
Resilient U.S. Crude Market Rebalances

Rapid rebound after twin shocks in March 2020.

Morningstar Commodities Research

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Data Sources for This Publication

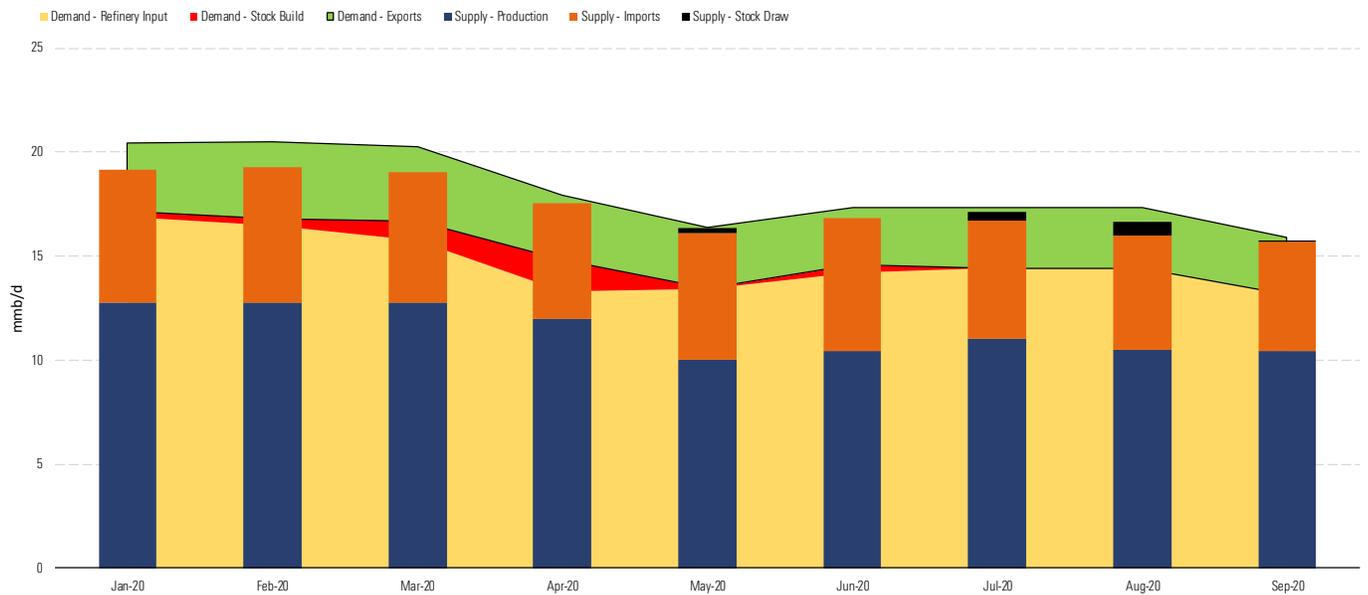
EIA
CME Group

High Volatility

CME Nymex West Texas Intermediate crude futures prices, for prompt delivery, experienced their highest ever volatility during April and May 2020. The disruption began in March with the twin shocks of OPEC+ producers abandoning restraint and flooding the market at the same time as demand collapsed in the face of coronavirus-induced lockdowns. In the two months that followed, refinery demand dropped by 2.5 million barrels/day, a storage squeeze at the Cushing, Oklahoma delivery point for futures caused negative prices for the first time and producers shut in 2.0 mmb/d. Amazingly the crude oil market returned to balance in June and even experienced storage draws in July and August. A big drop in imports and resilient exports played key roles in the rapid rebalancing. The impact of storage was less significant but had a dramatic impact on the market psyche. This note reviews the evolution of domestic crude balances in the first three quarters of 2020.

Crude Balance

Exhibit 1 shows 2020 U.S. crude oil balances between January and September by month in million barrels per day based on monthly and weekly data from the Energy Information Administration. The vertical bars represent domestic production (blue), imports (orange) and inventory draws (black). The shaded areas represent refinery input (yellow), exports (green) and storage builds (red).

Exhibit 1 Monthly Supply Demand Balances U.S. Crude

Source: EIA, Morningstar.

