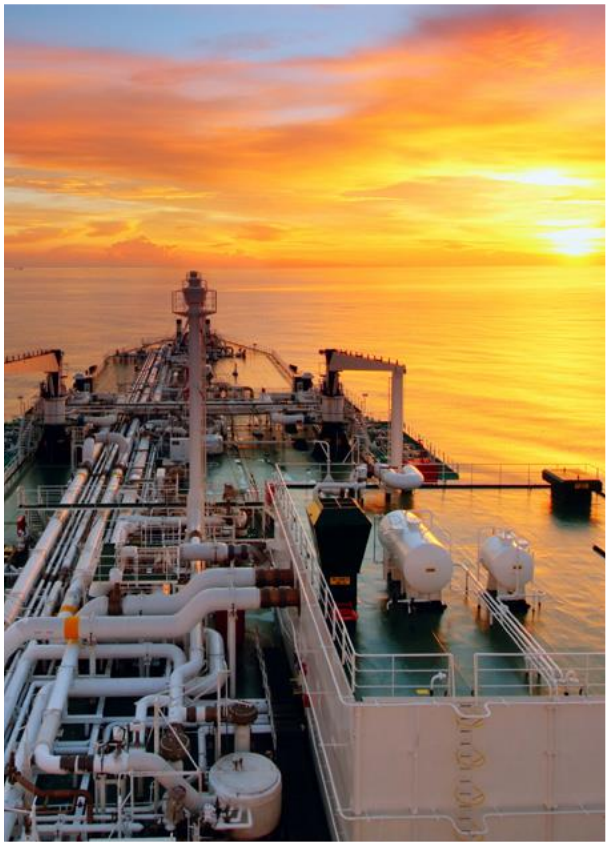
Crossroads – The Way Forward for North American LNG Exports

How North American LNG is Forging a New Path Amid Global Market Volatility



- **U.S. LNG exports have more than rebounded from the COVID-induced global price crash and cargo cancellations of last summer. Feedgas demand is currently above 10 Bcf/d and poised to head higher later this year as new liquefaction capacity is being commissioned and expected to enter full service in early 2022.**
- **Global gas and LNG prices are at record highs, as robust gas demand around the world and low European storage inventories have led to fierce competition for a limited supply of LNG cargoes. Prices are expected to remain strong through this winter given the low European storage inventories and overall tight balances across the major consuming regions.**
- **Prolonged high global gas prices have revitalized interest in offtake capacity from new LNG buildout. But the development and funding of the second wave of North American export projects will look much different than the first wave.**
- **Offtakers are looking for more diverse pricing structures, shorter-term contracts, and green LNG to meet growing demand while also addressing environmental regulation and navigating long-term uncertainty.**

1. Introduction

It has been an incredibly tumultuous 18 months for North American LNG and the global gas market. International gas prices have seen both historic lows and highs as markets swung from precipitous demand destruction due to COVID-19 for much of 2020 to acute supply shortage in 2021. For LNG buyers and offtakers, the sharp reversal from one extreme to the other in a relatively short period of time has underscored the risks of long-term commitments in a rapidly changing environment. At the same time, the supply shortage is signaling the need for more liquefaction capacity and LNG supply — in stark contrast to the conventional wisdom in pre-COVID times that the market was entering an overbuilt, oversupplied cycle. The long-term uncertainty coupled with near-term supply fears has had a profound impact on the way the existing

fleet of LNG terminals operates and what offtakers expect for the next generation of LNG buildout, from contractual flexibility to price diversification. Complicating matters is that pressure to reduce greenhouse gas (GHG) emissions has reached fever pitch, and LNG offtakers are increasingly demanding greener solutions, both to comply with government regulations and to appease public concerns. The convergence of these events has brought LNG producers and developers to a crossroads, requiring them to take all of the lessons learned from the past 18 months and before, to forge a new path forward for the future of North American LNG.

