

Cheniere Energy and Cryoquip are pioneering a green, environmentally-friendly solution for LNG receiving terminals



Liquefied natural gas (LNG) is natural gas that has been cooled to less than minus 260°F (161°C) so that it can be safely and economically transported around the world. Once delivered to a receiving terminal, the LNG must be pressurized, re-vaporized, and heated to at least 40°F (4.4°C) before it can be put into pipelines carrying the natural gas throughout the country. In the past, base load LNG regasification (vaporization) terminals have used heat from very large volumes of seawater (which can damage nearby marine life) or from burning a portion of the natural gas itself.



Cheniere Energy, Inc. (Cheniere) and Cryoquip, Inc. are pioneering an improved “green” design that is a more environmentally-friendly alternative at the Sabine Pass LNG receiving terminal in Cameron Parish, Louisiana, USA. Nearly a decade ago, Cheniere identified Cameron Parish as an ideal location for its Sabine Pass LNG receiving terminal. The site has a deep water channel, is close to open water, and has pipeline access to over 75 percent of the U.S. gas market.

Ambient air heated vaporizers, AAV’s, will use the abundant heat in the air to vaporize and heat the LNG. However, unlike other technologies that pump an intermediate fluid to forced fan exchangers and into LNG vaporizers, natural draft ambient air heated vaporizers directly exchange heat between the air and the LNG with no intermediate fluid, and do not require pumps, fans, or consume electrical power. AAV’s turn liquid LNG at 260°F to natural gas at 40°F using air with NO CO₂ emissions, NO fuel consumption, NO sea water impact and NO moving parts. Cold air and fresh water are the only by-products of the process.

A full scale AAV train (a series of 18 vaporizer cells connected together to form one operating element) has been installed and has passed initial performance tests, and all the

theoretical expectations have been realized in practice. Cheniere is in the process of refining the design and is already permitted to expand the application to process more than 1.0 Bcf/d of LNG. At that time, this technology will reduce fuel use by 60% or more and reduce CO₂ emissions by as much as 280,000 tons per year at the Sabine Pass receiving terminal.

An Ambient Air Vaporizer, AAV, is an interconnected array of vertical finned aluminum tubes. As LNG flows through the tubes, they cool the surrounding air. As the air becomes colder it also becomes more dense and gravity causes it to flow downward through the array. This is the reverse of the familiar “chimney effect” where heated air naturally rises due to its lower density. This natural draft method requires no fuel or electricity. In fact, natural draft AAV’s do not have any moving parts. In addition, the process emits no CO₂ or other harmful emissions, and uses no natural gas to vaporize the pipeline gas, unlike conventional systems.

With a total send-out capacity of 4.0 Bcf/d and 16.8 Bcf of storage capacity the Sabine Pass terminal is the largest receiving terminal, by regasification capacity, in the world. In the future stages of Phase 2, a sixth storage tank and related facilities are planned to bring the total LNG storage volume to 20.2 Bcf. AAV technology will reduce Sabine Pass LNG’s fuel use by 60% or more and reduce CO₂ emissions by as much as 280,000 tons per year, providing a truly environmentally-friendly, “green,” solution to the regasification of LNG. This technology holds great promise to become the new standard in the years to come, resulting in a cleaner, less polluted environment.

For more information contact Eric Foster at Cryoquip, +1.951.677.2060, efoster@cryoquip.com or Ed Lehotsky at Cheniere Energy, +1.713.375.5206, ed.lehotsky@cheniere.com.

