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TIME TO MOVE ON - SHELL'S PLAN TO SELL ANOTHER REFINERY, THIS TIME IN LOUISIANA'S REFINERY ROW

July 21, 2020

Earlier this month, Shell announced that it was exploring the sale of yet another refinery — this time, it is the company's Convent facility in Louisiana, which is one of the two refineries in the state that remain with Shell from the unwinding of its former joint venture with Saudi Aramco. Convent, with a capacity of 240 Mb/d, is near the middle of the pack in terms of refinery size and possesses some unique characteristics that could make it an attractive option for the right buyer and market conditions. But Shell's announcement also raises a question, namely, how does the prospective sale compare with the company's stated intent to focus on a smaller set of refineries integrated with Shell's key trading hubs and petrochemicals operations? Today, we review the refinery's characteristics and how it stacks up against its nearby rivals.

Convent is the fourth U.S. refinery that Shell is looking to unload in a little more than a year's time. In June 2019, Shell announced the sale of its Martinez, CA, refinery to PBF Energy, and in March of this year, Shell put its Mobile, AL, and Puget Sound, WA, refineries on the block. In general, Shell has explained its refinery divestiture announcements by saying that it wants to focus its manufacturing interests on a smaller, core set of refineries that are highly integrated with the company's key trading hubs and petrochemicals operations. If all of these facilities were to sell, Shell will be left with only two U.S. refineries: the Deer Park refinery in the Houston area, which is operated as a JV with Petróleos Mexicanos (Pemex), and the Norco refinery in Louisiana, whose operations are integrated to some degree with the Convent facility. Of note, both the Deer Park and Norco refineries are connected to adjacent ethylene crackers and related petrochemical facilities.

Convent is located within the U.S. Gulf Coast region, which holds more than half of the country's refining capacity. More specifically, the refinery (green refinery icon in [Figure 1](#)) is positioned in the middle of Southeast Louisiana (SELA), which is its own subset of Gulf Coast refiners located along the Mississippi River between Baton Rouge and the Gulf of Mexico. In recent years, the SELA region has been experiencing major changes in its crude oil sourcing options and crude oil flows with the additions of pipelines such as Zydeco, PELA (Permian Longview and Louisiana Extension), Bayou Bridge, and the pending Capline pipeline reversal (see [Figure 1](#) and [Louisiana Rain](#)). With its position along the Mississippi River, Convent also has access to international waters. This provides significant crude oil and feedstock sourcing flexibility, as well as outlets to refined product export markets. Additionally, the refinery's location just upriver from the St. James, LA, storage and distribution hub provides a high degree of flexibility and optionality for both foreign and domestic oil supplies via pipeline. Over the last three years, all crude oil supplies have been delivered to the refinery via an 18-inch-diameter pipeline from St. James operated by Zydeco, which is owned by Shell and Shell Midstream Partners.



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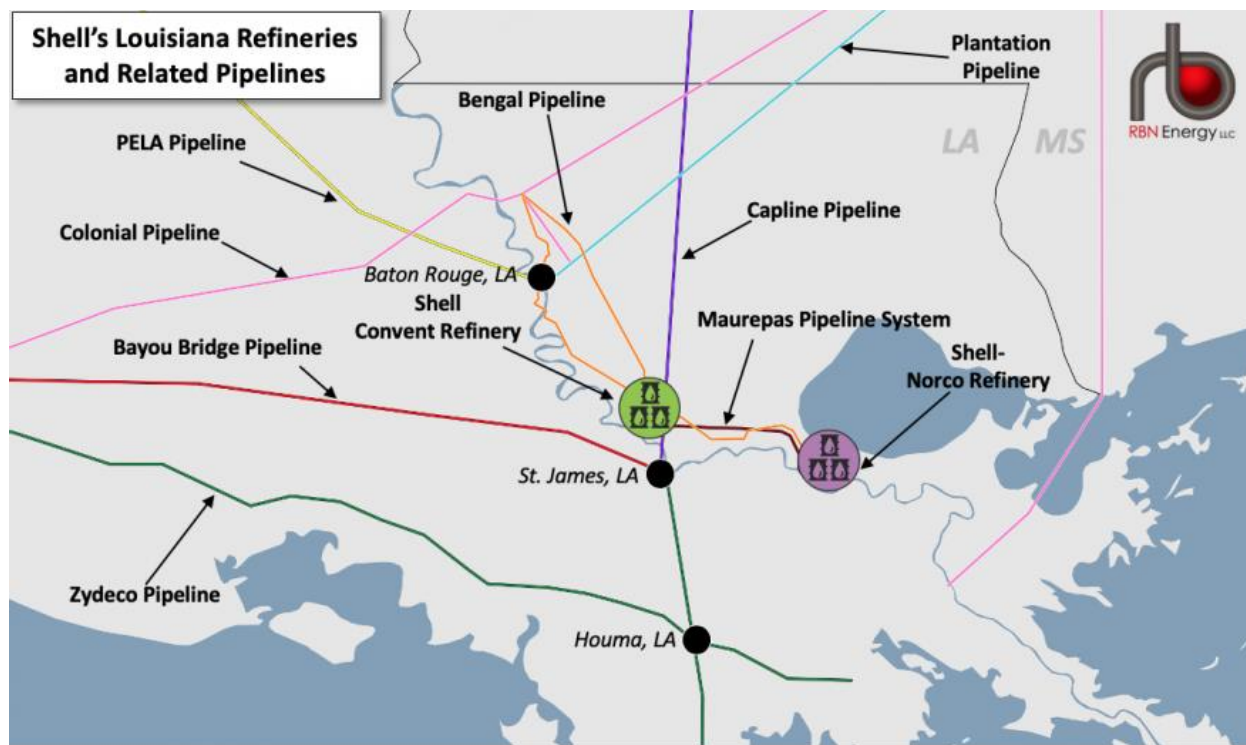


