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## Working on a Dream - Plans Afoot to Load Crude onto VLCCs at More Gulf Coast Ports

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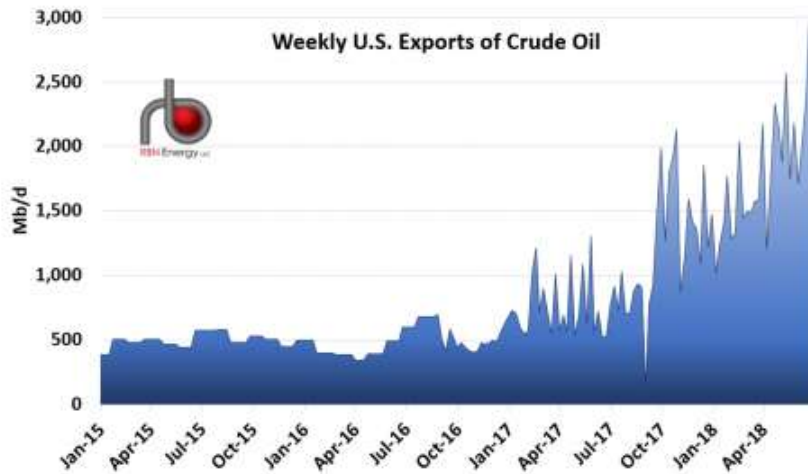
For the first time ever, U.S. crude oil exports have hit the 3 MMb/d mark — a once-unthinkable pace equivalent to sending out 10 fully loaded Very Large Crude Carriers a week. VLCCs, with their 2-MMbbl capacity and rock-bottom per-bbl delivery costs, are the most cost-effective way to transport crude to distant markets like China and India. But there's still only one terminal on the Gulf Coast that can fill a VLCC to the brim — the Louisiana Offshore Oil Port — and pipeline connections from key Texas and Oklahoma plays to LOOP are limited. Elsewhere along the coast, VLCCs need to be loaded in offshore deep water by reverse lightering from smaller vessels — a slower and more costly loading process. Change is a-comin', though. Companies are testing the docking and partial loading of VLCCs at terminals along the Texas coast, and plans for a number of greenfield facilities capable of partially — or even fully — loading the gargantuan vessels at the dock are being considered. Today, we review the latest efforts to streamline the loading of VLCCs and what they mean for crude-export economics.

As we said in our last look at VLCCs a few months ago ([Rock the Boat](#)), the use of the supertankers during the U.S.'s 40-year ban on most crude exports was largely limited to imports to LOOP, occasional shipments out of the Valdez Marine Terminal in Valdez, AK (the southern terminus of the Trans-Alaska Pipeline System) and into Andeavor's Berth 121 in Long Beach, CA — the two other U.S. facilities designed to handle VLCCs. Since the export ban was lifted in December 2015, though, crude exports — and interest in using VLCCs for exports out of the Gulf Coast — have been on the upswing. Figure 1 shows that in 2015, the last year the ban was in place, exports (almost all of them to Canada) averaged 465 Mb/d, according to the Energy Information Administration (EIA). Exports rose 27% (to just about 590 Mb/d) in 2016, then almost doubled in 2017 (to more than 1.1 MMb/d).

Figure 1. U.S. Crude Exports by Week (in Mb/d). Source: EIA (Click to Enlarge)

Export volumes continued rising through the first half of 2018, averaging 1.8 MMb/d so far and hitting an all-time high — an even 3 MMb/d — in the week ended June 22.

VLCCs are the Airbus A380s of the crude-shipping world — highly efficient, long-distance conveyors of valuable cargo (crude and people, respectively). An A380 is a double-decker, wide-body jet airliner that can transport up to 850 (!) passengers in (God forbid) an all-economy configuration (or 525 in a typical first-class/business/economy layout) more than 8,000 miles at a cruising speed of about 560 miles per hour (mph). VLCCs may be much, much slower (traveling at about 14 knots, or 16 mph), but they can move about 2 MMbbl of crude oil, the equivalent of about five hours' worth of U.S. production. The supertankers have an average length of about 1,100 feet, with an average beam (or width) of nearly 200 feet and an average fully loaded draft of 72 feet.



