Global liquid fuels

- EIA expects global petroleum and liquid fuels demand will average 100.3 million barrels per day (b/d) in the first quarter of 2020. This demand level is 0.9 million b/d less than forecast in the January STEO and reflects both the effects of the coronavirus and warmer-than-normal January temperatures across much of the northern hemisphere. EIA now expects global petroleum and liquid fuels demand will rise by 1.0 million b/d in 2020, which is lower than the forecast increase in the January STEO of 1.3 million b/d in 2020, and by 1.5 million b/d in 2021.

- EIA’s global petroleum and liquid fuels supply forecast assumes that the Organization of the Petroleum Exporting Countries (OPEC) will reduce crude oil production by 0.5 million b/d from March through May because of lower expected global oil demand in early 2020. This OPEC reduction is in addition to the cuts announced at the group’s December 2019 meeting. EIA now forecasts OPEC crude oil production will average 28.9 million b/d in 2020, which is 0.3 million less than forecast in the January STEO. In addition to these production cuts, EIA’s lower forecast OPEC production reflects ongoing crude oil production outages in Libya during the first quarter. In general, EIA assumes that OPEC will limit production through all of 2020 and 2021 to target relatively balanced global oil markets.

- Global liquid fuels inventories fell by roughly 0.1 million b/d in 2019, and EIA expects they will grow by 0.2 million b/d in 2020. Although EIA expects inventories to rise overall in 2020, EIA forecasts inventories will build by 0.6 million b/d in the first half of the year because of slow oil demand growth and strong non-OPEC oil supply growth. Firmer demand growth as the global economy strengthens and slower supply growth later in the year contribute to forecast inventory draws of 0.1 million b/d in the second half of 2020. EIA expects global liquid fuels inventories will decline by 0.2 million b/d in 2021.

- Brent crude oil spot prices averaged $64 per barrel (b) in January, down $4/b from December. Brent prices fell steadily through January and into the first week of February, closing at less than $54/b on February 4, the lowest price since December 2018, reflecting market concerns about oil demand. EIA forecasts Brent prices will average $61/b in 2020; with prices averaging $58/b during the first half of the year and $64/b
during the second half of the year. EIA forecasts the average Brent prices will rise to an average of $68/b in 2021.

- EIA forecasts U.S. crude oil production will average 13.2 million b/d in 2020, up 1.0 million b/d from 2019, and then rise to 13.6 million b/d in 2021. Most of the production growth in the forecast occurs in the Permian region of Texas and New Mexico.

**Natural gas**

- In January, the Henry Hub natural gas spot price averaged $2.02 per million British thermal units (MMBtu), as warm weather contributed to below-average inventory withdrawals and put downward pressure on natural gas prices. As of February 6, the Henry Hub spot price had fallen to $1.86/MMBtu, and EIA expects prices will remain below $2.00/MMBtu in February and March. EIA forecasts that prices will rise in the second quarter of 2020, as U.S. natural gas production declines and natural gas use for power generation increases the demand for gas. EIA expects prices to average $2.36/MMBtu in the third quarter of 2020. EIA forecasts that Henry Hub natural gas spot prices will average $2.21/MMBtu in 2020. EIA expects that natural gas prices will then increase in 2021, reaching an annual average of $2.53/MMBtu.

- U.S. dry natural gas production set a record in 2019, averaging 92.1 billion cubic feet per day (Bcf/d). Although EIA forecasts dry natural gas production will average 94.2 Bcf/d in 2020, a 2% increase from 2019, EIA expects monthly production to generally decline through 2020, falling from an estimated 95.4 Bcf/d in January to 92.5 Bcf/d in December. The falling production mostly occurs in the Appalachian and Permian regions. In the Appalachia region, low natural gas prices are discouraging natural gas-directed drilling, and in the Permian, low oil prices are expected to reduce associated gas output from oil-directed wells. In 2021, EIA forecasts dry natural gas production to stabilize near December 2020 levels at an annual average of 92.6 Bcf/d, a 2% decline from 2020, which would be the first decline in annual average natural gas production since 2016.

