

# Strategies to Expand Marine LNG Infrastructure

*The onus is on suppliers and developers with the flexibility to extend the LNG supply chain into relatively new and higher risk markets*

More major ports are weighing the benefits of LNG bunkering capability to supply the growing fleet of LNG powered container ships, cruise ships, etc. Trade organizations serving the marine business note that very few ports offer LNG bunkering services, even though new shipbuilding, including cruise liners, will use LNG powered propulsion.

Major bunkering centers such as Rotterdam and Singapore are first movers in development of LNG bunkering facilities, opening new markets for them throughout the Pacific Rim. Current EU policy requires at least one LNG bunkering port in each member state. Whether this policy will be duplicated in other markets such as North America is yet to be seen.

## PARTNERSHIPS

Going into the new decade, the viability of small-scale LNG (ssLNG) infrastructure to support the marine industry has become a reality for a variety of reasons. LNG has become an increasingly flexible commodity, with 2019 marking a year of record financial investment decisions around LNG. Due to the increasing number of LNG suppliers, importers are opting for short-term volume contracts, making ssLNG projects more attractive.

Whereas mega LNG producers generally compete on volume and long-term contract commitments, ssLNG producers target regional markets and flexible partnerships with marine shippers.

Demonstration of win-win value among these participants goes a long way in acquiring financing for LNG infrastructure that's modular in its design with minimal on-site installation requirements.

Even when LNG prices are above other bunker fuels (e.g., HSFO), pricing and infrastructural limitations don't appear to be preventing LNG from being adopted for long-haul shipping outside emissions containment areas (ECAs), according to industry officials. Furthermore, resolution of infrastructural limitations is creating new hubs between short international shipping routes, such as Florida to the Caribbean.

Mutually beneficial risk sharing partnerships between ssLNG producers, terminal and bunkering operators, and marine shippers ensures a commitment to infrastructure development. New regulations and market forces also accelerate investment. Jacksonville, Florida has recently witnessed a few firsts in the LNG sector, including becoming the only U.S. East Coast port to offer on-dock and near-dock fueling capabilities.

Texas-based Eagle LNG partnered with Crowley Fuels in 2018 to supply fuel for Crowley's ConRo Ships as well as to transport LNG to Puerto Rico for industrial customers. Eagle LNG has also recently announced the Jacksonville export-plant, which the company believes will solidify Florida's place in the ssLNG distribution market. This partnership demonstrates the three components driving the ssLNG market, which is supply, infrastructure and regulations for low emissions (e.g., IMO 2020).

## VIRTUAL PIPELINE

The 'Shale Revolution' allowed access to cost-effective North American natural gas to be distributed globally. This fundamental development opened the door to profitable ssLNG supply chains. This allowed Crowley Fuels, supplied by Eagle's Jacksonville ssLNG facility, to create a "virtual pipeline" to the Caribbean.

This virtual pipeline gives Crowley the opportunity to work with its Puerto Rican industrial partners to replace their current fuels with a more cost-effective and environmentally friendly fuel and to transport the LNG on an IMO 2020 compliant LNG vessel. Expansion of terminal operations and bunkering capabilities jump start the creation of new export markets, including LNG powered vessels and supplying industrial customers with LNG.

As with many other states and provinces in the U.S. and Canada, Florida's business-friendly stance has also been a big driver in developing an ssLNG based infrastructure. The industry recently saw the U.S. DOE issue a small-scale export license to a marine shipper for LNG transportation from the U.S. into Free Trade Agreement (FTA) countries. This doesn't appear to be a one-off. Other licenses may soon follow from the DOE, such as for LNG export from the U.S. into Non-Free Trade Agreement (NFTA) countries.

The U.S. Federal Energy Regulatory Commission (FERC) has allowed ssLNG terminals to be developed but a lengthy approval process may be required. This is one of several compelling reasons to taking a stair-step investment approach for LNG investment on a small scale. Another sector affecting growth of the marine industry are LNG powering of cruise liners, container roll-on/roll-off vessels, and other custom designed craft (ATV tugboats, etc.).

## PROFITABILITY

All these factors accelerating growth can be met by nimble ssLNG facilities with direct links to terminal and bunkering solutions. Partnerships provide the scope for different types of bunkering solutions. Whether the investment revolves around bunkering (ship-to-ship, shore-to-ship, etc), export terminals or liquefaction facilities, the small-scale focused projects are still in their infancy compared to the mega-scale LNG facilities that have been built along the Gulf Coast over the past decade.

Even though less than 1 percent of the world's ships are LNG powered, the number of dual fueled and LNG fueled vessels being fabricated has seen a significant increase. A growing uncontracted and flexible supply of LNG is set to offer more options for customers in the future. What it's really going to come down to is cost savings, such as what Eagle LNG has demonstrated with its partners in the development of an entire liquefaction, terminal and bunkering infrastructure in the Jacksonville area. Helping this inertia is that LNG is priced 50 percent to 75 percent less than diesel on an energy equivalent basis, according to a study by the Florida Ports Council.

## INVESTOR RISK

Meanwhile, the global LNG carrier fleet is gradually growing. There are now over 25 small-scale LNG vessels with capacities of less than 40,000 cubic meters in operation, with almost a dozen more expected to be commissioned in the next two years. Relative to the new world-scale LNG facilities under construction (or currently on hold), modular ssLNG facilities can be built much faster and cheaper.

The major components of ssLNG projects can be designed as modular, prefabricated skids to significantly reduce costs and risk to the project.

In addition, many organizations are evaluating partnership agreements in which investor risk in ssLNG projects is distributed among different parties with ownership in the LNG value chain. LNG allows risks and rewards to be decentralized and distributed to all parties throughout the entire chain, mitigating the risk to LNG suppliers while increasing revenue streams.

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