

Tolling model a new option for LNG plant ownership

Traditionally, going back to the start of liquefied natural gas exports in the 1960s, LNG plants have been owned and operated by the same companies that owned the gas resources, be they multinational petroleum companies or state-owned national oil and gas producers.

But sometimes economic necessity pushes aside tradition.

U.S. LNG export projects plan to go with a different model, in which the plant owner is not necessarily a gas producer. Driving the change are companies seeking to turn their dormant LNG import terminals into busy export operations.

The new model is called "tolling." That is, customers will pay a toll to run gas through the liquefaction plant.

The LNG plant owner collects the same toll regardless of how much the customer paid for the gas, how much it is worth to the customer on delivery overseas, and how much the customer makes or loses on each cargo.

The plant owner is merely interested in providing liquefaction services and collecting the toll. The customers make the decisions about where to send their cargoes and also fully assume the risk of volatile natural gas prices.

Those are big changes from the traditional model where the LNG plant owners and gas owners are the same, and where cargoes are locked in to their destination country for years at a time. A tolling plant offers a lot of advantages for all parties, explained several speakers at Platts 12th Annual Liquefied Natural Gas conference Feb. 12-13 in Houston.

The long-term global LNG market is changing

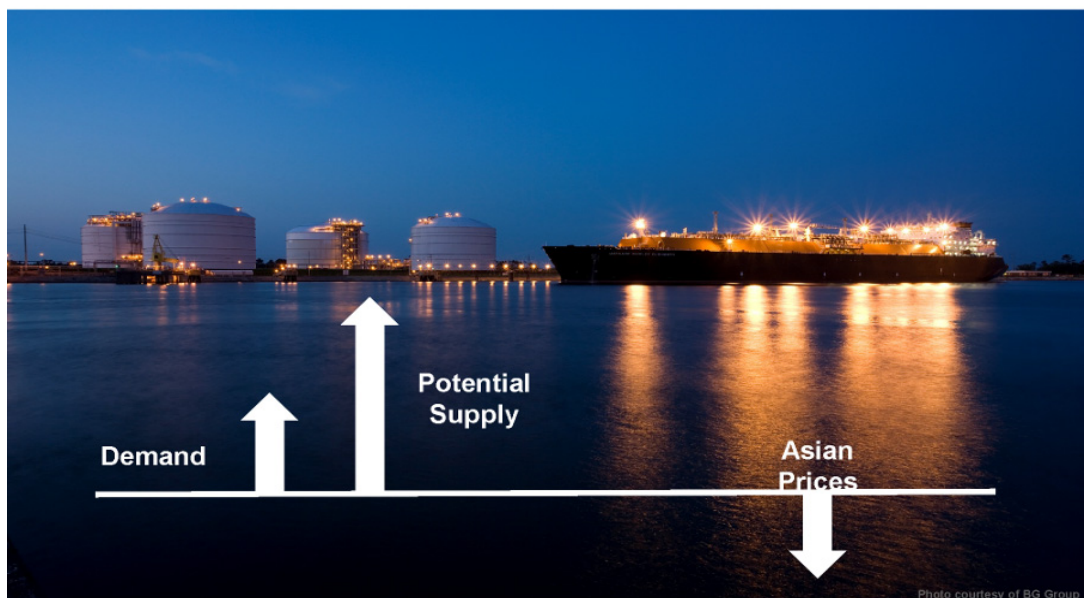


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LNG Financing Challenges



"My plan is to build a sandcastle here, but right now I'm working on the **financing**."

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Source: Fulbright & Jaworski LLP

LNG project financing challenges include regulatory, political, technological, construction, resource, commerce and litigation risks, said Mark Tibberts of the law firm Fulbright & Jaworski.

"They get paid" regardless of the price or profit on gas sales, an international energy consultant said of the plant operators.

Buying gas for liquefaction and signing pipeline commitments to deliver that gas to the LNG plant, well, the plant customers could have to line up those deals, said Gauthier van Marcke, senior director at Houston-based Galway Group.

