing initiatives to coordinate action on standards and public procurement in order to create globally competitive markets for green industrial products. In parallel, we will also work to reduce emissions from key industrial processes through enhanced energy efficiency, the development of circular economy and resource efficiency principles, electrification, comprehensive industrial heat utilisation and reduced waste in industry, fuel switching and carbon capture, usage and storage (CCUS). We recognise the importance of early action to decarbonise hard-to-abate industrial sectors such as iron and steel, cement, chemicals, and petrochemicals, to ensure that emissions across the entire economy reach net zero by 2050. For these hard to abate sectors to achieve this, we commit to targeting greater levels of innovation funding to lower the costs of industrial decarbonisation technologies, including the use of hydrogen, electrification, sustainable biomass, CCUS and synthetic fuels (including ammonia and fuels made from hydrogen). Acknowledging that achieving net zero industry will require enhanced global

efforts, we will support low and middle-income countries through financial and technical cooperation, as well as in multilateral fora. We will work together to accelerate the decarbonisation of industry, and welcome the development of the new Industrial Decarbonisation Innovation Mission and the launch of the Clean Energy Ministerial's Industrial Deep Decarbonisation Initiative, while supporting ongoing activities in the Leadership Group for Industry Transition.

We recognise the importance of renewable and low carbon hydrogen on the pathway to net zero. We will step up efforts to advance commercial scale hydrogen from low carbon and renewable sources across our economies, including support for fuel cell deployment globally. This will help realise the development of a future international hydrogen market that creates new jobs for current and future workers in the energy sector.

While the focus must remain on protecting and expanding our natural carbon sinks, we recognise that negative emissions technologies, such as Direct Air Capture, can also play a role in reaching net zero GHG emissions. Negative emissions will be required to offset residual emissions in sectors that are difficult to decarbonise completely. Technical solutions such as CCUS, and carbon recycling where appropriate, will also be important for some countries in meeting our goal of a net zero economy.

## **Environment**

### **Resetting our relationship with nature**

A healthy natural environment is critical to human health, wellbeing and prosperity globally and underpins sustainable development. Despite existing global agreements for the protection, conservation, sustainable use and restoration of biodiversity, global negative trends in biodiversity and ecosystem functions are projected to continue or worsen. We therefore confirm our strong determination to halt and reverse biodiversity loss by 2030, building on the G7 Metz Charter on Biodiversity and the Leaders' Pledge for Nature as appropriate.

We recall with deep concern the 2019 IPBES Global Assessment Report on Biodiversity and Ecosystem Services and the 2021 UNEP Making Peace with Nature report. We commit to take urgent action to address the five direct drivers of biodiversity loss, all a result of human activity: changes in land and sea use, direct exploitation of organisms, climate change, pollution and invasive alien species. We will also address overexploitation and illegal exploitation of resources as well as the indirect drivers identified, including those caused by

unsustainable methods and patterns of consumption and production. We stress that concerted and collaborative action is needed by all partners and stakeholders including governments, businesses, farmers, academia and scientists, NGOs, citizens, Indigenous Peoples, and local communities, and underline the importance of including these groups in co-design, decision-making and implementation.

We commit to raise ambition and accelerate and intensify action, including at CBD COP 15, UNFCCC COP 26, Ramsar COP 14, UNCCD COP 15, UN Environment Assembly (UNEA) 5, UN Food Systems Summit and the UN Ocean Conference, and in support of the UN Decades on Ecosystem Restoration and Ocean Science for Sustainable Development. We will also build on existing synergies, break down silos and support linkages at the domestic and institutional level across relevant Multilateral Environmental Agreements, as appropriate, including Regional Seas Conventions.

Highlighting the urgent need for transformative action, we will champion the agreement and successful implementation of an ambitious and effective post 2020 global biodiversity framework to be adopted by parties at CBD COP15 to protect, conserve and restore ecosystems, halt and reverse biodiversity loss, ensure the conservation and sustainable use of biodiversity, increase resilience to climate change and sustain healthy ecosystems on which our lives, well-being and economies depend. We commit to champion ambitious and effective global biodiversity targets, including conserving or protecting at least 30 percent of global land and at least 30 percent of the global ocean by 2030 to halt and reverse biodiversity loss by 2030 and address climate change, including through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures (OECMs) by 2030 (30by30), recognising that Indigenous Peoples, and local communities, are full partners in the implementation of this target. We will strive to ensure the effective and equitable management of protected areas and OECMs, and strive to improve their ecological connectivity, with a focus on areas that deliver the greatest benefits for global biodiversity, ecosystem services and climate protection. We underline the importance of a strong accountability framework that strengthens implementation and increases transparency of our actions to meet these targets, and will actively support the development of robust implementation, monitoring and review frameworks. We will enhance or put in place robust, science-based domestic implementation plans, strategies and policies to conserve, protect and restore terrestrial,

freshwater, marine and coastal ecosystems and play our part in successfully delivering these global goals and targets. We will work with the competent international and regional organisations, including Regional Seas programmes, Regional Seas Conventions and Regional Fisheries Management Organisations (RFMOs). We will contribute to 30by30 by conserving or protecting at least 30 percent of our own land, including terrestrial and inland waters, and coastal and marine areas by 2030 according to national circumstances and approaches.

### **Mainstreaming nature**

According to the WEF “New Nature Economy Report 2020”, over half the world’s GDP in 2019, almost US\$44 trillion, was generated from industries that depend on nature. Waldron et al in their report “Protecting 30% of the planet for nature: costs, benefits and economic implications” suggest that achieving 30 percent protection in two biomes alone could result in gross economic benefits of US\$170 billion to US\$530 billion per annum by 2050. The report also states that the global financial cost of adequately protecting 30 percent of all the earth’s land and ocean has been estimated to be between US\$103 billion and US\$177.5 billion per annum. It is clear therefore that the economic benefits of protecting and conserving the land and ocean far outweigh the financial costs of doing so.

We welcome the contribution of the Dasgupta Review on the Economics of Biodiversity, which builds on The Economics of Ecosystems and Biodiversity (TEEB) process among other initiatives. Its conclusion that a fundamental change is needed in how we think about and approach economics if we are to reverse biodiversity loss and protect and enhance our prosperity will inform our work. We will work collaboratively to build on the Dasgupta Review insights and those of other such reports, as appropriate, to support efforts for economic and financial decision-making to account for the goods and services we derive from, and the intrinsic value attributed to nature. We commit to take the urgent and transformative action required to ensure that a deep understanding of ecosystem processes, their interlinkages, and how they are affected by economic activity, is incorporated as part of economic and financial decision-making. To ensure appropriate management of environmental risks and reduce related transaction costs, we will also work with businesses and other stakeholders in developing standardised natural capital accounting practices. We welcome the work being done by the UN Statistical Commission to continue updating the SEEA ecosystem accounting system.



**We commit to mainstream nature into all sectors and policies.** We recognise the urgency and call for the integration of both climate and nature-related risks into organisational risk management architecture, and of investing in natural capital, which will enable finance to play a greater role by pivoting towards nature positive projects and investments. We recognise the importance of work on nature-related financial disclosure and note with interest the establishment of the Taskforce on Nature-related Financial Disclosures and its aims.

We note the analysis from the OECD, which provides policy recommendations based on the findings of the Dasgupta Review, among other reports. The G7 commits to review these recommendations in order to identify actions to mainstream nature into financial and economic decision-making. In particular we note the OECD's analysis and recognise the harmful effect of some subsidies on the environment and people's livelihoods. We therefore commit to lead by example by reviewing relevant policies with recognised harmful impacts on nature and will take action, as appropriate, to deliver nature positive outcomes.

### **Preventing and combatting zoonoses and antimicrobial resistance (AMR) using a One Health approach**

The COVID-19 pandemic reminds us that human, plant, animal and environmental health are interdependent and we therefore stress the importance of a strengthened One Health approach. We welcome the contribution of the IPBES Workshop Report on Biodiversity and Pandemics to the debate and recognise with concern that increased contact between humans, wildlife and livestock, as a result of human activities including habitat loss, human encroachment into natural areas, land use change such as agricultural expansion, unsustainable food production systems, deforestation, climate change, the legal and illegal wildlife trade, unsustainable international trade and unsustainable consumption is increasing the risk of zoonotic disease emergence and spread. The COVID-19 pandemic has reinforced the importance of close international collaboration in preventing and combatting existing and emerging zoonotic threats. We call for further cross sector research and scientific analysis and evidence on the interactions between humans, wildlife, domesticated animals and the environment, the pathogens which exist in these populations, the risks arising from these interactions and the control and prevention of zoonoses. We call on all governments to ensure transparency and swift sharing of data and information on zoonoses.

As the G7, we will continue to strengthen global collaboration and work towards improving the resilience of our surveillance systems through sharing relevant information in a timely manner, implementing best practice, building capability and improving technology domestically and internationally, particularly with developing countries and countries with economies in transition.

We endorse the work of the One Health Working Group and will join, on a voluntary basis, the International Zoonoses Community of Experts (IZCE) established under the UK Presidency. The IZCE will bring together national points of contact with expertise and interest in zoonoses, their drivers, prevention and monitoring. Through sharing best practice and methodologies, knowledge will be increased across the community and will contribute to improve risk assessment, risk management and early warning capabilities at a global level. We recognise the need to ensure complementarity with such initiatives as the Tripartite Plus and the One Health High Level Expert Panel to avoid duplication. The IZCE will liaise with other relevant G7 working groups, for example the G7 Chief Veterinary Officers Group.

We recognise that better understanding and enhanced visibility, accessibility and interoperability of data is a crucial first step in delivering improved global surveillance and response to One Health threats and issues. We encourage climate, environment and health stakeholders to consider how best they can work together to support the Tripartite Plus in this crucial work.

We recognise that the release of antimicrobials into the environment can select for antimicrobial resistance (AMR) and have an impact on human, animal and environmental health. We also note that heavy metals and biocides potentially have an impact on AMR and human, animal and environmental health. We underline the importance of a One Health approach in tackling AMR and call on all governments to promptly implement measures for the sound management and reduction of inappropriate use of antimicrobials. In this context, we note the potential role that soil microorganisms may play in the fight against AMR. We call on UNEP, in collaboration with the Tripartite organisations, to strengthen the evidence base on the contamination, mechanisms, causes and impacts of AMR emerging and spreading in the environment as mandated at UNEA 3. We commit to work in close collaboration with governments and relevant parties such as, medicines regulators where independent of government agriculture, academia, industry, the Tripartite on AMR and UNEP to develop and implement long-term, sustainable solutions to this issue. We note with concern that there are currently no international standards on safe concentrations of antimicrobials released into

the environment from, inter alia, pharmaceutical manufacturing, healthcare facility effluent, agriculture and aquaculture. We also acknowledge the work of the AMR Industry Alliance in this regard. We commit to accumulate knowledge on AMR in the environment. We will work with our ministerial colleagues with responsibility for health, food, farming and medicines regulators where independent of government, as appropriate to develop and agree such standards.

## **Transition to sustainable and legal use of natural resources**

### Resource efficiency

Recalling the findings of the Global Resources Outlook 2019 of the International Resource Panel, we recognise that the continued degradation and loss of natural resources threatens our ability to meet our shared commitments to sustainable development, conservation and restoration, food security and combatting climate change. We underline the importance of increasing the resource efficiency and reducing the global environmental footprint of products and moving to more globally sustainable methods and patterns of consumption and production. We reaffirm our commitment to progress actions to increase resource efficiency and transition to a more circular economy, in line with the Bologna Roadmap, to reduce the pressure and adverse impacts on our natural environment, reduce resource use, maximise the value of materials through a life-cycle approach, curb biodiversity loss, and support climate mitigation and adaptation action and in doing so are determined to reduce pollution from all sources. We ask the G7 Alliance for Resource Efficiency to continue technical work on all aspects of the Bologna Roadmap and invite the next G7 Presidency to take stock of its implementation.

### Deforestation

We recognise that deforestation, forest degradation and ecosystem conversion are global threats to our climate, biodiversity, food security and livelihoods and are driven by the expansion of agriculture, mining, logging and infrastructure projects. **Agricultural expansion is the driver of around 80 percent of global deforestation.** A significant proportion of this expansion is linked to the production of agricultural commodities, including particularly those traded internationally. We will increase our support for sustainable supply chains that decouple agricultural production from deforestation and forest degradation, including production stemming from illegal land conversion, and other negative impacts on

nature, in accordance with our national legislation, and commit to conserve, sustainably manage, restore and protect forests and other ecosystems. We will do this while promoting development and trade, including through participating in the dialogue between consumer and producer countries under the Forest, Agriculture and Commodity Trade (FACT) dialogue hosted by the UK as UNFCCC COP26 President, and through work by the International Tropical Timber Organisation. We will work with partners, including the private sector and producer countries, NGOs, as well as Indigenous Peoples, and local communities, to incentivise consumption of commodities that are not associated with deforestation and forest degradation. We will therefore enhance supply chain transparency and traceability, and if appropriate, develop regulatory frameworks or policies, which may include the introduction of due diligence requirements, to bring about trade that is environmentally, socially, and economically sustainable, and resilient, in order to achieve a successful green recovery. We look forward to discussions by G7 Trade Ministers on facilitating sustainable supply chains.

We reaffirm our commitment to the New York Declaration on Forests to end natural forest loss and, building on the Bonn Challenge, restore 350 million hectares of forest by 2030. We commit to support measures to strengthen forest governance, transparency, and the rule of law, while also empowering Indigenous Peoples as partners in decision-making as well as local communities. We also support measures that promote sustainable finance and tackle the drivers of forest loss and degradation, including efforts to enhance sustainable production and increasing the incentives for preventing deforestation, protecting intact forests and restoring degraded forests and lands. We recognise the need for enhanced monitoring of deforestation globally, regionally and nationally.

### Illicit threats to nature

We recognise that the illegal wildlife trade (IWT), trafficking in timber and timber products, hazardous and other wastes, and precious metals, gemstones and other minerals, illegal logging and illegal, unreported and unregulated (IUU) fishing have a devastating impact on our natural environment and livelihoods, with an estimated full global economic value of over US\$1 trillion to US\$2 trillion per year. These activities drive biodiversity loss, corruption, money laundering, insecurity and other forms of organised criminal activities as well as undermining our efforts to tackle climate change and its impacts. We commit to continue our efforts to strengthen international and transboundary cooperation to tackle these crimes and harmful activities.

We acknowledge that wildlife trafficking is a serious crime, often carried out by transnational organised criminal networks linked to other forms of organised crimes and commit to take urgent and collective action to address this criminal activity in a way that reflects and acknowledges the serious nature of this crime. We remain robustly committed to delivering on our commitments within the 2018 London Declaration and will work to strengthen the capacity of law enforcement authorities and judiciaries in investigating, prosecuting and adjudicating wildlife-related offences where needed. We note proposals to discuss options inter alia to strengthen the international criminal legal framework to effectively combat such offences including prevention, while maintaining our focus on making the best possible use of existing international mechanisms, strengthening legislation, international cooperation, capacity building, criminal justice responses, and law enforcement efforts to strengthen our response. We commit to increase our efforts to reduce the demand for IWT products by developing targeted and evidence-based interventions in order to inform consumer behaviour and close markets where these illegal products are trafficked and sold. We will review our administrative, preventative and criminal justice responses to wildlife and forest crime using the International Consortium on Combatting Wildlife Crime's (ICWC) Wildlife and Forest Crime Analytic Toolkit. We welcome the discussions by Finance Ministers on strengthening beneficial ownership transparency to better tackle the illicit financial flows stemming from IWT and other illicit threats to nature and welcome the work of the Financial Action Task Force and its recommended actions in this area.

We recognise that IUU fishing remains one of the most serious threats to a healthy ocean, depleting fish stocks, distorting competition, destroying marine habitats and jeopardising international efforts to promote better ocean governance and effectively and sustainably manage fisheries. We recognise the importance of concerted international action to deter IUU fishing, including through support for developing countries. Urgent efforts are needed to prohibit harmful fisheries subsidies that contribute to overfishing, overcapacity and IUU fishing. We commit to concluding the ongoing WTO negotiations as swiftly as possible in order to ensure that a meaningful agreement is reached that delivers effective disciplines.

