

Understanding the value of an LNG portfolio

In an ever more complex global market, evolving LNG actors face a challenge in valuing what they have and choosing their next steps

Global LNG demand has been growing at a double-digit pace, c.10pc/yr since 2016. And the LNG market’s commercial evolution has accelerated in parallel, driven by new and more flexible sources of supply on one side and less passive buyers on the other.

Market development has also been supported by new players, improving liquidity and a transition to shorter and more flexible contracting. As the market matures, substantial value creation opportunities are emerging.

These opportunities are reflected in the evolution of LNG market players. Large producers such as Shell, BP and Total are expanding their value-chain presence. Trading focused intermediaries including Gunvor, Vitol and Trafigura are driving liquidity growth and evolution of the traded market. And major buyers like Japan’s Jera, South Korea’s Kogas and Singapore’s Pavilion are expanding their portfolio footprints and developing commercial capabilities or joint ventures to support this growth.

LNG portfolio value creation is underpinned by a robust analytical framework. Firstly, a solution is required to manage the shorter-term optimisation of portfolio cargo delivery, shipping constraints and logistics, e.g. the annual delivery programme. But this is not enough on its own.

Firms are also building out portfolio valuation models

with a medium to longer-term horizon (from six months up to ten years). The focus here is on quantifying incremental value created by adding new assets, contracts and hedging strategies to an LNG portfolio. A successful modelling framework can be the ‘engine room’ of portfolio value growth.

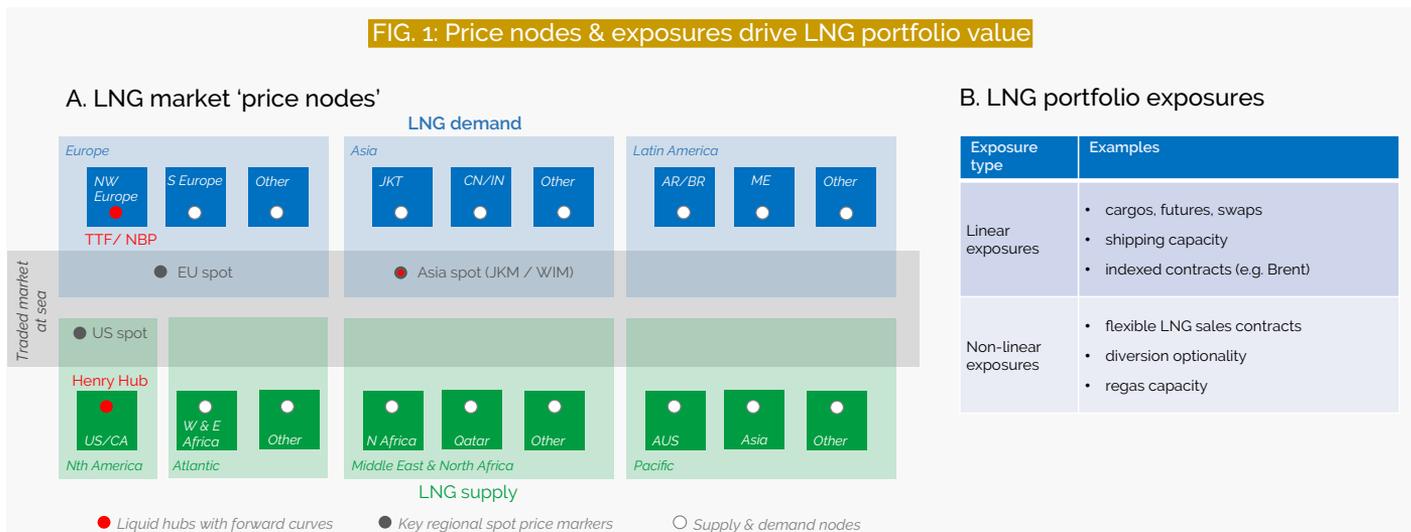
Analysing portfolio value

LNG portfolio value creation poses a unique set of challenges:

- Value interdependence: the value of individual LNG assets within a portfolio is interdependent, given the physical and contractual complexity of the LNG supply chain.
- Unique portfolios: each LNG portfolio is unique given, for example, specific exposures, constraints, logistics, trading strategies and tax implications.
- Market illiquidity: the LNG market remains relatively illiquid and has complex physical and contractual logistical constraints.
- LNG price dynamics: prices do not follow standard normal distributions(!), and standard pricing models do not capture the complex relationships across regional price markers.

These challenges mean that LNG asset investment,

FIG. 1: Price nodes & exposures drive LNG portfolio value



By [Olly Spinks & David Stokes](#),
Co-managing directors,
Timera Energy



contracting and hedging decisions need to be considered from a portfolio perspective, rather than on a standalone basis. Otherwise value is left on the table and risk cannot be properly quantified.

How is LNG portfolio value created? The most accurate answer is probably ‘in a bar over a five o’clock beer’... But behind the deals that underpin a portfolio, value is created via the interaction between:

- Constraints and stress points in the LNG supply chain
- Changes in market dynamics.

Value is captured via constructing and optimising an appropriate combination of portfolio components and optionality.

Breaking it down

LNG portfolios can be simplified using market price ‘nodes’ and asset ‘exposures’. Market prices act on exposures to drive portfolio value. *Fig.1* shows a simple mapping of key LNG market price nodes and some examples of key LNG portfolio exposures.

An effective analytical representation of an LNG portfolio needs to capture the interaction between:

- Nodal price dynamics (price level, spreads, correlations and volatility)
- Portfolio exposures (e.g. commodity positions, asset flex and constraints)

If you can define a realistic but transparent representation of the way price dynamics act on portfolio exposures, you are more than halfway to cracking the problem.

Value creation

It may be useful to consider a practical case study of portfolio value creation: the addition of a sales contract to a portfolio dominated by supply contracts.

FIG. 2: Value distribution impact of adding a sales contract to a portfolio

Total Margin Metrics	Base Portfolio	Base Portfolio plus China SPA
Mean	\$673M	\$871M
p10	\$357M	\$700M
p90	\$961M	\$1,026M
p90-p10	\$604M	\$326M
Stdev	\$235M	\$127M

Source: Timera "LNG Bridge" LNG Portfolio Valuation Model



Value creation is underpinned by an understanding of how an LNG portfolio responds to changes in market conditions. For example, being able to quantify the value impact of a shift in Brent vs TTF pricing dynamics.

The only way to effectively analyse LNG portfolio valuation dynamics is by using a Monte Carlo price simulation framework. This is illustrated via the case study in *Fig. 2*, which we have generated using Timera Energy’s ‘LNG Bridge’ portfolio valuation model.

The case study considers an existing ‘base portfolio’ consisting of Brent-indexed and US export supply contracts and European regasification capacity. The distribution of base portfolio value is shown in blue. It is generated by simulating multiple (500+) correlated Henry Hub, TTF, JKM and Brent price paths and optimising portfolio value against each price path.

The orange distribution then shows the impact of adding a premium sales-and-purchase agreement (SPA) with a Chinese buyer to the portfolio. Given the base portfolio is long, the Chinese SPA reduces portfolio risk; it narrows the portfolio value distribution. The SPA also increases the expected value of the portfolio as it is signed at a premium to market prices—to reflect the flexibility provided to the buyer.

The ability to quantify the impact of origination, investment and hedging decisions on portfolio value distributions is a powerful weapon for LNG commercial teams. It enables business developers, originators and traders to define and quantify genuine portfolio value upside. ■