Production

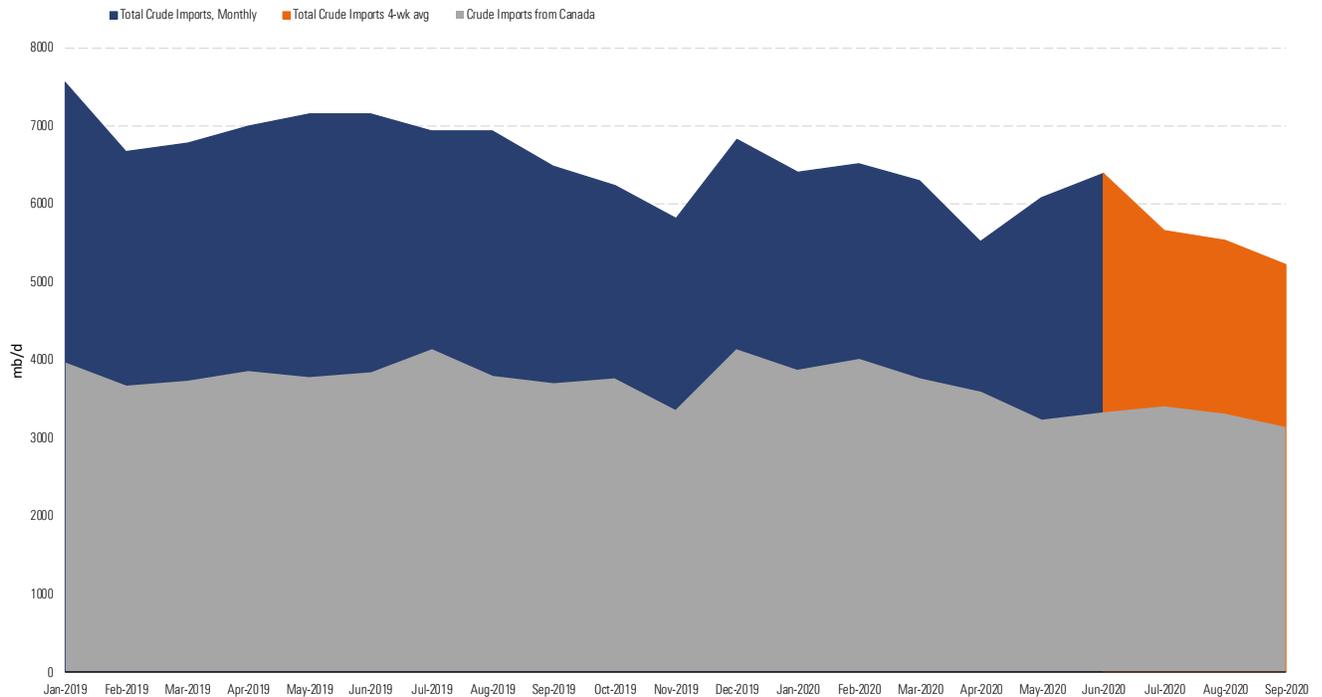
On the supply side domestic production saw a slight decline at the start of this year after reaching a record 12.8 million barrels/day in December 2019, falling to 12.7 mmb/d by March 2020. Then came the twin punches of a supply glut caused by the OPEC+ production agreement breaking down and coronavirus lockdowns stifling demand in most Western economies. As a result, average crude prices tumbled 40% worldwide from over \$50/barrel in February to around \$30/barrel in March. And although U.S. producers initially responded by reducing output 0.7 mmb/d in April that was no match for the dramatic 2.5 mmb/d downturn in refinery demand caused by COVID-19-related demand destruction that month. With imports falling by just 0.7 mmb/d in April, the market was massively oversupplied, and producers and shippers searched high and low for storage capacity to accommodate the surplus.

The scramble for storage caused a game of musical chairs in late April, with real-life consequences. The game reached its logical conclusion on April 20 when holders of CME Nymex WTI crude futures were squeezed by limited storage capacity at the Cushing, OK delivery point, the day before the May contract was due to expire on April 21. The squeeze resulted in an historic negative WTI settlement price of \$37.63/barrel that day with wider implications for the market as a whole (see our April note [Crushing Cushing: Wider Impact of Negative Crude](#)). The negative price crash proved a wake-up call for producers suddenly faced with the prospect of paying refiners to take their crude away. Even though negative prices turned out to be a one-day anomaly, the average WTI price in April was just \$16.70/barrel—a 70% decline from January’s average \$57.52/barrel. The storage scare and plummeting prices led to widespread production shut-ins with crude output dropping by 2.0 mmb/d to 10.0 mmb/d during May.

