
Canadian Syncrude Outage Offset by Alternate Supply

Short-term Cushing impact.

Morningstar Commodities Research

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Data Sources for This Publication

U.S. Energy Information Administration

CME Group

National Energy Board

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July Cash Spike

West Texas Intermediate crude prices for Cushing, Oklahoma, delivery in July spiked by nearly \$6/barrel compared with August on Monday, June 25 (according to Bloomberg) in response to news light sweet synthetic crude production halted at the Suncor majority owned Syncrude upgrading plant in Alberta, Canada. The plant, which produced an average 253 thousand barrels/day during 2017, is expected to be shut until at least the end of July. Prospects of a Syncrude shortage tightened Cushing fundamentals in the short term, but alternative domestic supplies are available to alleviate any U.S. shortage. This note discusses the impacts of a Syncrude shortage on the U.S. crude market.

Syncrude Outage

The synthetic crude brand known as Syncrude is produced at the Mildred Lake Upgrader facility in northern Alberta, jointly owned by Suncor (58.74%), Imperial (25%), Sinopec (9.03%), and NEXEN/CNOOC (7.23%). The plant surface mines oil sand to extract bitumen using water-based processes. The heavy sour bitumen is then upgraded into light sweet crude through fluid coking, hydroprocessing, hydrotreating, and reblending processes. The resulting Syncrude synthetic crude has an API gravity of 32.5 and a low 0.2% sulfur content—making it easier for refiners to process and increasing its value closer to grades like U.S. benchmark WTI Cushing. Syncrude is sent by pipeline to Edmonton-area refineries and via pipeline terminals to refineries in Canada and the U.S. The nameplate capacity of the Mildred Lake upgrader is 350 mb/d, but the plant's actual output varies depending on maintenance and other outages, averaging only 253 mb/d over 2017 as a whole but producing a higher 324 mb/d during the last quarter of 2017. A tripped power transformer caused the entire complex to shut down on Wednesday, June 20, and by Friday, June 22; Suncor indicated the plant would likely be out of commission through at least the end of July (according to Reuters).

Outage Impact

We assess the impact of the Syncrude outage on U.S. refiners below.

The Canadian Association of Petroleum Producer's June 2018 Oil Market and Transportation report estimates Canada produced an average 4.2 million barrels/day of crude in 2017 with Canadian refiners processing about 1 mmb/d and most of the rest headed to U.S. markets. Most Canadian barrels shipped to the U.S. are heavy crude conventional grades or oil sand bitumen that has not been upgraded. During the 12-month period ending April 2018 (latest data from Canada's National Energy Board), average light crude Canadian exports to the U.S. totaled 509 mb/d. Of that total about 160 mb/d went to East Coast refineries—mainly offshore Atlantic Coast Canadian production delivered by tanker. The other 350

mb/d, including Syncrude production, was delivered by pipeline with 60% or 210 mb/d going to Midwest refineries and 33% or 116 mb/d going to West Coast plants and the balance to refineries in the Rockies.

On the West Coast, Andeavor's 120 mb/d Anacortes and Phillips 66's 101 mb/d Ferndale refineries appear to be most vulnerable to a shortage of Canadian light crude. These refineries are supplied with light and medium Canadian crude from Edmonton via the Kinder Morgan Trans Mountain Express pipeline (see our January 2017 outlook, "[Pacific Northwest Refineries—Cheap Crude and a Captive Market](#)"). Both refineries also process Alaskan North Slope (ANS) crude delivered by tanker and North Dakota Bakken crude delivered by rail and could increase their use of those grades to make up for a shortage of Canadian supplies. However, ANS demand typically exceeds production that has declined in recent years and (as we detailed in a note last month — see "[Why Crude By Rail Isn't Picking Up the Slack](#)") rail transport is currently constrained by limited tank car capacity. That means these refineries will end up paying higher prices to secure limited Canadian supplies or have to import equivalent grades from international suppliers.

In the Midwest we estimate 11 of the region's 26 refineries process at least some light sweet crude based on our 2017 review (see "[Heavy Bets Pay Off For Midwest Refineries](#)"). However, many of these refineries have access to alternative supplies, delivered via Patoka, Illinois, that will offset the Canadian shortage. These alternatives are North Dakota Bakken crude from the 520 mb/d Dakota Access (or DAPL) pipeline and multiple grades of domestic or imported barrels from the Gulf Coast delivered via the 1.2 mmb/d Capline pipeline that runs from St. James, Louisiana, to Patoka.