- EIA estimates that U.S. working natural gas inventories ended January at more than 2.6 trillion cubic feet (Tcf), 9% higher than the five-year (2015–19) average. EIA forecasts that total working inventories will end March at almost 2.0 Tcf, 14% higher than the five-year average. In the forecast, inventories rise by a total of 2.1 Tcf during the April through October injection season to reach almost 4.1 Tcf on October 31, which would be the highest end-of-October inventory level on record.

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

- EIA expects the share of U.S. utility-scale electricity generation from natural gas-fired power plants will remain relatively steady; it was 37% in 2019, and EIA forecasts it will be 38% in 2020 and 37% in 2021. Electricity generation from renewable energy sources will rise from a share of 17% last year to 20% in 2020 and 21% in 2021. The increase in
the renewables share is the result of expected use of additions to wind and solar generating capacity. Coal’s forecast share of electricity generation will fall from 24% in 2019 to 21% in both 2020 and 2021. The nuclear share of generation, which averaged slightly more than 20% in 2019 will be slightly lower than 20% by 2021, consistent with upcoming reactor retirements.

- EIA forecasts that U.S. coal production will total 595 million short tons (MMst) in 2020, down 95 MMst (14%) from 2019. Lower production reflects declining demand for coal in the electric power sector and lower demand for U.S. exports. EIA forecasts that electric power sector demand for coal will fall by 81 MMst (15%) in 2020. EIA expects that coal production will stabilize in 2021 as export demand stabilizes and U.S. power sector demand for coal increases because of rising natural gas prices.

- After decreasing by 2.3% in 2019, EIA forecasts that energy-related carbon dioxide (CO2) emissions will decrease by 2.7% in 2020 and by 0.5% in 2021. Declining emissions in 2020 reflect forecast declines in total U.S. energy consumption because of increases in energy efficiency and weather effects, particularly as a result of warmer-than-normal January temperatures. A forecast return to normal temperatures in 2021 results in a slowing decline in emissions. Energy-related CO2 emissions are sensitive to changes in weather, economic growth, energy prices, and fuel mix.
Petroleum and natural gas markets review

Crude oil

**Prices:** The front-month futures price for Brent crude oil settled at $54.93 per barrel (b) on February 6, 2020, a decrease of $11.32/b from January 2, 2020. The front-month futures price for West Texas Intermediate (WTI) crude oil for delivery at Cushing, Oklahoma, decreased by $10.23/b during the same period, settling at $50.95/b on February 6 (Figure 1).

Several events in January contributed to significant uncertainty in crude oil markets and the world economy in general. Early in the month, geopolitical developments drove oil prices. Brent spot prices closed at $70/b on January 6, the highest level since May 2019, following U.S. military operations in Iraq. However, as tensions in the Middle East deescalated and market concerns over any related oil supply disruptions faded, crude oil prices fell. The price declines accelerated with concerns about economic growth as a result of the outbreak of coronavirus. Oil prices declined for five consecutive days starting on January 21. Further reducing demand in January were the warmer-than-normal temperatures across much of the northern hemisphere, which EIA estimates reduced heating oil consumption.

The magnitude and duration of the coronavirus’s effects remain highly uncertain, but EIA is reducing its estimates for Chinese and global oil consumption for 2020 as a result of the events. Travel restrictions in China that began in mid-January are disrupting petroleum demand in not only China but also in other countries. EIA expects liquid fuels consumption in China to average 14.8 million barrels per day (b/d) from February through April, when EIA assumes the effects of travel restrictions will be most acute. That level of consumption is 0.4 million b/d less than forecast in last month’s STEO. Jet fuel demand is likely to fall because of travel restrictions and demand for other oil products is likely to fall because of lower economic growth.
EIA has also lowered its expected liquid fuels consumption for the rest of Asia (excluding China) by 0.1 million b/d for the February through April period compared with last month’s STEO.

In addition to demand disruptions, oil markets faced renewed supply disruptions from Libya, where unrest in the country led to force majeure events at its main export terminals. EIA estimates that the export terminal disruptions caused Libya’s crude oil production to average 0.8 million b/d in January, down from 1.2 million b/d in December. The outages became more severe later in the month, and by the first week of February, EIA estimates Libya was producing less than 0.2 million b/d.