Building on the outcomes of the Canadian G7 Presidency, we commit to ending IUU fishing by ensuring strong measures are effectively implemented and enforced, such as the Catch Documentation Schemes (CDS) to increase traceability, including those used by RFMOs and other relevant bodies for certain

species; a commitment to develop and enforce more robust Port State measures including by effectively implementing the UN Food and Agriculture Organization (FAO) Port State Measures Agreement (PSMA) and other relevant initiatives, as well as increasing Monitoring, Control and Surveillance (MCS) activities to help tackle IUU fishing. We highlight the importance of bilateral agreements that include mechanisms that effectively address IUU fishing, in particular through effective regulation and enhanced monitoring of fisheries activities, transshipments, landings, and trade in fish and fish products. We also commit to the enhanced sharing of information, intelligence, and best practice and expertise in tackling IUU fishing, acknowledging that international cooperation is the most effective way to tackle this issue.

Recognising that illicit threats to nature deprive some of the world's poorest communities of sustainable forms of living income, we commit to mobilise public and private support for sustainable livelihoods as an alternative to these activities. We recognise the importance of Indigenous Peoples, and local communities, in protecting forests and natural habitats and supporting sustainable land use. We further recognise the importance of securing the legal recognition of the right of Indigenous Peoples to the lands, territories and resources which they owned, occupied, or otherwise used or acquired as acknowledged in national law and international instruments. We also recognise the importance of securing applicable resource and legitimate tenure rights of persons belonging to local (or other) communities, women, and persons in marginalised groups as acknowledged in national law and international instruments. We underline the importance of engagement with these groups to co-develop solutions to these issues, including land tenure rights.

## **Ocean Action**

We recognise that the health of our seas and ocean is critical to the economic, social and environmental well-being of people and the planet, and has a vital role in supporting biodiversity, providing ecosystem services including regulating our climate. Yet the ocean and seas are under significant threat from human actions. Overfishing, IUU fishing, overexploitation of marine habitats and resources, the introduction of invasive alien species, pollution, including marine litter, other anthropogenic pressures on ocean habitats, microplastics, underwater noise are major drivers of marine biodiversity loss. At the same time, climate change is leading to sea level rise, extreme weather events, ocean warming and influences stratification, reduced oxygen levels and shifts in marine resources, which also impact marine biodiversity. Increased carbon dioxide absorption is also leading to



increased ocean acidification. We acknowledge with concern the recent high-level findings from the IPCC Report on Climate Change on the Ocean and Cryosphere. Building on the outcomes of the Canadian and other G7 Presidencies, including the Charlevoix Blueprint for Healthy Oceans, Seas and Resilient Coastal Communities, we commit to support the UN Decade of Ocean Science for Sustainable Development (2021-2030) and work towards its goals, which include the global ocean being clean, healthy and resilient, productive, safe, predicted, accessible and inspiring and engaging. We recognise the value of robust and continuous scientific observation and cooperation to ensure a sustainable ocean for all and to support the science-based implementation of commitments under the 2030 Agenda, SDGs, the CBD, the Paris Agreement and within UNEA resolutions. We will continue our efforts to strengthen the conservation, protection and restoration of coral reefs, mangroves, seagrass beds, salt marshes, polar regions and other ecosystems and we recognise the value of blue carbon ecosystems, which can provide climate resilience benefits while also sequestering carbon. We recognise the importance of sustainable resilience for coastal communities and marine ecosystems and will strengthen our support for the Ocean Risk and Resilience Action Alliance (ORRAA).

We commit to upholding the UN Convention on the Law of the Sea (UNCLOS) which sets out the legal framework within which all activities in the ocean and seas must be carried out, including for the conservation and sustainable use of the ocean and seas. We will work to expeditiously conclude, **if possible** by the end of 2021, the negotiation of a new and ambitious international legally binding instrument under UNCLOS on the conservation and sustainable use of marine biological diversity of **areas beyond national jurisdiction** which will include a clear obligation to conserve and sustainably use marine biodiversity and include a mechanism to establish Area-Based Management Tools (AMBTs), including Marine Protected Areas (MPAs) and will aid the implementation of intended new marine targets, recognising our commitment to support global 30by30 for the ocean.

As an example of the kind of action that needs to be taken to protect and conserve the ocean, we fully support the commitment by the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) to develop a representative system of MPAs in the Convention Area. This should be based on the best available scientific evidence, the proposals to establish MPAs in East Antarctica, in the Weddell Sea and in the Antarctic Peninsula, and taking full consideration of the CCAMLR Convention.

Recognising that marine litter continues to pollute the ocean worldwide, has adverse impacts on marine life through ingestion and entanglement, as well as damaging habitats and people's livelihoods, and with possible impacts on food safety and human health, we are determined to accelerate action to tackle sources of marine litter, building on national, regional and global efforts, noting the example of the G7 Action Plan to Combat Marine Litter, the Osaka Blue Ocean Vision, and the G20 Implementation Framework for Actions on Marine Plastic Litter and the Ocean Plastics Charter as appropriate. We acknowledge that there are a number of key contributors to marine litter, including inadequate management of land-based sources, and abandoned, lost and otherwise discarded fishing gear, also known as Ghost Gear, which has a significant direct impact on marine life. Effective policies, practices and management measures to address these issues need to be taken nationally, regionally and internationally by all countries, in partnership with relevant stakeholders, including industry and NGOs. Concerning fishing gear loss and its retrieval, we commit to working through relevant international and regional frameworks to address Ghost Gear including by the FAO, IMO, RFMOs and the Regional Seas Conventions and will work with or support other initiatives such as the Global Ghost Gear Initiative (GGGI). We will collaborate through concrete actions such as gear marking and retrieval and will support and expand existing efforts to address ghost gear as appropriate, including through the implementation of the UN FAO voluntary guidelines on the marking of fishing gear. We note with interest the contribution to the debate of the OECD report Towards G7 Action to Combat Ghost Fishing Gear, and will carefully consider its recommendations.

Recognising the scale, urgency and transboundary nature of the global action needed to tackle marine plastic litter and microplastics, including by considering a life-cycle approach, we welcome the work of the ad hoc open-ended expert group (AHEG) established by UNEA resolution 3/7 and extended by UNEA resolution 4/6 towards UNEA 5.2, and will fully engage in discussions or negotiations on the options identified, with the aim of taking a step forward on that occasion on suggested options which include strengthening existing instruments, a potential new global instrument, and multi-stakeholder engagement. We look forward to the forthcoming OECD study on existing MDB resources that address marine litter, prepared in cooperation with the G7 Alliance for Resource Efficiency.

We welcome the discussions of the Expanded Future of the Seas and Oceans Working Group and endorse the G7 Ocean Decade Navigation Plan establishing

a framework for ambitious and collaborative action under the UN Ocean Decade. This framework will advance the ocean science needed to underpin ocean action, with direct reference to the UN Ocean Decade, its societal outcomes and other international agreements. We commit to work closely with international and regional partners and organisations, including the Intergovernmental Oceanographic Commission (IOC) of UNESCO, to support the UN Ocean Decade and its societal outcomes. We welcome the ongoing work of the G7 Future of the Seas and Oceans Initiative and will continue to support its programme of activities, including to share best practice, and advance scoping activities such as to develop a digital twin ocean, work towards net zero oceanographic capability, and evaluate global ocean indicator frameworks.

### **Food Loss and Waste**

We recognise that one third of food produced for human consumption is lost or wasted globally, and that food grown but never eaten consumes an estimated 250 km<sup>3</sup> of fresh water per year and requires an estimated 1.4 billion hectares land area. Furthermore, food loss and waste produces an estimated 8 percent of global GHGs. We note with concern the recent estimate within UNEP's Food Waste Index Report 2021 that 931 million tonnes of food waste was generated globally in 2019 at the level of retail, food service and households, which represents 17percent of food available for consumption. We acknowledge the importance of reducing food loss and waste in improving food security, particularly in the most vulnerable communities, mitigating climate change and land degradation and protecting biodiversity. We welcome the upcoming UN Food Systems Summit which will highlight the need to put sustainable food systems at the centre of efforts to meet the 2030 Agenda and its SDGs. We reaffirm our commitment to achieve SDG 12.3 and commit to utilise a "Target, Measure, Act" approach and establish national targets to reach that goal.

We further commit to measure food loss and waste in accordance with the transparent methodologies outlined in the Food Loss and Waste Accounting and Reporting Standard and consistent with the requirements of international reporting under SDG 12.3. We will establish national baselines and goals against which progress can be measured. We will implement actions to support food supply chains and households to reduce food loss and waste and promote the adoption of sustainable food consumption and production through circular economy and resource efficiency approaches. Our actions will include encouraging collaboration and cooperation between public, private and civil society actors, the adoption of innovative business models and technologies,

redistribution of surplus food, the promotion of youth and wider public education and behaviour change programmes across all sectors on food loss and waste prevention. Food no longer intended for human consumption should be prevented from becoming waste through use as animal feed or reprocessing into new products, whilst ensuring that all safety and related requirements are met. Recalling our commitments under the Bologna Roadmap, and recognising that approximately 60 percent of global food waste occurs in households, we welcome the discussions of the G7 Alliance for Resource Efficiency on key components that support action to reduce food waste at the household level, and the Presidency Summary of the discussion. We further welcome the G7 Alliance for Resource Efficiency document highlighting examples of best practice across the G7 to address this issue.

## **Conclusion**

We express our appreciation to the Formal G7 Engagement Groups and other partners for their important contributions to the UK's G7 Presidency. We look forward to continuing our collaborative efforts on these and other issues under the German G7 Presidency in 2022.

**21/05/2021**

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**Søren Skou** · 2nd  
CEO, A.P. Moller - Maersk  
11h ·

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We propose a carbon tax on ship fuel of at least \$450 USD per ton fuel (\$150 USD per ton CO<sub>2</sub>), a levy to bridge the gap between the fossil fuels consumed by vessels today and greener alternatives that are currently more expensive.  
Members states at [International Maritime Organization](#) play a key role in securing production and availability of zero carbon fuels.

**Søren Skou**  
CEO A.P. Moller - Maersk

"Fossil fuels cannot keep being cheaper than green fuels. Action is required NOW. It is vital to consider all greenhouse gases, not just CO<sub>2</sub>, on a full life cycle analysis, otherwise we will not be able to truly decarbonise shipping by 2050 in line with the Paris Agreement.



**Søren Skou**  
CEO A.P. Moller - Maersk

Governments and regulators play a key role in securing production and availability of zero carbon fuels for shipping. Maersk proposes a Market Based Measure of at least 450 USD/t fuel in the medium term at current oil price.



**Søren Skou**  
CEO A.P. Moller - Maersk

We all have a joint responsibility to do everything in our power to reduce carbon emissions. We owe that to customers, consumers and society in general."



- ELECTRIC POWER | NATURAL GAS | OIL | METALS | SHIPPING

- 08 Jun 2021 | 08:18 UTC

## **SHIPPING: Carbon tax proposals ahead of IMO meeting make owners jittery**

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- Author Sameer C. Mohindru; Carina Li

### **Owners doubt carbon costs' recovery**

### **Maersk CEO's tax proposal fails to cut much ice**

### **Concerns over green fuels' supply**

Shipping industry fears that any imposition of a carbon tax on ships that use traditional bunker fuels, to encourage greener fuels is likely to make freight exorbitantly expensive, reduce already paltry earnings and discourage investments on new builds, market participants said June 8.

The Marine Environment Protection Committee, or MEPC, of the International Maritime Organization is scheduled to meet June 10-17, where according to sources several issues related to reduction of carbon emissions are likely to come up for discussion.

IMO is a UN affiliate body and the shipping industry is expecting clearer guidelines on indexes to reduce carbon intensity that may become operational as early as end of next year. The MEPC meeting will be followed by that of the IMO council by end June.

In the run-up to the IMO gatherings, Soren Skou, CEO of Maersk Line, the world's largest containers shipping company proposed a carbon tax on ship fuel of at least \$450/mt fuel, or \$150/mt CO<sub>2</sub>, to bridge gap between fossil fuels and costlier greener alternatives.

"The message being given to shipowners is that here is another bill to be paid. If you are lucky, you can pass it on to the charterers or end users but if not, settle it yourself," a senior executive with one of the largest tankers' company by fleet size told S&P Global Platts.

Maersk's Skou has not yet replied to the email sent by Platts but a dry bulk shipping executive said that instead of making such proposals where tax collection is impractical, better option will be to reduce carbon emissions from existing fleet. "The first step to do so will be to use dual fuel engines and LNG bunkering, which can cut emissions by upto 20%," he said.

Executives managing tankers said their earnings are already very poor with recovery unlikely in near-term and any fresh tax will make it difficult for them to pay off their debt.



VLCCs, that typically carry two million barrels of crude and fuel oil each, are currently losing almost \$3,000/day on the Persian Gulf-North Asia routes, according to the estimates of brokers. Long Range II, or LR2s, a very popular ship size to move cargoes from Persian Gulf to East Asia, are earning not more than \$1,500/day, the estimates showed.

## Missing green fuels

A common refrain in the shipping sector is that, crude prices and by default bunker costs have gone up at a time when "owners are bleeding."

Shipowners are paying around \$520/mt for bunkers in Singapore, well above the year-to-date average of \$496/mt, they said.

Bunker costs will further double if such a carbon tax is implemented, another dry bulk shipping executive said. There is also concern over green fuels' supply.

Earlier this year, shipping bodies such as BIMCO submitted a proposal to the IMO, calling for bringing forward discussions on carbon tax, by several years. However, they conceded that for a pricing signal to work, there must be viable alternatives to fossil fuels, which don't yet exist for large ships.

Environmental activists argue that these proposals are for the medium term and not related to daily prices.

A carbon tax on shipping fuels will bring about a level playing field among such bunker types and if mandatorily implemented, international trade and markets will find their own equilibrium where it will be passed on to charterers and end-users, one such activist said.

Shipping industry executives mostly disagree with this contention. "Targets to reduce emissions are politically decided and market economics are completely irrelevant while doing so," the senior shipping executive said.

## Slow fleet expansion likely

A chartering executive said that Maersk's proposal shows that even among a large section of the shipping industry, the current attitude is, "there is too much carbon around, it will cost you money if you put it in the air, otherwise find out ways to look greener."

His company mostly trades in commodities and had decided few years ago not to invest on ships and sold-off the 2-3 ships they controlled. The argument put forward is that maintaining a fleet does not necessarily reduce costs and on the contrary is expensive, particularly at a time when new regulations on fuel emissions and management are being implemented.

Sources said levying a carbon tax will reduce the scope of maritime earnings, investors may be discouraged from putting their money on ships and instead move towards assets classes such as gold and forex.

At present the global VLCC fleet is estimated by brokers at around 840 tankers with 20 likely to be delivered this year and another 45 in subsequent years, making the orderbook size less than 8% of the fleet. For a fleet of 360 LR2s, the orderbook size is also similar at just under 8%.

Due to the uncertainty over carbon regulations, many maritime companies are playing safe by investing in second hand ships, said a broker in Singapore.

Woodside CEO stares down activists on climate

2021-06-08 20:11:56.423 GMT

By Angela Macdonald-Smith

June 9 (Financial Review) -- Woodside Petroleum's acting CEO Meg O'Neill has rejected talk of a "watershed moment" for the oil and gas sector after a global escalation of climate pressures, describing recent events at energy multinationals as just a further evolution of the decarbonisation trend that her company is already well progressed in addressing.

Ms O'Neill, who has been leading the oil and gas producer for two months since the retirement of Peter Coleman, shrugged off widespread suggestions that a confluence of events at Shell, ExxonMobil and Chevron last month represented a line in the sand for the oil and gas industry that marked a change in investor appetite for the sector and darkened the outlook for further investment in new projects.

"I don't see it as a watershed moment, but I do see it just as a significant continuation of the trend that the industry has been on, which is we as investors in this space need to be doing our part to decarbonise," she told the Credit Suisse Australian Energy Conference in Sydney.

Ms O'Neill was speaking after the West Australian government ruled that Woodside's proposed expanded Pluto LNG project in the state must slash carbon emissions by 30 per cent and reach net zero by mid-century in order to proceed.