Plant customers would also benefit from the tolling model. When U.S. natural gas prices are too high to make the LNG cargoes affordable overseas, the customers can opt to get their gas elsewhere, said Keith Barnett, senior vice president at Asset Risk Management, a Houston-based firm that advises international producers on hedging trades.

In those cases, the customer would pay the LNG plant owners a fee for the contracted liquefaction

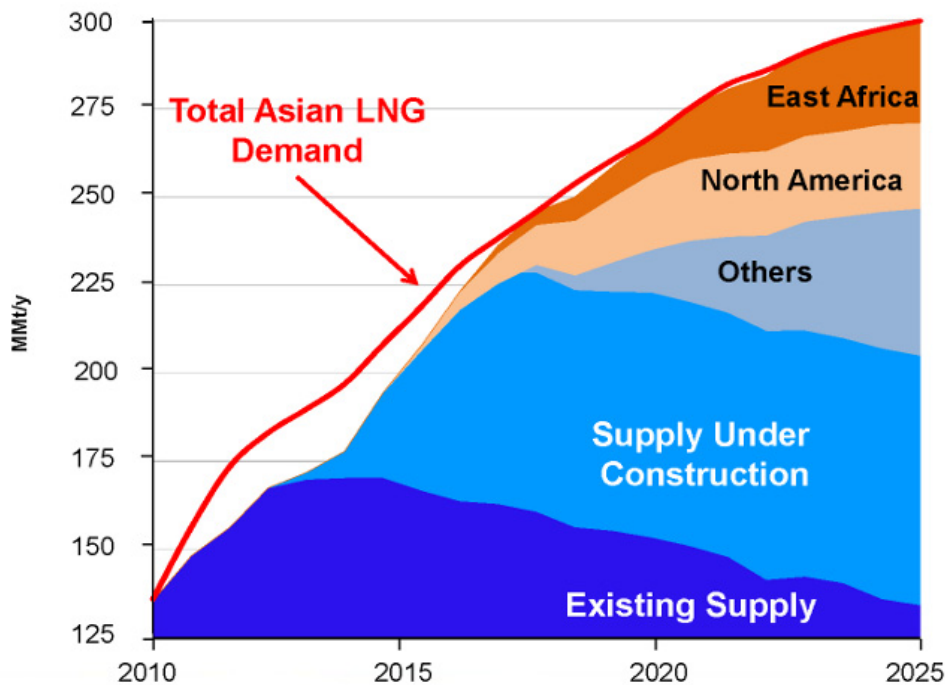
capacity it did not use, but would not have to buy and take ownership of gas. It's like a stock option in a way: If the buyer bets wrong on price, the loss is no bigger than the fee to use the LNG plant. No sense losing more money by actually buying expensive gas.

As long as the plant owners get their toll, which covers the mortgage, upkeep and some profit, what do they care if customers do or don't park their tankers at the dock? Long-term contracts would guarantee the toll revenue — essential to financing the multibillion-dollar developments.

TOLLING MODEL UNIQUE TO U.S.

The new model does have its drawbacks. A biggie is that plant owners don't share the upside when gas prices are high. But that's a trade-off for not having

North America and East Africa expected to capture the majority of incremental Asian demand



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to absorb any downside risk when prices are low.

Tolling can work in the United States because the nation's natural gas market is huge and liquid. There are always producers willing to sell gas, and always buyers ready to take gas someone else doesn't want. The gas wouldn't get stranded if no one wants to pay to liquefy it for tanker delivery overseas.

In effect, the United States becomes a huge storage facility for the global gas market, sending out cargoes when they are needed, said H. Davis Thames, president of Cheniere Marketing, whose parent company is building the first LNG export terminal in the Lower 48 states.

The U.S. plants would be the only tolling models in the world.

Besides separating the cost of gas from the cost of liquefaction, the tolling model's flexibility for where the LNG gets delivered also is a big change from

tradition, said Richard Pratt, vice president of Fearnley LNG where he advises on global LNG trade. "This is a model that is so, so important." It allows liquefaction plant customers to move their cargoes wherever in the world they can get the best price. Not flexibility for 10 percent or 20 percent of their cargoes, as in some older contracts with producer-owned LNG plants. But 100 percent destination flexibility.

