

TO THE CARIBBEAN WITH GAS

With the patents secured and a final investment decision near, Forrest Hoglund opens up about his new business.

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In May, SeaOne Caribbean LLC and Samsung Heavy Industries Co. Ltd. signed a letter of intent to build 12 articulated-tug-and-barge (AT/B) vessels to ship SeaOne's CGL.

In the future, medium-size ships will shuttle U.S. natural gas and liquids as a single cargo to Caribbean islands and Central America from the Gulf Coast. The floating pipeline may eventually offer containers of fuels, dropped off at ports for buyers.

This future is not so distant. SeaOne Caribbean LLC plans to make its final investment decision (FID) this November and begin delivering to its first buyer, the Dominican Republic, in mid-2020 from Gulfport, Miss.

"This has giant potential. It has the chance to become an industry standard," said Forrest Hoglund, SeaOne Holdings LLC chairman and CEO.

Hoglund is primarily known in the energy industry for leading EOG Resources Inc. as chairman out of Enron Corp. in 1999. Retiring at 66 upon the deal's closing, he was working on plans for a gas pipeline from Alaska.

What Houston-based SeaOne is launching shortly is the culmination of that work—in a somewhat nonlinear way. Hoglund met Bruce Hall, now SeaOne's president and COO, while on the Alaska project. The concept was for a dense-phase pipeline that would carry ethane along with gas and was an idea of Hall's.

Meanwhile, U.S. shale gas development was being proved economic, and the U.S. didn't

need the relatively more expensive Alaskan gas or gas liquids. Rather, producers and marketers began work to export excess Lower 48 supply.

Hoglund's and Hall's rethink involved export as well, but with a new technology to economically transport U.S. natural gas and liquids together.

Having acquired the patents, American Bureau of Shipping approval for its purpose-built vessel's design and a first customer, Hoglund is ready to talk about the project. "After all these years—more than 50 years of LNG—we've been able to come up with a lower cost, more efficient, safer, patented answer to get low-cost, clean fuel to so many places," he told *Oil and Gas Investor* in a recent interview.

Solvation process

First, this isn't LNG, which is cryogenically liquefied C1—methane, aka "dry gas." LNG destinations require a regasification plant on the receiving end, and LNG carriers generally have a deeper draft than SeaOne's ship design.

Instead, SeaOne's manufactured, solvated product is CGL—compressed gas liquid or "wet gas." It's what comes out of a wellhead: methane along with ethane, propane, butane and C-pluses all mixed together. Components are stripped at gas processing plants and fractionation facilities.

SeaOne's CGL is the methane and NGL put back together—with ingredient ratios based on a customer's order for more or less, say, propane. The order is loaded into a web of 42-inch pipe in cargo and held at 1,400 pounds per square inch gauge and -40 degrees Fahrenheit. A fractionation facility on the receiving end, such as the Dominican Republic, strips from it to order.

"Our technology is completely different than that of LNG," Hoglund said. "If you want to move natural gas now, it is basically LNG and you have to chill, chill and chill until you get to -256 degrees. We are able to take methane, ethane, propane, butane and put it all together into a solution."



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The concept for a dense-phase pipeline that would carry ethane along with gas was an idea of Bruce Hall, SeaOne’s president and COO.

“It’s basically a solvation process. It’s a patented solvation process.”

The methane is absorbed into the liquids when chilled and compressed. “You can inject a whole lot of methane into the very same space as the NGL.”

Initially, SeaOne isn’t “selling” the fuels it delivers. Instead, the customer will buy gas from commodity dealers and have it delivered to SeaOne’s facility at Gulfport. SeaOne will be paid a flat delivery fee—a tariff typical of a pipeline. “The customer loves it,” Høglund said.

With fuel-service agreements, “we can go and get the project finance. That’s how every pipeline is built. We don’t take custody. The customer buys it in the U.S. and has it delivered to us at Gulfport. We receive the gas and NGL, solvate it into a liquid cargo and load it aboard the CGL ship.”

