
Permian Majors Expand Downstream Processing

Exxon and Chevron increase light crude refining capacity.

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Data Sources for This Publication

U.S. Energy Information Administration

Texas Railroad Commission

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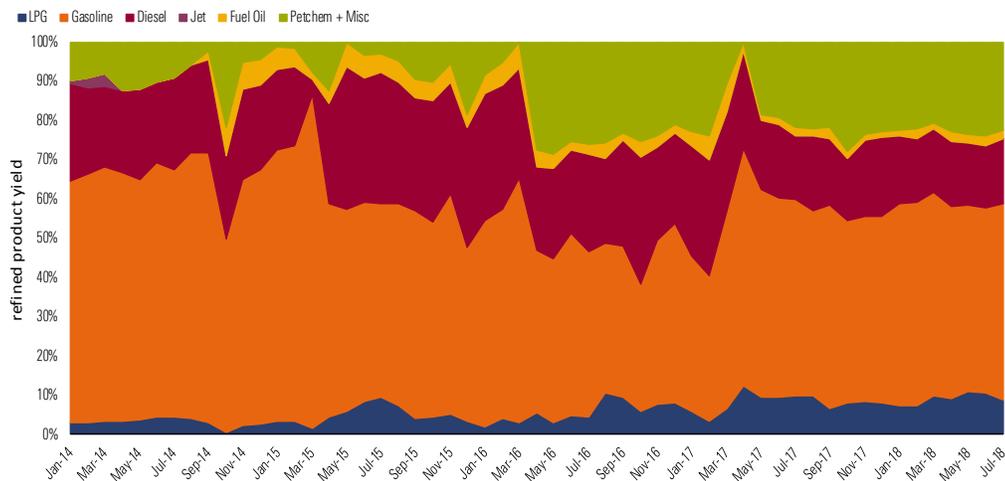
Build and Buy Strategies

During the last week of January 2019, Exxon announced a final investment decision to expand its Beaumont, Texas, refinery capacity by 250 thousand barrels/day, making it the largest U.S. plant, and then confirmed an investment with Plains All America and Lotus Midstream to build a 1 million barrel/day pipeline to ship crude to its Beaumont and Baytown, Texas, refineries. In the same week, Chevron announced its purchase of the 110 mb/d Pasadena, Texas, Houston Ship Channel refinery from Brazil's national oil company Petrobras. Both Exxon and Chevron boasted record Permian production in their fourth quarter 2018 earnings calls. This note reviews Chevron's purchase and Exxon's expansion considering the changing Gulf Coast refining market.

Chevron Purchase

The 110 mb/d Pasadena Refining System, or PRSI, plant was acquired by Petrobras at the end of 2008 after buying an initial 50% stake costing \$360 million in 2005 and paying a reputed \$639 million for the remaining 50% from joint venture partner Astra Oil at the end of 2008. Some of those payments subsequently featured in Brazil's investigation into the Petrobras "carwash" corruption scandal. As part of the clean up after that scandal, Petrobras has agreed to sell the refinery to Chevron for \$350 million—about one third of what was paid for it. The acquisition is expected to close during the first half of 2019.

PRSI is configured to process light crude to produce gasoline and distillate components. Data from the Texas Rail Road Commission shows the plant is primarily supplied with crude from the Enterprise Houston Terminal (formerly OilTanking)—likely a mixture of Permian and Eagle Ford shale grades. The refined product yield has changed over the past five years with an increase in gas liquids (propane and butane) from 3% of output in 2014 to 9% in 2018. Gasoline output of 63% in 2014 has fallen to 50% in 2018 due to increased production of gas liquids and naphtha petrochemical feedstocks. Diesel output is lower today (16%) than in 2014 (22%) probably because lighter shale crudes produce less distillate material. Exhibit 1 shows monthly refinery output percentage by product between January 2014 and July 2018 as reported to the TRRC. Average refinery throughput between January and July 2018 was 101 mb/d or 92% of operable capacity. Chevron buys the refinery together with 5.6 million barrels of storage and access to Houston Ship Channel docks as well as area crude and refined product distribution systems.