Figure 1. Shell's Louisiana Refineries and Related Pipelines. Source: RBN

Generally, the refinery runs a medium-sour crude slate, which is sourced primarily from domestic production areas, including the offshore Gulf of Mexico. Notably, Shell has large oil and gas production interests in the Gulf, with nine deepwater production hubs, numerous production systems, and interests in various pipeline systems. In addition to crude oil (orange bar segments in left graph in Figure 2), the company makes supplemental purchases of distillate blendstock, including fuel oil (light blue bar segments) and residual fuels (or resids; brown bar segments) to fill out the remainder of the feedstocks.

On the products side, the Convent refinery has a high degree of conversion capability, with about 93% of its throughput resulting in high-value products like gasoline (navy-blue bar segments in right graph), diesel/distillates (red bar segments), and jet fuel (green bar segments). (More on this in a moment.) The main product distribution artery is via the 16-inch-diameter Bengal Pipeline, which is owned by a JV of Shell Midstream and Colonial Pipeline Co. Bengal runs from Convent to Baton Rouge. From there, product is transferred to Colonial Pipeline, which is also partially owned by Shell Midstream, for delivery to the East Coast. Additionally, the refinery can access Plantation Pipeline to the East Coast and exports some products to international markets via the Convent refinery's barge and ship docks.



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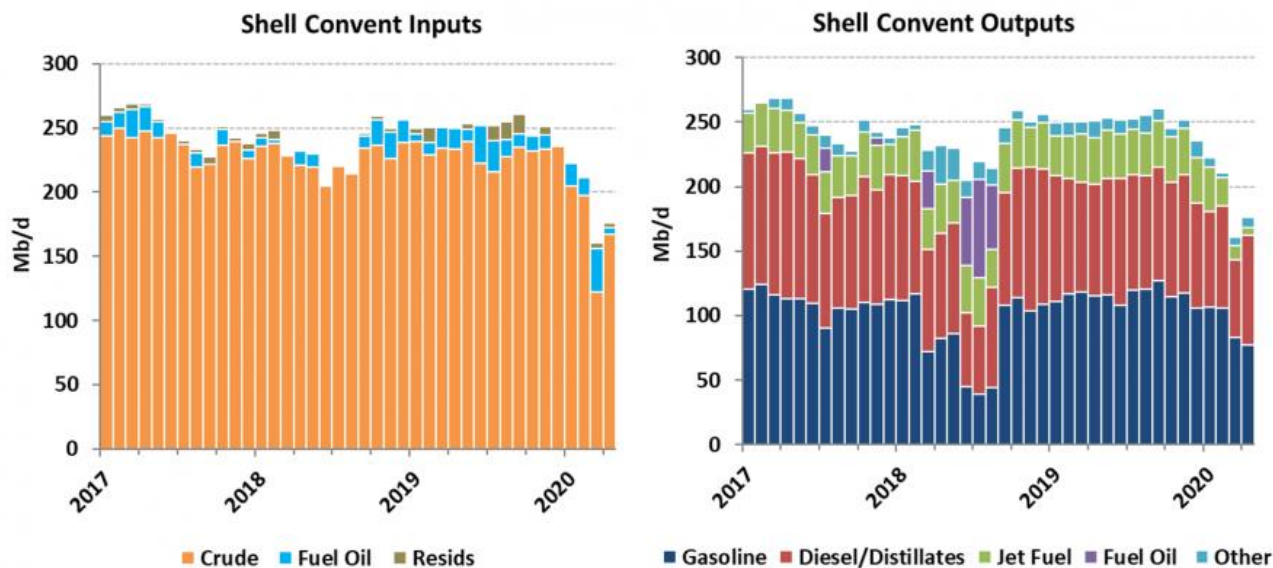


Figure 2. Convent Refinery's Inputs and Outputs. Source: Louisiana Department of Natural Resources.