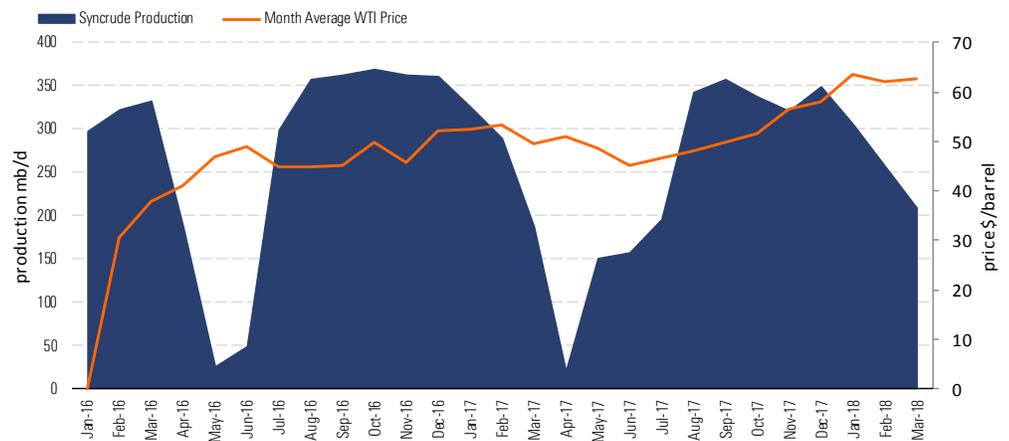
Higher prices in a tight market starved of Canadian Syncrude are likely to encourage North Dakota Bakken shippers to deliver more barrels into the Midwest at Patoka rather than sending them to the Gulf Coast export market via DAPL's Nederland, Texas, terminus. Any shortage of light sweet crude at Patoka can also be alleviated by Capline shipments from St. James. Capline flows have been reduced to a minimum by increased domestic supply to the extent that its owners are considering proposals to reverse its flow (see our November 2017 note, "[Cautious Capline Proposal Reflects Low Demand](#)"). In the meantime, it's still operating northbound and can deliver light sweet grades to Patoka.

Midwest refineries likely to have a tougher time replacing Canadian light crude are those that rely on Cushing for light crude feedstock or those supplied exclusively from Canada and Minnesota via Enbridge's Lakehead pipeline system. Two larger refineries reliant on Cushing pipelines for light crude are Valero's 190 mb/d Memphis, Tennessee, and Phillips 66's 200 mb/d Ponca City, Oklahoma, plants. Both have alternative supply routes. The Plains/Valero Diamond pipeline has fed the Memphis refinery since it came online from Cushing at the end of 2017, but the plant can revert to using a Capline lateral at Collierville, Mississippi. The Phillips 66 Ponca City plant can source alternative supplies from the 320 mb/d Tallgrass Pony Express pipeline that runs southeast from Guernsey, Wyoming, to Cushing, Oklahoma, carrying crude from North Dakota and the Rockies as well as Permian crude via the Oklahoma Mainline pipeline from Wichita Falls, Texas. Potentially more vulnerable is the PBF Energy 160 mb/d Toledo, Ohio, refinery fed by Lines 6B and 17 on the Enbridge Lakehead system. That refinery processes a mix of Bakken and Canadian synthetic crude both delivered on the Enbridge system with no

alternative pipeline access, meaning they could struggle to secure replacement barrels as downstream demand for Bakken crude tightens the market. Two refineries in St. Paul/Minneapolis, Minnesota—the 290 mb/d Flint Hills Pine and the 89 mb/d Andeavor St. Paul Park plants—are also vulnerable since they are partially supplied with light crude from the Enbridge system via the Koch operated 410 mb/d Minnesota pipeline from Clearbrook, Minnesota, to St. Paul. The only alternative pipeline supply to the two Minnesota refineries is the smaller 90 mb/d Koch Wood River pipeline connected to Cushing and Patoka.

