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# Gulf Coast Crude Exporters Navigate Port Limitations

## Vessel size logistics complicate shipments.

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**Data Sources for This Publication**  
RBN Energy Crude Voyager  
EIA  
To discover more about the data sources used, [click here](#).

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### Lack of Deep-Water Docks

U.S. crude exports reached just under 3 million barrels/day in February, according to the Energy Information Administration. About 2.8 mmb/d of that total was shipped from terminals along the Gulf Coast, mostly using infrastructure that was never designed for crude exports. Yet U.S. crude is reaching destinations worldwide with the largest volumes traveling long distances to Asia. This note looks at detailed shipment data provided by RBN Energy to understand how and where crude leaves Texas and Louisiana and how shippers work around a lack of deep-water docks to load the largest tankers.

Crude exports from the Gulf Coast are growing and expected to increase further as new pipelines from the Permian and Eagle Ford come on line over the next two and a half years to December 2021 (see our December 2018 note, [Pipeline Plans Suggest Tsunami of Crude Exports](#)). Strong markets for U.S. crude exports have developed in Europe as well as Asia—both long-distance journeys from the Gulf Coast (see our March note, [Gulf Coast Crude Exports to Europe and Asia Drive 2018 Growth](#)). The export market is still less than four years old and has had to overcome challenges such as a lack of price transparency (see our April note, [Auctions Offer Houston Crude Exporters Half-Baked Solution](#)) as well as a lack of purpose-built terminals. In these circumstances, actual shipments still require considerable logistic juggling as crude is loaded from smaller tankers onto long-distance supertankers for the voyage to Asia.

The analysis in this note is based on voyage-level data provided by RBN Energy in its weekly [Crude Voyager](#) publication. The data covers every export shipment from Gulf Coast ports between Jan. 1, 2018, and April 24, 2019, showing the size of vessel, load terminal, and ultimate destination as well as ship-to-ship transfers to larger tankers.

### Size Matters

Except for the Louisiana Offshore Oil Port terminal 20 miles offshore Louisiana in the Gulf of Mexico, the Gulf Coast is not blessed with deep-water ports that can accommodate the largest very large crude carriers, which hold around 2 million barrels of oil. These VLCCs and a handful of their giant brethren—the 3 million-barrel ultra large crude carriers—require at least a 75-foot draft to load fully but are the workhorses of intercontinental oil transportation. Most Gulf Coast terminals are restricted to a 45-foot draft; this only allows them to fully load Aframax tankers, which hold 500-650 thousand barrels of crude, or to partially load Suezmax tankers, which hold up to 1.3 million barrels. Analysis of RBN's Voyager data shows that during the 16-month period from January 2018 to April 2019, 548 different vessels made a total of 1,402 crude export shipments from Gulf Coast terminals. Of these, 69% used Aframax tankers, 21% Suezmax, 6% smaller Panamax (less than 500,000 barrels), and 3% were loaded onto VLCCs.

### Load Terminals

Exhibit 1 lists the top 15 export terminals by volume over the study period. Enterprise's Houston hydrocarbons terminal is the Gulf Coast's busiest crude export terminal, followed by Energy Transfer's Nederland terminal in Port Arthur, Texas, and Moda Midstream's Ingleside terminal in Corpus Christi, Texas, in third place.

**Exhibit 1** Gulf Coast Export Load Terminals by Volume

<b>Terminal</b>	<b>Volume mb/d</b>
Enterprise Houston	355
ETP Nederland	271
Moda Ingleside	197
P66 Beaumont	153
Seaway Texas City	101
Seaway Freeport	83
Buckeye Corpus	80
NuStar Corpus	76
Plains St. James	75
Houston Fuel Oil	75
Magellan Seabrook	73
FHR Ingleside	71
NuStar St. James	57
Enterprise Beaumont	52
LOOP	50

Source: RBN Energy, Morningstar.