"What happened with Exxon was quite unusual, but it is very clear that their shareholders are saying 'you've not been doing enough'," she told The Australian Financial Review.

Ms O'Neill noted that Woodside had committed to putting its climate change report to a non-binding shareholder vote in 2022 and had been consulting with shareholders to test reactions to the company's actions in the area.

Scrutiny of the climate footprint of Woodside's \$16 billion Scarborough and Pluto LNG expansion project has intensified after landmark developments last month that saw ExxonMobil forced to admit three climate-focused directors to its board, while Chevron failed to derail climate resolutions passed by a majority of its shareholders.

The International Energy Agency has also noted that no new oil and gas resources must be developed to have even a 50-50 chance of meeting global climate goals, while Shell has been ordered by a Dutch court to slash emissions much deeper than it planned.

But Ms O'Neill, a former senior executive at Exxon, said the US companies should have been prepared for the ramp-up of investor pressure on climate change.

"These are signals that the US producers should have seen

coming from what's been happening to our European counterparts," she said.

"In many ways this is a trend that we have been aware of for a very long time."

#### Transition, not step-change

Her view found support among other industry speakers at the conference, with Andrew Tan, president of Oceania for LNG construction contractor Chiyoda, describing the developments as "quite a big media event" rather than anything more fundamental for the sector.

"The young environmentalists, they will call it a watershed moment, but I think most companies that have been in this business for a while have been expecting this," he said.

"It's energy transition, not energy step-change, so it's another step in that transition," added Azad Hessamodini, president of strategy and development at engineering firm Wood Group, saying the events meant American operators had to formally climb on board.

Ms O'Neill also stood firmly by the emissions and economic credentials of the Scarborough LNG project amid a storm of protest about its emissions footprint.

She also ruled out any reworking of the structure of the controversial project to avoid building a costly second LNG production train at the Pluto site near Karratha by processing Scarborough gas instead at the North West Shelf plant, where gas supplies are depleting.

"The ship has sailed on Scarborough," she said. Processing Pluto gas at the North West Shelf would require "pretty extensive surgery on an ageing plant".

In contrast to claims by conservation groups that the Scarborough project would be "worse than Adani" in terms of its climate impact, Ms O'Neill insisted that the minimal content of carbon dioxide in the gas from the offshore field made it attractive for LNG.

"Scarborough is a resource very well suited to our times. Successful LNG producers will need to be low-cost and low-carbon," she said.

"The Scarborough reservoir contains almost no carbon dioxide, which makes it particularly attractive in a decarbonising world."

The WA government ruled that Woodside will have to cut emissions at the expanded Pluto LNG by 30 per cent by 2030 and reach net zero by 2050 as a condition for approval.

The ruling, which results from advice from the Environmental Protection Authority and has been agreed to by Woodside, imposes the emissions requirements on the existing production unit at Pluto as well as the proposed second unit, and represents much tougher standards than those approved in 2007.

WA Environment Minister Amber-Jade Sanderson said it would result in a reduction in emissions of 1.2 million tonnes a year by 2030 compared to the original approval.

But activist investor group the Australasian Centre for Corporate Responsibility said Pluto emissions would surge from 1.8 million tonnes a year in 2019-20 to 3.6 million in 2026, and described the project as completely at odds with the expectations of investors to align capital spending with the Paris Agreement.

Meanwhile, Ms O'Neill, the lead internal candidate to replace Mr Coleman, said she expected the board to take its time to decide on the permanent CEO given the seven- to 10-year commitment involved.

"The thing I can do is put my best foot forward and demonstrate that I am a strong candidate for the role," she said. "I think the key is delivery."

When asked what she expected to be judged on as to whether she was the best person for the job, she pointed to four strategic priorities she has laid out: improving cost and efficiency; achieving the go-ahead for Scarborough; delivering the \$US4.6 billion Sangomar oil project in Senegal; and delivering value in the accelerating energy transition.

Woodside, which added former WA treasurer Ben Wyatt to its board last week, is aiming to make a final investment decision on the Scarborough project in the December half. Ms O'Neill said it would have a rate of return of more than 12 per cent and a payback of less than seven years.

"Scarborough provides the scale and revenues needed to fund Woodside's next wave of investment as we proceed in the energy transition," she said.

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let's use this competitive advantage. What is your view? Is Europe still upfront in the ESG field, or is there a shift and balance here?

### **Laurence Fink**

First, I would answer, Jörg, to say it's not a race. It's certainly not a competitive race. No question, society in Europe stated that sustainability is a societal risk. In the United States, it took a number of years for society and government to start talking that way. It was harder in the United States to move forward when government was saying climate risk was not a societal risk. I think, globally now, including Asia and China, our conversations, and this began about two years ago, are saying -- more and more societies are saying climate risk is a societal risk.

And once you go over that hurdle, then you have more cooperation. And that's what we're seeing now. And to me, I see a huge movement, very accelerated movement by the Biden administration. I see huge movement by investors now in the United States. I don't think it matters who's first or second on this, because this is not a race. We're all trying to improve society and improve the earth's health. And so I would start there. But I would say -- saying it's a societal risk and actually moving to a true net zero, that's the difficulty. Okay. We can all believe in it, but now getting there we're not seeing what I would say an aggressive stance by many governments yet.

They're talking the talk. Many societies, including Europe, are talking the talk but not walking the talk. Because to really get to a net zero, we don't have the science yet. A great article today about as much as airlines want to move forward on more sustainable, they can't do it yet. Biofuels right now are 50% to 60% more expensive than hydrocarbons. The margins on airlines is so severe. Now, basically, if we want to get every airline to use biofuels, I think within a number of years, we could do it. But are we then really getting back to your inflation story in question? Maybe that it will reduce the cost differential of the green premium. But to do that, are we willing to say to everybody in the world that you're going to be -- your cost of flying is up 30% to offset the cost or whatever the differential is?

### **Jörg Eigendorf**

Should it be up 30%, because it's external costs of environmental damage? Should it be up 30%?

### **Laurence Fink**

With the cost of flying or the biofuel costs?

### **Jörg Eigendorf**

No, the cost for carbon -- for cost for flying in general?

### **Laurence Fink**

Yes, did we create a giant carbon tax is that what you're referring to that offsets it? The problem is it displaces so many jobs. It displaces -- I don't think politically you can do that day one, it displaces jobs. When I write in my CEO letters, a transition has to be fair and just. And so if you can tell me we can increase a carbon tax to X, Y without displacing jobs, without having regional inequalities, without



having all these other issues, let's do it. It's just not feasible now. Now, what is feasible that I don't see movement in Europe. If Europe really is about this, and if the U.S. is really going to be about this, to name two parts of the world, we need to develop a continental power grid.

Okay. We all know we're going to move to electric cars. We now have solar and wind having no green premium versus any other source of energy today. Now it's intermittent. We have to have storage and all that. But that's a great example of these issues. It took 30 years to bring the cost of solar and wind back down to the same level of other hydrocarbon costs. We need to do that for every industry. So what I'm trying to suggest is, and this is why I say transition is an opportunity, but it's an opportunity because we have to be investing more and more.

We need to do the R&D. Governments are going to need to do much more R&D in credits on developing new science and technologies. It's not just about the carbon tax. Here's my issue in many of the countries of Europe. If they really want to have a true carbon tax, shouldn't 100% of the revenue from carbon tax go into green? In many countries in Europe, the carbon tax goes to balance a budget. Okay. That's not a good solution. And so what I'm trying to say is, it's not so simple here. And my last thing I would like to say, and I'm saying it loudly to every person who will listen to me, if society believes that all public companies need to now report under TCFD, the IFR standards, whatever standard one wants to use, it can't just ask public companies of doing it and not ask for a society.

Right now, what we are seeing worldwide is a movement by regulators and policymakers moving very rapidly for disclosure of public companies. You see that in Europe right now, some countries have mandated it. But there's no conversation about the rest of society. So the burden is, if Deutsche Bank and BlackRock tomorrow needed to report under TCFD Scope 3, which is all our supply chains, we are then the policeman. We are the organization that is policing the down streaming. I don't think politically that's going to work. They're going to hate us more than ever; big companies, banks, because isn't it the responsibility of government setting policy that policy is good for all of society.

But right now, all I'm seeing is mostly governments and regulators are asking public companies to move forward. BlackRock is too, by the way. We don't manage a lot of private money. But the key of getting this done to really get into net zero, and to doing it effectively, is that asking all the society moving together. And the last thing, if we only ask public companies to disclose and to report, if they don't ask the rest of society, we're going to have some very important companies that are in hydrocarbons or chemicals to go private. And that's not a solution. That doesn't change the net zero of the world.

Two, what we have witnessed in Europe are some of the hydrocarbon companies what they do, they sell some of the worst and dirtiest of their assets. And that's considered good. We as a shareholder like how those companies look now because they have less of a carbon footprint. But the world doesn't change. It just goes from a transparent organization to an opaque organization. That is not going to get us to where we want to go as a society. And so these are issues we need to ask. And so I'm urging everybody to focus on this in a societal way, not just with public companies. And we need regulators.

When you ask Christian about coming together, if we could get one thing done in the G20s, the COP26 is have a one taxonomy, which we don't have at the moment, so we can judge companies worldwide in the same way. But two, we come to terms with the idea that we're trying to get all parts of society moving together, not just public companies, or we're going to have this incredible arbitrage of companies leaving the private -- leaving public domain into the private domain. We're going to see a lot of the worst assets just going into the private domain, then we don't change the world.

## **Jörg Eigendorf**

Thank you, Larry. You touched very important topics here. Effectively, [indiscernible] short is how do we manage this transition? It's not black and white. It's not green or brown. It's how do we get from A to B as quickly as possible? What role for governments to play, what role for banks to play and what role for society?

## **Christian Sewing**

Well, first of all, it's important that we are really not talking about a race, but that we are talking from ambition to impact. We need an impact now and not only the talk, but really impact. By the way, that was the reason why we declared last week or two weeks ago in our sustainability deep dive, that we don't want to even raise our absolute numbers for the time being, but we move it forward by two years in order to have an impact. Number two, the most important, because when we talk about ESG, of course, climate change is super important and it's a societal task. But we have to do it in a way that the S part is not lost on people's mindset. And that's what I'm always saying.

When we talk about the climate change and the transformation, for instance, German corporates have to do, it's our task as the bank to support the transformation integrate, but not to stop in an abrupt way the relationship with corporate. I think that would be the worst thing to do, because you leave something on the table, which is twofold. A, a societal problem in countries like, for instance, Germany or in others and the real issue exactly what Larry is saying is only moved from one country into another because the production will take place but at another part of the world, and it's not addressed.

And in this regard, I really do think that when we talk about the role of banks, the role of regulators; a, we need to take this jointly together with the governments. Secondly, there must be a clear understanding that with a certain ratio to be achieved or implemented by the end of next year, nothing is actually one. We need the understanding that this is a transformation over the next four, five, six years in order to come into the direction of net zero. But if we stop from one day to the other, also what we as public companies are sometimes by some of our shareholders, we do actually nothing good for the long term to the society, to the environment, and it will net zero not help the climate. And therefore, we need the joint understanding that this is a long way of transformation.

In this regard, I think the banks are very much there to support that. This is something where we want to be part of, but we need the understanding that this is a long-term race, that this needs joint understanding of regulators, governments and the private economy. And what Larry is saying is more than true. I can tell you in our M&A activities, in the mandates we are getting, we get so many mandates that we should advise public companies in order to get rid of the so-called bad part of their

production facilities. That goes privately. That goes somewhere else where it's not reported. That doesn't help the next generation. That is not the right thing to do. But therefore, we need to change the direction of speech, the direction how people and public companies are measured and we need a different understanding what is really needed.

And getting it right, ESG, getting it right is a 10-year task starting now and it must be a fundamental transformation. For that, the banks are there. And for that, to be honest, we need two other things. You need balance sheet in order to finance it, happy to do this. And in Europe, other than in the U.S., more than ever, we need the Capital Markets Union, because the financing needs in order to transform the economy in Europe cannot only be done by banks. We need a deeper capital market. And therefore, I kept saying and I keep saying the Green Deal in Europe will only come if the Capital Markets will also come -- the Capital Markets Union will come to Europe. The one thing is the necessity for the other and we should jointly work on both.

### **Jörg Eigendorf**

Larry, we see the huge volume targets out and [indiscernible] very clear coming to an end and the final 1.5 minute, we see the huge volume targets out there. What will be the future metrics banks have to follow, companies have to follow? Is it carbon footprint? Is it green asset ratio? What will be the future of what everybody will scrutinize?

### **Laurence Fink**

It has to be more than that. Just to further the conversation that Christian and I just had, Jörg, I don't believe in divestiture of public companies. And so their carbon footprint is going to be larger for a while. But I want to understand how are they evolving into a more green foundational company? How are they moving? How are they creating green hydrogen from regular hydrogen? How are they doing this? Some of the top energy companies are going to be the leaders in the decarbonization component of sequestering carbon.

And so it can't just be done through a metric as saying, and this is some of the risks we have, and we just use carbon footprint, then you have massive divestiture and the world doesn't get anywhere. These are very complex solutions that have to be done. And so to me, it's not about okay, what's your carbon footprint? If they could do it for BlackRock and we could do that, we can measure there. But the companies that are essential in the carbon world, and I'm talking about agricultural companies, because agriculture represents 18% of the footprint of carbon. I'm talking about steel and cement, they represent 10%.

We focus on a lot of other things, but there are many components that create this carbon footprint. It is not about just okay, a numeric number of where's your carbon footprint but I want to understand over this journey, how are you migrating and changing it? How are you creating -- I look at this using a financial term. I use the carbon or let's say energy and oil, that's an iostream. Okay. How are you going to navigate your iostream and create a new stream of revenues? Those are the things that we're going to do this fairly and justly is going to be how we're going to have to do it.

The last thing I just want to say and to link in ESG&E with the question on inflation, let's be clear. If we rush this and if our solution is entirely just to get a green world, we're going to have much higher inflation, because we do not have the technology to do all this yet to have it equivalent to the cheapness of hydrocarbons. And so that's going to be a big policy issue going forward too. Are we going to be willing to accept more inflation if the inflation is to accelerate our green footprint? And that's going to be a big policy question.

### **Jörg Eigendorf**

A final question to both of you and just one word answer before I hand over then to Christian also for the one word answer and his final remarks. But, Larry, with that complex issue, are you an optimist or a pessimist that we get that done fast enough?

### **Laurence Fink**

I've lived my life as being an optimist. Because when we talk about the problems and when we see the problems and the severity of the problems, we solve solutions. That is the beauty of human beings. We proved it with COVID, having a vaccination within 10 months. So if we focus on it, we talk about it, we talk about how severe it is, we'll fix it.

### **Jörg Eigendorf**

Christian, you're an optimist.

### **Christian Sewing**

I couldn't agree more. I think I said in my first answer to one of the question and now it depends on leadership. And if you have the right people around with the right mindset and with the long-term horizon and with the right spirit, to be honest, we will get the stuff. You need now to really get the right people in the world together in order to address it. And we have proven so many things over the last years and decades that I don't think this will stop us.

### **Question-and-Answer Session**

### **Jörg Eigendorf**

Thank you so much for this seventh conversation with Larry Fink on our Global Financial Services and FinTech Conference. I think for everybody who has followed us in the last 40 minutes, Larry, we would like to see an eighth conversation with Larry Fink and Christian next year again. Thank you so much. And thanks to everybody who followed us in the last 40 minutes. Thank you and goodbye.