There are about 800 VLCCs operating in the world today, with an increasing number being filled with U.S. crude along the Gulf Coast and sent to faraway ports in Europe and Asia. The vast majority of the VLCCs being used to export crude from the U.S. are reverse-lightered in designated trans-shipment areas (TSAs) off the Texas and Louisiana coasts. Reverse lightering is a multi-day process that involves anchoring an empty VLCC in a TSA and using Aframax-class tanker (capacity ~750 Mbbl) or other smaller vessels to ferry crude from the terminal to the

VLCC. According to our friends at Navigistics, transporting crude from a fully reverse-lightered VLCC from a TSA off Corpus Christi to various Asian destinations (Singapore and Ulsan, South Korea) would cost about \$3/bbl less than shipping it the same distance on a smaller tanker. That's half the transportation cost — quite a savings when you consider the VLCC's 2-MMbbl capacity.



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What would be even more cost-efficient, though, would be fully or at least partially loading a VLCC at a land-based marine terminal or an offshore terminal connected to land by pipeline — and, if only partial loading is possible due to physical constraints (most likely the water depth of the channel or alongside the terminal), topping off the vessel with partial reverse lightering out in a TSA. LOOP, which consists of three single-point mooring buoys (in 110-foot-deep water) and a pumping station connected by a 48-inch-diameter pipeline to the Clovelly, LA, storage facility, is still the only Gulf Coast option for fully loading a VLCC without at least some reverse lightering. To date, LOOP has sent out a total of three fully loaded VLCCs, the most recent being the *Eagle Vancouver*, which left LOOP on June 27 and is now bound for India. (The first and second loadings at LOOP occurred in February and March of this year.) There's a catch with exporting through LOOP, however. As we said in [Clovelly Calling?](#), the Clovelly hub is currently the only source of crude for exports out of the offshore terminal — the hub and LOOP are linked by what is the now-bidirectional LOOP Pipeline. While Clovelly has some 70 MMbbl of underground salt-cavern and aboveground tank storage (more than enough to line up the 2 MMbbl needed to fill a VLCC), its primary purpose in life (so far) has been to receive imported crude (from LOOP via the LOOP Pipeline) and crude from offshore Gulf of Mexico (GOM) production — primarily from the Shell-operated Mars pipeline system and BP's Thunder Horse field (via the Endymion pipeline system) — and then distribute that imported and GOM crude to U.S. refineries. Also, since 2013, Clovelly has been a destination point for Shell's Zydeco (formerly Ho-Ho) Pipeline, which can transport up to 350 Mb/d of crude east from storage terminals in Houston and Port Arthur/Beaumont, TX, and Lake Charles, LA.

Put another way, it is key ports along the Texas coast (Corpus Christi, Houston Ship Channel/Texas City, and Beaumont, to name three) — and not LOOP — that are most directly connected by pipeline to production areas like the Permian and SCOOP/STACK whose increased production growth is increasingly relieved through exports. Our understanding is that the pace of reverse-lightering activity in TSAs off the coast of Corpus Christi, Galveston and Beaumont/Port Arthur is still increasing — from only one VLCC being fully loaded via reverse lightering every other month in 2016 to six per month in 2017 to even more in the first half of 2018. Now, we're seeing the beginnings of another trend, namely, docking VLCCs at marine terminals, filling the supertankers to the dock/channel draft limit (often about halfway), then moving them out to TSAs where their loading can be completed through partial reverse lightering.

