
U.S. Crude Fundamentals Move On From Cushing

Incumbent benchmark contract at odds with Gulf Coast market.

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Data Sources for This Publication
EIA

Shale Decade

A decade of fundamental data since 2010 reveals the Gulf Coast's increased importance to the U.S. crude market in the shale era. Refining capacity in the region has always been higher than elsewhere in the United States—and that remains the case—but crude supply, storage, and export flows now make the Gulf Coast market centered on Houston pre-eminent. The change has reduced the importance of the Midwest trading hub at Cushing, Oklahoma, previously the key pivot point for U.S. crude flows. But while Cushing fundamentals now play second fiddle, crude pricing remains centered on the CME Nymex West Texas Intermediate futures contract delivered to the Midwest hub. The trade dominance of WTI Cushing futures and its links to domestic pipeline sales now represent a barrier preventing crude pricing from migrating to the Gulf Coast alongside physical volumes. This note reviews fundamental changes in the decade from 2010 to 2019 showing how the U.S. crude market evolved away from the Midwest and toward the Gulf Coast.

Incumbent Contract

Last month, we described the June 2020 launch of American GulfCoast Select crude trading assessments by Platts and Argus price reporting agencies (see [American GulfCoast Select Launched as WTI Rival](#)). The goal of the producers behind the new benchmark is to establish American GulfCoast Select as the default reference for U.S. light sweet crude. To succeed, it must eclipse long-established WTI Cushing, the grade underpinning CME Nymex futures. That futures contract remains the linchpin of domestic crude pricing through its links to underlying physical transactions. We described the calendar month average mechanism behind those links in an April note about the Cushing price implosion (see [Crushing Cushing: Wider Impact of Negative Crude](#)). That price implosion this year—when futures prices turned negative for the first time in response to a storage squeeze—has battered confidence in the incumbent WTI contract.

Fundamentals

Analysis of U.S. crude fundamentals relies on weekly, monthly, and annual data from the Energy Information Administration. The data is framed by the Department of Energy's division of the U.S. market into five regions known as Petroleum Administration Districts for Defense, or PADDs. Under this schema, PADD I is the Atlantic or East Coast states from New England to Florida; PADD II is the Midwest from the Canadian border to Oklahoma; PADD III is the Gulf Coast region stretching from New Mexico through Texas, Louisiana, Mississippi, and Alabama; PADD IV is the Rockies region; and PADD V encompasses West Coast states plus Arizona, Nevada, Alaska, and Hawaii.