So how does Convent stack up with its U.S. Gulf Coast competitors? As shown in the [Figure 3](#) table below, Convent is mid-sized, with a capacity of 240 Mb/d compared to an average of 289 Mb/d for the 30 refineries in the broader Gulf Coast region. The refinery is of reasonable complexity, with two crude trains that achieve a high degree of conversion. This is especially impressive given that Convent consumes a diet of crude that, with a 30.0 API gravity, on average, is slightly heavier than the 35.3-API average for Gulf Coast refineries as well as more sour, with a sulfur content of 1.79% versus the 1.45% regional norm.

2019 Summary Table	Convent	USGC Average
Crude Distillation Capacity, MB/D	240	289
PRISM Replacement Cost Index	7.8	9.3
Est. Replacement Cost, \$ Billions	\$6.1	\$6.8
Crude Slate API Gravity	30.0	35.3
Crude Slate Wt. % Sulfur	1.79%	1.45%
Conversion, % of Crude Capacity		
Catalytic Cracking	35%	30%
Distillate Hydrocracking	0%	14%
Coking	0%	17%
Resid Hydrocracking	20%	1%
Light Oil Product Yield, % of Total Inputs	93%	85%
CO ₂ Emissions, pounds/bbl input	96.6	77.5
H ₂ Consumption, SCF/bbl input	632	525

Figure 3. Metrics of Convent Refinery vs. U.S. Gulf Coast Fuels Refineries. Source: Baker & O'Brien



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What makes the Convent refinery stand out from its peers is its resid hydrocracker unit (RHU), in this case an “H-Oil” unit licensed by Axens. The RHU enables the refinery to process and convert low-value residue from the vacuum unit — also known as vacuum resid — into higher-value products. Relatively few refineries in the world have an RHU, as most instead use a delayed coking process for converting vacuum resid. The RHU is fairly energy and hydrogen intensive because the processing and conversion take place at high pressure, but the end result is an even more valuable slate of products than that produced by a coker. The downside of RHU units is they are much more complex and operationally sensitive than cokers. Further, the RHU likely limits crude slate options to a greater degree than a coker does.

The size of Convent’s fluid catalytic cracking unit (FCC), on a relative basis, is slightly larger than average, at about 35% of crude distillation capacity, but that’s not surprising since one of the RHU products is FCC feed, a.k.a. vacuum gas oil (VGO). Given the concern about the long-term gasoline demand growth trajectory combined with larger gasoline yields from an FCC unit, this might be seen as a bit of an Achilles’ heel for the refinery. When Convent and Norco were still owned by the Shell/Aramco JV, the joint venture’s larger integration project was to have involved closing the FCC unit at the Convent refinery and transporting the intermediate VGO to the Norco refinery. Shell later decided to continue running the FCC for at least another turnaround cycle, presumably due to more favorable economics.

Given its configuration, the Convent refinery could likely continue to be a competitive asset in another company’s hands. However, the motivations behind a potential sale leave us curious. As we noted in the intro, Shell has commented that it is looking to focus its manufacturing interests into a smaller, core set of refineries that are highly integrated with its key trading hubs and petrochemicals operations. In general, this asset seems to fit that bill. For example:

- **Location:** Convent is located in the Gulf Coast region, which is a key trading hub for Shell and provides ready access to domestically produced — and potentially lower-cost — crude oil.
- **Integration:** The refinery is integrated with Shell crude oil production, receives its crude oil through Shell or Shell affiliate-owned pipelines, and places its domestic product into Shell or Shell affiliate-owned product distribution pipelines. While the integration with crude production may not be as strategic as it was when the U.S.’s ban on most crude exports was in place, the pipeline integration is likely still a positive.
- **Untapped integration potential:** A few years ago, the Maurepas pipeline system was built between Convent and Norco to integrate these two refineries under a \$500 million Shell/Aramco plan — the project involved two new intermediates lines and a new crude pipeline to Norco. The plan was to shut down Convent’s FCC unit, ship the refinery’s VGO to Norco, and expand Norco’s hydrocracker to increase its diesel yield. While full integration was delayed due to continued operation of the FCC, the logistics assets are in place to push down this path should Shell decide to do it. At the time, the Shell/Aramco JV was expecting \$350 million in incremental annual EBITDA (earnings before interest, taxes, depreciation and amortization) from the integration, a prospect that will certainly come into consideration when deciding on a potential sale.

On the other hand, as Convent does not currently have integration with petrochemicals without the full integration with Norco, selling the refinery would appear to align with Shell’s stated strategy. It



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is possible that the new owner can negotiate to capture some of the envisioned synergy with Norco. This potential asset sale will certainly be one to watch as Shell's discussions with potential buyers progress.

Note: The article was authored by Amy Kalt of Baker & O'Brien and published on RBN Energy's Daily Energy Post on July 21, 2020.

"Time to Move On" was written by Tom Petty, and appears as the third song on Petty's second solo album, Wildflowers. Personnel on the record were: Tom Petty (vocals, guitars, bass), Mike Campbell (guitars, slide guitar), Howie Epstein (backing vocals), Steve Ferrone (drums), Lenny Castro (percussion), Benmont Tench (keyboards), and Michael Kamen (orchestration).

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