# Will The Demise Of Oil Take Longer, Just Like Coal? IEA and Shell Highlight Delays/Gaps To A Smooth Clean Energy Transition

Posted Thursday June 11, 2020. 1:45 MT

We expect one of the major global energy themes in 2021 will be that the world is not on track for a smooth energy transition to a world of clean energy. And this will be elevated to the #1 global energy theme if Joe Biden becomes President and moves to “*rally the rest of the world to meet the threat of climate change.*” There has been no pull back from the aspirational goal of almost every country for a clean energy transition, even in the face of a global economic crash. It is going to happen. The world is on a path for clean energy at the cost of fossil fuels. But this transition is not just adding more wind and solar. Rather it is complex, requires advancing a wide range of “*critical energy technologies*” and, most of all, a major jump up in investment capital. The IEA has just provided data to show the world is far behind in “*critical energy technologies*” and in invested capital for the energy transition. And this week, Shell’s CEO noted his concerns (similar to the IEA) that also point to a disorderly energy transition. If the world isn’t ready for this energy transition, it should point to a need for more oil and gas to fill the delay gap, and this should lead to delays in oil demand declines on the path to peak oil demand. We don’t think the energy transition will impact oil demand by millions b/d. However, even if the energy transition delay only reduces oil demand declines by 0.5 mmb/d or more, it should help push back peak oil demand a few years. And this should be happening as non-OPEC oil supply sees an impact from the lower upstream capex over the past couple years and the massive capex cuts in 2020. And we think this helps support a higher WTI oil price by \$5 for the 2022 to 2027 period whether you believe in the current forward strip for WTI averages ~\$44 for 2022 thru 2027, or, if you are like us, believe in oil above the strip. Its support for a view that oil in the 2022 to 2027 period will stronger than expected. And maybe the demise of oil will be like the expected demise of coal – it will take longer than expected.

Shell warned the world is not ready for a smooth energy transition. Shell CEO’s message was very clear and was captured clearly in the title of the Bloomberg Green Tuesday story “*Shell’s CEO Worries About a Disorderly Energy Transition: Q&A*”. The Shell CEO said “*The energy transition is massively complex. It will require orchestration on a scale that the world has never seen. If you don’t start with it soon, it’s going to be highly disruptive at the end or it’s not going to happen. And both are unpalatable conclusions*”.

“The energy transition is massively complex”, its not just adding more wind/solar. The Shell CEO reminded of something that is overlooked by almost everyone, he said “*the energy transition is massively complex. It will require orchestration on a scale that the world has never seen.*” We think the most overlooked aspect of the energy transition is that it is much more than just adding more solar and wind to replace some portion of the fuel supply. One of the major challenges is replacing an electricity grid that has been built on fossil fuels, nuclear and hydro delivering high intensity energy on a continuous as needed for whatever is needed basis. Again, its not just adding solar and wind, its having the proper electricity storage, generation and delivery system to support this fossil fuels out/renewables in switch.

The IEA reminds the energy transition has many “critical energy technologies”, the vast majority of which are not on track. There was an excellent illustration of the many significant areas, or major pieces of the puzzle, involved in an energy transition by the IEA last week. The IEA also noted the progress of each of the major pieces and the overall conclusion is that the vast majority of the pieces are behind or well behind where they should be to meet a smooth timely energy transition. It is important to note that these are just what the IEA calls the “*critical energy technologies*” and does not get into the wide range of other considerations needed to support the energy transition. The IEA divides these “critical energy technologies” into major groupings and then ranked the progress of each of these pieces in its report “*Tracking Clean Energy Progress*” [\[LINK\]](#) by on track, more efforts needed, or not on track

**IEA's Progress Ranking For "Critical Energy Technologies" For Clean Energy Transition**

● Power	● Renewable Power	● Geothermal
	● Solar PV	● Ocean Power
	● Onshore Wind	● Nuclear Power
	● Offshore Wind	● Natural Gas-Fired Power
	● Hydropower	● Coal-Fired Power
	● Bioenergy Power Generation	● CCUS in Power
	● Concentrating Solar Power	
● Fuel Supply	● Methane Emissions from O&G	● Flaring Emissions
● Industry	● Chemicals	● Pulp and Paper
	● Iron and Steel	● Aluminum
	● Cement	● CCUS in Industry and Transformation
● Transport	● Electric Vehicles	● Transport Biofuels
	● Rail	● Aviation
	● Fuel Consumption of Cars and Vans	● International Shipping
	● Trucks and Busses	
● Buildings	● Building Envelopes	● Lighting
	● Heating	● Appliances and Equipment
	● Heat Pumps	● Data Centres and Data Transmission Networks
	● Cooling	
● Energy Integration	● Energy Storage	● Demand Response
	● Hydrogen	● Direct Air Capture
	● Smart Grids	

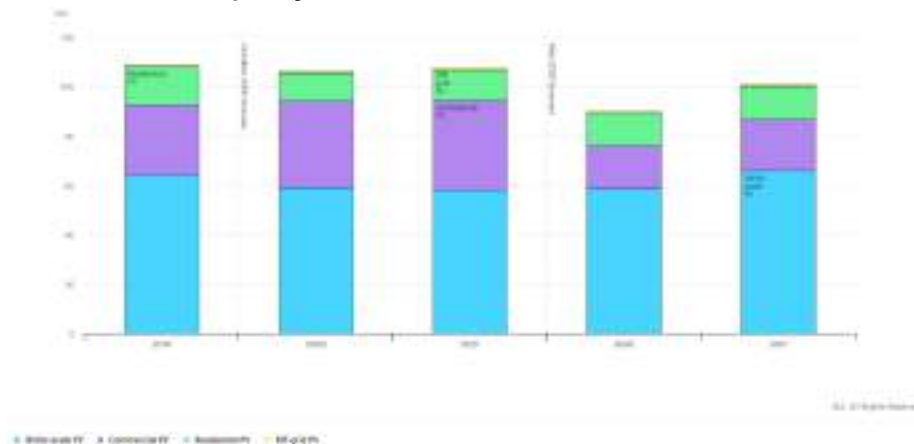
Source: IEA

- On Track
- More Efforts Needed
- Not on Track

Source: IEA Tracking Clean Energy Progress, June 2020

Even the "on track" items like solar PV are seeing a pause in growth especially with lower 2019 and 2020 investment capital. As noted in the above chart, the IEA ranks Solar PV as one of its few green dots "on track" critical energy technologies. However, the IEA's tracking update also shows how COVID-19 has led to the IEA revising down its solar PV capacity additions forecast down by ~15% for 2020 and by ~5% for 2021 ie. solar PV additions won't get back to 2019 levels at least until 2022 or possibly 2023. The IEA explains "Covid-19 has led to construction delays and weaker than anticipated investment, requiring us to revise capacity addition projections down by over 15% for 2020".

**IEA's Solar PV Capacity Additions, 2019-2021, October 2019 Forecast vs May 2020 Forecast**



Source: IEA Tracking Clean Energy Progress, June 2020

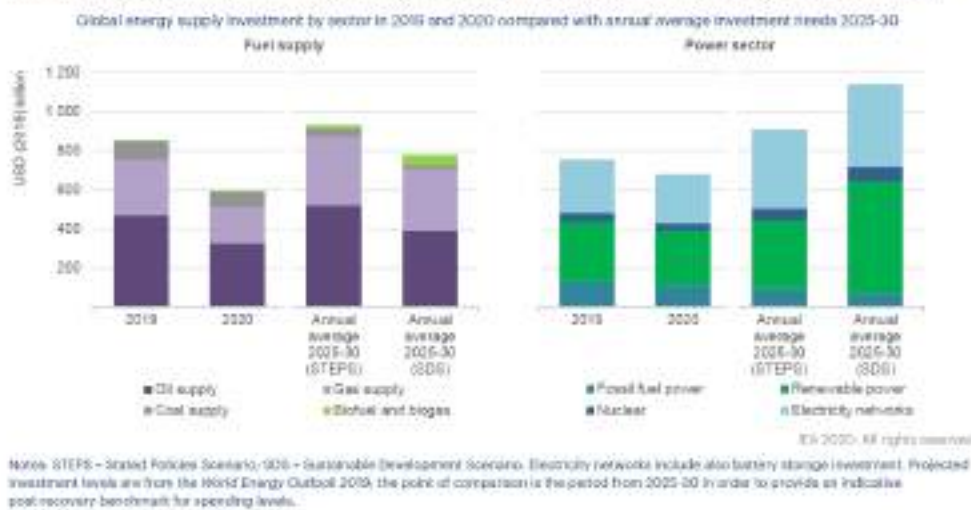
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No surprise the energy transition is not on track, there hasn't been enough capital invested in the transition even before COVID-19. On May 27, we tweeted [LINK](#) "Seems clean energy supply + related grid/infra won't be anywhere close to meet aspirational goals of many countries" based on the IEA's just released that morning major report "World Energy Investment 2020" [LINK](#). The IEA reviews investment in the full spectrum of energy including in 2020 and provided some excellent insight into the implications of the capital, or lack thereof, for the future. The IEA notes the required investment capital for clean energy wasn't being spent in 2019 and COVID-19 made the investment gap larger in 2020. Prior to 2020, the IEA estimated clean energy spending was relatively flat for 2015-2019, before declining in 2020. As is happening in almost every sector, the world economy crash in 2020 has led to declines in invested capital in all energy sectors, including power and clean energy. In discussing renewables, one of the many shortfall IEA comments was on slide 90 "Current investment levels are not aligned with a sustainable pathway. Compared with the average annual investments projected in the IEA SDS, power sector spending in 2019 was about 35% short of the level required a decade from now. There is a continued need for capital reallocation to meet energy security and sustainability goals, to bring in more low-carbon power and to ensure that renewable-rich systems can operate with sufficient system flexibility. The largest projected growth in investment to align with such a pathway would be required in solar PV and wind, on average an extra USD 160 billion of spending each year. Electricity networks would require an extra USD 150 billion from today's levels, in addition to a higher level of capital for other renewables and nuclear."

**IEA's Estimated 2019 and 2020 Invested Vs Future Required Investment**

Even before 2020, investment trends were poorly aligned with the world's projected needs



Source: IEA Tracking Clean Energy Progress, June 2020

Massive government intervention will be needed to get the energy transition closer to its energy transition miss. It doesn't make a difference what side of the clean energy fence someone is on, everyone knows that the energy transition has been, and must continue to be, driven by governments if there is to be any shot of trying to get closer to the energy transition target. The Shell CEO said something everyone knows – leaving it to the private sector to somehow fit all the pieces together on a timely basis won't work. It will require increasing government intervention. Bloomberg asked the Shell CEO "All that will need a very heavy-handed government. Do you support that?" And he replied "If we believe that somehow the market is going to take care of this, that you put a price on carbon and everything will sort itself out, or that we can shame companies into doing it by having ESG frameworks that will tell them what is right and what is wrong, then I think we're kidding ourselves. This needs a very significant interventionist approach, and all industries have to be part of the intervention."

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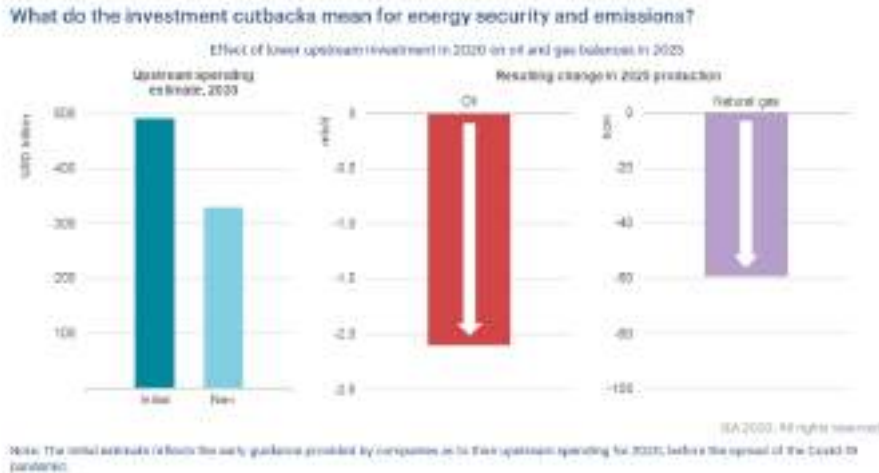
2021 could see a major global (and Canada) renewal push and commitment to the energy transition aspirational goal. The Nov 3 US presidential elections will determine if there is a renewed and urgent global push on climate change. The united global push for climate change was given a major kick in the pants when, on Nov 4, 2019, the Trump administration announced it was starting the formal process to withdraw from the Paris Accord. The official withdraw date would be Nov 4, 2020, one day after the upcoming US presidential election. And the reality is that the US had effectively ceased to have any interest in working on climate change since President Trump was elected in Nov 2016. It still ~5 months to the election, but Joe Biden is currently running well ahead. One of his climate change priorities [\[LINK\]](#) is to “*Rally the rest of the world to meet the threat of climate change*” and he also tries to deal with the need to catch up investment saying “*the United States urgently needs to embrace greater ambition on an epic scale to meet the scope of this challenge*”. But, at least in the US, we see Biden’s initial 2021 push for climate change initiatives to be more aspirational than specific programs as he will be restrained to some degree by the increasing US debt and the expected slower recovery of the US economy as noted by Fed Chair Powell yesterday. In Canada, we believe we could see a similar new urgency to climate change in 2021. We recognize it isn’t a major topical item today, but we believe there is a good chance for an early fall federal election and, if the polls hold, the Liberals would likely have a majority government. We believe that, even with the massive debt increases, this would lead to increasing federal government support for clean energy initiatives in Canada and possibly (likely?) to support clean energy initiatives in developing countries.

The aspiration to spend more will be there, but increasing government debt levels will have to limit government incentives that require government capital or hurt government revenues. The reason why the IEA report caught our attention is that the investing gap was worse in 2020 when 2019 was already lagging. It’s hard to see the scenario where 2021 investing jumps up significantly above 2019 to start to close the gap. Rather, we have to believe the gap will, at best, be maintained in 2021. No one has to be an economist to know that every country in the world is taking on massive debt in its fight against the economic shut down from COVID-19. Our concern is that the increased debt has to force all governments to go slower than they would want on the clean energy transition. This will just widen the gap. The countries that have a reasonable financial position will continue to support clean energy advancement, but their pace will inevitably be slowed down due to balance sheets. It’s why we think a Biden presidency will be more aspirational in 2021. Yesterday, the US Treasury Dept [\[LINK\]](#) reported there continues to be an accelerating in US federal government debt. It reached \$26 trillion, after hitting \$25 trillion on May 5, and \$24 trillion on April 7. US debt is up over \$6 trillion since the Nov 2016 elections. Our SAF June 7, 2020 Energy Tidbits [\[LINK\]](#) highlighted the Thurs June 4 German government \$145b stimulus package and that it included a doubling of EV purchase incentives, but did not include any incentives for ICE vehicles. It was also interesting to see how the German government targeted cheaper EVs as the priority to get a broader EV penetration. But then there are most countries, such as Mexico, that are having a much tougher time with the economic hit from COVID-19. On May 16, we tweeted [\[LINK\]](#) “*Not yet law, but seems Mexico will move to "temporarily" limit renewables. COVID-19 has been impacting near term power/#NatGas demand, but any limit on renewables should restore Mexico's steady increase in #NatGas consumption as economy restarts and need for US #NatGas supply*”. Mexico’s concern was that it needed to maintain the reliability of the electricity grid in the face of the COVID-19 health crisis, but the reality is that it doesn’t have any financial flexibility to support any new renewable initiatives for the time being. If governments are going to provide some form of incentive, they need to have the financial capacity to do so and many governments do not have that luxury. COVID-19 is only going to increase the gap and put the energy transition further behind. This is a key point from the IEA’s reports.

We think the decline rate in oil demand on the path to peak oil demand will be like coal’s demise – slower than expected, especially with the delays and gaps in the clean energy transition. We believe the world is on the path to a clean energy transition and there will be peak oil demand. But we always think about coal when we think about the energy transition that will lead to peak oil demand. No one ever disagreed that governments will go to intervene to move to eliminate coal power generation. But it hasn’t happened anywhere near as quickly as expected. When we see the Shell CEO comments and IEA reports, it’s clear that the energy transition isn’t going as smoothly and quickly as expected. Most importantly, the IEA highlighted that investment in clean energy is too low and there are too many “*critical energy technologies*” that are not on track. And to use the demise of coal analogy, this should point to better demand for oil for a good portion of the 2020s. Our May 27 tweet on the IEA investment report also said “*Seems clean energy supply + related grid/infra won’t be anywhere close to meet aspirational goals of many countries. Good for oil/gas prices in mid 20’s, will need more oil/gas just as impact of big capex cuts kick in.*” It doesn’t have to be a huge change in demand, even

if demand is only 0.5 mmb/d or a little better than the expected decline in oil demand growth rates in the 2020s on the path to peak oil demand. It will be a positive to oil price expectations as it will happen during the period that will see the impact of underinvestment in oil today from the past couple years, and more so from the massive upstream underinvestment in 2020. Below is the IEA's May 27 below graph showing how the underinvestment in oil in 2020 will hurt 2025 production by ~2 mmb/d. Plus the global oil industry has moved away from long cycle projects like major 100,000 b/d oil sands projects so there aren't an inventory of large long cycle projects in inventory. And even if oil prices are much stronger than expected, oil companies won't re-add long cycle oil projects given that that the energy transition (while delayed) is solidly the goal.