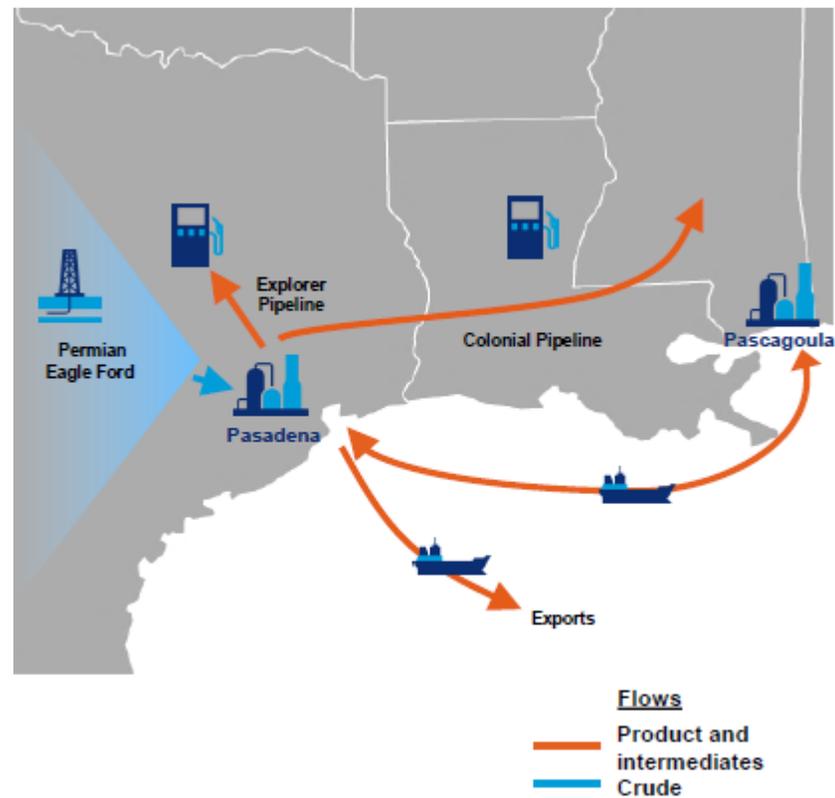
Exhibit 1 Pasadena Refinery Product Yields

Source: TRRC, Morningstar.

The PRSI acquisition becomes the fifth refinery in Chevron's U.S. fleet that includes the El Segundo (269 mb/d) and Richmond (245 mb/d) plants in California, the Salt Lake City (52 mb/d) plant in Utah, and the 352 mb/d Pascagoula plant in Mississippi. The company sold the 55 mb/d Burnaby refinery north of Vancouver, British Columbia, to Parkland Fuels in April 2017. The PRSI addition brings Chevron's North America refining capacity to 1.0 mmb/d and its worldwide fleet to 1.8 mmb/d.

A big selling point for PRSI is its location adjacent to the Houston Ship Channel that hosts four refineries and has great access to domestic crude supply and refined product distribution. Unlike many of its Gulf Coast counterparts, PRSI is a relatively unsophisticated plant that does not process heavy crude. In a January 2017 note we described failed efforts by neighbor LyondellBassell to sell its high complexity Houston plant (see "[Deal or No Deal? LyondellBassell Hold on to Refinery](#)") and at the time estimated that Pasadena's refining margins were the lowest of the four Ship Channel rivals because it could not process cheaper heavy crude. However, the recent narrowing of the sweet-sour spread in light of sanctions on Venezuela and transport challenges delivering more heavy Canadian crude to the Gulf Coast mean that a refinery configured to process abundant light domestic shale may well retain a longer-term advantage.

Chevron plan to integrate PRSI with its eastern Gulf Coast Pascagoula refinery operation as well as to distribute refined product into the Gulf Coast and Midwest regions via the Explorer and Colonial pipelines (Exhibit 2). Naphtha and LPG petrochemical feedstock from the refinery could also be used by Chevron's joint venture with Phillips 66 (CP Chem) that brought a new 1.5 million metric tons per year ethylene plant online at Cedar Bayou near Baytown, Texas, in April 2018. The PRSI refinery marks a clear pivot away from heavy crude processing by Chevron, whose Pascagoula refinery processed 66 mb/d of heavy Venezuelan crude during 2018 according to RBN Energy. Chevron remains a partner with Venezuelan national oil company PDVSA in the production of heavy Boscan crude.

Exhibit 2 Chevron Pasadena Refinery Integration

Source: Chevron Investor Presentation.

Exxon Beaumont Expansion

We previously detailed Exxon's Gulf Coast refinery expansion plans including adding capacity to its 366 mb/d Beaumont, Texas, plant in a March 2018 note (see "[Exxon Bets on Downstream U.S. Returns](#)"). That note describes how the complex Beaumont plant is currently equipped to process a mixture of heavy sour and light sweet crudes and how the refinery's crude import diet has evolved over the past four years with a reduced dependence on supplies from Mexico, Colombia, and the Middle East and an increase in Canadian heavy crude. The refinery is also integrated with a petrochemical cracker and lubes plant plus a downstream polyethylene plant.

