

LNG buyers love everyone

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It's not like it was

- ❑ LNG markets were boring, driven by security of supply and certainty of revenue
- ❑ Long-term contracts linked to oil prices were the norm for decades
- ❑ Then, after 40 years of stability, everything changed in a few years
- ❑ \$120 oil quadrupled LNG prices under some of the long-term contracts
- ❑ Japan's 2011 nuclear disaster shut down power plants and spiked LNG demand
- ❑ More \$250 billion in LNG projects just this decade in Australia, Angola, Peru, Papua New Guinea and Russia brought new supplies to the global market
- ❑ U.S. shale boom will supply cheap gas for six liquefaction plants, and more coming

This is what it is

- ❑ An oversupplied market — but for how long? Pick a number, any number
- ❑ Outside of U.S. Gulf Coast, few new projects are under construction
- ❑ Looking ahead, much of the demand growth is price sensitive — but how much?
- ❑ Buyers are demanding better deals, lower prices, renegotiations
- ❑ Pakistan and India have renegotiated lower prices with Qatar, ExxonMobil
- ❑ More short-term contracts and fewer long-term deals as buyers play the market
- ❑ Several U.S. LNG customers are looking to swap or resell their contracted cargoes

Buyers go more short-term

➤ "If the market's liquidity has improved to the point where it's possible to buy or sell LNG any time, it would become less necessary to rely on long-term [deals]."

— *Sunao Okamoto, LNG Trading General Manager, Osaka Gas*

➤ "Actions based on predictions rarely work out. That is how it works in the world."

— *JERA Co. Chief Fuel Transactions Officer Hiroki Sato*

JERA, a Tokyo Electric and Chubu Electric joint-venture, plans to cut the amount of LNG it buys under long-term contracts by almost half by 2030

This is what it could be

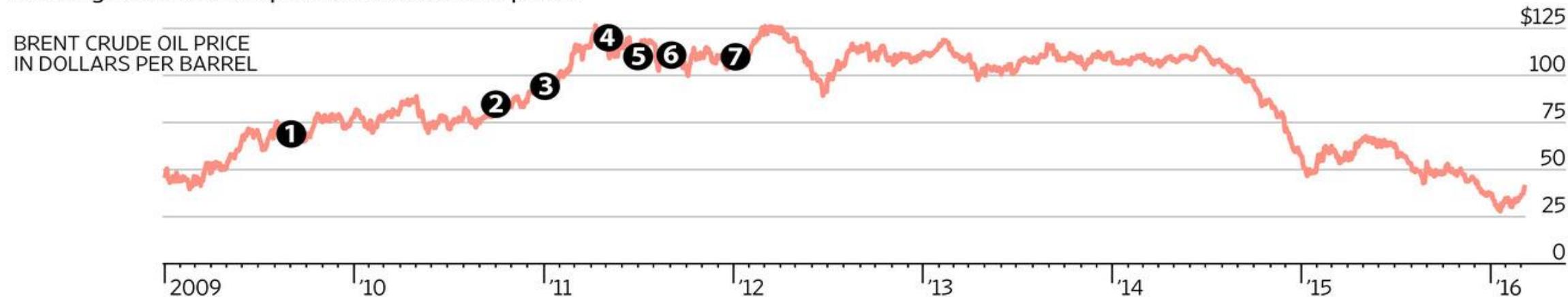
- ❑ Growing demand outpaces new supply online in the 2020s and world is short LNG
- ❑ China, India and Europe continue to turn away from coal-fired power plants
- ❑ Global economy continues to grow; emerging economies need more electricity
- ❑ Japan and South Korea see nuclear power in the past, not the future
- ❑ The U.S. and China learn to like each other even if they don't trust each other
- ❑ China does not fall in love with Russian gas any more than necessary
- ❑ And there is no major LNG plant or tanker accident anywhere in the world

Or this is what it could be

- ❑ Global economy slows down for any number of potential geopolitical reasons
- ❑ China, India, Pakistan and other countries find their governments cannot afford LNG imports, and their residents, businesses and industries miss cheap coal
- ❑ Nuclear power claws back market share and renewable energy gains in favor
- ❑ President Trump could embark on a damaging trade war with China
- ❑ Political pressure in Washington could deny Chinese investment in U.S. projects
- ❑ Russian gas is too cheap for China to pass up, even if they don't trust each other
- ❑ And, simply, many other projects can supply LNG at a lower cost than Alaska

Tough Timing

Massive liquefied natural gas projects in Australia were approved when oil prices were on the rise. They have begun shipping the chilled natural gas amid a slump in benchmark crude prices.



Project and budget estimate	1 Gorgon	2 Queensland Curtis LNG	3 Gladstone LNG	4 Prelude*	5 Australia Pacific	6 Wheatstone	7 Ichthys
	\$54 Billion	\$20.4B	\$18.5B		\$18.4B [†]	\$29B	\$37.4B
Investment decision	Sept. 1, 2009	Oct. 1, 2010	Jan. 3, 2011	May 2, 2011	July 1, 2011	Sept. 1, 2011	Jan. 3, 2012
LNG Capacity (metric tons a year)	15.6 Million	8.5M	7.8M	3.6M	9.0M	8.9M	8.9M
Project operator	Chevron	BG Group	Santos**	Royal Dutch Shell	Origin Energy	Chevron	Inpex
Production start date	March 2016	December 2014	September 2015		December 2015	2017 ^{††}	2017 ^{††}