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Testing of this hybrid approach (partial dock loading and partial reverse lightering) has been going on for more than a year now. As we said in [Take It to the Limit](#), Occidental Petroleum (Oxy) in May 2017 brought in an empty 2-MMbbl VLCC to its Ingleside marine terminal across the bay from Corpus Christi to test what improvements might be needed at its dock to allow the partial loading of VLCCs. Currently, Oxy is in the midst of a major expansion program at Ingleside that will add VLCC loading arms and allow partial VLCC loading (1.2 MMbbl to 1.4 MMbbl) there starting in the fourth quarter of 2018. By the second half of 2019, the Ingleside terminal's export capacity will increase to 750 Mb/d from the current 300 Mb/d. Also at Ingleside, and within a stone's throw of Oxy's terminal, a joint venture of Buckeye Partners (50% stake), Phillips 66 Partners (25%) and Andeavor (25%) is developing the open-access South Texas Gateway Terminal, which by late 2019 will offer 3.4 MMbbl of crude storage capacity (expandable to 10 MMbbl-plus), connectivity to the Phillips 66 Partners and Andeavor's planned 700-Mb/d [Gray Oak Pipeline](#) from the Permian (expandable to 1 MMb/d), and two deepwater docks each capable of partially loading VLCCs. Again, the VLCCs will receive the balance of their crude at a TSA off the coast. [Across the bay in Corpus Christi, Buckeye recently completed improvements at its Buckeye Texas Hub terminal that for the first time will allow Suezmax-class vessels (capacity ~1 MMbbl) to dock there.]

The *FMPC C Melody* at the Seaway Texas City Terminal. Source: Enterprise

The first (albeit only partial) loading of a VLCC at a Texas port occurred just a few days ago (in late June) at the Texas City marine terminal owned by Seaway Crude Pipeline Co., a joint venture of Enterprise Products Partners and Enbridge that is best known for its Cushing-to-Gulf-Coast crude pipeline system. Enterprise on June 22-24 loaded 1.1 MMbbl onto the *FMPC C Melody* (a 2-MMbbl VLCC) at the Seaway terminal, which has two docks offering a 45-foot draft; then, reverse lightering in a nearby TSA filled the VLCC to the brim. (Enterprise first brought in a VLCC to the terminal in April 2018 to determine what improvements would be needed to load the vessel; it then made those tweaks, which included adjustments to the terminal's loading arms.)

So, partial loading of VLCCs at Texas marine docks has now happened at Texas City, and the same is likely to be occurring with some regularity at Oxy's Ingleside terminal within a few months and at the





Buckeye-led South Texas Gateway Terminal (also at Ingleside) within a year and a half. This approach to vessel loading should help to hold down shipping costs and, with that, make the U.S. even more competitive in overseas markets. *Fully* loading VLCCs at land-based terminals along the Texas coast will take longer, though, and will require channel-deepening projects (like the one planned for Corpus Christi, which will deepen the channel to 54 feet from the current 45 feet by 2022, if all goes to plan). There's also been talk (by Magellan Midstream Partners, for one) about the possible development of a deepwater offshore terminal, *a la* LOOP.

And privately held JupiterMLP has indicated it is seeking permits for the proposed Jupiter Offshore Loading Terminal six miles off the coast of Brownsville, TX. Yup, the plan is to fully load VLCCs there.



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"Working on a Dream" is a single off a Bruce Springsteen album of the same name. The song, like all the others on the LP, was written by The Boss himself, and was first heard when Bruce and his wife, Patti Scialfa, sang it during a campaign appearance with Barack Obama a few days before the 2008 election. The single was released three weeks later.

The *Working on a Dream* album was recorded between the summer of 2007 and the fall of 2008 during breaks in Springsteen and the E Street Band's "Magic Tour." Bruce has said of the LP, "I hope *Working on a Dream* has caught the energy of the band fresh off the road from some of the most exciting shows we've ever done." The LP, released in January 2009, shot to #1 on Billboard's Top 200 Albums chart, and has sold more than 3 million copies to date. The personnel on the record were: Bruce Springsteen (lead vocals, guitar, keyboards and percussion), Roy Bittan (piano, organ and accordion), Clarence Clemons (sax and backing vocals), Danny Federici (organ), Nils Lofgren (guitar and backing vocals), Patti Scialfa (backing vocals), Garry Tallent (bass), Steve Van Zandt (guitar and backing vocals), Max Weinberg (drums), and Soozie Tyrell (violin and backing vocals).

Bruce Springsteen has made 18 studio albums, and five live albums. He has won one Academy Award, four American Music Awards, two Golden Globes, 20 Grammys and five MTV Music Video Awards. He was inducted into the Rock and Roll Hall of Fame and the Songwriters Hall of Fame in 1999, and was a 2009 Kennedy Center Honors recipient. In 2016, Bruce was given a Presidential Medal of Freedom.

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