SUCCESS BY SIMULATION

Karen Lukacs, Eka Software Solutions, Canada, highlights the critical role that simulations play in facilitating effective LNG trading.

While oil remains the most widely traded commodity worldwide, with annual physical crude deliveries of at least US$2.3 trillion, the LNG market is growing more rapidly.[1] According to McKinsey Energy Insights, LNG volumes increased to US$150 billion last year. By next year, LNG volumes will be more than triple what they were at the start of the century, making it the quickest-growing segment of the fossil-fuel industry.

The biggest energy commodity traders now trade two or three times as much oil they did a decade ago, but their earnings have remained largely flat as the margin per barrel has narrowed. These narrowing margins have made LNG trading more appealing. Growing demand for cleaner burning fuels has also fuelled demand for LNG. There are now more than 800 people working in LNG trading and sales, a significant increase from the 150 or so trading LNG a decade ago.

Several factors are driving demand for LNG:

- New supplies are coming on-stream.[2] In 2019, more than 30 million t of new LNG supply will be available, including new supplies from Russia's Arctic region and the US Gulf Coast, both of which exported their first cargoes within the past three years.
- China is expected to double its demand for LNG in the next two decades as it works to clean its smoggy skies.
- Highly-populated nations like India and other emerging buyers in Asia are likely to increase demand.
- New technology, such as floating production plants and receiving terminals and more advanced ships, has also made the expansion of LNG trading easier.

Supply outstrips demand

While doubling or tripling supplies greatly expands the market, it also carries risk. Globally, analysts anticipate 33 million t of new supply in 2019, driven by the full ramp-up of the new Australian plants and by the start of new US projects. At the same time, analysts predict only 16 million t of extra demand.

Increased demand from China and emerging buyers may not be enough to absorb the additional supplies hitting the market this year. According to Wood Mackenzie, China will likely increase its LNG demand by approximately 8 million t in 2019, nowhere near the 15.7 million t jump seen in 2018 from 2017.[2] Therefore, LNG producers are going to have to find new buyers in Asia and Europe. For any industry operating on tight margins, carefully calibrated delivery schedules and with a complex interconnected supply chain, surplus product sitting homeless and waiting for a buyer is a disturbing and costly problem.

As supply outstrips demand, prices fall, enabling LNG to replace other fuel. For example, in Europe, LNG can displace Russian pipeline gas if the price is right. At the end of April, the spot price of LNG in Asia dropped to just above US$5.00/million Btu, down 57% from the 2018 peak of US$11.60/million Btu.

Figure 1. New LNG supplies are flooding the market.

Figure 2. LNG becomes more attractive as oil prices rise.

Technology fuels profits

Trading profitably in uncertain markets – especially relatively new markets – requires a careful evaluation of all variables. LNG trading is new for many market participants, and they cannot rely on old ways of doing business, or historical trends, to drive current decisions. The sheer number of variables to manage is too big for manual analysis. However, innovations in technology provide access to real-time data and the power to analyse this data quickly and effectively.

Thanks to the advent of cloud and mobile technologies, and the abundance of easily accessible computing power, LNG traders can analyse structured and unstructured data – including weather feeds, market information, supply chain variables, market sentiment, and more – to evaluate dozens or hundreds of possible choices and make the best, most profitable decisions. Even better, they can do these simulations at any time, in any place, by using simple apps on a laptop, tablet or even a cell phone.

Take, for example, a market disruption that causes oil prices to spike and demand for LNG to soar. Modern technology enables LNG traders to know immediately when the market disruption occurs. Simply by setting alerts for large changes, LNG traders can receive an alert on their phone the moment the market starts to shift and immediately spring into action – whether they are at the office, on a train, or at home. Just the ability to know something happened when it happens, not days or weeks later, enables better decision making and increased profits.

Adapting to change

Armed with immediate visibility into shifting markets, LNG traders can jump into action the moment they receive an alert. They can run simulations to determine how the market shift impacts their business. Are there new opportunities? Can they offload excess stock? Should they try to secure more stock to meet increased demand? Are there new markets to explore?

Thanks to the diagnostic and predictive capabilities of advanced analytics, traders can evaluate a spectrum of likely-to-unlikely outcomes in any number of given scenarios. These scenarios can then be stress-tested, the variables altered and the outcomes refined.

With the power of real-time data and advanced analytics, LNG traders can evaluate current, future and potential opportunities to make the most profitable decisions.

- With advanced analytics and real-time data, the trader can check current and predicted positions to create an accurate assessment of position if the trader makes no changes to their strategy.
- They can stress test the value of their portfolio. Using current and projected prices, LNG traders can revalue their portfolio based on hypothetical market price movements and see the impact those prices would have on the company. As prices increase or decrease, traders can simulate the value of their position, profit and loss (P&L), and existing contracts and make changes necessary to ensure profits.
- They can run dozens or even hundreds of scenarios, creating 'what if?' simulations. LNG traders can evaluate hypothetical

transactions – using real-time data and projected data – to determine their potential impact on position, risk, revenue and profits. For example:

- Oil prices have skyrocketed, so demand for LNG should increase. What would be the impact on my business if I sold all my inventory at today's prices? What would profits look like? What would risk look like?
- What if I hold my inventory to wait for prices to increase and can sell all my inventory at the higher price. How does that impact profits? What about risk?
- What if I hold my inventory to wait for prices to increase more and I am stuck holding excess inventory for three more months. How does holding excess stock impact profits? Risk?
- I can increase production to meet projected demand. What if I increase production and that demand never materialises? What is the impact of holding excess stock on profits and risk?
- How much can I charge to sell in new markets? Is that price worth the risk of working with new customers with unknown history?

- They can even simulate cash flow based on all the different scenarios to determine how each scenario impacts cash flow and ensuring whatever choices they make do not compromise operations.

Simulations cannot predict the future, but they can help LNG traders thoroughly evaluate choices and compare a series of potential outcomes by testing the impact of specific decisions before putting them into practice.

Making better everyday decisions

Simulations are not just for market disruptions. LNG traders can use simulations to evaluate potential deals, new investment opportunities, transportation routes, fleet optimisation and even scheduling. Using the power of all available data, scenarios can be fully explored, enabling better decision making. Even the impact of a Category 1 hurricane storm can be compared to the impact of a Category 5 to create contingency plans and mitigate risk.

Simulations enable LNG traders to explore and test thousands of different scenarios, visualise the interactions between hundreds of different variables, and understand the consequences of each potential decision. They create a much more accurate picture than analysing historical data and making decisions based on what happened in the past.

Conclusion

LNG is a relatively new market, and one that is evolving. Agility and adaptability are going to be key success factors going forward. Simulations provided in solutions like Eka's give LNG traders the flexibly to continually reevaluate their options and adapt quickly as the market changes around them. **LNG**

References

1. SHIRYAEVSKAYA, A. and HOFFMAN, A., 'Commodity Traders Turn to LNG as Big Oil Profits Prove Elusive', *Bloomberg*, (March 2019), https://www.bloomberg.com/news/articles/2019-03-27/lng-grows-for-trading-houses-from-gunvor-to-trafigura-glencore
2. RUSSELL, C., 'Even China may not be able to soak up all 2019's new LNG', *Reuters*, (February 2019), https://www.cnbc.com/2019/02/28/reuters-america-column-even-china-may-not-be-able-to-soak-up-all-2019s-new-lng-russell.html