Since May, prices have recovered close to \$40/barrel and some shut-in production has come back online. However, the production recovery has been slow with September output expected to average just 10.6 mmb/d. As we discussed in an August note [What if Shale Doesn't Recover?](#) the production slowdown is perpetuated by a collapse in new drilling and high-legacy decline rates in shale basins. There has also been weather disruption this summer in the Gulf of Mexico where Hurricane Laura reduced production by 1.0 mmb/d in late August and early September, and Hurricane Sally shut in 0.5 mmb/d for a week in mid-September. Overall, we expect domestic production to enter a long slow decline until prices recover above \$50/barrel for a sustained enough period to attract new investment in shale drilling.

Imports

Despite growing domestic production and exports, the U.S. still relies on imported crude because older refineries are configured to process heavier grades found overseas rather than domestic light shale barrels. In response to the twin punches of excess supply and lower demand, refiners reduced imports by nearly a quarter or 1.6 mmb/d this year. In 2019 U.S. crude imports averaged 6.8 mmb/d with 56% of that total or 3.8 mmb/d coming from Canada—mostly heavy sour crude processed in Midwest refineries (Exhibit 2). As we detailed in our June note [Mixed Lockdown Results for Canadian Crude](#), lockdowns resulted in Canadian crude prices increasing relative to domestic barrels after pipeline congestion that had kept the imports discounted for years disappeared with lower production. Uncompetitive prices and curtailments by Canadian producers resulted in a 1.0 mmb/d drop in United States imports from Canada between December 2019 and September 2020. Imports from other countries suffered a similar fate to Canadian supplies, falling by 0.6 mmb/d between December 2019 and September 2020. Over the summer U.S. imports from Saudi Arabia evaporated as that country cut production with its OPEC+ partners in an effort to boost prices. As we detailed in an August note [Louisiana: Refining in a Pandemic](#), weaker demand for refined products has made more sophisticated Gulf Coast refineries that typically import heavier crudes, less profitable than their simpler rivals because secondary and tertiary processing units haven't been needed. In a post-COVID-19 lockdown world, simpler refineries do better processing light sweet shale crude to produce more gasoline and less diesel when demand for the latter has remained stubbornly low.

Exhibit 2 U.S. Crude Imports 2019-2020

Source: EIA, Morningstar.

The combination of lower production and reduced imports, trimmed U.S. crude supply by 3.3 mmb/d between March and September 2020. As we discuss next, that supply adjustment allowed the market to balance the dramatic 2.6 mmb/d collapse of refinery demand. A robust export market where overseas shipments were only trimmed by 0.7 mmb/d between March and September, prevented the need for greater production curtailments to balance crude supply and demand.

Refinery Demand

The largest demand event this year was the 2.6 mmb/d plunge in refiner crude processing between March and September. Although crude prices fell rapidly in March and April, bringing down feedstock costs, refined product prices fell further and faster, prompting refiners to cut runs rapidly in response to horrible second-quarter margins (see our July note [U.S. Refiners' Worst Second Quarter in a Decade](#)). Crude input averaged 16.9 mmb/d in April and May last year but declined to an average 13.4 mmb/d in April and May this year. The refining slump occurred just before the all-important summer driving season when crude processing typically ramps up. Average crude throughput between May and August 2020 was down 20% versus last year. An initial refining recovery in June, July and August pushed throughput above 14 mmb/d but low margins, record high distillate inventories and the threat of a second COVID-19 wave, cut September crude runs back to average 13.3 mmb/d.

Exports

In the nearly five years since regulations preventing most exports, except to Canada, were lifted in December 2015, the U.S. became a major crude exporter, averaging shipments just under 3.0 mmb/d last year, according to the EIA, up 50% from 2 mmb/d in 2018 and five times the 0.6 mmb/d shipped in 2016. This year looked set for another record with exports reaching 3.7 mmb/d in February. Then came the March twin punch of excess supply and demand destruction. In the face of an oversupplied international market, U.S. exports held up well in March and April. This was partly due to already contracted cargoes being shipped as well as traders placing crude in floating storage to profit from contango (see our June note: [“What Happens if U.S. Crude Exports Dry Up?”](#)). Significant crude purchases were also made by overseas buyers after WTI prices crashed at the end of April. Low prices made U.S. crude very competitive as WTI averaged just \$16.70/barrel in April, which was \$10/barrel under international rival Brent.