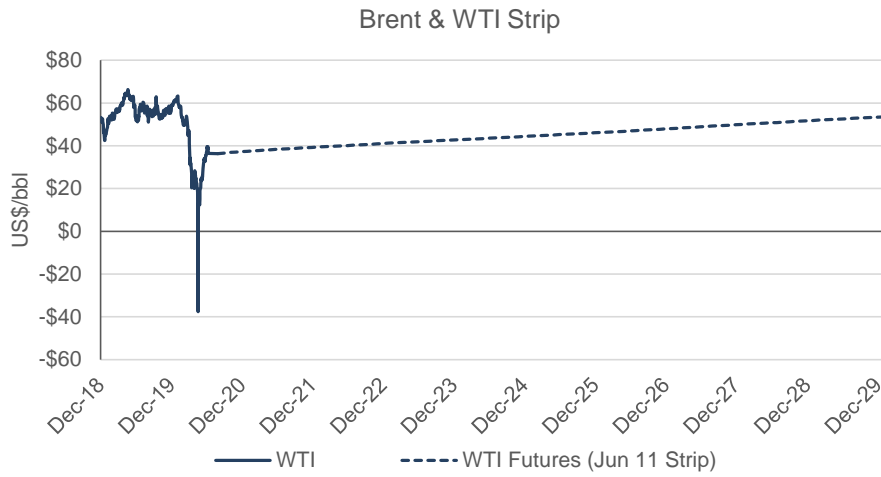
### IEA Impact of Lower Upstream Spending In 2020



Source: IEA World Energy Investment 2020

There is a big difference for oil if WTI is >\$50 versus >\$40. There is a big difference to the US/Canada oil sector if WTI is >\$50 or >\$40. We don't think we need to see hugely better oil prices, just better visibility looking to oil for 2022 thru 2027. We think the IEA and Shell views will become more broadly accepted once there is a focus on a post COVID-19 world. We don't see a huge impact, but rather believe its reasonable to see this clean energy transition delay will lead to a lesser decline in oil demand growth rates on the way to peak oil demand. It doesn't have to be a huge impact, but even if its only delaying oil demand decline by 0.5 mmb/d thru 2027, we could see the potential to impact oil by \$5 whether you believe in the WTI forward strips (currently average ~\$44 for the 6 years 2022 thru 2027, before WTI reaches \$50 in 2028), or if you are already more bullish (as we are) expecting oil above these forward strips. As noted above, these delays should happen when the impact of upstream underinvestment kicks in. In addition, we don't expect to see any major oil company approve a large long cycle oil project like the former +100,000 b/d oil sands projects, especially as these major oil companies are all committing to reduce emissions and be leaders in the clean energy transition. If there is stronger oil demand in the 2022 to 2027 period and WTI >\$50, it means that the likely winners will be those with spare capacity (ie. OPEC+), or effective spare capacity from short cycle quality shale/tight oil in US and Canada, and also oil projects that have multi phase quick cycle development like Exxon in offshore Guyana, or even small scale SAGD.

**WTI Oil Price Futures**



Source: Bloomberg

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## Any Way You Want It - Proposed 'Green,' 'Turquoise,' And 'Blue' Hydrogen Production Projects

Wednesday, 06/09/2021

Published by: [Jason Ferguson](#)

We get the sense that many hydrogen-market observers are looking for a silver bullet — the absolute best way to produce H<sub>2</sub> cheaply and in a way that has an extremely low carbon intensity. If anything has become clear to us over the last few months, however, there isn't likely to be an "Aha!" or "Eureka!" moment anytime soon. Rather, what we have seen so far in regard to hydrogen production has been a veritable smorgasbord of production pathways, with varying degrees of carbon intensity. While costs vary by project, it is also fair to say that a front-runner has yet to emerge when it comes to producing inexpensive hydrogen at scale. There is a silver lining though, if not a bullet, and that is the realization that there are many options when it comes to procuring environmentally friendly hydrogen. Today, we provide an update of currently proposed hydrogen projects.

It's been a while since we wrote on hydrogen production, and various projects have popped on the scene over the last few months. Granted, they aren't huge, but the project list in our weekly [Hydrogen Billboard](#) has continued to expand since the last time we looked at it in a blog, way back in March in [I Did It](#). That blog focused on how to interpret hydrogen project announcements, converting the various units into terms that our fossil-fuel-oriented readers can understand. At the time, we wrote that all the projects we were tracking totaled about the same energy equivalent as one Haynesville gas well. The list has expanded by a few "wells" now, maybe even a small basin worth if the largest projects go through, so we thought it would be a good time to revisit the various project announcements to hit the market this spring.

### 'Green' Hydrogen Projects

We almost shudder at the color schemes that have been devised for hydrogen, though it sometimes helps to be able to put things in buckets and, for lack of a better method, we have lumped some of the projects into a "green" bucket. These are projects that generally use some form of electrolysis (which we covered in [our second-ever hydrogen blog](#)) to generate hydrogen from electricity and water. Also, the electricity is usually from a source with a low carbon intensity (CI). Figure 1 below summarizes the existing and planned projects in this category. As you will quickly notice, there is only one of these "green" projects currently in service in North America, that being Air Liquide's Bécancour facility in Quebec, which started up earlier this year and utilizes hydropower to produce hydrogen with proton exchange membrane (PEM) technology.

North American Green Hydrogen Production Capacity										
Capacity										
Existing	Operator	Technology	Efficiency (est)	MW	kg/day (RBN)	kg/day (published)	MMcf/d	MWh/day	Location	Start Date
Bécancour	Air Liquide	PEM	56%	20	8,050	8,200	3.3	915	Quebec	1/21
Planned	Operator	Technology	Efficiency (est)	MW	kg/day (RBN)	kg/day (published)	MMcf/d	MWh/day	Location	Start Date
Plug Power	Plug Power	PEM	56%	120	48,302	45,000	20.1	5,492	New York	TBD
RCV	Hydro-Quebec	Electrolysis	56%	88	35,421	30,411	14.7	4,027	Varenes, QC	2025
Wells Dam	Douglas PUD	PEM	56%	5	2,013	2,000	0.8	229	Pateros, WA	2021
Holtwood	Plug Power	PEM	56%	37	15,000	15,000	6.2	1,706	Bethesda, PA	2022
Corpus Christi	POEC/Arco	Electrolysis	56%	61	24,658	24,058	10.2	2,804	Corpus Christi, TX	TBD
Fort Worth	Plug Power	PEM	56%	149	60,000	60,000	24.9	6,822	Fort Worth, TX	TBD
<b>Existing Total</b>				<b>20</b>	<b>8,050</b>		<b>3.3</b>	<b>915</b>		
<b>Planned Total</b>				<b>461</b>	<b>185,393</b>		<b>77.0</b>	<b>21,079</b>		
<b>Combined Total</b>				<b>481</b>	<b>193,444</b>		<b>80.3</b>	<b>21,995</b>		

Figure 1. North American Green Hydrogen Projects. Source: [RBN Hydrogen Billboard](#)

Though there is just one project currently in operation, that doesn't mean there aren't some big plans on the drawing board. As shown in Figure 1, we are tracking six projects that fall into this "green" category, and they all plan to use electrolysis. The two largest are planned by Plug Power, one in New York and the other in Texas. Both are expected to use PEM, which we have assumed is 56% efficient. (For more on electrolyzer efficiency and capacity, you may want to review the aforementioned [I Did It](#) blog, in which we covered the subject in painful detail.) The efficiency of the technology is important when projects quote capacities in kilograms per day (kg/day), which is often the case. For example, the Plug Power project in New York is expected to be capable of producing 45,000 kg/day of hydrogen (H<sub>2</sub>), which we calculate would require about 120 megawatts (MW) of electrolyzer capacity. Electricity for the New York project will come, at least in part, from hydropower, while the Plug Power project in Texas sounds like it will be backed by wind generation. Given that the Texas project is said to be capable of producing 60,000 kg/day of hydrogen, we estimate it would require about 150 MW of wind power at peak rates.



It's a similar story for the other projects in Figure 1, with the three of the other four projects driven by low-carbon hydropower and one backed by solar. While the other projects are not as big as Plug Power's New York and Texas projects, a lot of little projects can add up and the total amount of power needed for the planned projects in Figure 1 is almost 500 MW, far greater than the 20 MW currently operating at the Air Liquide plant in Canada. Still, the total energy output from these projects (if they are all built) is around 20 million British thermal units per day (MMBtu/day). That's big in hydrogen market terms but is still just about the size of two medium-sized Haynesville shale wells.

### 'Turquoise' and 'Blue' Projects

The variety of "green" hydrogen projects we are tracking in our Figure 1 list all use water electrolysis technology and mostly hydropower, with some wind and solar, for electricity. However, there are other low-carbon production projects operating or in the works. The first project in this bucket is considered "turquoise" since the carbon from the methane used in the process is captured as a solid, but as we see it that label doesn't make it any less "green" than the projects in Figure 1. The "turquoise" project in question is Monolith Material's methane pyrolysis facility in Nebraska, known as Olive Creek 1, which we detailed in [Back in Black](#). Monolith's project, which has a planned expansion called Olive Creek 2 in the works, isn't the only "turquoise" facility in our list. There is also a planned project in Lancaster, CA, that would gasify paper waste and create hydrogen. The project is being led by a company called SGH2 Energy and would be capable of producing 11,000 kg/day of H<sub>2</sub>.

The rest of the projects shown in Figure 2 belong in what is traditionally known as the "blue" hydrogen category, though it's worth emphasizing again that such labels are imperfect and should be taken with a pinch of salt. Six of the projects plan to use steam methane reforming (SMR) to produce low-carbon hydrogen. (For more on SMR, see [Help! Part 2](#).) The largest of these is a potential project between Suncor and ATCO that could produce over 800,000 kg/day of hydrogen. That's a big project in hydrogen and energy production terms, as the stated capacity would equate to over 90,000 MMBtu/day, or the equivalent of about 10 medium-sized Haynesville wells. Other "blue" projects on the list include some modest-sized facilities, such as the Air Liquide facility planned to start up next year in Nevada. Others are much smaller, including two projects SoCalGas is planning in Thousand Palms, CA, that would utilize small-scale SMR to produce fuel for the transport sector.

North American Turquoise and Blue Hydrogen Production Capacity										
Capacity										
Existing	Operator	Technology	Efficiency (wt)	MW	kg/day (RIN)	kg/day (published)	MMcf/d	MMBtu/day	Location	Start Date
OC1	Monolith	Pyrolysis			11,699	11,699	5.7	1,558	Hallam, NE	2018
Planned/Proposed	Operator	Technology	Efficiency (wt)	MW	kg/day (RIN)	kg/day (published)	MMcf/d	MMBtu/day	Location	Start Date
OC2	Monolith	Pyrolysis			168,384		68.5	18,690	Hallam, NE	TBD
Colton/OC	Arctica	SMR w/FG			7,000	7,000	2.9	796	CA	TBD
Nevada	Air Liquide	SMR w/FG			40,000	40,000	16.5	4,548	North Las Vegas	2022
Lancaster	SGH2	Gasification			11,000	11,000	4.6	1,251	Lancaster, CA	TBD
Raven/Hyzon	Raven	SMR			4,500	4,500	1.9	522	San Francisco	TBD
Suncor/ATCO	Suncor/ATCO	SMR w/CCUS			821,918	821,918	343.3	93,452	Alberta	2028
SoCalGas (Inde)	Santitas Transit	Modular SMR			650	650	0.3	74	Thousand Palms, CA	TBD
SoCalGas STARS	Santitas Transit	Modular SMR			330	330	0.1	38	Thousand Palms, CA	TBD
<b>Existing Total</b>					<b>11,699</b>		<b>5.7</b>	<b>1,558</b>		
<b>Planned Total</b>					<b>1,049,781</b>		<b>435.9</b>	<b>119,360</b>		
<b>Combined Total</b>					<b>1,061,480</b>		<b>441.6</b>	<b>120,918</b>		

Figure 2. North American Blue and Turquoise Hydrogen Projects. Source: [RBN Hydrogen Billboard](#)

As you can see, there are no shortage of ideas for producing low-carbon hydrogen — and there is no silver bullet either. Somewhat lofty goals for hydrogen production are [often cited](#) by advocates and politicians but, based on the project lists we've assembled, significant additional progress will need to be made if the market is to meet those expectations. That said, we don't see the project diversity as a knock on hydrogen, nor is the seemingly scattershot approach likely to be a transient phenomenon. All you have to do is look at the broad array of current hydrocarbon production, from shale wells in West Texas to offshore Gulf of Mexico, to get a sense of how diverse the hydrogen production landscape may become as it develops. While some narrowing of focus in hydrogen production is likely, it seems that there will remain many ways to get it, if you want it.

"Anyway You Want It" was written by Steve Perry and Neil Schon. It appears as the first cut on side one of Journey's sixth studio album, *Departures*. Released as a single in February 1980, the song went to #23 on the Billboard Hot 100 Singles chart. Personnel on the record were: Steve Perry (lead vocals), Neal Schon (guitars, backing vocals), Ross Valory (bass, backing vocals), Gregg Rolie (keyboards, backing vocals), and Steve Smith (drums).

*Departure* was recorded in November 1979 at The Automatt in San Francisco. Produced by Geoff Workman and Kevin Elson, the LP was released in February 1980. It went to #8 on the Billboard Top 200 Albums chart, and has been certified 3X Platinum by the Recording Industry Association of America. The album would mark the last



appearance of founding member Gregg Rolie, who had tired of life on the road. Rolie helped in finding his replacement in the band, Jonathan Cain from The Babys. Four singles were released from the album.

Journey is an American rock band formed in San Francisco in 1973 by two ex-members of Santana. Their biggest commercial success came between 1978 and 1987, when Steve Perry was their lead vocalist. They have released 14 studio albums, four live albums, eight compilation albums, two EPs, and 59 singles. The band has sold more than 80 million records worldwide, and was inducted into the Rock and Roll Hall of Fame in 2017. Seventeen members have passed through Journey since its formation. The band still records and tours, with their next scheduled appearance being on July 31 in Chicago at Lollapalooza.

# Ontario Expands Access to Natural Gas in Rural, Northern and Indigenous Communities

Province makes life more affordable for families, businesses and farmers

June 09, 2021

[Energy, Northern Development and Mines](#)

Toronto — The Ontario government is expanding access to natural gas across the province to help keep the cost of energy low for families, businesses and farmers. Phase 2 of the Natural Gas Expansion Program will allocate more than \$234 million to support approximately 8750 connections in 43 rural, northern and Indigenous communities.

“Today we’re celebrating an important milestone in Ontario’s energy history with Phase 2 of the Natural Gas Expansion Program,” said Premier Doug Ford. “We’re making good on our promise to deliver affordable energy and expand natural gas pipelines to more communities, while at the same time improving economic development and creating thousands of new jobs.”

In addition to connecting thousands of residential customers across Ontario, Phase 2 will support economic development in the Hamilton and Niagara areas with expansion projects planned for Grimsby-Lincoln and the Hamilton Airport and surrounding areas. The projects are expected to create approximately 5000 jobs within these communities.

“We’re sending a clear message that Ontario is open for business,” said Bill Walker, Associate Minister of Energy. “As part of our government’s plan to make life more affordable, we prioritized broad distribution across Ontario to help as many homes and businesses keep the cost of energy low, support jobs and attract new investment. This will be a game-changer for these 43 communities.”

The average household could save between \$250 to \$1,500 per year in energy costs by switching to natural gas from costlier fuel sources. Businesses are expected to save up to 30 per cent on energy costs per year.

Construction for projects under Phase 2 will begin as soon as this year, with all 28 expansion projects expected to be underway by the end of 2025.

