

LNG Market Transformation

UT Energy Week



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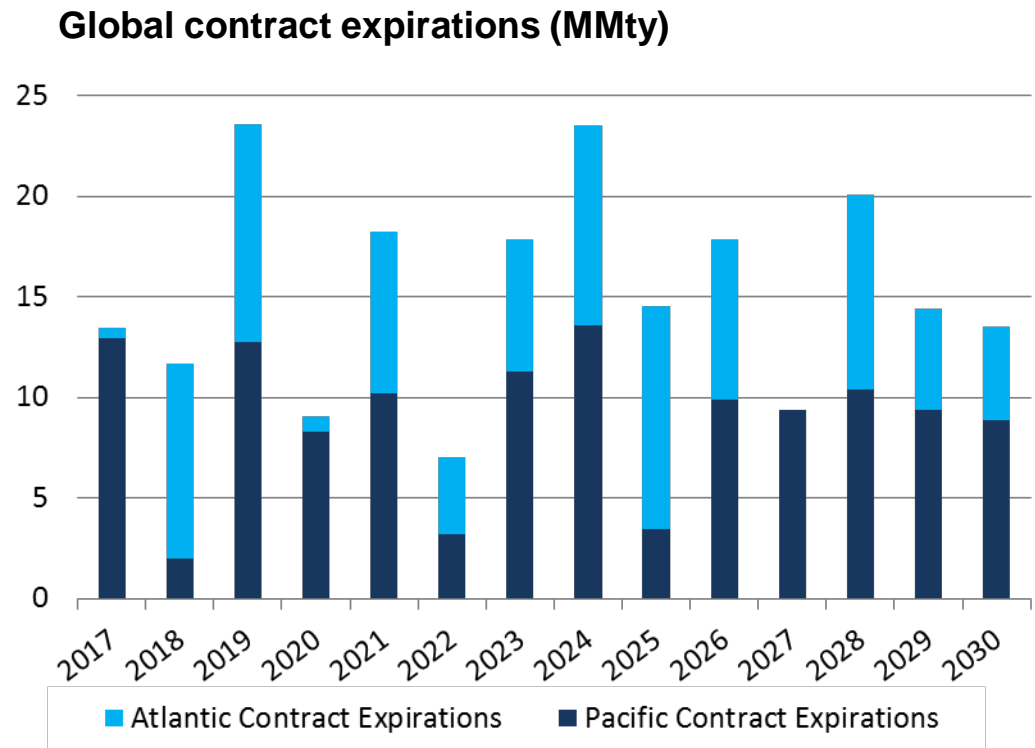
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Introduction

- The LNG industry developed as a point-to-point market
 - Large liquefaction projects built with massive project-finance loans supported by long-term contracts with credit-worthy offtakers
 - Capacity developed in tandem with long-term offtake commitments
 - Low-risk, high-return business that benefited everyone
- US projects, expiration of long-term contracts and changing nature of global markets have blown this up
- LNG is becoming more commoditized
 - Shorter contracts
 - Smaller volumes
 - Less credit worthy buyers
 - More spot and short-term trade
 - Demands for more flexibility
 - More risk management requirements
- Long-term contracts will continue to be part of the LNG business
 - But structural change is a problem for project finance

Contract expirations raise uncertainty

- 213 MMt/y of contract expirations through 2030
 - Mostly long-term supply
 - About 55% of expirations in Asia-Pacific and Middle East, rest in the Atlantic
- Why does this matter?
 - Most of this volume is from projects that have paid off their loans
 - They can sell short term if buyers prefer
 - In some cases, output is declining so a straight renewal is not possible
 - Most buyers now want a portfolio of contracts with different terms, lengths and degrees of flexibility
 - Many 20-year contracts will not be renewed for 20 years or for the full volume of the original contract
- This is a fundamental restructuring of the LNG market

