

# The Future of Long-term LNG Contracts

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The last decade or so has witnessed a decline in the dominance of long-term contracts between exporters and importers of LNG. Data from the International Group of Liquefied Natural Gas Importers show that spot and short-term (less than four-year duration) contract trades generally increased from 2000 to become more than 25% of total trade in 2011. Over the same period, parties to long-term contracts engaged in increasing amounts of spot and short-term trade.

There has also been increased short-term trade from the Atlantic to the Pacific basin. This may reflect, in part, lower economic growth in Europe than in East Asia, coupled with the progressive elimination of destination clauses in long-term contracts for LNG supply to the EU after the EU Commission found such clauses anti-competitive in 2001. Another reason, especially from 2008, is the unanticipated increase in US and Canadian shale gas production. At the beginning of this century, the US was expected to become the largest LNG importer in the world. Firms that had been preparing to export LNG to the US later found themselves in need of an alternative market. The closure of all of Japan's nuclear power plants following the Fukushima nuclear disaster in March 2011 also attracted LNG to the Pacific from the Atlantic basin in 2011 and 2012.

Increased flexibility in recent LNG projects and associated contracts have supported, but also responded to, these developments. Less than 100% off-take commitments by buyers have left uncommitted quantities available for spot market trades. Many recent contracts allow quantity adjustments in more circumstances, greater destination flexibility, and a wider range of pricing options (including linking LNG prices to spot market natural gas prices) and price review provisions. Growth in "branded LNG," where non-consuming buyers purchase LNG from multiple projects and sell to buyers under their own names, has also increased flexibility. As the LNG market has matured, early long-term contracts have expired leaving suppliers with spare capacity and

without a need to finance large investments. Some of these suppliers have entered the short-term and spot market rather than sign new long-term contracts.

The model developed in this paper examines the advantages and disadvantages of long-term contracts for trading LNG. Long-term contracts reduce cash flow variability and thereby increase the debt capacity of large, long-lived, capital investments for both the exporter and the importer. Increased leverage in turn reduces the cost of financing. However, long-term contracts also limit the ability of the contracting parties to take advantage of profitable short-term trading opportunities. The model shows how take-or-pay provisions and supplemental spot market trades limit the inefficiencies arising from contract limitations on trading outside of the long-term contract.

These considerations imply that additional debt under a long-term contract, and the benefits of a long-term contract relative to spot market trade, decrease substantially with decreasing spot price variability. In addition, a smaller gap between average netback spot prices available to the exporter and average spot prices available to the importer reduces the advantages of a long-term contract. Intuitively, the pairing of the exporter and importer is more advantageous when the next best alternative trading partners for each party are less satisfactory. A smaller gap between average netback spot prices available to the exporter and the average spot prices available to the importer also encourages substantially more spot market trading by parties to the contract.

The model also shows that changing spot price variability has complicated effects on the optimal contract price and volume, and the volume of spot market trading. Supplementary spot trading by contracted parties, such as use of swap agreements, destination flexibility, and sourcing supply from multiple locations, can be thought of as exercising embedded options. Since increased spot price variability raises the value of these options, it also tends to increase the volume of such trades. Increased variability of spot market prices also tends to increase the ex-post inefficiencies of contractual limits on trading, and on that account reduces the attractiveness of long-term contracts.

A key implication of the analysis is that increased LNG market liquidity as a result of increased participation by new suppliers and customers is likely to encourage volume and destination flexibility in long-term LNG contracts and greater reliance on

short-term and spot market trades. These changes could, in turn, reinforce the initial increase in LNG market liquidity.

Based on our analysis, we foresee continuing evolution of world LNG markets toward a larger proportion of volumes being traded on short-term contracts or sold as spot cargoes, and increased use of swaps, re-exports and other short-term arrangements to take advantage of temporary arbitrage opportunities. Conversely, the recent decline in volumes moved under long-term contracts can be expected to persist in the years ahead.