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## Quick Facts

- Phase 2 of the Natural Gas Expansion Program will allocate more than \$234 million to support 28 new natural gas expansion projects, which are expected to be underway by the end of 2025.
- Two expansion projects will directly benefit Indigenous communities, specifically the Red Rock First Nation and the Mohawks of the Bay of Quinte First Nation.
- Since its launch in 2019, Phase 1 of the Natural Gas Expansion Program has supported projects that are forecast to connect over 9,000 customers, in 16 communities, to natural gas.

- Phase 1 and 2 projects are funded through a \$1-per-month charge to existing natural gas customers.
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## Quotes

"Through Ontario's Natural Gas Expansion Program, these projects will bring much needed and wanted natural gas to additional communities while supporting jobs, helping to attract local investment, and providing energy savings to residents and businesses. We are thrilled that the Government of Ontario selected these projects and look forward to working together with the province and local municipalities to continue to bring natural gas to more Ontario homes and businesses."

**- Cynthia Hansen**

**Executive Vice President & President, Gas Distribution & Storage, Enbridge Inc.**

"EPCOR is looking forward to expanding our natural gas infrastructure and connecting neighbours to an affordable, reliable, convenient and clean source of energy. Under the province's Phase 2 expansion, more families, farms and businesses throughout rural Ontario will be able to access natural gas while generating economic development in the region."

**- Susannah Robinson**

**Vice President, Ontario Region, EPCOR**

"Natural gas is a reliable and affordable source of energy for households and businesses across the province, and it is currently the only resource with enough flexibility and capacity to meet peak demand periods year-round. We are pleased to see the Ontario government move forward with the expansion of natural gas to ensure businesses can continue operating throughout economic recovery and beyond."

**- Rocco Rossi**

**President and CEO, Ontario Chamber of Commerce**

"The OGVG is pleased to hear of the outcomes from the Natural Gas Expansion program and the efforts of the Ontario government, Ministers Walker and Rickford, and all staff at the Ministry of Energy, Northern Development and Mines, that will ensure increased accessibility for rural communities and potential greenhouse development."

**- Aaron Coristine**

**Manager of Science, Regulatory Affairs, Government Relations, Ontario Greenhouse Vegetable Growers**

"OFA is pleased to see the continuation of natural gas expansion to rural and remote communities across Ontario. Natural gas access is vital to farms and rural businesses, providing reliable, affordable energy options with the potential to drastically boost businesses opportunities by significantly lowering energy costs."

**- Peggy Brekveld**

**President, Ontario Federation of Agriculture**

number of growing companies burdensome and unnecessary reporting and paperwork. I propose setting a similarly higher threshold for oversight of mergers and acquisitions. That is, if a deal does not exceed 800 million rubles, it will not require the approval of antimonopoly authorities.

And, finally, my fifth point: measures to drive demand for the output of entrepreneurs across all sectors of the economy are especially relevant now. In this regard, I propose increasing the share of goods and services that our large companies, as well as state and municipal customers, must purchase from small and medium-sized enterprises, including non-profit organisations. It should be at least 25 percent.

We have held numerous discussions on this matter. I want to draw your attention right away to the fact that we are talking about companies that operate under Federal Law 223 and the companies that work with state and municipal authorities under Law 44.

I am aware there are many subtleties here. And I know well that Russian industry does not even make certain products. However, the bar must be set where I said, and the Government will finalise the finer points.

In addition, it is imperative to cut the time it takes to pay for delivered goods and services from 30 to 15 business days, which is also important. Small businesses and socially oriented NGOs must see this time go from 15 to seven days.

Of course, real companies, not all sorts of sham or affiliated operations, should benefit from these preferences. I want the oversight authorities to keep this in mind. At the same time, I am instructing the Government to make sure that procurement for state needs involves mainly Russian manufacturers, of course, in compliance with internal competition rules, in this case.

Ladies and gentlemen,

As I have said earlier, international cooperation must be instrumental in overcoming the socioeconomic consequences of the pandemic. It is all the more important for us to pool our efforts in the face of common, systemic, long-term challenges that do not depend on the situation in the market or political disputes and setups, but determine the future of entire societies in a decisive way.

What am I talking about now? What am I referring to? Primarily, the climate agenda. Scientists estimate that over 2 trillion tonnes of greenhouse gases have accumulated in the Earth's atmosphere because of human economic activity. Every year, the volume goes up by 50 billion tonnes, gradually warming up the planet.

I often hear that Russia is not that interested in resolving global environmental problems. I can say that this is nonsense, a myth, and sometimes outright distortion. Like other

countries, we feel the risks and threats in this area, including desertification, soil erosion and melting permafrost. Many of those here work in the Arctic and know that we have entire cities built on permafrost in the Arctic. If it all starts to thaw, what consequences will Russia face? Of course, we are concerned.

We are consistent supporters of the UN Framework Convention on Climate Change, the Kyoto Protocol, and the Paris Agreement. I must emphasise that there is no separate Russian, European, Asian, or American climate. All our countries bear a common responsibility for today's world and for the lives of future generations. We must set aside political and other differences and avoid turning the transition to "hydrocarbon neutrality" into an instrument of dishonest competition where attempts are made to change investment and trade flows in someone's specific interests under the pretext of the hydrocarbon footprint, and where limited access to advanced 'green' technology becomes a factor in deterring individual countries and manufacturers.

How do we see Russia's contribution to countering climate change? I am sure environmental and climate projects in our country will play a leading role in global efforts in climate conservation by virtue of Russia's size, place and role in the world. We have set a goal: in the next 30 years the accumulated amount of pure greenhouse emissions must be lower in Russia than in Europe. This is an ambitious goal, but I am confident that it is feasible. I would like to ask the Government to draft a detailed plan of action on this before October 1 of this year. We will discuss this issue at a separate meeting.

What are our areas of focus?

The first one includes projects designed to reduce emissions throughout the economy. I have already mentioned that the Russian energy sector is increasing its share of low-carbon sources primarily through building nuclear and hydroelectric power plants and using renewable sources of energy. We have the world's largest gas reserves, and while gas – we will probably discuss this later – is, of course, carbon, it is the purest kind of carbon, and we will be unable to do without it during the transition period. Incidentally, using its nuclear industry as the foundation, Russia is already creating infrastructure for the production of hydrogen to be used as a raw material, fuel and energy source in metallurgy, the production of cement, and transport, among other areas.

We will also keep reducing emissions from hydrocarbon production and utilising associated gas. By the way, we probably utilise more gas this way than any other oil-producing country. We will thoroughly modernise the thermal power industry and electrify gas transport infrastructure. We also plan to further improve energy

efficiency in the residential sector and heat supply systems, to switch public transport to natural gas, electric and hybrid engines, and to reduce material consumption in construction. In a word, we are talking about end-to-end technological retrofitting of our entire economy and infrastructure.

Clearly, such projects need market incentives in order to be launched successfully. To this end, we are starting to issue state-subsidised 'green bonds.' Also, we have developed performance criteria for environmental projects or a 'green taxonomy' in the parlance of experts.

Of course, reducing emissions is not enough to overcome the challenge of global warming. Greenhouse gas sequestration is essential if we want to achieve carbon neutrality. It is important to reduce existing levels of greenhouse gases in the atmosphere, and our main goal is to learn to capture, store, and make productive use of carbon dioxide coming from all sources.

Now, regarding a second area in this context: an entire industry, a fundamentally new market for so-called 'carbon units' is being created almost before our eyes. Many people, especially those in power production, are aware of this, but I will explain. This is the amount of harmful airborne emissions that can be absorbed by a section of land or forest. So, if you have done some additional work on your land to increase its ability to absorb the emissions in the air, you have created a number of carbon units. Many countries and associations are already planning to accept these units from exporters to offset the emissions from the production of imported goods.

Russia has enormous potential for emission absorption with its forests, tundra, agricultural lands and marshlands. Our country has a fifth of the world's forests; they occupy almost 10 million square kilometres. Specialists and scientists believe that they are already absorbing billions of tonnes of carbon dioxide equivalents every year.

I repeat, the importance of Russia's potential in natural compensation is enormous, simply huge in terms of the planet's climate sustainability. Clearly, by virtue of its natural advantages, Russia can maintain a special place in the global market for carbon units. To achieve this, we need to use the forests and lands more effectively and enhance their absorption capacity. We must increase reforestation areas, fight wildfires, and expand pristine nature reserves, sanctuaries and national parks. In effect, we are now doing all this and intend to continue to do this in the future while introducing new soil-recovery agro-technology.

Importantly, we can work towards three objectives at the same time. Firstly, by investing in technology, the protection of forestry and land improvement, we will enhance



the environmental wellbeing of our people, and the cities and territories they live in. Secondly, we will create jobs in the new high-tech industry of greenhouse emissions mitigation, and thirdly we will provide our exporters with an additional dimension for competitiveness in foreign markets.

This concerns many of you here in this hall. I would like you to see this as a direct message to Russian companies that are buying or starting to buy carbon units abroad or are planning to do this in the future. Instead, it is better to invest funds in climate projects in our country. Eventually, those who engage in this will receive many benefits, economic benefits. This effort will be more effective and oriented towards the future.

I would like to note that, based on our estimates, revenue from this new climate industry in the Russian market could soon surpass \$50 billion a year, which is another important figure. In a word, this is a good, beneficial destination for investment by both domestic and foreign companies. We invite our interested partners to take part in this work. We will create the necessary conditions for this.

I would like to discuss several issues that are of critical importance for climate projects in Russia. It is necessary to work through in detail the criteria underlying these projects, to determine the sites and areas that are best suited for launching them, and the kind of technologies to use.

It is also imperative to create a transparent and objective system for assessing the outcome of climate projects. This is a critical part of what I am saying now – that is, to identify the current absorbing capacity of the sites and what it will be after the project is implemented. Actually, it is about calculating the delta in the form of the “carbon units” that I just mentioned.

All the while, it is important to monitor the emission and absorption of greenhouse gases based, among other things, on observations from outer space, digital technologies, and AI methods.

The construction of such a national system that makes use of the potential of Russian science is already underway in Russia. We are creating a network of “carbon testing grounds” to monitor carbon dioxide emission and absorption in real time, as well as the state of environmental systems, the quality of water resources and other variables.

We are also creating a pilot carbon market in Sakhalin Region. This experiment will come as a step towards achieving carbon neutrality and creating a nationwide carbon unit market.

I am aware that a system of this kind is about to be launched in other countries as well. Here is another important matter, which concerns mutual recognition of greenhouse gas emission and sequestration. This requires a transparent climate statistics system, mutual understanding between states and, of course, joint scientific research. We are open to this cooperation.

I am instructing the Government, by July 2022, to fully form the regulatory framework for implementing climate projects in Russia at the level of federal laws and departmental bylaws and guidelines, so that businesses, domestic and international alike, can draw up and implement their plans in this area relying on clear and easy-to-follow rules and criteria.

Colleagues, let me close by saying again that, despite the challenges presented by the global pandemic, life is gradually returning to normal. To reiterate, our meeting in St Petersburg is a case in point. Next week, St Petersburg will be hosting matches of the 2021 UEFA European championship which is getting underway.

On this note, I would like to convey my greetings to our great friend, the Emir of Qatar. It was his birthday yesterday. Our best wishes to you, Your Highness. I am confident that Qatar will host the FIFA World Cup 2022 with great success.

Such major events and forums truly unite and bring people from different countries closer. Businesspeople, of which there are many here, are well aware that in-person contacts based on mutual trust move forward, in many respects, business projects and initiatives, and, therefore, the global economy.

Russia will do its best to create every opportunity for these contacts to take place, for sharing experience and demonstrating the latest achievements in science and technology.

Thank you for your patience and your time, and I wish the forum every success.

Thank you very much.

## How the Covid-19 pandemic affected liveability worldwide

Data for this survey was collected from February 22nd to March 21st 2021. Key findings include the following:

- The overall global average liveability score has fallen by seven points, as compared with the average pre-pandemic score. The extent to which cities were sheltered by strong border closures, their ability to handle the health crisis and the pace at which they rolled out vaccination campaigns drove significant changes in the rankings.
- Auckland, in New Zealand, is at the top of The Economist Intelligence Unit's Liveability rankings, owing to the city's ability to contain the coronavirus (Covid-19) pandemic faster and thus lift restrictions earlier, unlike others around the world.
- Six of the top ten cities in the March 2021 survey are in New Zealand or Australia, where tight border controls have allowed residents to live relatively normal lives.
- Many European and Canadian cities have fallen down the rankings, having battled a second Covid-19 wave by restricting cultural and sporting events, and closing schools and restaurants.
- The lower end of the rankings has seen less change, with the Syrian capital, Damascus, still the least liveable city in the world.
- Healthcare scores fell after the onset of the pandemic in most cities across the world, with the least-affected cities concentrated in western Europe and the Asia-Pacific region.

### Lockdowns affect the most liveable cities

The pandemic has caused huge volatility in our bi-annual Liveability index, which ranks 140 cities across five areas: stability, healthcare, education, culture and environment, and infrastructure. (For a full methodology, see page 6.) Data for this survey were gathered between February 22nd and March 21st 2021, when cities were at different stages of their battle with the pandemic.

The new leader is Auckland. Owing to border closures and a consequently low Covid-19 case count, New Zealand has been able to keep its theatres, restaurants and other cultural attractions open. Students have been able to continue going to school, giving Auckland a 100% score for education. This has allowed the city to move up from sixth place in our autumn 2020 survey to first position in our March 2021 rankings. The New Zealand capital, Wellington, has also gained from this relative freedom, moving from 15th to joint fourth place in our current rankings.

Japanese cities of Osaka and Tokyo ranked second and fourth, respectively, owing to continued high stability scores. In third place is Adelaide in Australia, which also imposed a ban on international travel. Three more Australian cities—Perth, Melbourne and Brisbane—appear in the top ten, with Sydney in 11th place. The Swiss cities of Zurich and Geneva also maintained their places in the top ten, despite some social restrictions still being in place.

## Ten of the most liveable cities in the world

City	Location	Rank	Index	Stability	Healthcare	Culture & Environment	Education	Infrastructure
Auckland	New Zealand	1	96.0	95	95.8	97.9	100.0	92.9
Osaka	Japan	2	94.2	100	100.0	83.1	91.7	96.4
Adelaide	Australia	3	94.0	95	100.0	83.8	100.0	96.4
Wellington	New Zealand	4	93.7	95	91.7	95.1	100.0	89.3
Tokyo	Japan	4	93.7	100	100.0	84.0	91.7	92.9
Perth	Australia	6	93.3	95	100.0	78.2	100.0	100.0
Zurich	Switzerland	7	92.8	95	100.0	85.9	83.3	96.4
Geneva	Switzerland	8	92.5	95	100.0	84.5	83.3	96.4
Melbourne	Australia	8	92.5	95	83.3	88.2	100.0	100.0
Brisbane	Australia	10	92.4	95	100.0	85.9	100.0	85.7

Source: The Economist Intelligence Unit

## European cities slump as US cities rise

Further down the rankings, the picture is grimmer, particularly in Europe. Vienna, capital of Austria, occupied the top spot throughout 2018-20 but has slipped down to 12th place for the current survey, following the second Covid-19 wave. In Germany, Frankfurt, Hamburg and Dusseldorf have seen the biggest falls in ranking of all our 140 cities. Canadian cities such as Montreal, Vancouver, Calgary and Toronto, which have previously scored highly, have also slipped. The downward movement in rankings for the European and Canadian cities can be attributed to the heightened stress on healthcare resources during the second wave of the pandemic.

However, several US cities, including Honolulu and Houston, the biggest gainers in the latest survey, have bounced up the rankings over the past six months as social restrictions have lifted.

## Conditions have not improved in the least liveable cities

While the top end of the liveability rankings is volatile, there are few changes at the bottom. As in previous surveys, living conditions remain worst in Damascus. Also scraping along the bottom are Lagos in Nigeria; Port Moresby, the capital of Papua New Guinea; and Dhaka, the capital of Bangladesh.