Prior to COVID and the subsequent global market crash, U.S. LNG had always operated at or near full capacity when operationally feasible. It seemed that no matter how low international gas prices fell, U.S. LNG production continued to soar. But as it turned out, they simply had not fallen low enough yet — that is, until last year. As prices in Europe and Asia tumbled to new record lows in 2020, U.S. LNG was pushed firmly out of the money, and by last summer, more U.S. cargoes were being canceled than exported. Then, almost as quickly as the market had deteriorated, the market rebounded, getting flipped on its head for a second time in a matter of months. As prices recovered, cancellations eased. However, even as the market was recovering, a series of events — from hurricanes, and maintenance-related outages, to delays through the Panama Canal and the resulting vessel shortages, plus an extremely long, cold winter that depleted Asian LNG reserves and European storage inventories — all sent the global gas market into the worst supply shortage in recent history. As such, prices in recent months have staged the longest and strongest bull run in the Shale Era, if not ever.

Hot weather across the Northern Hemisphere and soaring global demand this summer have led to fierce price competition as offtakers outbid each other for cargoes in an undersupplied market. Europe, in particular, has felt the pain as it struggled to compete with Asia for LNG cargoes even as its other supply sources — domestic production and piped imports — have been below market expectations this summer. As a result, European storage injections were stymied all through the spring and unable to make up the difference over the summer. That means inventories will now likely start the withdrawal season — when the market relies heavily on stocks to meet winter heating demand — at their lowest level in recent history. In other words, the storage shortfall and tight balances will leave the global gas market exposed to weather-related price spikes and continued high prices this winter.

Figure 1 below illustrates the impact of the global market swings on U.S. LNG. The graph shows total U.S. feedgas (blue line, left axis) vs. LNG capacity (orange line, left axis) overlaid with the Japan-Korea Marker (JKM; gray line, right axis) as representative of the global market. (While JKM is not the only global gas pricing index, it is the oldest, most liquid LNG index, and a good representation of the LNG world at large). From the buildout of the first modern-era liquefaction and export unit at Sabine Pass in 2016 and until the COVID lockdowns of 2020 (denoted by the red dashed line), it seemed that no matter how global prices performed, feedgas tracked close to total terminal capacity or even higher when new liquefaction units were being commissioned. If utilization fell much below operating capacity in those years, it was typically only temporary and due largely to short-term pipeline and terminal maintenance events. That consistent demand for U.S. LNG collapsed in the spring and summer of 2020, as low global prices and poor economics for exporting U.S. LNG overshadowed all else and led to widespread cancellations of contracted cargoes, with most U.S. producers being forced to shut-in at least some production. However, as global demand bounced back in fall 2020, prices rebounded, and a strong winter followed, leaving buyers playing catch-up. U.S. feedgas deliveries again reflected high utilization rates, even as new capacity was added. In the spring and summer of 2021, feedgas flows have seen frequent dips below capacity because of pipeline maintenance, which has affected feedgas more than previously as the volume of gas required to feed export facilities has increased and because of

growing pipeline constraints, particularly in Louisiana. Nevertheless, deliveries to the terminal in 2021 have averaged far above last year as well as previous years in each month.