EIA acknowledges significant uncertainty in forecasting global oil inventory and crude oil price changes amid both ongoing disruptions in crude oil supply and reductions in oil demand. EIA estimates global inventories increased by 2.5 million b/d in January and will rise by an average of 0.6 million b/d during the first half of 2020, 0.1 million b/d more than expected in last month’s STEO. The higher expected inventory builds primarily reflect a downward adjustment to the global liquid fuels consumption forecast. EIA now forecasts consumption will rise by 1.0 million b/d in 2020, compared with forecast growth of 1.3 million b/d in the January STEO. EIA expects that most of the decrease stems from decreased liquid fuels consumption in China during the first half of 2020. EIA expects that some of the effects of lower oil consumption early in 2020 will be offset by reduced production from the Organization of the Petroleum Exporting Countries (OPEC). EIA assumes that OPEC will reduce crude oil production by 0.5 million b/d from March through May in response to concerns over oil demand growth. This cut would be in addition to existing OPEC cuts.

EIA forecasts global oil inventories will begin drawing by the fourth quarter of 2020, which EIA forecasts will provide upward price pressure in the second half of the year. EIA expects the Brent crude oil price will average $58/b in the first half of 2020 before rising to average $64/b during the final six months of the year. Brent crude oil prices are forecast to average $61/b for all of 2020, a decrease of $4/b from the January STEO.

Changes in the shapes of the Brent and WTI futures curves supports EIA’s estimates of a looser global oil balance in 2020, reversing the market tightness that developed in the fourth quarter of 2019. Prices for both crude oils now exhibit slight contango (when near-term prices are lower than longer-dated ones) in the 1st–13th month spread. The Brent and WTI 1st–13th spread declined $6.07/b and $5.27/b, respectively, since January 2, 2020. The Brent 1st–13th spread settled at -46 cents/b on February 6, 2020, and the WTI 1st–13th spread settled at -20 cents/b (Figure 2). The contango in the WTI futures curve that developed in January are consistent with increases in U.S. crude oil and other liquids inventories, which—averaging 0.3 million b/d—increased at the fastest pace for the month of January since 2017. In addition, trade press reports a significant decline in China’s refinery intake, which is likely contributing to builds in crude oil inventories in Asia.
Implied volatility: Implied volatility of crude oil prices increased to the highest levels since September 2019 by early February, as illustrated in higher premiums for options contracts amid the uncertainty surrounding global economic growth and supply disruptions in Libya. The implied volatility of Brent prices increased by 9 percentage points from January 2 to settle at 36.0% on February 6. WTI implied volatility increased by 13 percentage points to settle at 37.5% over the same period (Figure 3).

Swap dealer positions: Short positions held by swap dealers accounted for 32% of the open interest for the WTI futures contract as of January 21, 2020, slightly less than the all-time high of 33%, reached in 2018 (Figure 4). Initiating a short position, or selling a futures contract, enables the holder to lock in a price today for the physical delivery of a commodity at some future date. Oil producers commonly use swap dealers to hedge their future production. Swap dealer short positions increased to 30% of the WTI open interest in mid-December, when WTI prices
increased to more than $60/b. This price level, according to a survey of U.S. exploration and production companies conducted by the Federal Reserve Bank of Dallas, is sufficient to generate enough cash flow from operations for the majority of firms to cover capital expenditures. The increase in swap dealer short may have increased, in part, because U.S. producers hedged some of their expected 2020 production at about $60/b.