## Biggest movers up the ranking in the past six months

City	Location	Index	Rank	Rank move	Index move
Honolulu	US	90.6	14	46	14.2
Houston	US	84.0	31	31	7.8
Madrid	Spain	86.8	19	25	5.5
Miami	US	84.3	28	24	5.6
Barcelona	Spain	88.3	16	22	5.5
Pittsburgh	US	85.3	25	22	5.4
Chicago	US	84.3	28	21	5.1
Minneapolis	US	83.4	36	19	5.6
Boston	US	83.8	34	18	5.1
Melbourne	Australia	92.5	8	16	5.0

Source: The Economist Intelligence Unit

## Biggest movers down the ranking in the past six months

City	Location	Index	Rank	Rank move	Index move
Hamburg	Germany	81.9	47	-34	-8.5
Frankfurt	Germany	82.8	39	-29	-8.5
Dusseldorf	Germany	80.2	50	-28	-8.3
Prague	Czech Rep	71.2	72	-27	-9.6
Dublin	Ireland	80.1	51	-22	-6.4
Rome	Italy	77.3	57	-21	-6.5
Nouméa	New Caledonia	73.0	67	-20	-6.9
Bratislava	Slovakia	69.3	77	-20	-8.0
Athens	Greece	62.9	92	-20	-9.1
Montreal	Canada	82.7	40	-19	-6.0

Source: The Economist Intelligence Unit

These continue to score poorly across the five categories. A consistently low stability score, owing to ongoing civil unrest and military conflicts, is the reason behind most of these cities featuring in the bottom ten. However, conditions have deteriorated even further as a result of Covid-19—particularly for healthcare.

## Healthcare scores have fallen sharply

Unsurprisingly, the healthcare scores in our rankings were affected badly by the pandemic. Compared with six months ago, the average city score for healthcare has dropped by nearly five points.

Healthcare conditions have worsened markedly in Prague (Czech Republic), Athens (Greece) and Jakarta (Indonesia), where the Covid-19 case count was rising at the time of the survey. This added stress on the healthcare sector, making it more difficult to get a hospital bed and access to quality healthcare services.

## Ten of the least liveable cities in the world

City	Location	Rank	Index	Stability	Healthcare	Culture & Environment	Education	Infrastructure
Caracas	Venezuela	131	41.7	35	25.0	45.6	58.3	53.6
Douala	Cameroon	132	38.6	60	12.5	40.3	25.0	42.9
Harare	Zimbabwe	133	36.6	40	12.5	44.4	58.3	35.7
Karachi	Pakistan	134	36.2	20	33.3	33.3	58.3	51.8
Tripoli	Libya	135	34.2	30	29.2	33.8	41.7	41.1
Algiers	Algeria	136	34.1	35	29.2	37.3	41.7	30.4
Dhaka	Bangladesh	137	33.5	55	16.7	30.8	33.3	26.8
Port Moresby	PNG	138	32.5	30	16.7	36.1	33.3	46.4
Lagos	Nigeria	139	31.2	20	20.8	41.0	25.0	46.4
Damascus	Syria	140	26.5	20	16.7	36.8	25.0	32.1

Source: The Economist Intelligence Unit

By contrast, the US city of Honolulu witnessed a rise in its healthcare score of 33 points compared with the previous survey. Over half of Hawaii's residents have now received at least one dose of a vaccine. Positivity rates have also reduced, thereby imposing a much lower stress on the city's healthcare infrastructure. The Spanish cities of Barcelona and Madrid (capital) gained nearly 25 points for healthcare, as they coped better in terms of the stress on their healthcare systems compared with the previous wave of Covid-19.

In the latest survey, we introduce new metrics scoring cities on their responses to Covid-19, as well as access to healthcare and the quality of care received. The subscription version of the liveability rankings also contains some additional scores on Covid-19 vaccination rates, case rates and death rates.

## Culture and environment have been affected

Since the pandemic started, curbs on public gatherings have also had a major impact on scores under the culture and environment category. The average score for this category fell by 14 points compared with the autumn 2019 survey.

Some of the social and cultural restrictions have been lifted since September 2020 in some parts of the world. New Zealand and Australian cities have benefited the most from this trend, as have cities in the US and China. When, in March 2021, Texas became one of the first US states to lift restrictions on public spaces, Houston became the only US city to enter our top ten for culture and environment conditions. European cities such as Copenhagen, Zurich and Geneva also feature among the top ten, having eased restrictions on outdoor gatherings.

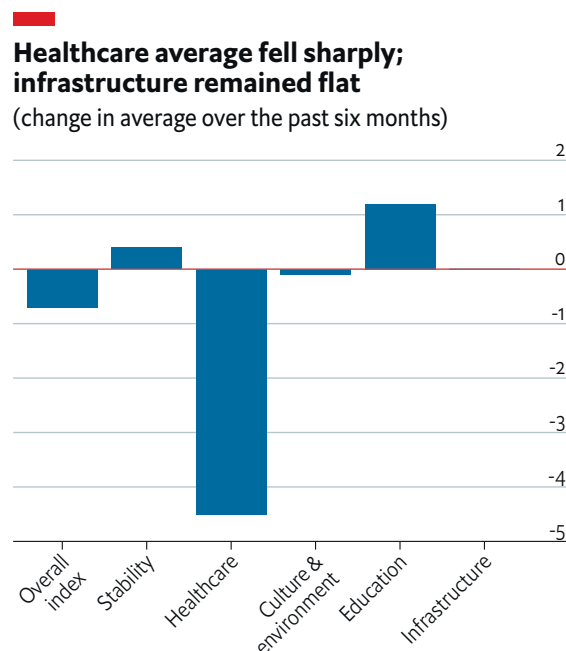
## Little change in other categories

Stability, education and infrastructure have seen little change in their overall scores from six months ago; education is still lagging behind its pre-pandemic scores. Australia and New Zealand now

dominate the top of the education rankings.

Elsewhere, however, there are still intermittent school closures in many cities, forcing pupils to rely on online learning. Infrastructure, including transport, has been protected in many geographies by public funding.

Stability scores, meanwhile, have deteriorated in some Middle-Eastern locations since before the pandemic, but generally remain stable. Across the world, there have been protests over issues such as civil liberties, racism, legislation and living standards over the past six months. In many cities, increased government subsidies and restrictions on public gatherings have reduced visible social unrest.



Source: The Economist Intelligence Unit.



### **Covid-19 will continue to affect city liveability**

Vaccination campaigns are now under way, at varying levels of efficiency, across the world. So, what changes should we expect in our next survey? Conditions in the poorest cities are likely to deteriorate further, should cities fail to get the vaccines they need to prevent the spread of new Covid-19 variants. Weak healthcare systems could come under greater strain, as they have in India. A slower inoculation drive would result in a more strict lockdown, thereby affecting the expected recovery in economic growth. This, in turn, could affect other categories, including stability.

The pace of recovery of liveability in most regions will be determined by how effectively the health risks of the pandemic can be controlled, through a combination of vaccination, testing, tracing and quarantine measures. Barring huge setbacks, such as the emergence of vaccine-resistant variants, scores for culture and environment should improve. Schools should begin to return to normality. However, healthcare systems will remain under pressure as they attempt to catch up with a backlog of non-Covid care cases. Moreover, what residents value in their cities may also have changed, with green spaces becoming more popular and public transport less so than before the pandemic.

<https://calgaryherald.com/news/local-news/housing-prices-rising-time-on-market-shrinking-as-canmores-property-market-heats-up>

## Housing prices rising, time on market shrinking as Canmore's property market heats up

Author of the article:

**Dylan Short**

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Spring Creek Mountain Village in Canmore. PHOTO BY FILE, KRISTIAN BOGNER /For Postmedia

Canmore's housing market is experiencing a spike in prices, with one Realtor attributing much of it to a COVID state of mind.

A report from Re/Max looking into recreational property prices across Canada shows the average price of non-waterfront properties in the community west of Calgary have increased by 26 per cent between 2019 and 2021, up to an average of \$1,360,594 from \$1,082,930. The report predicts a 20 per cent increase on such locations throughout the rest of the calendar year.

Meanwhile, Canmore condos have seen an eight per cent increase over the same three-year period with a predicted 15 per cent jump for the rest of 2021.

Karen Fawcett, a Realtor who works in the community, says a big factor in that jump has been COVID-19. She said people living in larger Canadian cities such as Calgary have decided they no longer want to live in large urban centres as life continues to operate heavily online.

"People are now taking advantage of the fact that they don't have to go to work five days a week, and going forward, that may be more of the norm," said Fawcett. "That makes Canmore incredibly attractive."

While the market is hot in Canmore, it is not a unique situation. The recreational property Re/Max report shows Whistler, B.C., a mountain town outside of Vancouver with a similar population to Canmore, has seen a 29 per cent price increase since 2019 for chalets and a 34 per cent increase in duplexes and townhouses.

Waterfront recreational properties in B.C.'s central Okanagan region have seen a 25 per cent increase with an expected four per cent increase for the remainder of the year.

Back in Canmore, Fawcett said other factors influencing the market are a low number of homes being on the market, currently 88 properties listed, and low interest rates. She said that in the Alberta mountain town, homes are continuing to sell at a rapid pace despite the increased cost.

Fawcett noted the average amount of time a home listed between \$1 million and \$2.5 million in May 2020 was 53 days. By May 2021, that time frame shrank to 16 days.

"In the last 30 days, in the last month, in Canmore there have been 75 homes sold," said Fawcett on Saturday. "I mean it's unbelievable, really, what's going on in Canmore right now."

She said there was a home in the town that sold in one day for over \$1-million after a bidding war took place. She noted that the fast turnaround time meant it was sold without conditions.

Moving forward, Fawcett said it will be interesting to see how the market reacts as COVID-19 restrictions loosen and people want to attend festivals and sporting events that are only available in larger centres. She also noted there continues to be international interest in the market which could see a further boom as borders reopen.

[dshort@postmedia.com](mailto:dshort@postmedia.com)

SAF --- Dan Tsubouchi @Energy\_Tidbits - 16h  
 Does STOU also believe #LNGCanada brownfield Phase 2 is likely to FID? New slide, an incremental ~4 bcf/d LNG Canada is envisaged. Hmmm! Phase 1 FID is 2 trains for 1.64 bcf/d. Brownfield Phase 2 would add 2 more trains i.e. total 3.68 bcf/d. #LNG see below SAF Apr 28 blog



SAF --- Dan Tsubouchi @Energy\_Tidbits - Apr 28  
 New blog was just posted to our SAF Group website. Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2? #LNG #NatGas #AECO #OOTT

4 2 15

SAF --- Dan Tsubouchi @Energy\_Tidbits - Jun 12  
 Breaking. #Oil demand surge is now happening. @TSA screened >2 mm passengers for 1st time since March 2020. Still 26% lower vs 2019, but 1.5 mm more than 2020. Reinforces key oil theme supporting >\$70 price - the demand surge is now happening. #OOTT

tsa.gov/news/press/rel...  
 8 10 77

SAF --- Dan Tsubouchi @Energy\_Tidbits - Jun 12  
 #Toyota aims for #CarbonNeutral factories by 2035. Reminds all industries to use #RenewableEnergy or #Hydrogen for power everywhere they can. Also big capital allocation to #CO2Credits or #CarbonOffsets, and also to "etc.". Everything will cost more under #EnergyTransition



5

**SAF** Dan Tsubouchi @Energy\_Tidbits - Jun 12  
 amazing morning sky in [#Cammore](#) in cdn rockies. first over the Bow River looking toward Calgary and then over the town and finally towards Banff. with decent temp of 18c high, lots of visitors and good for local restaurants who reopened indoor dining on thurs



0:11 405 views

1 17

**SAF** Dan Tsubouchi @Energy\_Tidbits - Jun 11  
 Some final/formal US concession coming soon that won't stand in way of 5.3 bcf/d [#NordStream2](#). Can't see any way [#Merkel](#) would commit to visit [#Biden](#) on July 15 without this concession. Negative to 2022 Europe [#NatGas](#) prices and US [#LNG](#) exports to NW EU [whitehouse.gov/briefing-room/](https://www.whitehouse.gov/briefing-room/)



1 17

**SAF** Dan Tsubouchi @Energy\_Tidbits - Jun 11  
[#OIL](#) demand surge now happening supports prices. Big QoQ growth in [#EIA](#) [#DMR](#) w/ Q2 +1.6 mmb/d, Q3 +3.1 mmb/d, Q4 +1.3 mmb/d. IEA 1st look at 2022 demand is just so slightly below 2019 levels, Hmmm! Thx [@ksiedenburg@bloomberg.net](https://twitter.com/ksiedenburg) for table! [#OOTT](#)

**EIA DMR - Comparison of the Oil Market Report Forecasts by Month**  
 (in Estimated Bbl/d) (M) (Billion Barrels per Day)

Month	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Jan 21	96.7	91.2	97.7	92.2	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
Feb 21	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
Mar 21	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
Apr 21	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
May 21	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
Jun 21	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
Jul 21	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
Aug 21	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
Sep 21	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
Oct 21	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
Nov 21	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
Dec 21	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
Jan 22	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
Feb 22	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
Mar 22	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
Apr 22	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
May 22	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
Jun 22	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
Jul 22	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
Aug 22	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
Sep 22	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
Oct 22	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
Nov 22	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2
Dec 22	96.7	91.0	97.7	92.1	92.9	92.2	92.7	92.4	92.2	92.4	92.2	92.2	92.2	92.2

Source: EIA, Bloomberg, updated Jan 11, 2022

1 1 5

**SAF** — **Dan Tsubouchi** @Energy\_Tidbits - Jun 10 ...

#G7 leaders will be repeating the May 21 #G7 policymakers 30-pg communique of big new commitments on #EnergyTransition, emissions, reducing #oilfuels etc. Details in SAF Group May 23 Energy Tidbits memo. #NatGas #OOTT

[safgroup.ca/insights/trend...](https://safgroup.ca/insights/trend...)

— **Dan Tsubouchi** @Energy\_Tidbits - May 23

Our weekly SAF May 23, 2021 Energy Tidbits memo was just posted to our SAF Group website. This 43-pg energy research piece expands upon and covers many more items than tweeted this week. See the research section of the SAF website. #OEI #OOTT #OPEC #LNG

[safgroup.ca/insights/trend...](https://safgroup.ca/insights/trend...)

## Energy Tidbits

May 23, 2021

Presented by Dan Tsubouchi

### G7 Policymakers Make New Commitments On Energy Transition ie. Future Emissions Laws/Regulations That Are Coming

Welcome to new Energy Tidbits memo readers. We are continuing to add new readers to our Energy Tidbits memos, energy blogs and tweets. The focus and content for the memos was set in 1998 with input from PIBs, who were looking for research (both positive and negative items) that helped them shape their investment thesis in the energy space, and not just focusing on daily trading. Our priority was and still is to not just report on events, but able to integrate and point out implications therefrom. The best example is our version of investor days, conferences and earnings calls focusing on sector developments that are relevant to the sector and not just a specific company results. Our target is to write an 40 to 50 weekends per year and to post by noon mountain time on Sundays.

This week's memo highlights:

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**SAF** — **Dan Tsubouchi** @Energy\_Tidbits - Jun 10 ...

