Bridging the LNG and energy transition GAP

Magnus Ulseth, Quorum Software, explains how cloud-based software can help LNG fulfil its potential as a transition fuel.

The energy transition is one of the defining movements that will shape the future of the oil and gas industry. As oil and gas companies seek out alternative fuel sources to power their operations, they simultaneously need to keep in mind the impact this energy will have in the immediate term. Will they improve or hurt profitability? How viable are these fuel sources for their current customer base?

Through this lens, the appeal of LNG as a transition fuel has become abundantly clear. LNG provides a cleaner option than traditional fossil fuels in the near-term as businesses look to move their operations to renewable sources over the next several decades. However, with this interest comes additional scrutiny of LNG terminals, driving the need for efficiency and sustainability improvements in both new and existing infrastructure.

Regulatory bodies are also pushing for optimal use of LNG infrastructure, which has led to an increase in regulated or negotiated third party access (TPA). And as more participants enter the market, it is no longer sustainable to manage terminal operations, contractual obligations and commercial services with spreadsheets.

As interest in TPA has grown, so has the need for operators to have a software solution that supports flexible contract management, robust planning and scheduling and more, in order to help drive the increase in LNG for the energy transition.

LNG as a global commodity

Tales of LNG's growing impact emerge every day – in fact, the US Department of Energy recently shared that the US vastly exceeded its 2021 export totals in 2022, despite the country's second largest LNG exporter experiencing an unexpected six month shutdown.[1] There are a number of factors driving this change, from geopolitics and energy security policies to investment in hydrocarbon production and distribution infrastructure.

LNG terminals must be able to keep up with these rapidly changing market factors and considerations – especially import terminals, as they keep searching for new revenue streams, which include commercial marine services and small-scale LNG services. But investors are wary of over-investing in the midst of an energy transition, as these terminals are expected to be 'renewable-ready.'

This is why LNG software solutions must be designed and leveraged to manage the energy transition – not just on a global scale, but unique to the needs of each region.

Region-specific LNG software needs

Whilst LNG's value is apparent on a global scale, the needs of individual regions vary greatly, and software must be agile enough to address these differences.

Take Europe, for instance. Historically, Russia has been responsible for 40 – 50% of European consumption of natural gas, according to the European Commission. As supply from Russia disappears, however, countries are scrambling to charter floating storage regasification units (FSRUs) and buy LNG on the spot market. Meanwhile, Europe is hyper-focused on accelerating the energy transition, with a spotlight on renewable electricity and hydrogen economies of scale, so countries in this region have been known to be hesitant to sign long-term LNG purchase contracts.

Given these goals, European operators would rely on software exclusively for LNG import terminals, which would need to be secure and auditable, ensure fair implementation of TPA regulations, provide integrations to transmission system operators (TSOs) for gas nomination, and be renewable-ready (to support the transition). However, in the US, it is a different story.

The US has the product and supply to meet the growing demand for LNG, and is therefore heavily export-focused. Meanwhile, the Inflation Reduction Act incentives for clean energy have caused those in the industry to prioritise the expansion of existing terminals, as new projects could take three to four years to develop.

A software solution to support LNG export terminals would need to help tolling and merchant-based LNG terminals to optimise production and cargo schedules, handle nomination and change requests, and manage carbon capture, utilisaton and storage (CCUS), as well as documentation on carbon footprints as the demand for LNG increases.

It is crucial to choose a software solution that is able to meet the specific regional needs of an operation, especially as interest in becoming carbon-neutral grows.

Carbon-neutral LNG

One crucial consideration to receive financial backing for new export terminal infrastructure projects is lowering the carbon footprint of cargoes, with carbon-neutrality as the ultimate goal. However, the term 'carbon-neutral' lacks a uniform definition, which can vary from well-to-tank and well-to-grid to full life cycle.

To ensure emissions transparency and reduction, a new framework was introduced by the International Group of Liquefied Natural Gas Importers (GIIGNL) in 2021 for monitoring, reporting and verification related to LNG. The framework includes collecting and calculating data points in a full life cycle approach (from Scope 1 and 2 to a reasonable estimation of Scope 3 emissions), tracking operational and logistical activities, and a new set of carbon documents that must follow each LNG cargo in the same way as traditional carbon documents.

With these additional requirements comes even more challenges that an LNG software solution must address. Software must be able to handle increased commercial complexity, factor in physical splits into smaller deliveries, and monitor emissions from upstream activities (which have a major impact on the overall carbon footprint of LNG). An LNG cargo that leaves an export terminal can also transition through various commercial transactions, further complicating the measurement process.

LNG's value in the energy transition

At the end of the day, the single most important role for LNG to play in the energy transition is in the shift from coal and oil toward LNG and natural gas. In fact, EQT's Toby Rice estimates that natural gas could replace one-third of the world's coal by 2030 if unleashed properly.[2]

It is easy to understand why LNG is so important. It is the cleanest fossil fuel available that can be transported across the globe, and unlike electricity, it can be stored in significant quantities, making it a stronger alternative to balance cost and the environmental impact of power system balancing. However, although many LNG terminals are built to accelerate the replacement of coal and oil, the countries in which they are established typically struggle with environmental concerns, growing populations and energy poverty.

This challenge necessitates finding the 'optimal fuel mix.' Rather than simply importing as much LNG as possible, operators must balance energy security, fuel prices and environmental impact. And to enable this balancing act, software solutions must support commodity management and help manage the various reagents and byproducts from the combustion process.

LNG is the most realistic transition fuel to play a significant role in the energy transition, but it does not come without its challenges. The increasingly complex commercial factors and public scrutiny associated with LNG require a robust, auditable and flexible software solution to help support the fuel's growth.

It all starts by bringing all business processes together into a single cloud-based, integrated system. This includes production management, transportation and cargo management to minimise the need for third-party cargoes, sales and revenue, pipeline management, and more. Managing the entire LNG life cycle in a single platform provides oil and gas companies with a comprehensive data set to avoid siloed decision making, which also improves auditability and security compliance as all information is in a single location.

The future of the energy transition relies heavily on LNG – and proper data management can help companies reach their full potential by ensuring facilities are operating at peak efficiency to support today's energy security concerns, all while providing support for long-term low-emission strategies.

References

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