The Enterprise hydrocarbons terminal formerly owned by Oiltanking and located on the Houston Ship Channel has over 22 million barrels of crude storage and seven tanker berths with a 45-foot draft capable of partially loading Suezmax and fully loading Aframax vessels. Enterprise loaded 172 Aframax and 79 Suezmax vessels for crude export from the terminal between Jan. 1, 2018, and April 24, 2019, amounting to an average 355 thousand barrels/day. Enterprise can deliver crude to its Ship Channel terminal by pipeline from the Permian and Eagle Ford basins as well as domestic and Canadian supplies from north of Cushing, Oklahoma, delivered into Houston on the Seaway pipeline.

In addition to the Ship Channel terminal, Enterprise operates the fifth- and sixth-busiest Houston region terminals at Seaway Texas City and Seaway Freeport. Other top 15 terminals in the Houston region are SemGroup's Houston fuel oil terminal and the Magellan/LBC Seabrook terminal.

The second-busiest export terminal on the Gulf Coast is Energy Transfer's Nederland facility, which has 27 million barrels of storage capacity and pipeline connections to Cushing (TransCanada Cushing Marketlink), the Permian (Energy Transfer's Permian Express and West Texas Gulf pipelines), Houston (Shell Midstream's Zydec pipeline), and North Dakota (Dakota Access Pipeline). Nederland has five tanker berths that can fully load Aframax and partially load Suezmax vessels with a 40-foot draft. Nederland loaded 146 Aframax and 62 Suezmax tankers between Jan. 1, 2018 and April 24, 2019.

Third place in the Gulf Coast export ratings belongs to the Moda Ingleside Energy Center, located in the outer harbor of Corpus Christi. Moda purchased the terminal from Occidental in August 2018, and the latter remains its principal customer. The purpose-built crude export terminal can partially load VLCC and Suezmax tankers at three deep-water berths. Export capacity is currently being expanded from 300 mb/d to 750 mb/d, and the channel draft is being deepened to 54 feet to accommodate fully laden Suezmax tankers. Moda Ingleside receives crude from the Permian and South Texas Eagle Ford basins. The terminal loaded 83 Aframax, 33 Suezmax and 22 VLCC tankers between Jan. 1, 2018, and April 24, 2019.