For the most part we believe the re-plumbing of the domestic crude pipeline system to accommodate shale supplies from North Dakota and the Rockies will ensure adequate replacement for the loss of 200 mb/d or so of Canadian Syncrude delivered to U.S. refineries. In fact the Mildred Lake Syncrude plant has had lengthy outages twice in the past two years—first during the Canadian wildfires in 2016 (see our May 2016 note, “[Western Canadian Wildfire Threatens 1.5 MMb/d of Oil Sands Production](#)”) and then again because of a plant fire in March 2017 that limited output for four months. As shown in Exhibit 1 the loss of Syncrude production (blue shaded area, left axis) had negligible impact on U.S. light sweet crude prices represented by the monthly WTI average (orange line, right axis).

Exhibit 1 Syncrude Production and WTI Prices



Source: CME Group, Oil Sands Weekly

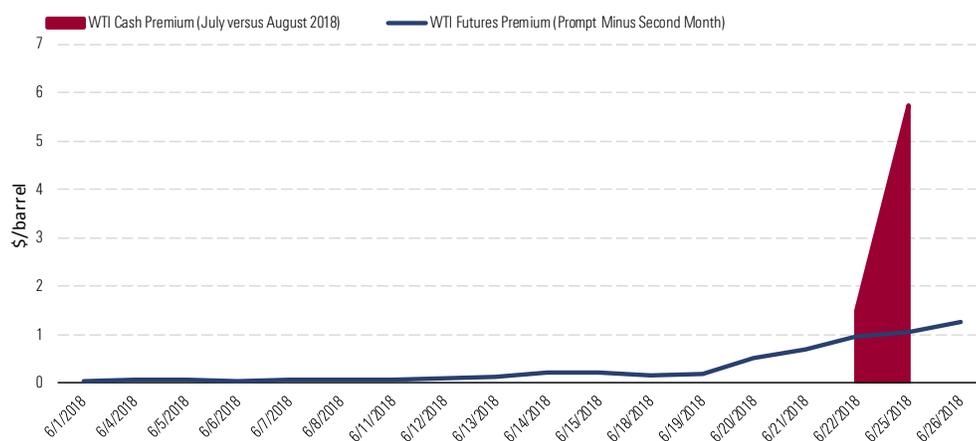
In that respect, the Syncrude outage is less significant than an equivalent loss of heavy Canadian crude. Canadian heavy barrels have no domestic alternative and would need replacing by imports that are now almost impossible to deliver to the Midwest because most import distribution pipelines except Capline have been reversed to accommodate southbound supplies. In contrast, the U.S. is over supplied with light crude and exporting record volumes this year—some of which will be spared to make up for the Syncrude shortfall.

Cushing Squeeze

In the short term, news of the Syncrude outage forced traders in Cushing to scramble for July light crude supplies before pipeline nominations closed on Monday, June 25. An accident of timing led to a rare

wide gap opening between prices for futures contracts linked to underlying WTI delivery at Cushing and prices for physical delivery at the Oklahoma hub. That's because the Syncrude outage occurred during the three-day window between futures expiry and the end of physical trading, that provides parties holding open futures contracts time to arrange delivery before pipeline nominations close on or after the 25th of each month. When news emerged on Friday, June 22 that the Syncrude outage might shut the plant through July, the futures contract had already expired, and refiners scrambling to shore up supplies bid up physical WTI July crude by as much as \$5.75/barrel over August WTI on Monday, June 25 (Exhibit 2). By Tuesday, June 26, cash prices for WTI August delivery fell back into line with futures at \$70.53/barrel.

Exhibit 2 WTI Prompt vs. Second Premium and Cash July vs. August — June 2018



Source: EIA, CME Group, Morningstar

Without Syncrude supplies we expect Cushing stock draws to continue - keeping upward pressure on prompt month futures and increasing backwardation in outer month contracts if the disruption extends into August.

Market Focus

Aside from that blip at Cushing, we see crude market attention turning to the changing international environment, where expectations of tighter OPEC supply after their Vienna meeting delivered a promise, but no great expectation, of higher output. That was followed by confirmation of a tough U.S. stance on Iran sanctions to limit that nation's 2 mmb/d of exports and President Trump's exhortations this weekend for the Saudis to increase output to counter that impact. It remains to be seen if Saudi production can meet that challenge.

Meanwhile, U.S. demand for crude is higher than ever with exports hitting a record 3.0 mmb/d, refineries processing a record 17.8 mmb/d, and a heavy draw on inventories of nearly 10 million barrels during the week ended June 22, according to Energy Information Administration data. All signs point to tighter supply and higher prices, but refinery margins are being squeezed as crude prices increase faster than products—raising the likelihood refiners take their foot off the gas pedal soon. ■■■

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