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Deep Water - Contenders in the Race to Build Crude Oil Export Terminals Off the Texas Coast

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As Gulf Coast marine terminal owners consider ways to at least partially load Very Large Crude Carriers (VLCCs) at their facilities, a handful of midstream companies also are planning *offshore* terminals in deep water that would allow the full loading of VLCCs via pipeline. Projects under development by Oiltanking and others for sites along the Texas coast would appear to have at least two legs up on the Louisiana Offshore Oil Port, or LOOP. For one, they'd have more direct access to the Permian, Eagle Ford and other crudes flowing to coastal Texas. For another, the new terminals would be focused on crude exports — no double-duty for them. Today, we begin a review of the projects vying to be the first LOOP-like project in the deep waters off the Lone Star State.

U.S. crude exports hit the 3-MMb/d mark a few weeks back (the week ending June 22), and while they've since retreated slightly, there's every reason to believe that export volumes will be ratcheting up in the months and years to come. They'll almost have to, really. As we said in [Got That Swing](#), the three production-forecast price scenarios that we assessed in our most recent update — crude prices flat at \$70/bbl or \$55/bbl to 2023, or (like the forward curve) ramping down to \$55/bbl over the next five years — would result in crude production growth of between 2.0 MMb/d (under the flat-at-\$55 scenario) and 5.0 MMb/d (under the flat-at-\$70 scenario). That's on top of the 11 MMb/d the U.S. is already producing, which is twice the 5.5 MMb/d rate back in 2010. U.S. refineries already are operating at close to full capacity with a mix of domestic and imported barrels that fits their hardware configurations, cranking out increasing volumes of gasoline, diesel and jet fuel for export, and while at least a few refinery expansion projects are being planned, they would only be capable of absorbing a small portion of the incremental crude production we're likely to see. So export the U.S. must.

RBN Crude Oil Infrastructure Maps

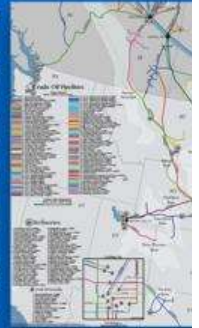


US Gulf Coast

Gain an expert understanding of the crude oil pipelines and infrastructure connecting North America's most dynamic crude oil markets — the Permian Basin, Cushing, OK and Gulf Coast refining and export complex.

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Complementing the US Gulf Coast map, RBN's new US & Canadian Interior Crude Oil Infrastructure Map provides a comprehensive view into North America's northern oil transportation routes and infrastructure, from the Western Canadian oil sands and U.S. Rockies producing regions to Cushing, OK and Midwest refineries.



As of the week ending July 20 (the most recent data available from the Energy Information Administration or EIA), U.S. crude exports have averaged just over 1.8 MMb/d so far in 2018, up from 1.1 MMb/d on average in 2017 and 590 Mb/d in 2016. The clear preference of many long-distance shippers is to move their barrels in VLCCs, each of which can economically transport about 2 MMbbl of crude. The VLCC is the largest of the four types of tankers that account for the vast majority of international oil shipments (see [Come Sail Away](http://rbnenergy.com/come-sail-away-exporting-us-crude-oil-by-ship-vessels-chartering-loading-costs) (<http://rbnenergy.com/come-sail-away-exporting-us-crude-oil-by-ship-vessels-chartering-loading-costs>)), the other prominent classes being (in descending size order) Suezmax (capacity ~1MMbbl), AFRamax (~750 Mbbl) and Panamax (350 Mbbl to 550 Mbbl). They are giants — a typical VLCC is about 1,100 feet long, with a beam (or width) of nearly 200 feet and a fully loaded draft of 72 feet. But as we said in [Rock the Boat](#), there's still only one terminal on the Gulf Coast that can fill a VLCC to the brim — LOOP (green diamond in Figure 1), which is located in 110-foot-deep waters 18 miles off Port Fourchon, LA — and pipeline connections from key Texas and Oklahoma plays to LOOP are limited. (More on LOOP in a moment.) Elsewhere along the coast, VLCCs need to be loaded in offshore deep water by "full reverse lightering" from smaller vessels — a slower and more costly loading process that typically involves shuttling crude out in AFRAMaxes or other smaller vessels to a VLCC in a trans-shipment area (TSA) and transferring the crude onto the larger ship. More recently, a number of companies have been testing the docking and partial loading of VLCCs at terminals along the Texas coast, with the hope of using a hybrid approach — partially loading of VLCCs at the dock, followed by partial reverse lightering offshore in TSAs (see [Working on a Dream](#)), mostly in the Galveston Offshore Lightering Area (GOLA). That would be more efficient than the full reverse lightering in common usage today, but an even more efficient alternative would be to fully load a VLCC at an onshore dock — or at an offshore terminal in deep water á la LOOP.



Figure 1. Source: RBN (Click to Enlarge)

Fully loading VLCCs at land-based terminals along the Texas coast would require multi-year channel-deepening projects — even the ambitious dredging program planned for Corpus Christi (deepening the channel to 54 feet from the current 45 feet by 2022) wouldn't be nearly enough to allow fully laden VLCCs there. A potentially simpler and quicker alternative would be to develop a new, greenfield offshore loading terminal in waters deep enough to accommodate fully laden VLCCs (72 feet

or more), and to connect the facility by large-diameter pipe to onshore storage and pipeline networks to allow for rapid loading.