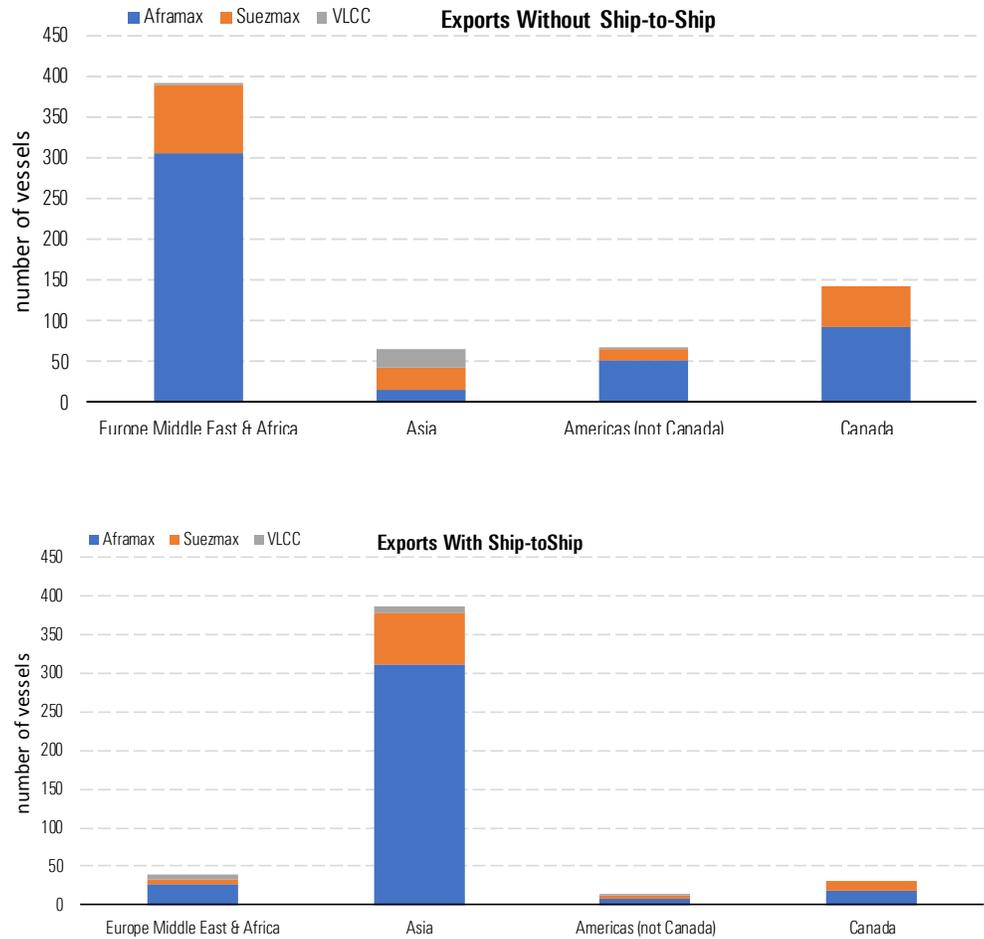
### **By Region**

During the 16-month period of our analysis, 38% of export shipments were from the Houston region, encompassing the Ship Channel, Texas City, Freeport, and Seabrook terminals. The Beaumont/Port Arthur region was second busiest, with 26% of export volumes leaving three facilities: Energy Transfer's aforementioned Nederland terminal as well as Phillips 66 and Enterprise terminals in Beaumont. Shipments out of Beaumont/Port Arthur just beat volumes leaving the Corpus Christi area (25% of the total) where crude was exported from Buckeye, NuStar, and Valero terminals in the Corpus Christi Ship Channel as well as the Flint Hills Resources (owned by Koch Industries) and Moda terminals at Ingleside. The lowest volume leaving the Gulf Coast — representing 12% of the total — left Louisiana. These shipments were made from the LOOP terminal in the Gulf of Mexico, the NuStar and Plains terminals in St. James, Louisiana, and a few refinery terminals.

### **Ship-to-Ship**

Despite the preponderance of exports loading onto Aframax tankers, most long-distance crude shipments from the Gulf Coast to buyers in Asia are made on larger VLCCs because the latter boast the most competitive freight rates. Since VLCCs can only be loaded directly at deep-water ports like LOOP, RBN's data shows it's common practice to use Aframax and Suezmax tankers loaded at Gulf Coast terminals to make ship-to-ship transfers onto VLCC tankers located in offshore Gulf of Mexico loading zones. These ship-to-ship transfers, also known as reverse lightering, allow shippers to build a full VLCC cargo for onward shipment from the Gulf. RBN data shows that just under half, or 46%, of the crude export vessels loaded at Gulf Coast ports were destined for ship-to-ship transfers onto VLCCs. The data further shows that the 85% of Aframax and 76% of Suezmax STS transfers were made onto VLCCs destined for Asia. While VLCCs are popular for the longer-haul Asia runs, smaller Aframax and Suezmax vessels are most popular for shipments to Europe (Exhibit 2). During the 16-month analysis period, a total of 306 Aframax and 85 Suezmax tankers were loaded directly (without transfers) for voyages to Europe.

**Exhibit 2** Crude Export Vessel Size and Destination, With and Without Transfers



Source: RBN Energy, Morningstar.

**Infrastructure Test**

The detailed logistics involved in getting U.S. crude to export markets underlines the ingenuity of shippers, which have built export volumes from nothing to 3 mmb/d in just four years. The oncoming tsunami of crude from new pipelines out of the Permian and Eagle Ford over the next two years will severely test existing export infrastructure. If projects proceed to build new offshore terminals in the Gulf of Mexico adjacent to Corpus Christi, Freeport, and possibly Louisiana as well as to deepen the Corpus Christi outer harbor channel to accommodate fully laden VLCCs, they will reduce the number of ship-to-ship transfers required. Until that time—when pipelines feed deep-water terminals and load VLCC tankers directly—we expect to see increased congestion as existing Gulf Coast docks struggle to handle ever larger volumes. ■■■

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