

# LNG vaporization

Small scale, big picture

By Adam Van de Mortel, Sales Engineering Manager at Applied Cryo Technologies

Developing new markets for Liquefied Natural Gas (LNG) fuel requires an enormous web of technology and accessing solutions can be a challenge. LNG storage solutions are often the focus of many projects, but vaporization and process integration can play a large part in the overall system value.

Considering the project goals and conditions, the vaporization and overall process solution can be optimized for a variety of categories. For small scale and intermittent projects, new technology is being deployed, challenging traditional standards to develop turnkey solutions that revolutionize the industry.

The market landscape for LNG equipment providers has most often presented moving targets. Understanding how to access markets with the most valued vaporization solution is a challenge that requires knowledge of customer goals and innovative products that are focused

on the application. The pioneers who lead this industry into new stretches are driving demand needed to fill production lines by reimagining traditional vaporizers within the framework of a larger picture. Deploying advanced vaporization system technology on small scale projects from around 5,000 Standard Cubic Feet per Hour (5 MCFH) to several hundred MCFH has created a new layer of value in the energy market that allows business developers to convince users to make the switch to LNG without looking back.

“Learn what users value when they are being asked to move away from the familiar into the unknown: simplicity”

So how do you approach buying vaporization equipment while weighing the challenges and risks of geopolitical pressures on energy prices, navigating a pandemic, and obtaining approvals and funding needed in ever uncertain capital markets? Learn what users value when they are being asked to move away from the familiar into the unknown: simplicity. Keep it simple for them by removing uncertainty about the process and risk of owning equipment that has stranded value. Ease of operation and customer service are invaluable tools that are often hard to find in a supplier. Zero in on value that can be gained from equipment that offers versatility, strong customer service, and a high level of integration with the process in a user-friendly interface. Use a top-down approach to review project goals from a bird’s eye view and drill down to equipment capability after painting a clear picture of the overall process requirements.

© ACT | Gas fired vaporizer, high pressure pump skid and Queen LNG mobile storage



A good starting point for reviewing project goals is timing. A permanent solution may be suitable, but many off-grid customers are not looking for an extensive civil engineering project with many levels of approvals. Many projects can be completed with portable equipment that operates on trailers or skids that can be easily moved to and from a site and later used elsewhere.

Small-Scale LNG projects often require rapid conception and deployment with swift maneuvering capability to alter proposals as projects evolve, while sustained equipment performance is paramount once installed and operating. Project goals can shift as progress is made towards approval and execution, while successful operation is critical to building confidence and trust with the clients. Uncertainty is the last thing anyone is willing to face, so the solutions that move projects forward and spur new market opportunities are often those that can accommodate a moving target while maintaining flexibility along the way to meet a variety of customer needs. As projects reach execution and equipment is installed, it is critical they receive the service support needed to put customers at ease and allow development of future business down the road. Standard equipment can provide apparent solutions but finding the right value in custom tailored vaporizer products is key to repeated success.

Skidded vaporizer modules and trailer mounted regasification packages are leading LNG into new markets with innovative new features and capability. The all-inclusiveness and modern appeal of integrated equipment provides peace of mind and intuitive operation. Products that can be easily deployed and communicate with one another via a common control system are invaluable to business units looking to bridge the gap from the manufacturers to the end users. Instead of getting tied up

in the web of equipment integration and installation, they can focus on the sale and confidently approach new opportunities, knowing the solution will be a success.

Many vaporizer products may seem to satisfy the needs of the project, while process management is often an afterthought once budgets have been established. Having integrated process control with a vaporization system allows users to simply set parameters and worry no more. Operators can easily be trained to keep tabs on equipment while providing gas to the user with confidence.

## “Skidded vaporizer modules and trailer mounted regasification packages are leading LNG into new markets”

Applied Cryo Technologies (ACT) offers automated vaporizer systems that can plug and play with simple, quick connectors to communicate with other equipment, allowing common process control of an entire LNG facility. Stationary and/or mobile LNG tanks, LNG trailer offloading, safety monitoring systems, and vaporization can all be managed from a single point, allowing ease of installation and remote operation.

Cost models for projects can have additional challenges. Hidden capital costs such as civil engineering work or pneumatic system requirements can emerge as vaporizer systems unfold, while operating costs like staffing and maintenance requirements can be lost in the cards if not properly understood.