Petroleum products

Gasoline prices: The front-month futures price of reformulated blendstock for oxygenate blending (RBOB, the petroleum component of gasoline used in many parts of the country) settled at $1.50 per gallon (gal) on February 6, down 21 cents/gal from January 2, 2020 (Figure 5). The RBOB–Brent crack spread (the difference between the price of RBOB and the price of Brent crude oil) increased by 6 cents/gal to settle at 19 cents/gal during the same period. Almost all of this increase was in the first week of February, when RBOB crack spreads rose after the RBOB and Brent contracts rolled to the next contract month. Despite the recent increase, monthly average RBOB crack spreads were lower in January compared with December, likely because of low U.S. gasoline demand.
RBOB prices and crack spreads tend to be at their lowest during November and December, and they usually begin increasing in January. However, January 2020 deviated from this trend as monthly average RBOB prices and RBOB crack spreads fell by 5 cents/gal and 2 cents/gal, respectively, relative to December. The decline in RBOB crack spreads is the third consecutive month of month-on-month declines, the longest such streak since November 2018. The downward pressure on prices is supported by record inventory levels. Stocks of motor gasoline for the week ending January 24 reached the highest level ever recorded in EIA weekly data going back to 1990. Both the increase in gasoline inventories and the decline in RBOB prices and crack spreads likely stem from a broader decline in gasoline demand. According to EIA estimates, U.S. consumption of motor gasoline in January declined 5% from the previous month to reach a 36-month low of 8.6 million barrels per day (b/d).

**Ultra-low sulfur diesel prices**: The ultra-low sulfur diesel (ULSD) front-month futures price settled at $1.67/gal on February 6, 2020, a decrease of 36 cents/gal from January 2, 2020. The ULSD–Brent crack spread (the difference between the price of ULSD and the price of Brent crude oil) decreased 9 cents/gal to settle at 36 cents/gal during the same period (Figure 6). The decline in crack spreads likely reflects low heating oil demand because of warmer-than-expected weather and market concerns over global economic growth.
U.S. distillate inventories recorded a 4.1 million barrel month-on-month increase in January, a rarity for a month in which inventories typically fall. The increase likely reflects the warmer-than-normal U.S. winter. Based on data from the National Oceanic and Atmospheric Administration (NOAA), EIA estimates that U.S. heating degree days (HDD) in January were 18% lower than the 10-year (2010–19) average. However, at 143.2 million barrels, U.S. distillate inventories remain lower than the five-year (2015–19) average of 149.0 million barrels, suggesting some possible tightness in distillate markets. U.S. distillate inventories have not exceeded the previous five-year average since February 2018, and January 2020 retail prices for on-highway diesel fuel were the highest of any January since 2014. EIA, however, forecasts that prices for on-highway diesel fuel will decline by 19 cents/gal in February, following the recent decline in crude oil prices and ULSD crack spreads.

Jet fuel prices: Prices for jet fuel sold in key Asian markets fell sharply in January. The five-day moving average Singapore crack spread for jet fuel against the DME Oman crude oil price declined to $9.11 per barrel (b) on February 6, 2020, a decrease of $3.90/b barrel from January 2, 2020 (Figure 7). The decline in jet fuel crack spreads likely reflects the large increase in flight cancellations in East Asia’s economies—most notably China—in the wake of the coronavirus.
Based on an analysis of publicly available flight data, EIA estimates about 12,000 flights departing from airports located in China, Hong Kong, Taiwan, and Macau were cancelled in January. After factoring in each cancelled flight’s distance and adjusting for an estimate of the fuel efficiency of each route’s assigned aircraft, EIA estimates that cancellations in these four countries reduced demand for jet fuel by approximately 16,000 b/d during January. According to data from the International Energy Agency, China consumed 860,000 b/d of jet fuel and kerosene in 2019, making this loss equivalent to about 2% of 2019 China’s average daily jet fuel consumption. EIA anticipates larger declines during the coming months, assuming the rate of flight cancellations intensifies.

**Natural Gas**

**Prices:** The front-month natural gas futures contract for March delivery at the Henry Hub settled at $1.86 per million British thermal units (MMBtu) on February 6, down 26 cents/MMBtu from January 2 ([Figure 8](#)). Warmer-than-normal temperatures helped send natural gas front-month futures prices to their lowest level in many years. Typically, January natural gas prices are among the highest of the year. Based on NOAA data, EIA estimates that U.S. heating degree days (HDD) were 18% lower than the 10-year (2010–19) average during January.
Natural gas 1st-3rd spread: The spread between the 1st-month and 3rd-month delivery futures contracts averaged -1 cents/MMBtu in January (Figure 9). The spread represents price differences between natural gas delivered in the winter compared with natural gas delivered in the spring, which is typically a seasonally-low consumption period. The spread between the two values can be wide in winters with cold temperatures (as defined by HDD) in January. The difference between the 1st and 3rd month contracts averaged more than 30 cents/MMBtu during January of 2014, 2018, and 2019. Both 2014 and 2018 had more HDD than the 10-year average. However, in years with milder-than-normal weather in January, the spread is generally far smaller or even negative.