"The U.S. projects represent one of the very best sources for portfolio players in the future," Pratt said, referring to gas marketers and customers that assemble gas supply portfolios from a variety of supply sources at a variety of prices. U.S. exports, he said, are an "important development in LNG commerce."

In addition to Cheniere Energy's export terminal under construction at Sabine Pass, La., LNG projects proposed for Cove Point, Md.; Savannah, Ga.;

Corpus Christi, Texas; Hackberry, La.; Lake Charles, La.; and elsewhere on the U.S. Gulf Coast are likely to adopt the tolling model. The most recent contracts with Cheniere will cost plant customers \$3 per million Btu to reserve liquefaction capacity, plus the cost of gas consumed in plant operations if they take delivery of any LNG.

Though all of the proposed U.S. LNG export terminals have applied for federal approval as tolling operations, the couple with gas producers among the partners certainly could find some of their capacity committed under the traditional integrated model that bundles the gas and liquefaction into a single price.

IT'S DIFFERENT IN CANADA

The balance is different in Canada, where gas producers would develop most of the export projects proposed for British Columbia's Pacific Coast. They want to build a liquefaction plant to provide an outlet for their own gas fields.

"This is a conventional project," said Janine McArdle, senior vice president for global gas monetization with Apache Corp., a 50-50 partner with Chevron in an LNG plant proposed for Kitimat, B.C. "We're looking for a marriage," a long-term sales contract for gas and liquefaction services, she said.

Apache and Chevron, and the other producers looking at export terminals to move their gas from Alberta and British Columbia, need long-term sales contracts not just to underwrite the billions of dollars in investment to build the LNG plants, but also to justify the billions more needed to develop the remote gas fields and pipelines to move gas to the coast.

McArdle acknowledged that Canadian developers will need a different pricing structure from the U.S. projects for their LNG to attract investors. Many U.S. projects will cost less because they simply need to add liquefaction capability to an existing — and unused — LNG import terminal already connected

Proposed Canadian LNG projects

Projects	Participants	Status
Kitimat LNG (BC)	Apache Corp. - 50% Chevron Canada Ltd. - 50%	<ul style="list-style-type: none"> • Scope: 5 million tonnes / year (\$4.7 billion Cdn). • Status: Front-end engineering and design is underway. • Export License: Issued October 2011. • Estimated in-service date: 2016
BC LNG (Douglas Channel Energy)	LNG Partners / LLC - 50% Haisla Nation - 50%	<ul style="list-style-type: none"> • Scope: 0.7 million tonnes / year (cost estimate not available) • Status: Customer contract negotiations underway. • Export License: Issued February 2012. • Estimated in-service date: 2018.
LNG Canada (BC)	Shell Canada Ltd. - 40% Mitsubishi Corp. - 20% Korea Gas Corp. - 20% Phoenix Energy (PetroChina) - 20%	<ul style="list-style-type: none"> • Scope: 12 million tonnes / year (\$12 billion Cdn) • Status: Feasibility study underway. • Export License: Issued February 2013. • Estimated in-service date: 2020.
Pacific Northwest LNG (BC)	Petronas / Progress Energy - 100%	<ul style="list-style-type: none"> • Scope: 7.6 million tonnes / year (\$9 billion - \$11 billion Cdn) • Status: Pre-front-end engineering and design is underway. • Estimated in-service date: 2018
Pieridae Energy Canada (Nova Scotia)	Goldboro LNG - 100%	<ul style="list-style-type: none"> • Scope: 7.6 million tonnes / year (\$9 billion - \$11 billion Cdn) • Status: Pre-front-end engineering and design is underway. • Estimated in-service date: 2018
Nexen / Inpex (BC)	Nexen Inc. (CNOOC) - 60% Inpex Corp. - 40%	<ul style="list-style-type: none"> • Feasibility study is currently underway to determine project scope and cost.
British Gas (BC)	British Gas Services Ltd. - 100%	<ul style="list-style-type: none"> • Feasibility study is currently underway to determine project scope and cost.
Imperial Oil / ExxonMobil (BC)	Imperial Oil Ltd. - 100%	<ul style="list-style-type: none"> • Currently evaluating LNG project potential.
Kitsault LNG (BC)	Krishnan Suthanthiran - 100%	<ul style="list-style-type: none"> • Land owner is currently seeking partners to develop LNG facility.

