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# Pipeline Plans Suggest Tsunami of Crude Exports

## Midstream companies looking to double Gulf Coast shipments.

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### Data Sources for This Publication

Energy Information Administration

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### Infrastructure Blowout

As 2018 draws to a close, it's proving to be a record year for the U.S. crude market. Supply has reached historic levels, with production averaging nearly 11 million barrels/day and clinching the world's top producer spot over Russia and Saudi Arabia. Demand has also broken records this year, with domestic refinery runs at an all-time high and a rapidly growing export market. Next year, a combination of increased production and new pipeline capacity to ship crude to the Gulf Coast promises to unleash a new export surge. But massive planned pipeline capacity expansions over the next three years threaten to overwhelm both production growth and Gulf Coast export capacity. This note looks at the Gulf Coast crude supply/demand balance and the impact of new infrastructure over the next three years.

### Gulf Coast Balance

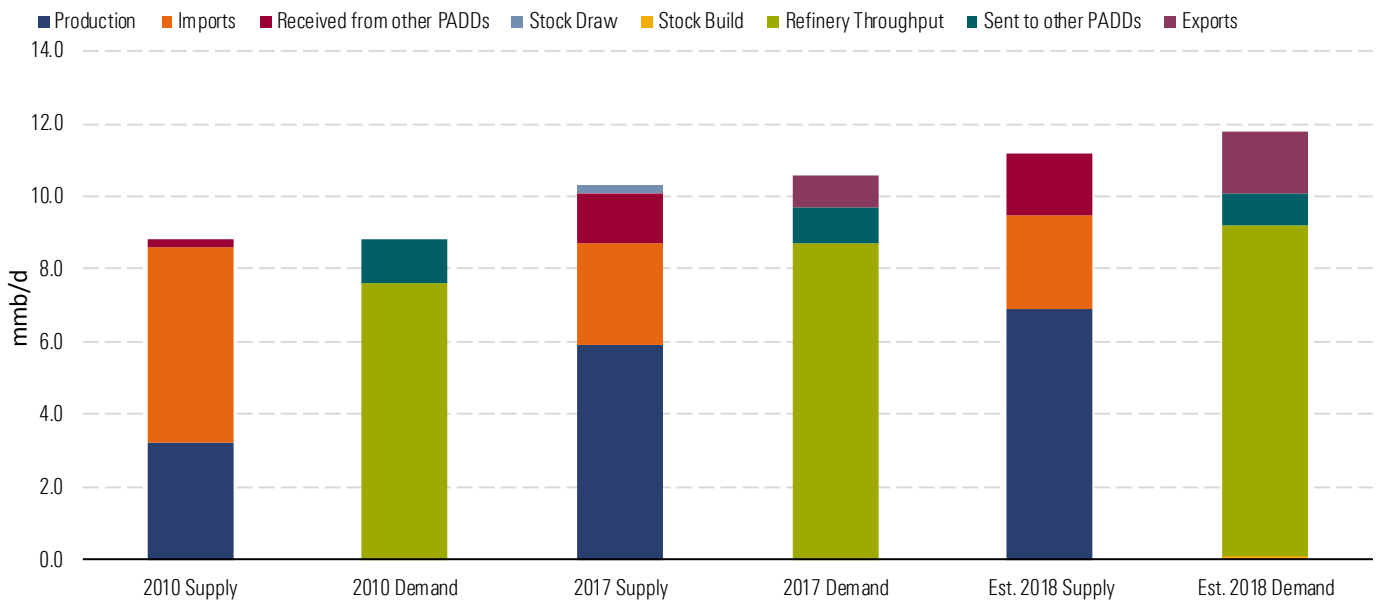
Analysis of the Gulf Coast supply/demand balance aptly demonstrates the magnitude of changes in domestic crude flows since the oil shale era began in 2011. To understand the trend, we reviewed monthly Energy Information Administration data in 2010, 2017, and 2018 between January and September to calculate the crude balance in the most important U.S. region for oil production, processing, and international trade. The Gulf Coast—defined by the Department of Energy as Petroleum Administration for Defense District 3, or PADD 3—includes New Mexico, Texas, Arkansas, Mississippi, Louisiana, and Alabama, as well as the offshore Gulf of Mexico. In addition to local production, crude supply comes into the region from the rest of the U.S. as well as imports by pipeline from Canada and by tanker from around the world. Demand is primarily from local refineries in PADD 3 that represent over 50% of the nation's processing capacity, as well as shipments to refineries outside the region and exports to world markets. Analysis of the supply/demand balance also takes inventory builds or draws into account. Predictably, the complexity of tracking crude movements and storage within the region makes it difficult to accurately balance supply and demand, but the trends are clear.

