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# Houston Crude Export Capacity Adequate for Now

## Deliveries on new pipelines could overwhelm.

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**Data Sources for This Publication**  
Railroad Commission of Texas  
RBN Energy  
U.S. Census  
EIA

To discover more about the data sources used, [click here](#).

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### Shippers Favor Large Vessels

Even as analyst sentiment waivers on whether U.S. shale production has peaked in this cycle, the expansion of Gulf Coast export facilities to handle increased output continues. Export growth is expected because new pipeline capacity is opening to deliver ever-greater volumes of crude to the Gulf Coast that are primarily destined for overseas markets. Today most crude is being exported from existing onshore marine docks — built years ago and that have been hurriedly expanded in the shale era by adding storage and modifying existing berths. Onshore Gulf Coast terminals don't accommodate the very large crude carriers preferred by international shippers selling cargoes to Asia. Following our recent analysis of Corpus Christi's dock capacity this note looks at the Houston region's crude export capacity.

### Corpus Christi

Our analysis of Corpus a few weeks ago (see "[Corpus Christi Constraints Threaten Exports](#)") suggested that although adequate dock capacity existed or was being built out to accommodate an increase in crude flows, vessel constraints within the Port of Corpus Christi harbor could create increased congestion over the next three years until 2022 when offshore terminals are expected to be built to handle efficient export operations.

### Houston Balance

To help understand how the Houston area crude infrastructure is handling increased inbound flows of crude from the Permian and other basins this year, we estimated the region's crude supply/demand balance for first-half 2019 as follows:

### Supply

Data from the Texas Rail Road Commission, or TRRC, shows monthly average flows on trunk line pipelines into Houston were about 3 million barrels/day between January and June 2019, compared with nameplate pipeline capacity of 4.5 mmb/d. The big gap between actual capacity and flows is explained by pipelines that pivot between Houston and the Beaumont/Port Arthur refining region further up the Gulf Coast and by lower flows from the Eagle Ford basin in South Texas. Pipelines into Houston from the Permian Basin (Longhorn, BridgeTex, Midland-ECHO) ran close to full, as did the two Seaway pipelines from Cushing, Oklahoma to Houston. The 0.8 mmb/d TC Energy Cushing Marketlink pipeline from Cushing to the Gulf Coast also ran full but it divides at Liberty, Texas to flow east to Port Arthur or west to Houston and only 9% of volume or 0.1 mmb/d on average came to Houston. A similar pivot in the offshore Gulf of Mexico production CHOPS pipeline meant flows on that system were lower into Houston than to Port Arthur. The Kinder Morgan and Enterprise pipelines into Houston from the Eagle

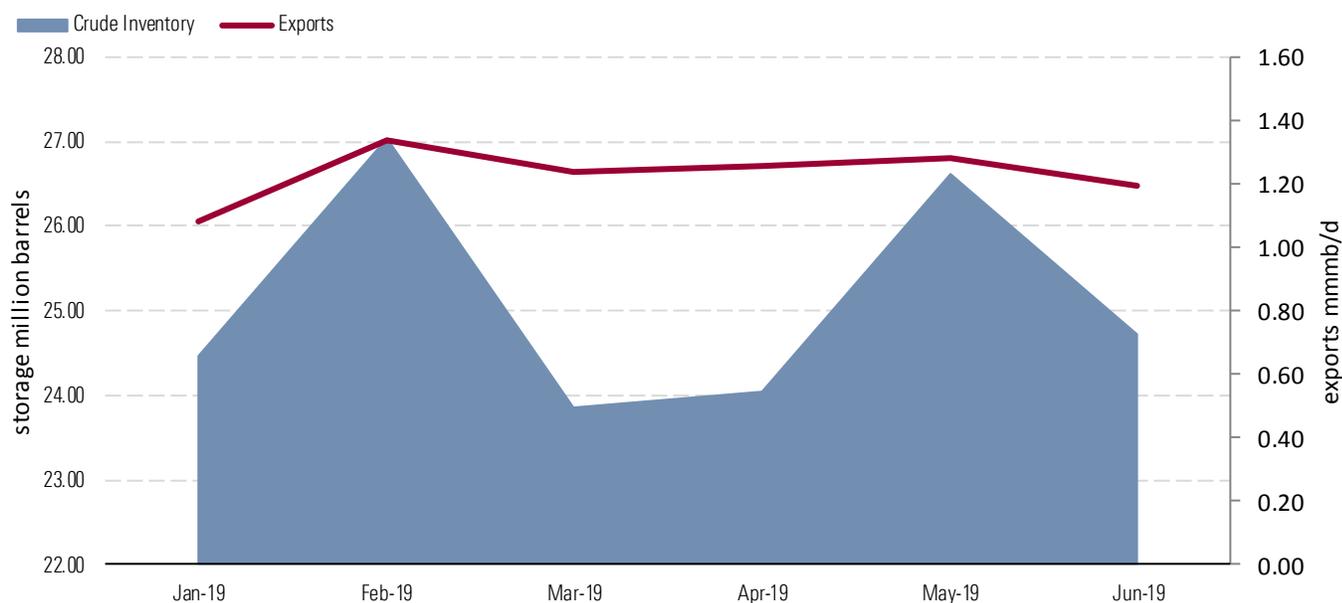
Ford in South Texas ran less than full due to lower production in that basin. In addition to incoming pipeline flows, Houston area terminals and refineries imported an average 0.7 mmb/d of crude according to the Energy Information Administration between January and June 2019. Pipeline and import flows added up to an average total crude supply of 3.7 mmb/d.