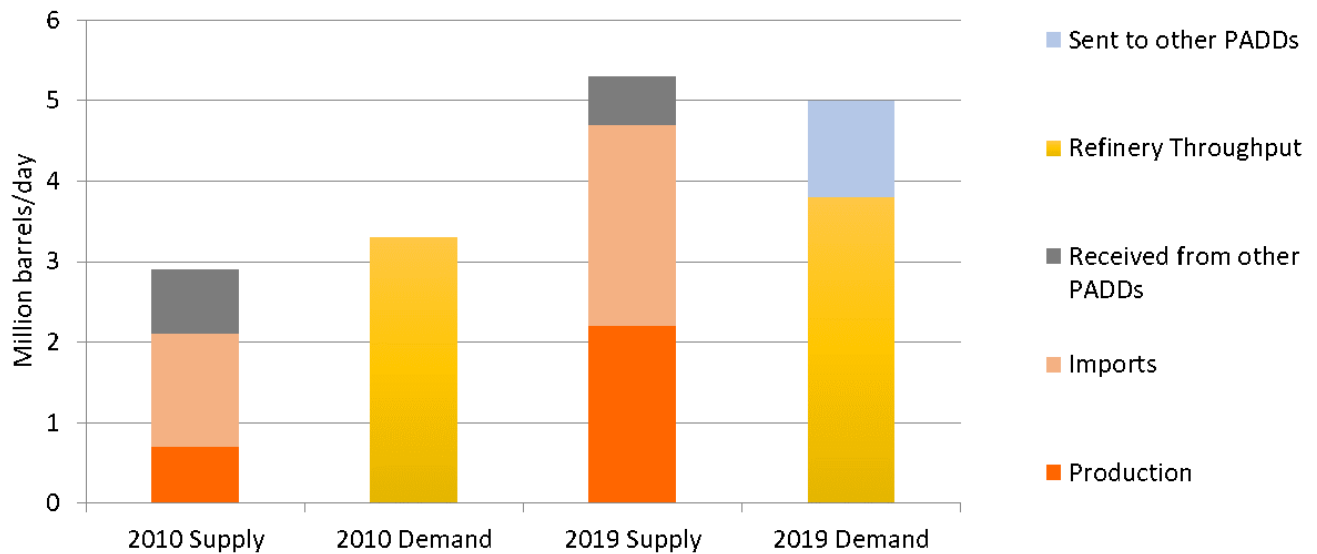
Crude Balance 2010

In 2010, total U.S. crude supply was dominated by imports that averaged 9.2 million barrels/day with domestic production averaging just 5.5 mmb/d, according to EIA. The regional breakdown of imports shows 5.4 mmb/d came in through the Gulf Coast region in 2010 while the East and West Coast markets imported about 1 mmb/d each and 1.2 mmb/d came into the Midwest from Canada. At the time, federal regulations limited crude exports to a trickle sent to Canada under a ban that was only lifted in December 2015. That meant domestic refineries represented the entirety of demand.

Midwest Hub

In 2010, coastal refiners in PADDs I, III, and V balanced their crude requirements by supplementing domestic barrels with waterborne imports. The key region that required outside supply from both domestic and foreign sources was the landlocked Midwest PADD II (Exhibit 1). Refining demand in that region averaged 3.3 mmb/d in 2010, but local production was just 0.7 mmb/d. Pipeline imports across the border from Canada averaged 1.2 mmb/d, leaving a net regional deficit of 1.4 mmb/d that was sourced primarily by pipeline from the Gulf Coast. The need to supplement Midwest demand with crude from outside the region meant the Cushing trading hub was a natural clearinghouse setting domestic prices for pipeline deliveries of U.S. and Canadian crude. Although Canadian crude is technically imported, shipments are made by pipeline and Canadian producers have few alternative markets, allowing Midwest refiners to treat it just like a domestic source in 2010. In this pipeline-dominated market, the WTI futures contract for Cushing delivery was the logical benchmark against which all other crudes were traded based on quality and location differentials.

Exhibit 1 PADD II Crude Supply Demand Balance 2010 and 2019



Source: EIA, Morningstar.