The stacked columns in Exhibit 1 represent average daily supply and demand volumes in PADD 3 by component during 2010, 2017, and 2018 January-September, respectively. In 2010, before shale was a factor, an average 8.8 mmb/d of crude passed through the Gulf Coast region. About 3.2 mmb/d of that supply was locally produced—primarily from the Permian and offshore Gulf of Mexico, with most of the remainder, or 5.4 mmb/d, being imports and an insignificant 200 thousand barrels/day trickling in from domestic production outside PADD 3. Demand came mostly from local refineries that consumed 7.6 mmb/d, with a further 1.2 mmb/d of production and imports being shipped to other regions, primarily the Midwest.

By 2017, the size of the daily crude balance at the Gulf Coast had expanded to about 10.5 mmb/d, with local output accounting for 5.9 mmb/d, including Eagle Ford and Permian shale production. Domestic production also boosted crude supply from outside the region to 1.4 mmb/d in 2017, while imports shrank from 5.4 mmb/d in 2010 to 2.8 mmb/d in 2017 as local output replaced refinery demand for imports of light sweet grades. On the demand side, refinery throughput increased by 1.1 mmb/d between 2010 and 2017 to 8.7 mmb/d as a result of expanding capacity and refiners processing more local crude. Lower volumes of crude were shipped out of PADD 3 to other regions in 2017 as refineries in the Rockies and Midwest were increasingly supplied by local domestic production. Because of the boom in shale production, crude supply outpaced demand at the Gulf Coast in 2017, and the market was balanced by 0.9 mmb/d of crude exports, which could expand after deregulation at the end of 2015.

The same trends have continued in 2018, with Gulf Coast crude production up another 1.0 mmb/d over 2017 to 6.9 mmb/d (on average between January and September). Imports shrank by another 200 mb/d to 2.6 mmb/d and crude from other regions jumped 300 mb/d to 1.7 mmb/d. Record runs increased refinery demand by 400 mb/d to 9.1 mmb/d. Slightly less crude was shipped to other regions, and congestion in the Permian Basin caused inventories to build by about 100 mb/d in 2018. This year, the balancing of demand through exports led to a near doubling of overseas shipments to 1.7 mmb/d.

**Exhibit 1** Gulf Coast Supply/Demand Balance



Source: Morningstar, EIA.

With refineries running close to full in 2018 and no major processing capacity expansions expected for several years, the Gulf Coast balance will probably mirror this year in 2019. That means any increase in production and crude inflows to the region will simply add to export volumes. Congestion this year in the Midland production zone of the Permian and between Cushing, Oklahoma, and the Gulf Coast have

constrained flows to export docks in 2018 and arguably held back drilling and completion in some basins.