International natural gas prices: Asia and Europe have also experienced mild temperatures, which has reduced international natural gas and liquefied natural gas (LNG) prices to their lowest average January prices on record in markets like the National Balancing Point in the
United Kingdom and the Japan-Korea Marker (JKM) (Figure 10). Likewise, concerns about the effects on economic activity stemming from the current coronavirus outbreak have also likely had a dampening effect on natural gas prices across markets. Lower LNG prices could reduce the competitiveness of U.S. LNG exports if current price levels persist. However, EIA’s forecast for LNG exports in 2020 currently remains relatively unchanged from the January STEO.

Notable forecast changes

- EIA forecasts Brent crude oil spot prices will average $61 per barrel (b) in 2020 compared with $65/b in the January STEO. The lower price forecast reflects EIA’s expectations of slower growth in global petroleum and liquid fuels consumption in 2020. EIA now expects Brent prices to be $7/b lower than previously forecast during the first six months of 2020. During the second half of the year, EIA now expects prices to be $1/b lower than previously forecast.

- The global oil consumption growth forecast for 2020 in this month’s STEO is 1.0 million barrels per day (b/d), down from a forecast of 1.3 million b/d in the January STEO. The lower global oil demand growth forecast is mostly related to the effects of the coronavirus. EIA expects these oil consumption effects will be concentrated in China but some effects will show up in other countries as well. EIA forecasts that liquid fuels consumption in China will average 14.7 million b/d in the first quarter of 2020 and 15.0 million b/d in the second quarter of 2020, down by 0.3 million b/d and 0.2 million b/d, respectively, from last month’s STEO.

- EIA revised diesel fuel wholesale margins downward to reflect recent supply trends and weaker-than-anticipated global diesel demand in tandem with the new International Maritime Organization (IMO) Marine Regulations that were enacted on January 1, 2020.
EIA now forecasts diesel wholesale margins to average 41 cents per gallon (gal) in 2020 (9 cents/gal lower than previously forecast) with a forecast peak of 46 cents/gal in March 2020 (7 cents/gal lower than in the previous forecast). Although diesel wholesale margins began the year much lower than initially forecast, EIA assumes that IMO-driven effects will still put upward pressure on diesel prices in the near future as the global market adjusts to the new regulations and as the more stringent carriage ban on non-compliant marine fuel begins on March 1, 2020.

- Henry Hub natural gas spot prices averaged $2.02 per million British thermal units (MMBtu) in January, which is 16 cents/MMBtu lower than EIA expected in the January STEO. Warmer-than-normal January temperatures reduced space heating demand and left natural gas working inventories 9% higher than the five-year average at the end of the month. With inventories levels expected to remain elevated as the winter heating season winds down, EIA now expects natural gas prices to be lower than previously forecast in the coming months. On average, the EIA forecast Henry Hub spot price will be $2.21/MMBtu in 2020, compared with a forecast of $2.33/MMBtu in the January STEO.

- EIA forecasts U.S. total liquid fuels production will average 21.7 million b/d in 2021, which is 240,000 b/d less than EIA had forecast in the January STEO. The lower forecast liquid fuels production reflects both lower crude oil production and hydrocarbon gas liquids production (HGL). EIA reduced its forecast for U.S. crude oil production in 2021 by 160,000 b/d from the January STEO as a result of lower expected crude oil prices in 2020. There is a lagged effect between changes in crude oil prices and changes in crude oil production. EIA reduced its forecast for U.S. HGL production in 2021 by 80,000 b/d as result of lower expected natural gas prices. Although HGLs are included in the liquid fuels category, their production growth is largely the result of natural gas production.

- For more information, see the detailed table of STEO forecast changes.

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