Source: Norton Rose Canada

by pipeline to producing fields.

The Apache-Chevron project has its export and environmental approvals, the site cleared and road building under way, McArdle said. First Nations are logging along the right of way for the 42-inch-diameter pipeline, which would run almost 300 miles to Kitimat.

What the project lacks are publicly announced, signed customers for the gas and a final investment decision by the owners.

GLOBAL LNG PRICING AN UNKNOWN

LNG pricing was a big topic among conference speakers and audience questions. Will Asian buyers break the decades-old pricing model that links LNG to oil on a somewhat Btu-equivalent basis? Will buyers enjoy years of lower LNG prices with contracts indexed to lower U.S. prices? Will project developers that need to raise billions of dollars be willing to bet their bottom lines on a new pricing

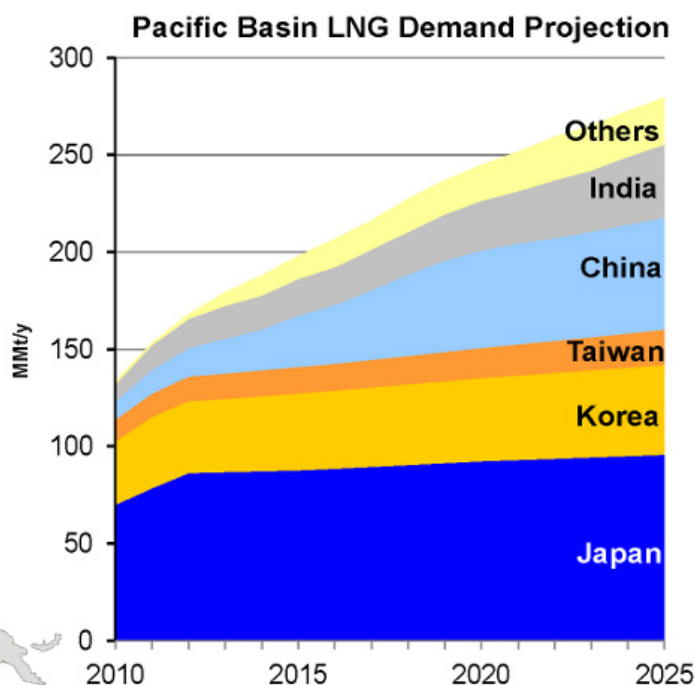
model?

There is "near universal opposition" to oil-linked pricing among Asian buyers, said Cheniere's Thames, adding that he sees an emerging blended-pricing structure between oil and U.S. natural gas prices.

Oil-linked pricing for LNG has been especially painful for Asian buyers the past two years, as increased demand after Japan shut down its nuclear power plants coincided with a time of high global oil prices. Japan in 2011 ran its first trade deficit in 31 years, thanks in large part to paying high prices for high volumes of imported LNG.

"The current post-tsunami market is a distortion," said Fernley's Pratt. The price difference between LNG in Asia and natural gas in North America and Europe will decrease as new LNG supplies arrive on the market. He said he is advising his Asia clients to add U.S. gas pricing to their contracts, concurring with those speakers who said the future will be a blend of price indexes.

Asia will continue to drive global demand growth



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Shasha Fesharaki, chief operating officer of FACTS Global Energy, is skeptical of an entirely new world order for LNG pricing. U.S. gas exports would have only a marginal effect on global gas prices, he said. The attraction of U.S. exports is more about portfolio diversification for buyers and destination flexibility so that they can move their cargoes at will for their own economic benefit, he said.

Besides, U.S. gas prices look good as a pricing link for LNG only when oil is high and U.S. natural gas is low, Fesharaki noted. If oil is \$70 or \$80 a barrel, an oil-linked LNG price is cheaper than buying gas at U.S. prices and then adding as much as \$6.50 per million Btu to liquefy it and ship it to Asia. At the

other end, when oil is above \$110 a barrel — as it is today — LNG based on U.S. gas prices is cheaper, he said.