### **Pipelines Into PADD 3**

That congestion should clear in 2019 and beyond. Midstream operators have announced pipeline projects that, if completed, would more than double crude capacity to the Gulf Coast from outside the region over the next three years. That's a huge number. Our estimate of current capacity as of December 2018, summarized in Exhibit 2, is that crude pipelines from Cushing to the Gulf Coast can ship up to 1.55 mmb/d, pipes from North Dakota to the Gulf Coast up to 450 mb/d, pipes from the Permian and Eagle Ford to Houston and Nederland, Texas, up to 2.5 mmb/d, and from both those basins to Corpus Christi up to 1.8 mmb/d. It all adds up to a total of 6.3 mmb/d operating today. As our PADD 3 balance shows, about 1.7 mmb/d of that total is currently headed into the export market, with the rest serving local refining needs. We assume any added capacity to be dedicated to exports.

### **Pipeline Expansion**

There's a huge volume of new capacity being planned. We count at least 15 new pipeline projects announced so far this year, summarized on the right side of Exhibit 2. A total of 2.1 mmb/d capacity in four projects is proposed between Cushing and the Gulf Coast, including the Magellan/Navigator Voyager, Phillips 66 Red Oak, SemGroup/DCP Midstream Gladiator, and Tallgrass Seahorse projects. These pipelines aim to improve Gulf Coast access for Rockies and Oklahoma STACK basin crude as well as heavy Canadian crude ex-Cushing. The Phillips 66 Liberty project promises to add as yet unspecified capacity from North Dakota to Corpus Christi.

A further 2 mmb/d of pipeline capacity has been announced between the Permian and Eagle Ford basins and the Texas Gulf Coast at Houston or Nederland/Beaumont/Port Arthur. The two largest projects in this group are the 1.0 mmb/d plus Plains/ExxonMobil/Lotus Midstream joint venture from Wink and Midland in the Permian to Baytown and Webster Junction and extending to Beaumont, Texas, and the 600 mb/d Energy Transfer/Magellan/ Marathon/Delek joint venture Permian Gulf Coast pipeline from the Permian to Houston and Nederland. Magellan recently suggested that these two projects might merge. Smaller projects on this route include a 200 mb/d Enterprise gas liquids conversion and expansions to Energy Transfer's Permian Express system.

Another six projects plan to bring as much as 3.5 mmb/d of incremental crude from the Permian and Eagle Ford into the Corpus Christi region. These include the 825 mb/d Ares Capital EPIC crude pipeline, the 500 mb/d Jupiter pipeline that will extend to Brownsville, Texas, and the 900 mb/d Phillips 66, Marathon and Enbridge joint venture Grayoak pipeline into Corpus Christi and then running along the Gulf Coast to Freeport.

**Exhibit 2** Crude Pipeline Capacity to Gulf Coast

<b>Origin Region</b>	<b>Destination</b>	<b>Capacity Dec 2018(Mb/d)</b>	<b>Planned Capacity by 2021 (Mb/d)</b>
Cushing	Gulf Coast	1550	2100
Bakken	Gulf Coast	450	100
Texas	Houston/Nederland	2500	2040
Texas	Corpus Christi	1830	3495
<b>Total</b>		<b>6330</b>	<b>7735</b>

Source: Morningstar, company presentations.

**Export Tsunami**

Doing the math, if all these pipes are built and run near to capacity, the additions would carry as much as 7.7 mmb/d of new crude to the Gulf Coast, the majority of which would be light shale crude looking for a home in the export market. The only exception to this equation is the ExxonMobil Permian pipeline that may be destined in part to feed expanded capacity at their Baytown and Beaumont refineries (see our March 2018 note "[ExxonMobil Bets on Downstream U.S. Returns](#)"). That aside, the midstream plans imply a more than fourfold increase in export volumes from 1.7 mmb/d today to a tsunami somewhere north of 8 mmb/d in the years beyond 2021.

To meet this export demand as well as reassure potential shippers that their barrels will have access to export facilities, midstream companies have paid increasing attention to dock space during 2018. The result has been several ongoing projects expanding marine docks to accommodate larger vessels suitable for exports. The complication of this challenge is that U.S. Gulf ports are in relatively shallow water, whereas the most popular markets for U.S. crude exports have been Europe and Asia. For long-distance markets, larger vessels are preferred to keep freight costs down — especially to Asia. The result has been a scramble to develop the first onshore U.S. exports dock able to accommodate a very large crude carrier holding 2 million barrels or to build copycat versions of the existing offshore LOOP terminal in Louisiana that uses a pipeline linked to a mooring buoy to unload supertankers in deep water.