A number of such projects are now in various stages of planning. One we've learned about is a joint plan by Oiltanking, Enbridge and Kinder Morgan to build a new crude storage terminal in Freeport (TX) and connecting pipelines to a new offshore crude loading facility by 2022. The loading terminal would be located in the Gulf of Mexico about 30 miles offshore (yellow diamond) in waters about 100 feet deep — enough to easily accommodate VLCCs. (There would be space for two tankers to dock simultaneously.) The storage terminal would have about 10 MMbbl of capacity, and would be interconnected with Phillips 66 Partners and Andeavor's planned 700-Mb/d [Gray Oak Pipeline](#) (purple line) from the Permian to the Corpus Christi and Freeport/Sweeny areas, and via Kinder Morgan's existing Crude & Condensate Pipeline (green line) from the Eagle Ford to Sweeny. [As we said in [All Dressed Up With Nowhere to Go](#), P66 Partners currently owns 75% of Gray Oak and Andeavor (now in the process of being acquired by Marathon Petroleum) owns the other 25%; Enbridge and other third parties hold an option to acquire up to a 32.75% stake, which if exercised would reduce P66 Partners' share to 42.25%.] The planned Freeport storage capacity would be connected by pipeline to the Texas City and Houston areas. The connection between the new storage assets and the new offshore terminal would include about three miles of pipeline on land and another 30 miles of underwater pipe — all of it 42 inches in diameter. Loading onto VLCCs could occur at a rate of up to 85 Mb/hour, or 2 MMb/d — in other words, the storage and pipeline connector would enable a VLCC to be fully loaded in 24 hours.



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The Oiltanking/Enbridge/Kinder Morgan project's biggest selling points appear to be optionality and, of course, the ability to fully load VLCCs. Pipelines from the Permian that run only to Corpus Christi can really only serve the export market — there is relatively limited refinery capacity in Corpus compared to the Upper Texas Coast — but pipes like Gray Oak that also swing up the coast to Freeport/Sweeny (and connect to pipes to Texas City and Houston) enable shippers to respond to changing market dynamics and to serve a wider variety of customers. To be determined is whether the Freeport project would benefit (economically) from the fact that it requires "only" about 30 miles of undersea pipe — one competing project would require a much longer pipe and another calls a pipe only one-fifth as long.

How would the Freeport-area offshore project stack up against LOOP from an optionality/flexibility standpoint? Well, LOOP has direct pipeline access to what is one of the U.S.'s most extensive crude blending and staging storage facilities: the 72-MMbbl Clovelly storage hub (red dot) a few miles inland from where the LOOP Pipeline makes landfall. The problem for LOOP (as we discussed in [Clovelly Calling?](#)) is that Clovelly's access to crude from the Permian, SCOOP/STACK and some other plays is relatively limited. In addition to crude imported through LOOP, Clovelly receives crude produced in the offshore Gulf of Mexico; its only direct pipeline link from Texas and other points west, though, is Shell Midstream Partners' Zydeco Pipeline (blue line), which can transport no more than 350 Mb/d from storage terminals in Houston and Port Arthur/Beaumont, TX, and Lake Charles, LA. In contrast, the Oiltanking/Enbridge/Kinder Morgan project would have direct, unimpeded access to the Permian, which is not only the #1 production area in North America but which is poised for another round of rapid growth as soon as more takeaway pipeline capacity comes online.

In the next blog in this series, we will discuss plans by JupiterMLP for an offshore crude-export terminal off the southern tip of Texas. Time will tell how many — if any? — of these offshore-terminal projects will advance to construction and operation. The U.S. for decades has made do with only one offshore port capable of receiving VLCCs loaded with imported crude (namely, LOOP), and while rising export volumes are a near-certainty, it remains to be seen if the Gulf Coast really needs a new terminal (or two, or three) for routinely (and fully) loading crude onto VLCCs off the Texas coast. We'll continue to track this.



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"Deep Water" is a track off country singer George Strait's 1986 album, 7. "Deep Water" was written by Fred Rose and was first recorded and released by Bob Wills and his Texas Playboys in 1948. George Strait's 7 LP — his seventh album — reached #1 on the Billboard Top Country Albums chart, and #27 on the Billboard Top 200 Albums chart. It produced two #1 hit singles, "Nobody in His Right Mind Would've Left Her" and "It Ain't Cool to be Crazy About You." Personnel on the LP were: George Strait (lead vocals and acoustic guitar), Curtis Young (background vocals), Eddie Bayers (drums), David Hungate (bass), Billy Joe Walker (guitar), Reggie Young (guitar), Richard Bennett (guitar), John Jarvis (piano), Johnny Gimble (fiddle and mandolin) and Paul Franklin (steel guitar).

George Strait is a Texas country music singer, songwriter, actor, and music producer. He has released 29 albums on the MCA label, and has had 61 #1 songs on the country charts, more than any other artist in any genre. He has sold more than 68 million records in the U.S. alone, and has 13 multi-platinum, 33 platinum and 38 gold albums. He holds the record for the most CMA and ACM Awards. He is still recording and on tour through the end of 2018.

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