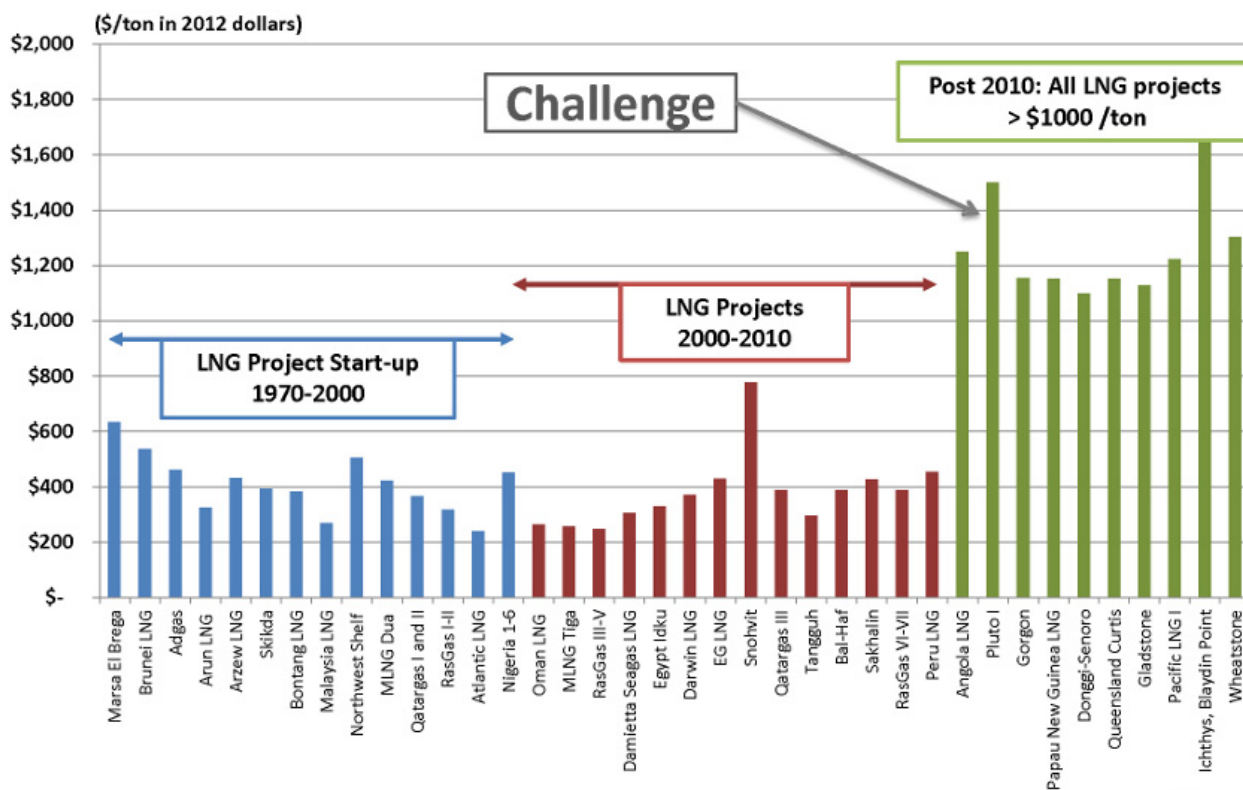
And, he said, who can guarantee that U.S. natural gas will always sell at today's low cost?

Fesharaki sees a hybrid price for 2020 and beyond, taking into account oil and U.S. gas prices, after new LNG supplies help settle down the market, but he does not believe U.S. exports will totally break the historic link to oil prices. High development costs for liquefaction projects require a commensurate price for the LNG.

As long as he was predicting future possibilities,

KITIMAT LNG - CHALLENGE

CAPEX \$/ton of LNG CAPACITY



Source: Apache from Public Data

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Source: Apache Corp.

Apache's Janine McArdle said the LNG export plants started since 2010 are averaging capital costs of more than \$1,000 per ton of annual capacity, with the costliest project exceeding \$1,600 per ton. At \$1,600 a ton, a 2-bcf-a-day plant would cost \$24 billion.