**Onshore or Offshore**

Deep-water export docks haven't proved simple to develop. The onshore variation — currently being built out by several companies in the outer harbor of Corpus Christi, require extensive dredging, including a channel from the Gulf of Mexico deep enough to accommodate a laden VLCC (80 feet). Dredging involves waiting on the government Army Corps of Engineers (that requires a lengthy budget approval process) or obtaining private financing, which the Port of Corpus Christi recently initiated. Either way, such projects usually take years to complete. The "LOOP copycat" offshore mooring buoy terminal is simpler to build but requires an offshore pipeline and permitting approval from multiple agencies. In addition to LOOP itself, that was built in the 1970s as a crude import terminal and has now been partially converted for exports, at least five new similar offshore projects were announced this year. The first was

the Trafigura Texas Gulf Terminals project that we described in a September note detailing a dispute between its owner and the Port of Corpus Christi (see "[Corpus Christi Objects to Trafigura Terminal](#)"). That dispute has heated up since with the Port of Corpus Christi arguing that their onshore project is a safer solution to the challenge of loading VLCCs.

Since Trafigura filed for permits with the Maritime Administration in July 2018, another four projects have been announced (none of which has yet filed for permits). The first is the Jupiter Brownsville export terminal that would be located offshore Brownsville, Texas, and designed to load VLCCs from their Jupiter pipeline currently being permitted to ship crude from Orla in the Permian to Corpus Christi and Brownsville. A second proposal came from Tallgrass to complement its proposed 800 mb/d pipeline from Cushing to St. James, Louisiana. It plans to extend a pipeline from the Mississippi estuary to an offshore terminal in the eastern Gulf of Mexico. The third and fourth proposals come from an Enbridge/Kinder Morgan/Oiltanking joint venture and Enterprise. They both propose offshore terminals built out from dock facilities at Freeport and Texas City in the Houston region.

### **Dock Congestion**

We don't expect any of these offshore terminals to be operating (assuming they are permitted and financed) until 2021 at the earliest. If they are delayed beyond then and if all the planned pipeline capacity we have detailed is built and in use, then the resulting tsunami of exports will almost certainly lead to dock congestion after 2021 if not before.

But the threat of dock congestion only arises if all the proposed pipelines are built and if they run full. That probability is low, at least in the next three years. The current EIA Short-Term Energy Outlook forecasts U.S. crude production to average 10.9 mmb/d this year and 12.1 mmb/d in 2019 implying a slowdown from this year's surge of 1.5 mmb/d over 2017 to 1.2 mmb/d year on year in 2019. Even if production grows by the same 1.2 mmb/d in 2020 and 2021, the net increase between 2018 and 2021 would be 3.6 mmb/d, well within currently planned pipeline capacity of 7.7 mmb/d.

### **Too Much Too Soon**

With 2018 shaping up to be a year of record U.S. crude production and exports, midstream companies are certainly planning for more of the same in the next three years. If all the current pipeline proposals are built and operate at anything like capacity, we'll see a fourfold expansion of crude exports to over 8 mmb/d after 2021. If that number is even close to reality, then we're certainly going to need most of the five offshore VLCC docks planned along the Gulf Coast. Fortunately, current production forecasts don't match the volume of pipeline projects, and crude growth over the next three years is likely to be closer to 3 mmb/d. The mismatch suggests an infrastructure overbuild is underway in the short term, and we expect consolidation of many of these projects before they're built. Yet the history of shale expansion has taught us that the most optimistic forecasts frequently appear in the rearview mirror. ■■■

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