Manually operated equipment and individual vaporizers may have an attractive price tag, but they may not comply with interpretations of codes and standards by Authorities

Having Jurisdiction (AHJ), or cause margins to be thinned due to high operating costs, which can undermine projects as operator time adds up. Automated vaporizer systems that include process integration and controls simplify operation by allowing unmanned installations with minimal supervision. Remote access telemetry capability further improves on this by allowing users to manage more with fewer resources.

So how do you maneuver to be positioned to win? The best approach is to understand what the AHJs require, what operating environment will be required for the equipment, and what is important to the end user. Operation and staffing requirements should be minimized to make converting from another fuel source like propane a simple change. Working with the right supplier can pay dividends, but finding the right partners often requires looking between the lines to find the value offered by raising the bar on conventional technology, which can drive new market opportunities.

Stationary fixed ambient vaporizers are the most conventional and familiar approach for regasification solutions, but they can lead to challenges down the road. Fixed ambient vaporizers require civil design and construction including concrete foundations, crane rental and extensive piping to be properly installed.

Mobile equipment such as skids and trailers can be easily deployed without cranes or civil work and can be up and running in less than a day. Small scale LNG projects allow capital decision makers to take reasonable risk to deliver significant savings opportunities in a term that makes sense to investors. Having a vaporizer solution that meets all requirements needed to satisfy authorities and can be readily deployed is a powerful weapon to cut through red tape and deliver gas to a customer as quickly as possible. ▶



© ACT | Dual shell and tube vaporizer skid with gas manifold



© ACT | Turnkey LNG storage and regas site with dual ambient vaporizer skid

▶ For many companies working with end users, collecting all the information to propose and execute a project can be time consuming and confusing. Bridging the gap are the innovators who can understand the project goals and deliver solutions that are aimed to suit the customer's exact needs. Finding partners like ACT who can guide you with confidence and deliver with reliability and strong customer service is key to developing successful fueling projects with LNG.

Vaporizer solutions designed to custom specs can be hard to identify when bidding out a project. While every equipment provider offers standard products, the best solutions can often be hidden on a bid tab on the decision maker's desk. The rewards of using a tailored solution are multi-pronged, but often under-valued by a purchasing manager if not properly vetted. Investors looking to purchase vaporization equipment should consider its practical value with technical evaluation. While a standard vaporizer solution may seem to satisfy the requirements, more complete solutions may add another layer of value that is not apparent without taking a closer look at the capabilities and features of the asset.

Many projects require unique challenges to be overcome such as off-grid operation with self-powered vaporizer equipment. For this, an integral natural gas genset offers huge advantages. Harsh climate conditions and operating temperature requirements pose a significant challenge for many vaporization products, but ACT

“Many projects require unique challenges to be overcome such as off-grid operation...”

has developed vaporizer project solutions that have overcome polar vortex conditions, hurricane winds, and extreme heat to deliver reliable performance in extreme weather.

Understanding project conditions and goals is key to developing regasification solutions that allow trouble-free operation while staying within budget and other constraints. Available space, heat or cooling demand, climate conditions, fast delivery, and CAPEX vs OPEX can steer the design to sync up with the best project solution.

Ambient vaporizers can be packaged with electric process heaters to increase cold weather capability, but some projects are off grid or require higher sustained capacity than is practical for such configurations. Gas fired vaporizers can provide up to 900 MCFH in trailer configuration with all-weather performance and allow integrated power generation for self-contained operation. In some cases, a small footprint eclipses all other requirements, leading to combined equipment such as electric regasification Queen mobile storage units.

Queen LNG storage trailers serve as mobile customer stations that can have integrated control systems,

vaporization and pumping capability and offer minimum footprint. Cooling water systems can be coupled with shell and tube vaporizers to provide energy savings when such systems are in proximity. Whatever the case may be, the possibilities are limited only by the imagination and determination of the pioneers who are continually developing new technology to revolutionize the industry.

Looking at vaporizer applications, it can be overwhelming to consider all the factors and navigate solutions. But there are innovators who have overcome the challenges of bringing new technology to the space to deliver results and can guide you through it. Market forces have favored small scale projects permeating the boundaries of what exists by allowing capital investment and industry experts to meet at the pinnacle of advancement. Developing the perfect regas solution is an art in thermal design, but also in practicality and versatility.

It may be small scale, but opportunities are all about seeing the big picture. [SW](#)

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#### ABOUT THE AUTHOR

Adam Van de Mortel is the Sales Engineering Manager at Applied Cryogenic Technologies in Houston, TX. ACT designs and manufactures cryogenic transport trailers and other cryogenic transportation, storage, and vaporization equipment. The views expressed in this article are those of the author and do not necessarily express the views of his employer.