Fesharaki said, FACTS believes global oil prices will fall to the \$80- to \$100-a-barrel range as new supplies come on stream, while U.S. natural gas prices will rise to the \$4- to \$6-per-million-Btu range for the 2020s and 2030s.

NO SHORTAGE OF NEW LNG SUPPLIERS

The big factor in future LNG pricing will be the economic law of supply and demand, said Daryl Houghton, manager for LNG Consulting Americas at Poten & Partners, a global energy broker and commercial adviser. He listed potential new supplies coming online in the 2020s in North America, East Africa, the Eastern Mediterranean, Russia and Australia — all chasing after demand growth in China, India and Japan.

"I don't believe there is any shortage of LNG projects this side of 2050," he said. "The only conclusion that you can reasonably reach ... is a downbeat on prices," Houghton said. Current high prices for spot LNG cargoes are due, in part, to delays in bringing new production online in Angola and Algeria, and service disruptions in Yemen and Oman.

The United States leads the world with proposed LNG export projects, totaling almost 25 bcf a day. "There is a whole bunch of wannabes in the U.S.," said Bill Gwozd, vice president at Ziff Energy Group in Calgary.

"It shows you the frenzy as far as exports are concerned," added Fesharaki of FACTS Global Energy.

"Ultimately, the markets will decide which projects will go to fruition," said van Marcke of the Galway Group. The winners, he said, will be those that sign up customers and financing.

U.S. FACES COMPETITION

Several conference speakers addressed the competition between U.S. and Canadian LNG export proposals to sell into the same Asian market.

"North America will become one of the key production regions of LNG in the next decade or so," Houghton said.

While the LNG export debate is loud in the United States, that's not the case in Canada. "There is no debate in Canada whether we should be exporting LNG," said Nick Kangles, senior partner at the law firm Norton Rose Canada.

Canada's National Energy Board already has approved three West Coast B.C. export proposals, all without a hearing, Kangles said. The only issue in Canada, he explained, is whether the gas is surplus to domestic needs. "The regulatory process in Canada at this point has more certainty than in the United States."

The U.S. Department of Energy has 16 export applications on hold while it considers public comments on a report that looked at how LNG exports could affect the overall U.S. economy. The department has not said when it expects to start making decisions on the applications, all of which are requesting permission that would allow sales into the lucrative Asia market.

Fearnley LNG's Pratt said U.S. projects face several hurdles, separate from export approval: No particular tax breaks from the federal government; a long sea voyage from U.S. Gulf Coast terminals to Asia; probably high tolls to move those tankers through the expanded Panama Canal; higher labor costs than many other gas-producing nations; and a lack of a supportive environment in some communities.

"You must be kidding," is how he described local support for liquefaction plants and shipping terminals in some communities.

Don't underestimate the need for a predictable and stable tax structure, said Mark Partridge, co-head of projects and structured finance at Gazprombank. "The tax regime for a project can mean life or death."

And no export conference would be complete without a project update on Cheniere's LNG terminal on the Louisiana coast—the only terminal

under construction in North America.

Cheniere's Thames reported construction work was 16 percent complete — 2,200 piles have been driven in the soft soil to support the liquefaction

plant and other structures. The first production train is scheduled to start service in 2015, followed by three more trains through 2017, totaling more than 2 bcf a day capacity.

So how do U.S. projects measure up?



Not very well

Factor	Score	Comment
Fiscal regime	0/5	No special deals available for LNG. Non-FTA ruling hampers decision making: unique to US
Cheap Gas	1/5	Gas price determined by US market and is volatile. No condensates for the project.
Geographic Location	1/5	Far from major markets in Asia. Panama Canal will add to logistics costs for buyers
Cheap Labor	1/5	These are not Thai built modules. US labor will not be cheap.
Strong technical sponsor	1/5	Nearly all import project companies with little LNG hands on experience
Supportive Environment	0/5	You must be kidding!
Local community benefits	?	These are usually addressed at permitting stage, not always successfully.

Source: Fearnley LNG

Richard Pratt of Fearnley LNG talked about how proposed U.S. LNG projects compare to other developments worldwide.



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