#Oil demand surge now starting. #OPEC MCOMR June: Q2/21 +1.50 mmb/d QoQ, Q3/21 up huge +3.11 mmb/d QoQ, and Q4/21 +1.84 mmb/d QoQ. Demand surge happening just as oil inventories only slightly above 2015-2019 levels. Kudos to Saudi Energy Minister Abdulaziz. #OOTT

OPEC Monthly Oil Market Report - June 2021

World Oil Demand

Table 1 - 2. World oil demand in 2021\* (mmb)

World oil demand	2020	1Q21	2Q21	3Q21	4Q21	2021	Change 2021/20	%
Americas	22.24	22.21	24.58	24.74	24.76	24.23	1.99	8.94
of which US	18.24	18.18	19.98	20.22	20.19	19.68	1.44	7.89
Europe	12.42	11.88	12.59	12.91	12.71	12.02	0.60	4.83
Asia Pacific	9.07	7.91	7.58	7.17	7.61	7.07	0.06	0.66
<b>Total OPEC</b>	<b>43.73</b>	<b>42.87</b>	<b>44.75</b>	<b>44.82</b>	<b>44.87</b>	<b>44.71</b>	<b>0.98</b>	<b>2.24</b>
China	12.18	12.36	14.21	14.33	13.80	14.41	2.23	18.27
India	4.31	4.84	4.22	4.40	3.91	3.99	0.68	15.76
Other Asia	2.13	2.34	2.96	3.37	3.59	3.52	1.39	64.80
Latin America	0.21	0.16	0.10	0.08	0.09	0.20	0.09	42.86
Middle East	7.54	7.82	7.67	8.20	7.97	7.88	0.34	4.51
Africa	0.88	0.90	0.80	0.78	0.48	0.74	0.06	6.82
Russia	5.57	5.57	5.33	5.57	5.74	5.66	0.09	1.61
Other Europe	1.07	1.18	1.30	1.14	1.09	1.20	0.13	11.60
Other Europe	0.44	0.41	0.40	0.40	0.34	0.44	0.00	0.00

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**SAF** **Dan Tsubouchi** @Energy\_Tidbits · Jun 10  
didn't say it but assume this new home grown iran destroyer to try to stop US from seizing any more tankers enroute to venezuela ie shouldn't see @EIAgov won't be reporting any more "imports" from iran. #OOTT



VIDEO: Homegrown 'Sahand' destroyer in Atlantic Ocean  
TEHRAN, Jun. 10 (MNA) – The 1,300-ton vessel named 'Sahand' after a mountain in northern Iran, is the country's most advanced homemade ...  
[@en.mehmews.com](https://en.mehmews.com)

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**SAF** **Dan Tsubouchi** @Energy\_Tidbits · Jun 10  
"Oil demand should remain robust up to 2025". #Equinor Energy Perspectives 2021. But >2025, big range of outlooks: Rebalance = big decline >2025. Reform = peak late 2020s. Rivalry = flattened by 2050. Oil demise will take longer #EnergyTransition #OOTT  
[equinor.com/en/sustainabil...](https://equinor.com/en/sustainability)



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**SAF** **Dan Tsubouchi** @Energy\_Tidbits · Jun 9 \*\*\*  
 3/3. Positive for #Oil if there is any lesser growth potential for Exxon in #Permian. #Exxon has been messaging its big #Permian growth potential. With its 2020 capex cuts, it lowered its mid term growth target from 1 mmbbl/d to 0.7 mmbbl/d by 2025. #OOTT



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**SAF** **Dan Tsubouchi** @Energy\_Tidbits · Jun 9 \*\*\*  
 2/3. @leefa\_institute brings back reminder of @WSJ @cmatthews9 @EmilyGlazer Jan 15 report "Exxon Draws SEC Probe Over Permian Basin Asset Valuation" on "whistleblower complaint last fall alleging" Exxon "overvalued" its Permian ... #OOTT



WSJ News Exclusive | Exxon Draws SEC Probe Over Permian Basin Asse...  
 A whistleblower complaint alleges that lower-level employees were pressured to use unrealistic assumptions on how quickly the company ...  
[wsj.com](https://www.wsj.com)

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SAF

**Dan Tsubouchi** @Energy\_Tidbits · Jun 9  
1/3. Positive for #Oil? @ieefa\_institute report title says it all "ExxonMobil: Permian Leader or Just Another Fracker? Analysis of Permian Oil Production Raises Troubling Questions About ExxonMobil's Investor Disclosures" ... #ODTT

**IEEFA.org** @ieefa\_institute · Jun 9  
Is #ExxonMobil a Permian leader or just another fracker? The supermajor touts success but achieves mixed results—and data suggests that \$XOM is underperforming in the #PermianBasin. #oott ow.ly/GWN850F65Zb

**Exxon's U.S. Oil-Producing Assets Not World Class**  
Big U.S. bet loses money; Permian wells' output has slowed

The figure consists of two charts. The left chart is a line graph showing 'Upstream U.S. cumulative capex' (orange line) and 'Cumulative earnings' (green line) from 2013 to 2021. The y-axis ranges from -\$10 billion to +\$60 billion. Capex shows a steady upward trend, while earnings fluctuate and end at a negative value in 2021. The right chart is a bar graph titled '1st-year well production, Delaware Basin' showing production in barrels per day for 2018 and 2019. The y-axis ranges from 0 to 700 barrels per day. Production was approximately 650 barrels per day in 2018 and decreased to approximately 450 barrels per day in 2019.

Source: ExxonMobil; IEEFA analysis of EIMS Market data. IEEFA

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**Dan Tsubouchi** @Energy\_Tidbits · Jun 9  
fly fishing in the #Calgary Elbow River. he has been fishing in this spot for the past 15 min or so. nothing yet.



0:09 283 views

**SAF** — **Dan Tsubouchi** @Energy\_Tidbits · Jun 9

For those not near their laptop, EIA weekly #OE #Gasoline #Distillates inventory data for week ended June 4 is out. #OOTT  
[eia.gov/wpsr/overview](https://www.eia.gov/wpsr/overview)

**Oil Products Inventory June 4: EIA, Bloomberg Survey Expectations, API**  
 (million barrels)

	EIA	Expectations	API
Oil	-5.34	-3.50	-2.11
Gasoline	7.05	1.20	2.41
Distillates	4.41	1.80	3.75
	6.22	-0.50	4.05

Note: In addition, SPR draw of 1.3 mmb for June 4 week  
 Note: Cushing had a build of 0.185 mmb build for June 4 week  
 Source: EIA, Bloomberg  
 Prepared by SAF Group

**SAF** — **Dan Tsubouchi** @Energy\_Tidbits · Jun 9

India's natural gas consumption has returned to its normal level in the last week. @EconomicTimes on comments by @gailindia Chairman Manoj Jain. Reminder India has not been able to grow its #NatGas production so increased consumption = more #LNG imports.



India's natural gas consumption starts to rebound in June  
 one "In the Indian market there was some slowdown, but the situation is not as bad as last year," Manoj Jain, chairman of GAIL (India), the ...  
 @economictimes.indiatimes.com

**SAF** — **Dan Tsubouchi** @Energy\_Tidbits · Jun 9

4/4. #Shell expects to appeal, but is moving to comply on a huge acceleration on a well thought out plan. His warning "bold steps" seems like an understatement just like saying #EnergyTransition is going to be very bumpy. Still think demise of #Oil #NatGas isn't quick. #OOTT

2 1 8

[Show this thread](#)

**SAF** — **Dan Tsubouchi** @Energy\_Tidbits · Jun 9 ...  
 3/4. how else can they catch up but sell more #Oil assets? but need upstream cash flow. #Shell CEO says "need this financial strength" to invest in lower-carbon energy, etc. upstream IRR 20-25% vs top wind project 7%... #NatGas #OOTT



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**SAF** — **Dan Tsubouchi** @Energy\_Tidbits · Jun 9 ...  
 2/4. Its not just the 45% cut, its vs what baseline. Dutch court is vs 2019. See below #Shell's big Apr 15 energy transition strategy was cutting vs "2016 baseline" had benefit of 2017 #OilSands sales, so lose benefit of early emissions reductions moves... #NatGas #Oil #OOTT

#Oil makes immediate reductions to emissions. #RDSA provides detailed carbon intensity reduction targets to measured vs baseline of 2016. Shell sold its Cdn #OilSands to #CNQ in 2017. #OOTT #EnergyTransition

The screenshot shows a presentation slide titled "OUR ENERGY TRANSITION STRATEGY". Below the title, it states "OUR GOAL is to become a NET-ZERO ENERGY BUSINESS BY 2050". The slide also features a globe icon and a circular arrow icon.

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**SAP** — **Dan Tsubouchi** @Energy\_Tidbits · Jun 9  
1/4. Big news. #Shell expects to appeal but concedes to move on Dutch ruling to reduce net carbon emissions by 45% by 2030 v 2019 on worldwide basis. huge cuts needed. means "taking some bold but measured steps over the coming years"... #NatGas #OOTT

[linkedin.com/pulse/spint-s...](https://www.linkedin.com/pulse/spint-s...)



2 5 9

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**SAP** — **Dan Tsubouchi** @Energy\_Tidbits · Jun 8  
Reminder to US/CAN #Oil #NatGas co's. Re: shareholders wanting more from #Exxon, @WoodsideEnergy CEO "These are signals that the US producers should have seen coming from what's been happening to our European counterparts". Thx @angelamacid for reporting. #OOTT

2 8

**SAP** — **Dan Tsubouchi** @Energy\_Tidbits · Jun 8  
sorry for typo. meant Total Mozambique. Not Shell Coral. apologies.

— **Dan Tsubouchi** @Energy\_Tidbits · Jun 8  
Bigger #LNG supply gap being created >2025. Papua #LNG originally expected FID in 2020 so 1st LNG is 2 years delayed. Common theme - new LNG supply is being delayed ie. Shell Mozambique. Don't forget need capacity>demand due to normal maintenance, etc. Positive for LNG. [twitter.com/Energy\\_Tidbits...](https://twitter.com/Energy_Tidbits...)

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**SAP** — **Dan Tsubouchi** @Energy\_Tidbits · Jun 8

Bigger #LNG supply gap being created >2025. Papua #LNG originally expected FID in 2020 so 1st LNG is 2 years delayed. Common theme - new LNG supply is being delayed ie. Shell Mozambique. Don't forget need capacity>demand due to normal maintenance, etc. Positive for LNG.

— **Dan Tsubouchi** @Energy\_Tidbits · Jun 8

Timing update Papua #LNG project. \$OSH June 8 update "2022 FEED, 2023 FID targeting 2027 first gas". \$TOT May 5 update didn't forecast 1st gas date. Papua is 2 trains w/ total capacity 0.74 bcf/d.

**Priorities for 2021**  
Ensuring a clear set of priorities in 2021

Enhance the system and improve the cost performance	Operations	• Continue to improve operations
Progress growth projects	Plan	• Complete the business case for the new LNG train
Reduce the overall system risk	Planning	• Complete the business case for the new LNG train
Continue operations for the future	Maintenance	• Complete the business case for the new LNG train

1 2 3

**SAP** — **Dan Tsubouchi** @Energy\_Tidbits · Jun 8

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1 2

**SAF** — **Dan Tsubouchi** @Energy\_Tidbits · Jun 7

#LNG reminder from @BloombergNEF @ubkirkohag1205 LNG supply/demand outlook. Europe storage is the key indicator for LNG market strength ie. are surplus cargos going there? SAF Sept 20/17 blog laid out #Shell's concept on why focus on NW Europe storage.

The screenshot shows a tweet with a bar chart and a text excerpt. The bar chart has a y-axis labeled 'Mtpa' and an x-axis with years from 2014 to 2017. The bars show an increasing trend. The text excerpt is titled 'Shell: More LNG Cargos, Not Quite Definitely So, Pointing to The Road Has Been Paved Another Case & Shell's Perspective' and discusses LNG supply and demand outlook, mentioning Europe storage as a key indicator for LNG market strength.

**SAF** — **Dan Tsubouchi** @Energy\_Tidbits · Jun 7

Here's how Saudi has corrected #Oil - real time demand/supply data, monthly #OPEC+ meetings, members paying back over produce. On today's @gulf\_intel podcast at 4:15 min @MatrixGlobalNRG CEO reiterates concept he said on May 5. The @sean\_everst #OCTT

[soundcloud.com/ussm-846530307...](https://soundcloud.com/ussm-846530307...)

— **Dan Tsubouchi** @Energy\_Tidbits · May 5

Kudos @MoEnergy\_Saudi #Abdulaziz for set up #OPEC+ monthly meet & pay back overproduced bbl. Real time supply data let them adjust monthly & its working. The @gulf\_intel @MatrixGlobalNRG CEO reminder on @Kpler tanker is key data. @horicuttall been hammering Kpler value add #OOTT

SAF created transcript of excerpt from Gulf Intelligence New Silk Road Podcast May 5, 2021. <https://soundcloud.com/ussm-846530307/sets/may-5>

Here is "Boris" are SAF created (1/20/21)

Richard Beringer, CEO Matrix Global Holdings, at 6:15am mark. "Never in history have we had a positive time where OPEC controls supply in real time, ever. Up till they did through the last time to a \$115 they controlled it. But now, they are not only controlling supply, they're controlling supply relative to demand. And no time in history, again James (refer to, for his history as well), has a market ever had demand fall year over year and a market made in bad words. So I would argue what we are going to see going forward, maybe we can come back four years from now and see what this chart looks like. I would argue that the range we come out of here in 2015, 2018 is going to look like that for the next 4 to 5 years. and if you go back to the volatility chart, its going to trend lower. and all of these different pieces are coming together, information, calculating demand in real time, adjusting supply in real time, we going to end to a market that might just kind of look like the post".

At 7:48 min mark, Question: "the sustainability of the OPEC ability to manage the supply in real time as you well A, that is ultimately, A, what is pressing up the market and, B, I supposed the surprise. I might take a little bit of challenge on the historical reference in the sense that in 1999 when prices went down to \$10 under \$20 a barrel, OPEC did meet, already went into a similar kind of attempt at that real time

**SAF** Dan Tsubouchi @Energy\_Tidbits - Jun 6  
 first sighting of the 2021 goslings. always great to see the new one and share the #Calgary Elbow River with those who were here before us.



1 8

**SAF** Dan Tsubouchi @Energy\_Tidbits - Jun 6  
 ICYMI \$BLK #LarryFink on #EnergyTransition "we're going to have much higher inflation because we do not have the technology to do all this". #EnergyTransition will take longer and cost more, also demise of #Oil #NatGas won't be as fast as expected #OOTT safgroup.ca/insights/trend...

significant asset, or major pieces of the assets, involved in an energy transition by the ICA last week. The ICA also noted the progress of each of the major pieces and the overall conclusion is that the vast majority of the pieces are behind or well behind where they should be to meet a smooth timely energy transition. It is important to note that these are just what the ICA calls the "critical energy technological" and does not get into the wide range of other considerations needed to support the energy transition. The ICA details these "critical energy technologies" into major groupings and then ranked the progress of each of these pieces in its report "Tracking Clean Energy Progress" 2,000 by or track, more efforts needed, or not on track". Our Supplemental Document package includes our SAF Group June 11, 2021/24.

Figure 20: ICA's Progress Ranking for "Critical Energy Technologies" for Clean Energy Transition

Category	Item	Progress
Energy Storage	Batteries	Not on track
	Hydrogen	Not on track
	Power-to-gas	Not on track
	Other	Not on track
Renewable Energy	Solar	Not on track
	Wind	Not on track
	Geothermal	Not on track
	Other	Not on track
Nuclear	Small modular reactors	Not on track
	Advanced reactors	Not on track
	Generation IV	Not on track
	Other	Not on track
Carbon Capture	Pre-combustion	Not on track
	Post-combustion	Not on track
	Oxy-fuel	Not on track
	Other	Not on track
Other	Smart grids	Not on track
	Energy efficiency	Not on track
	Energy storage	Not on track
	Other	Not on track

Source: ICA Tracking Clean Energy Progress, June 2021

1 11 10

**SAF** Dan Tsubouchi @Energy\_Tidbits - Jun 6  
 Our weekly SAF June 6, 2021 Energy Tidbits memo was just posted to our SAF Group website. This 40-pg energy research piece expands upon and covers many more items than tweeted this week. See the research section of the SAF website. #O1 #OOTT #OPEC #ING safgroup.ca/insights/trend...

### Energy Tidbits

June 6, 2021

Presented by Dan Tsubouchi

**Oil: Oil Stocks Back to 2019 Levels Means "All The Spare Capacity Will Sit With Those Who Want To Control The Price"**

Welcome to new Energy Tidbits memo readers. We are continuing to add new features to our Energy Tidbits memo, energy blogs and tweets. The basic and concept for the memo was set in 1990 with input from PMs, who were looking for research both positive and negative factors that helped them shape their investment thesis in the energy market, and not just focusing on daily trading. Our primary aim and still is to not just report on events, but also try to interpret and point out implications therefrom. The best example is our review of 10-year days, milestones and openings with focusing on sector developments that are relevant to the sector and not just a specific company results. Our target is to write on 40 to 60 memos per year and to post by noon mountain time on Thursday.

This week's memo highlights:

- Oil: Oil stocks back to 2019 levels in 2021, which means "all the spare capacity will sit with those who want to control the price" [\[Link Here\]](#)

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