### **Demand**

Houston crude is either consumed by local refineries, delivered east to the Beaumont/Port Arthur refining region or moved onto the water for domestic or export shipment. The TRCC data shows pipeline movements to Beaumont/Port Arthur between January and June averaged 0.4 mmb/d on the Shell Zydeco and Enterprise/Enbridge Seaway pipelines with 85% of that volume shipping on Seaway. We estimated refinery processing during this period at 2.3 mmb/d based on EIA monthly reported refinery utilization estimates for Texas Gulf Coast refineries — that averaged 88% — applied to the 2.6 mmb/d capacity of the 11 refineries and condensate splitters in the region. Crude exports from the Houston region as reported by the U.S. Census averaged 1.2 mmb/d. Total demand (shipments to Beaumont Port Arthur, refinery processing and exports) came to 3.8 mmb/d.

### **Inventory**

Our estimates almost balance Houston crude supply (3.7 mmb/d) and demand (3.8 mmb/d) over the first six months of 2019. That balance is corroborated by available TRCC crude inventory data for 14 commercial storage terminals (not including refineries), which held an average 25 million barrels during the first six months of 2019 (Exhibit 1, blue shaded area, left axis). The storage data is not comprehensive because not all storage is reported to the TRCC but it does show inventory levels in Houston didn't swell over the first six months of 2019. In fact, increased refinery throughput reduced stocks in March and April during the buildup to the summer driving season before they recovered in May and June. Crude exports (Exhibit 1, red line, right axis) increased 18% between January and May 2019 before retreating in June to 1.2 mmb/d.

**Exhibit 1** Houston Area Crude Oil Stocks and Exports 2019

Source: Railroad Commission of Texas, U.S. Census, Morningstar Commodities.

The important takeaway from the Houston crude balance is that the region's existing infrastructure handled exports comfortably in first-half 2019 without increasing inventories significantly. Next, we looked at the export terminals.

### Export Terminals

Our analysis of company presentations and shipping data identified five terminals in the Houston region regularly used for crude exports over the past two years. Exhibit 2 shows the storage and maximum load capacity of these terminals, which handled about 70% of Houston's exports between January and August this year according to RBN Energy. The largest is the Enterprise Houston ship channel, or EHSC, terminal formerly owned by Oiltanking. The EHSC boasts six docks, which can load crude tankers with a 45-foot draft up to partially loaded Suezmax size at rates up to 600 mb/d. The terminal has 21 mm barrels of crude storage and loaded an average 500 mb/d of crude for export between January and August 2019 according to RBN. Enterprise is currently upgrading the EHSC terminal to increase loading capacity to 840 mb/d. Houston's second-largest crude export terminal by volume, also in the ship channel, is the Houston Fuel Oil Terminal Company, or HFOTC, owned by SemGroup, which has loaded an average 105 mb/d of crude exports this year through August. The HFOTC terminal has 6.6 mm barrels of crude storage capacity and can load partially laden Suezmax vessels at 350 mb/d. On September 16, 2019 Energy Transfer announced the acquisition of SemGroup as well as a proposed pipeline linking HFOTC to their huge 22 mmbbl terminal at Nederland, Port Arthur.

The remaining top five Houston export terminals lie outside the ship channel in Galveston Bay at Seabrook, Texas City and Freeport. The Seabrook Logistics terminal is owned by a 50/50 joint venture between Magellan Midstream and LBC Terminals. That terminal has operated since mid-2018 and loaded an average 85 mb/d of crude exports this year. Seabrook has 2.4 mm barrels of storage and can load Aframax vessels at 400 mb/d. An expansion to the Seabrook terminal to increase storage by 700,000 barrels and increase loading rates by 240 mb/d is underway and expected to be complete by the end of 2019. Seaway Pipeline Company, a joint venture between Enterprise and Enbridge, owns the last two of Houston's top five export terminals. The Seaway Texas City terminal has 4 mm barrels of storage capacity, can load Suezmax vessels at a rate of 720 mb/d and loaded an average 80 mb/d of crude exports between January and August 2019. The Seaway Freeport/Jones Creek terminal has 2.6 mm barrels of crude storage, can load Aframax vessels at 480 mb/d and shipped an average 55 mb/d of crude exports this year.