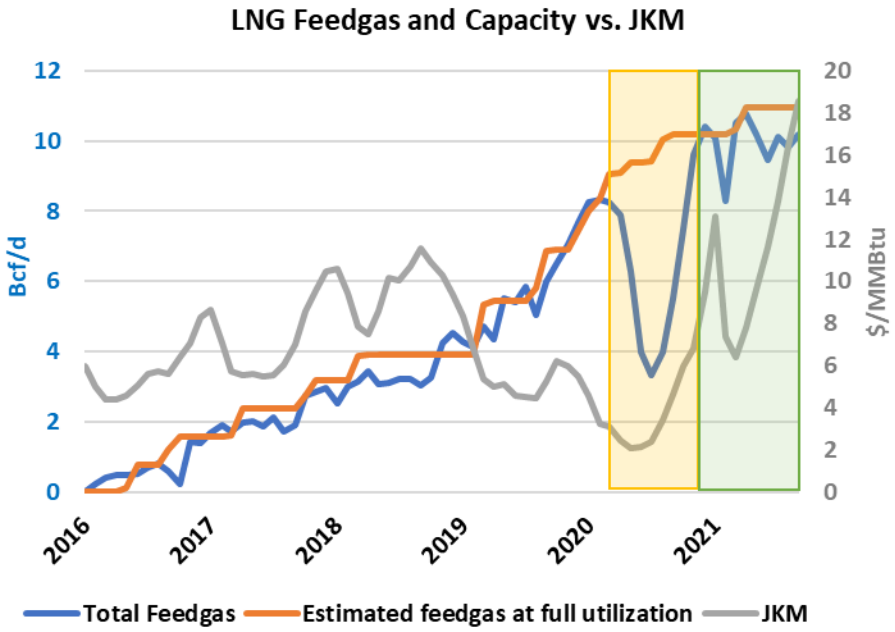


Figure 1. Average Monthly LNG Feedgas, Capacity vs. JKM. Source: **RBN LNG Voyager**

All through this tumultuous time, construction on new LNG terminals progressed with few COVID-related delays. The U.S. now has 15.35 MMtpa (~2 Bcf/d) more export capacity than it had prior to last March when the initial COVID lockdowns began, and that will soon increase by another 15.8 MMtpa (~2.1 Bcf/d) as Sabine Pass Train 6 and Calcasieu Pass are both currently commissioning and due online early next year. By mid-decade, the U.S. will be capable of exporting more than 106 MMtpa (14.1 Bcf/d). Additionally, the first export terminals in Mexico and Canada will be completed for an additional 16.5 MMtpa (2.2 Bcf/d) of export capacity from North America. The two new terminals outside of the U.S., Sempra Energy's Energía Costa Azul (ECA) LNG in Mexico and LNG Canada in Canada, will both export from the Pacific Coast, which is becoming a hub for LNG development thanks to its proximity to the all-important Asian markets, which provides more than a $1/MMBtu transport cost advantage over the Gulf Coast. Of course, the ease of sourcing gas in the U.S. Gulf Coast counterbalances some of that advantage, and at this point, more LNG development in both areas seems likely, albeit with a different scope and pace than was expected in the previous decade (the 2010s) when North America was first entering the global gas market.

Any new LNG development is a welcome change from where the market was last summer, when we were witnessing a slow-motion meltdown among the second wave of North American LNG export projects. Appetite for new LNG expansions had been waning due to oversupply even before the pandemic affected demand, but COVID brought project developments to a standstill. Offtake agreements expired and final investment decisions (FIDs) were delayed. Projects lost funding and were officially put on hold or even canceled. ECA LNG was the only project to reach FID last year. With the pandemic still raging, for a while it looked as if that would be the last project in North America to reach FID for the foreseeable future. Delays, pauses, reevaluations and cancellations (unofficial or otherwise) are still happening, and the majority of the proposed North American LNG projects will never be built. However, the worsening supply shortage and prolonged high global gas prices have brought offtakers back to the negotiation table, renewing

interest in offtake agreements and new LNG buildout. Support is coalescing around a handful of North American LNG projects that may take FID in the next year or so.

That said, offtakers and developers have learned a number of lessons from recent events, and the contracts underpinning these projects look very different from those that supported the first wave of North American LNG developments. The new deals signed in support of the next generation of LNG expansions share the market risks and rewards between LNG buyers and sellers and offer LNG indexed to a variety of different global prices, as opposed to strictly Henry Hub, as was the standard for the first-wave projects. The latest deals often also offer shorter terms in order to appeal to offtakers who are working to balance the need for reliability today with long-term uncertainty, particularly as environmental regulations tighten worldwide. In this Drill Down Report, we take a look at the latest trends affecting North American LNG development and its role in the global gas market as current supply shortages intersect with long-term demand uncertainty. We examine how we got here, what it means for LNG now and most importantly, what the future of North American LNG looks like.

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