China was the largest buyer of U.S. crude over the following three months, making a record purchase of 1.3 mmb/d in May then 0.7 mmb/d in June and 0.6 mmb/d in July according to U.S. Census data. Some Chinese buying appears to be bargain hunting by refiners but more recent purchases were based on government prompting to meet the terms of the U.S.-China Phase 1 Trade Agreement signed in January (see our February 2020 note [Hollow Energy Promises in China Deal](#)). Vessel tracking analysis by Reuters forecasts September shipments of U.S. crude to China of around 0.9 mmb/d. Shipments to China are expected to drop in October as U.S. crude price discounts to Asian benchmark Dubai narrowed in August and Chinese inventories are believed to be full.

Since the OPEC+ production agreement spearheaded by Saudi Arabia and Russia began in January 2017, U.S. crude exports have benefitted from their rival’s discipline, often gaining market share at their expense. This year was no exception after OPEC+ agreed dramatic cuts of 9.7 mmb/d starting in May, tapering to 7.7 mmb/d in August. The cartel cuts tightened the world market crude balance and reduced inventories, creating opportunity for U.S. exporters to take up the slack, at the same time as they prompted a price recovery to \$40/barrel. In addition, the European market for light U.S. crude exports was bolstered by the absence of 1.2 mmb/d of Libyan production this year as the armed conflict in the West African country blocked its export docks.

Relatively speaking, crude demand for exports held up better than expected this year with the January through September average of 3.2 mmb/d representing an increase of 0.3 mmb/d over the same period in 2019. Export volumes demonstrated the strength of demand for U.S. crude even during a period of international demand destruction. This resilience represents a ray of hope for battered U.S. producers in a post-COVID-19 world where forecasts of peak demand for oil abound and equity investors have lost faith in their narrative.

Inventory Balance

Storage is the traditional buffer bridging mismatches between supply and demand for commodities like crude oil. A market condition known as contango, where prices in the future are higher than today provides an economic incentive to store crude when supply exceeds demand. The opposite condition, backwardation, occurs when prompt prices are at a premium to futures, encouraging inventory draws. But contango only works when there is adequate storage available to absorb the surplus and that wasn't the case in the U.S. domestic market this spring when demand slumped faster than supply.

In the circumstances, storage played a lesser role than production cutbacks, lower imports and resilient exports in balancing the U.S. crude market through momentous events this year. The reality was that storage capacity couldn't cope with refinery demand plunging by 2.5 mmb/d, as it did in April and May, without producers responding as well. Nevertheless, storage did act as a critical buffer in the short term by soaking up 0.9 mmb/d of crude in March and 1.9 mmb/d in April. More importantly, rapidly filling storage capacity delivered a highly visible market stress signal to producers. The storage squeeze at Cushing and subsequent price crash in late April drove home the message by shocking producers into rapid shut-ins.

By shutting in or curtailing 2.0 mmb/d of production in May, producers relieved pressure on storage, leaving inventories flat in June. Since then lower imports and resilient exports have prompted stock draws in July, August and September. Although crude inventories remain high by historic standards, the threat of reaching tank tops has receded.

Conclusion

The U.S. crude market proved resilient so far this year in the face of momentous events. The Cushing price squeeze in April and resulting negative CME Nymex WTI futures price are viewed by some as system failures. Instead, we believe the shock impact of negative prices was just what the market needed to get producers to shut down as rapidly as they did. That quick response allowed the market to rebalance in just two months. Refiners had no choice but to cut processing in the face of an unprecedented demand collapse. They reduced their call on imported barrels from Canada and other overseas suppliers throughout the rest of the year—indirectly supporting domestic producers. Resilient exports also provided support for beleaguered producers. In fact, reliance on overseas buyers now appears critical to support any U.S. production growth. The limited impact of storage in relieving the sudden and deep market imbalance demonstrates how vulnerable the crude distribution system is to rapidly changing fundamentals.

We review this year's international crude balance in an upcoming report. ■■■

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