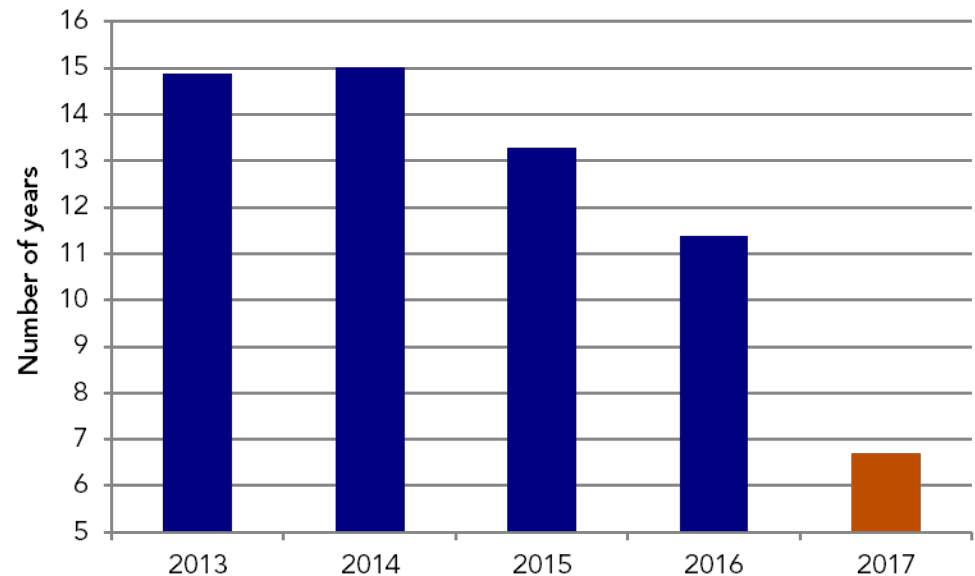


Source: Poten & Partners' Global LNG Outlook

Overall contract lengths are shrinking

- A rise in the number of short- and medium-term contracts, combined with a decline in long-term contracts has shortened the average length of all signed SPAs
- Overall number of contracts has been roughly stable at 26-31 over the past five years
- 2017 data shows number of contracts within normal range (30) and a significant decline in average contract length (6.7 years)

Average term of signed SPAs (More than two years)

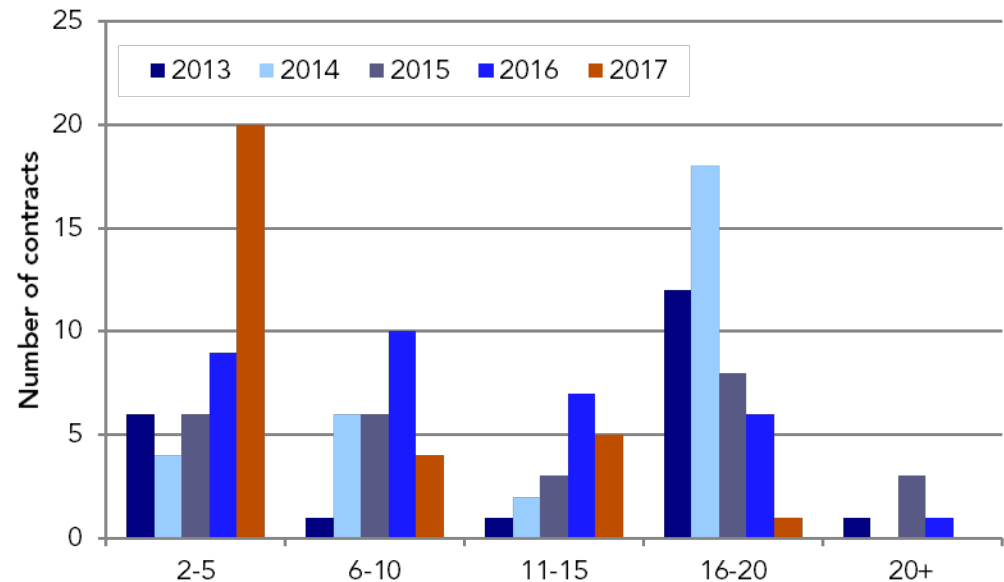


Source: Poten & Partners' LNG in World Markets

More shorter duration contracts are being signed

- Shortest contract durations mostly with traders and resellers
- Most 11-15-year deals are with end users or aggregators
 - Deals seen in Asia, Latin America
 - Sellers mostly producers or overcommitted end users
- Two thirds of 2017 deals (20 out of 30) were for 5 years or less. Continued decrease in 20-year deals