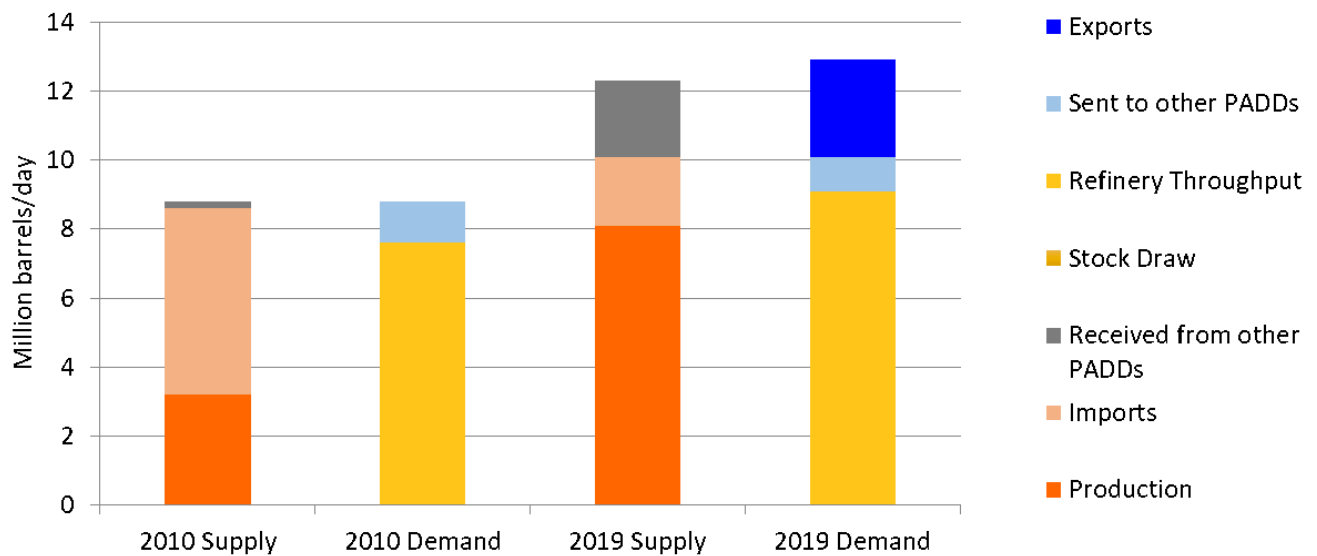
Crude Balance 2019

Fast forward a decade to 2019, and EIA data shows a different crude fundamental picture. Fueled by surging shale output, total domestic production more than doubled from an average 5.5 mmb/d in 2010 to 12.2 mmb/d in 2019, according to EIA. That surge still wasn't enough to meet overall U.S. refinery demand of 17 mmb/d in 2019, but it did allow imports to decline. However, most U.S. refineries weren't built to process the light crude produced from shale. That meant they continued to favor imported heavier grades, while surplus light shale barrels went to overseas markets once the export ban was lifted in 2015. As a result, while annual average imports declined from 9.2 mmb/d in 2010 to 6.8 mmb/d in 2019, the U.S. crude market as a whole ran a surplus balanced by exports averaging 3.0 mmb/d in 2019.

Toward the Gulf Coast

The big increase in domestic production over the past decade, declining imports, and the advent of exports changed the dynamic of the crude market by moving its center of gravity away from the Midwest Cushing hub toward the Gulf Coast. Two trends underlie this change. First, a tripling of local production in the Midwest to 2.2 mmb/d and doubling of imports from Canada to 2.5 mmb/d left that market with a 0.9 mmb/d supply surplus over refining demand of 3.8 mmb/d in 2019, according to EIA (right hand bars in Exhibit 1). That transformed PADD II from a net buyer of crude from the Gulf Coast in 2010 to a net seller of crude to the Gulf Coast in 2019. Second, the flood of shale crude from PADD III production as well as inflows from other regions created a 2.8 mmb/d Gulf Coast regional surplus that had to be cleared into the export market. These trends reduced the demand pull of Cushing and moved the crude clearing focus to the Gulf Coast where export sales now balance the market (Exhibit 2).

Exhibit 2 PADD III Crude Supply Demand Balance 2010 and 2019



Source: EIA, Morningstar.

Given these changing fundamentals, the logical pricing point for a U.S. crude benchmark today should be the Gulf Coast. That's because excess crude from the Midwest and the Rockies now flows into PADD III, and if it isn't consumed there, it has to be exported (assuming storage is finite). The marginal production barrel is priced to compete overseas. The ideal U.S. crude benchmark should be a Gulf Coast grade traded by both local refiners and international buyers. The GulfCoast Select light sweet index grades listed by Argus and Platts in June are designed by U.S. producers to fulfill that role.

Futures Uncertainty

The trouble is that while GulfCoast Select is attracting liquidity and participation by physical market players, it currently lacks an equivalent futures contract. That encourages international buyers at the Gulf Coast to choose international equivalents like Brent, which has a highly liquid futures market over GulfCoast Select when negotiating purchases. Developing a futures contract and competing against incumbent WTI Cushing is necessary for GulfCoast Select to succeed but is extremely complex to achieve. Despite some reputational damage from the price meltdown in April, CME WTI futures remain predominant in terms of volume traded, open interest, and market recognition. Creating a new contract is technically simple, but transferring the financial community's loyalty to such a new flag is far tougher.

In the meantime, U.S. crude market fundamentals are at odds with the incumbent WTI pricing mechanism at Cushing. That inefficiency harms U.S. producers and refiners as well as exposing them to the market turmoil witnessed at Cushing in April. In upcoming analyses, we'll look at the complexities associated with migrating CME WTI loyalty to a newcomer as well as the impact that a major retreat in shale production would have on the fundamentals described here. **■**

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