Exxon Beaumont is the eighth largest refinery in the U.S. and third largest in Exxon's fleet behind its 561 mb/d Baytown, Texas, and 503 mb/d Baton Rouge, Louisiana, plants. The plan to add 250 mb/d at Beaumont will make it the largest plant in the U.S. at 616 mb/d edging ahead of neighboring Aramco Motiva's 603 mb/d Port Arthur, Texas, refinery. Exxon is also expanding processing capacity at Baytown by 60 mb/d and at Baton Rouge by 17 mb/d. After these expansions, Exxon's five-plant U.S. fleet will have a combined 2.1 mmb/d capacity pushing them ahead of Phillips 66 (1.9 mmb/d at 11 plants) into third place among U.S. refiners behind Valero (2.6 mmb/d) and Marathon (3 mmb/d). Worldwide Exxon's total fleet is estimated today at 4.9 mmb/d and will increase to 5.2 mmb/d still second behind leader

Aramco with 5.4 mmb/d. Although all of Exxon's U.S. refineries today are sophisticated plants with heavy crude coking capacity, the Beaumont expansion is designed to process light domestic crude, marking a pivot away from high conversion refining by the world's largest major oil company.

Permian Crude Supply

Although Exxon is choosing to build new capacity while Chevron is buying an existing plant, both companies are expanding downstream refining at the Gulf Coast for the same reason—to process more of their growing crude production from the West Texas Permian basin. In January 2018, Exxon announced plans to triple its daily production in the Permian to more than 600 mb/d by 2025. This increase is made possible by the company's \$6 billion acquisition of premium Permian acreage from the Bass companies in 2017. On the company's fourth-quarter 2018 earnings call it stated that Permian production increased by 93% over fourth-quarter 2017. Chevron has also amassed substantial holdings in the Permian and ranks among the biggest producers in the region. Its fourth-quarter earnings presentation stated that Permian crude production increased 71% from 181 mb/d in 2017 to 310 mb/d in 2018. With most Gulf Coast refineries not equipped to process more light crude, both companies need to find a home for increasing Permian output. While U.S. exports are expanding, the option of domestic refining capacity to process equity crude provides greater flexibility if international markets cannot absorb more U.S. exports.

Pipeline Plan

Shortly before announcing the Beaumont expansion go-ahead, Exxon confirmed plans for a 1 mmb/d plus capacity crude pipeline from Wink in the West Texas Permian production region to the Houston and Beaumont, Texas, refining regions on the Gulf Coast. Known as the Wink to Webster Pipeline, the project will be built together with partners Plains All American and Lotus Midstream. The new conduit will ship Permian crude to Webster, junction in Houston as well as Exxon's Baytown and Beaumont refineries, and is expected online in the first half of 2021. By providing investment and anchor shipper support for this project, Exxon is securing its supply of crude for the Beaumont expansion as well as a route to export docks on the Gulf Coast. The new pipeline increases Exxon's supply optionality at Beaumont that is already served by the Energy Transfer Permian Express pipeline from West Texas. Another project—the 600 mb/d Energy Transfer, Magellan, Marathon MPLX, and Delek Permian Gulf Coast pipeline was announced in 2018 and would also ship Permian crude to Houston and Nederland. Magellan has muted the possibility of combining the Permian Gulf Coast project with Exxon's Wink to Webster pipeline.

Big Boy Stamp

Independent producers and domestic refiners alike have enjoyed the bounty of cheap domestic shale since 2012. The latest investments by Exxon and Chevron suggest major oil companies are firmly placing their big boy stamp on the shale turf and claiming it as their own. They are doing this by employing industrial scale production techniques in the Permian to extract more for less over the long term. This strategy is an integral part of their exploration and production portfolio—just as valued as Exxon's investment in offshore Guyana and Chevron's continued investment in deepwater Gulf of Mexico plays.

These investments in shale in the ground are now being consolidated into their vertically integrated operation through the acquisition of downstream refining capacity at the Gulf Coast.

Owning refineries to process shale crude provides both companies with optionality to sell shale domestically in addition to finding a home for it in the export market. Chevron's acquisition of an existing refinery is a lower-risk approach since the market for the PRSI plant's output is already established. Exxon is taking a larger risk that it can sell more refined product from the Beaumont expansion. The only logical market for that product is international sales—which have been booming in recent years but could see headwinds in the future. Exxon's investment in downstream Mexican markets for instance is now threatened by a less friendly regime. However, a brand-new Gulf Coast 250 mb/d crude unit at Beaumont should be competitive with any rival plant worldwide. We expect that these investments will be the first of many moves by Gulf Coast refiners to expand light crude processing capacity in the face of ever-growing domestic output and geopolitical threats to heavy crude supplies. ■■

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