Duration of signed SPAs over time

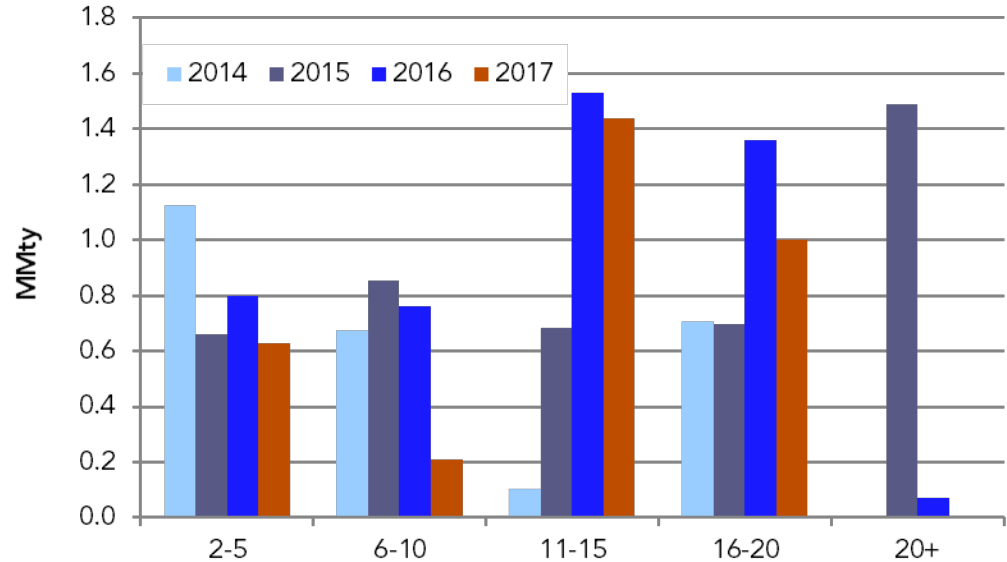


Source: Poten & Partners' LNG in World Markets

More volume moving into medium-term contracts

- Volumes falling as buyers opt for smaller contracts
- Average volumes for 11-15-year contracts holding up
 - Supports notion that 11-15-year contracts are the new long-term contract
- 2017 data shows overall average volumes per contract falling to less than 1 MMt/y (720kt/y)

Average contract volume by contract term



Source: Poten & Partners' LNG in World Markets

Uncertainty about new projects is rising

- **Buyers are reluctant to sign large volume, long-term contracts**
 - Most recent contracts have been for shorter periods and smaller volumes
 - Many buyers feel there is better pricing for shorter terms, and longer, if they hold out
 - Some large buyers are over contracted so they feel no urgency to agree to new long-term deals
- **There are many competing projects, particularly in the US**
 - Most projects under construction have additional trains that have not gone to FID
 - Their lead times are shorter and capex/opex lower
 - There are too many US projects
 - Driftwood, Golden Pass, Magnolia, Rio Grande, Monkey Island, Lake Charles, Texas LNG
- **Lack of FIDs is introducing structural volatility into the market**
 - A period of overinvestment in LNG capacity is now being followed by a period of underinvestment
 - This will have an impact on long-term natural gas demand from the LNG sector
 - With low prices, demand from LNG plants may be volatile
- **The market changes favor majors and producers who are already in the business**
 - Majors can make strategic decisions to build capacity and can pay for it
 - Projects under construction and brownfield projects already have spent money on infrastructure and may be able to offer more attractive terms
 - Greenfield projects requiring long-term contracts and lots of debt financing appear to be disadvantaged

Our outlook for 2018 and beyond

- The structure of the market will continue to evolve
 - Shift toward smaller, shorter contracts
 - Buyer demands for more flexibility
 - More short-term and spot trade
 - Much greater diversity of pricing mechanisms, more flexible terms, smaller volumes
 - Credit quality will become more of an issue as developers look to new markets
 - Choppy LNG market may mean additional volatility for US natural gas markets
- One consequence of these changes is that there is a dearth of long-term contracts
 - There have been only two final investment decisions in 2016-17 – Indonesia's Tangguh Train 3 and Coral South FLNG in Mozambique
 - Unless new projects go to FID in the next two years, there is a risk of underinvestment
 - Many buyers are reluctant to sign long-term contracts, but some anchor customers and aggregators might
 - There is a lot of work to be done in developing contract structures that will allow new projects to be developed

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