**Exhibit 2** Current Houston Export Dock Capacity

<b>Terminal</b>	<b>Owner</b>	<b>Storage (mmbbl)</b>	<b>Vessel Max</b>	<b>Load Rate mb/d</b>	<b>2019 Exports mb/d</b>
Enterprise Houston Ship Channel	Enterprise	21.0	Suezmax	600	499
HOFTI	Energy Transfer	6.6	Suezmax	350	105
Seabrook Logistics	Magellan/LBC	2.4	Aframax	400	85
Seaway Texas City	Enterprise/Enbridge	4.0	Suezmax	720	80
Seaway Freeport / Jones Creek	Enterprise/Enbridge	2.6	Aframax	480	55
<b>Total</b>				<b>2550</b>	<b>824</b>

Source: Corporate Presentations, Morningstar Commodities.

### **Congestion Ahead?**

While current Houston infrastructure appeared to cope with incoming crude for export during first-half 2019, flows into the region from new pipelines could stretch the system to breaking point in future. Proposed pipeline expansions expected online by 2022 include the ExxonMobil, Plains All American and Lotus Midstream joint venture 1.0 mmb/d Wink-to-Webster pipeline into Houston from the Permian and the 0.9 mmb/d Phillips 66 and Marathon Gray Oak pipeline from the Permian to Corpus Christi, which will extend along the Gulf Coast to Sweeny, Texas west of Houston. There are also two pipelines proposed between Cushing and Houston – the 300 mb/d Magellan Voyager and the 400 mb/d Phillips 66 Red Oak. The latest addition to the list is the Enterprise Midland-to-ECHO expansion project, which was confirmed last week to start service in first-half 2021 with 450 mb/d capacity from the Permian to Houston, although that plan involves repurposing the 200 mb/d Enterprise Sentinel pipeline from crude to gas liquids, meaning a net addition of just 250 mb/d. Between them these five projects potentially bring another 2.8 mmb/d of crude into the Houston region. If all that crude were for export it would overwhelm the 2.5 mmb/d loading capacity of Houston's top five export terminals.

As we detailed in our recent analysis of Corpus Christi export capacity (see "[Corpus Christi Constraints Threaten Exports](#)") Gulf Coast ports aren't deep-water facilities. That means they can't load the (2 million barrel) very large crude carriers, which exporters favor for lower freight costs on long voyages to popular Asian destinations. Like Corpus Christi, Houston exporters have to load smaller Aframax and Suezmax vessels at existing docks and transship onto VLCCs in the deep-water Gulf of Mexico (see our May 2019 note "[Gulf Coast Crude Exporters Navigate Port Limitations](#)"). That costs time and money. Using existing dock facilities also increases the risk of delays due to traffic congestion. Like Corpus Christi, Houston is evaluating deepening and widening its ship channel to better accommodate larger vessels. An Army Corps of Engineers proposal for this project is awaiting final approval this year but could take many years to complete. In the meantime, the busy 50 mile-long Houston ship channel is prone to congestion in foggy weather and experienced two separate days of long closures in May this year after a barge collision and a chemical plant fire. Shippers now face an additional risk in the shape of environmental protests – witnessed for the first time in the HSC during September.

### **Offshore Projects**

Apart from expansion underway at EHSC and Magellan Seabrook, there have been several projects floated in recent years to build out additional dock and storage capacity in the Houston region to meet increased export demand. These include a joint venture between Vopak and Moda Midstream for a storage and marine terminal at Deer Park on the Houston ship channel and a proposed Oiltanking ship dock at Texas City, neither of which has reached a final investment decision.

Recently, midstream investment sentiment has turned to offshore Gulf of Mexico facilities in the shape of deep-water single-point mooring buoys located at the end of pipelines connecting them to onshore storage (see our May note "[Gulf Coast Crude Exporters Navigate Port Limitations](#)"). There are currently three such proposals for the Houston region. The first is Enterprise's SPOT terminal backed by Chevron commitments, which reached a final investment decision earlier this year. The second is the COLT project backed by a joint venture between Enbridge and Oiltanking and third is the Texas Gulfink project owned by Sentinel Midstream. These terminals promise direct connectivity for crude production to export tankers without navigating the legacy Houston refinery distribution system. The offshore terminals will be capable of loading 1-2 mmb/d onto VLCC tankers without transshipment. Their primary disadvantage is the length of time they take to permit and build. Enterprise expect their SPOT project to obtain permits by 2021 and take two years to build, meaning the terminal won't be operating until 2023.

### **Before the Buoys**

Houston crude shippers enjoy greater flexibility than their counterparts in Corpus Christi who have few options but to export, given limited local refining capacity and no current pipeline connectivity to other Gulf Coast refineries. Houston shippers can shift crude east to Beaumont/Port Arthur, where there are more refineries and additional export docks. There is also considerably more crude storage capacity available in Houston than Corpus Christi. However, if crude production in the Permian continues to increase and new pipelines bring greater flows into Houston before at least one offshore mooring buoy

terminal is complete, shippers should expect more frequent congestion at existing docks in the next three years. ■■■

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