*Budget estimate and production start not disclosed, Bernstein estimates the cost at US\$16 billion, with a 2017 start-up hubs while the JV operate the LNG plant †Converted from Australian dollars at current rate ††Scheduled

**Santos operates the upstream activities, wells and compression

Sources: Thomson Reuters (oil prices); the companies

Competition not standing still

- ❑ Australia will overtake Qatar as world's largest LNG producer next year, but Qatar has decided to embark on a 30% expansion of gas production capacity
- ❑ To cut costs, Qatar merged its two LNG producers to save \$500 million a year
- ❑ Cameroon LNG start-up February; Gazprom is taking all 2.4 million tonnes a year
- ❑ Shell and Japanese partner INPEX in pre-FEED for Indonesian LNG project; 9.5 million tonnes per year and 24,000 barrels a day; possible 2027 start-up
- ❑ ExxonMobil has boosted its investment in Mozambique LNG developments
- ❑ Russia has offered to help Iran with its 1,200 tcf move into the gas export business

Just what is this ‘tolling model’

- ❑ Pretty much unique to U.S.; pioneered by Cheniere Energy at Sabine Pass, La.
- ❑ The company had an underused LNG import terminal and was in danger of default
- ❑ Low-cost option to add liquefaction units to go with existing storage tanks and dock
- ❑ All but one of the U.S. export terminals under construction are similar additions
- ❑ Terminal customers pay a fixed charge per million Btu to reserve capacity at the liquefaction plant, and must pay the charge even if they don't take any gas
- ❑ Terminal owner is guaranteed a revenue stream, regardless of market conditions
- ❑ Lenders love it; the commodity demand and price risk transfers to the customer

China's LNG investments in Canada

- ❑ China National Offshore Oil Corp. (CNOOC) and Japanese partner in September canceled \$28 billion LNG project near Prince Rupert, after four years of study
- ❑ CNOOC in 2013 paid \$15 billion to buy Canadian gas producer to feed LNG plant and still walked away from the project after deciding it was less risky to sell its gas even at low prices into the larger North American market
- ❑ China's Sinopec was a partner in the Pacific NorthWest LNG project, also at Prince Rupert, which was canceled in July after years of design and permitting
- ❑ Moral of the story: China wants and needs more LNG, but not at any price
- ❑ China grew into global economic power paying WalMart, not Nordstrom prices

China is shopping for gas worldwide

- ❑ Chinese companies in November signed MOUs with 2 U.S. Gulf Coast LNG projects
- ❑ Anadarko Petroleum is talking with China about signing up as a buyer for the company's \$15 billion to \$20 billion LNG project in Mozambique
- ❑ China also has invested in Italy's Eni LNG project in Mozambique
- ❑ China National Petroleum Corp. (CNPC) a partner in Yamal LNG in Russia's Arctic
- ❑ CNPC and China Development Bank have signed preliminary agreement with Russian gas producer Novatek for second LNG plant planned just east of Yamal
- ❑ Russia's Power of Siberia gas line to China under construction, with 2019 start-up

China a big player in Africa

- ❑ China plans more than \$8 billion in financing for smaller-scale floating LNG projects in Cameroon, Mozambique, Equatorial Guinea and Congo Republic
- ❑ But plans and agreements and talks are not always the same as writing the check
- ❑ London-based Ophir Energy has postponed final investment decision on \$2 billion Equatorial Guinea project to 2018 to look for alternatives to Chinese financing
- ❑ Ophir blamed “persistent hold-ups on Chinese bank loans” for postponement
- ❑ The Fortuna project would make 2.2 million tonnes of LNG per year
- ❑ Global commodity trader Gunvor signed up for 100% of output for 10 years shipping company Golar, oil field services company Schlumberger are partners

The price matters

- ❑ During period of high global LNG prices, China National Petroleum Corp. (parent company of PetroChina) lost \$1.68 billion on imports in first half 2015
- ❑ Despite falling spot-market prices and low oil-linked prices, PetroChina in the first nine months of 2017 lost \$2.6 billion on imported LNG and pipeline gas
- ❑ China has pipeline gas options: Russia, Turkmenistan, Uzbekistan and Myanmar
- ❑ And China has its own shale gas: U.S. Energy Information Administration in 2013 estimated China's unproved, technically recoverable reserves at 1,115 tcf; but China lacks technology and service industries, and much of its shale gas is in arid regions and hydraulic fracturing shale wells requires a lot of water
- ❑ Government could decide better to subsidize domestic shale gas than import gas

Update on Alaska LNG project

- ❑ State continues working to answer questions from federal regulators
- ❑ Alaska Gasline Development Corp. plans to submit last answers by Feb. 1.
- ❑ FERC will issue a timeline for the environmental impact statement only after it determines it has all the data it needs to promise a schedule it can keep
- ❑ State wants expedited review and final decision by December 2018
- ❑ While answering questions, waiting for FERC, looking for potential customers and partners, AGDC continues to refine the project as it looks to reduce costs
- ❑ Such as, extend Kenai water line to the LNG plant instead of drilling wells in Nikiski

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[China in talks with Anadarko to buy output from Mozambique LNG](#)

(Bloomberg; Jan. 9) - Anadarko is in talks to feed China's growing appetite for liquefied natural gas from its planned development in Mozambique. The Texas-based company is in discussions with "a variety of Chinese counterparts including national oil companies and emerging independent LNG buyers," Anadarko said. Growing demand makes China "a long-term strategic market for the Anadarko-led Mozambique LNG project," the company said. The project is estimated at \$15 billion to \$20 billion for 12 million tonnes annual output capacity.