At the market, SeaOne extracts and delivers to order. “When the customer wants pure propane, he gets pure propane. He wants high-Btu [British thermal unit] natural gas? He can get that.”

Ports of origin, destination

Gulfport was selected for the production and export terminal based on proximity to product. SeaOne has a 40-year lease on an initial 32-acre tract that can host up to three plant expansions for a total capacity of 1.6 billion cubic feet a day.

“Each CGL production facility is equivalent to a 3-million-ton-per-annum LNG plant, which would require 200 to 300 acres,” Høglund said. “So our footprint is much smaller, much lower cost.”

He added, “And it’s much safer.” A leak in the CGL containment system would vaporize similar to turning on the valve of a propane tank; the propane evaporates.

SeaOne’s vessel is an articulated tug and barge (AT/B)—a type that traditionally moves bulk goods, oil and containers. Its draft is shallow—about 26 feet. “We have just entered an agreement with a shipyard to construct and deliver 12 AT/Bs for Phase 1 of the project,” Hall said. After FID in November, construction will begin.

The initial market is the Caribbean and Central America, where oil is the feedstock for more than 90% of electricity generation and cooking. “The big market is for the rich blends of natural gas,” Hall said. “Diesel isn’t very good from an environmental standpoint.”

Høglund said, “We can give them clean-fuel blends that have a higher heating value of greater than 1,200 Btu per scf [standard cubic feet]. Whatever they order, we can give them. Conversion of their existing power plants to operate on CGL is relatively inexpensive and easy.”

In addition to the Dominican Republic, which will be the Caribbean distribution and manufacturing hub, Puerto Rico is another initial customer for Phase 1.

Both are members of the Small Island

Developing States, which consists of 57 island states in the Caribbean, southwestern Pacific, Indian Ocean and West African coast. The group was recognized by the United Nations in 1992. Initially, their collective concern was economic; in time, the concern of many members has grown to include climate change.

A SeaOne analysis determined that Puerto Rico, for example, would have saved \$5.6 billion in fuel costs during the past four years if it had converted from oil and diesel to a natural gas blend for power gen. Emissions would have been reduced by 62% in the San Juan area, which will be the location of the CGL receiving terminal and the source of 80% of Puerto Rico’s power demand. Two major oil-and-diesel-burning plants are there.

“We’re negotiating a fuel-service agreement with them as we talk,” Høglund said. “We’re the perfect answer for them. These islands have some of the highest electricity costs in the world.”

LNG has been available previously to the islands, but at a high cost. “We have the perfect technology. It’s ready to go and they’re standing in line.”

‘It will go viral’

SeaOne’s Phase 1 capital cost is about \$3 billion, including 12 vessels. The focus will be on delivering to the largest buyers first; smaller-design vessels may come later. “Or you can take these AT/Bs, pull the tug off and leave them as clean-fuel storage,” Høglund added.

The vessels are less expensive to build and operate than the LNG-carrier equivalent. “We just have standard low-temperature carbon steel for the containment system. There is no sloshing or boil-off issues, and there is no gas-blanket retention.”

CGL production involves a standard gas plant, generally, and one-third of the energy needed to produce the equivalent amount of LNG. In addition, “we use no processed water, have no process effluents and have very low emissions.”

The Caribbean project is the launch. “We will probably have a SeaOne Asia and so on.”

Overall, “it has the potential to just really take off. When people see how flexible it is, I think it will go viral. This is the shale oil and gas of the midstream. We can take gas and gas liquids worldwide. It’s scalable and lower cost.”

Høglund presented in Washington, D.C., in April at CG/LA Infrastructure’s “Blueprint 2025 Infrastructure Leadership Forum.” He told *Investor* that the initial response there and throughout SeaOne’s project development has been that “people have a hard time grasping it in some way.

“Potential investors ask us, ‘Why did you guys come up with this? Why not Exxon [Mobil Corp.]?’”

Why not? “I don’t know,” Høglund said, “but we have the patents on the wall. They missed shale gas and shale oil. They missed this too.” □