

ENERGY VENTURES ANALYSIS

QUARTERLY LNG OUTLOOK



Q4 2017

LIQUEFIED NATURAL GAS

GLOBAL LNG TRENDS & HIGHLIGHTS:

Status of the global market

❖ As of December 2017, there is 351 MMTPA of global LNG export capacity online. Having added 27.8 MMTPA so far in 2017, a massive amount of new capacity (84 MMTPA) remains under construction—the bulk of which is in the U.S. and Australia and is scheduled to start in 2018-2019.

What glut? Spot prices surge as market tightens dramatically

❖ Having hovered south of \$6/MMBTU through the summer, LNG spot prices have surged in early-winter. While upward price movement was expected heading into peak demand period, **prices are approaching \$10/MMBTU**—exceeding peak prices from last year and highlighting a surprisingly tight market.

Chinese demand soaring with winter only just beginning

❖ The tightening global market—largely unexpected due to the tremendous amount of new capacity coming online—has been primarily driven by soaring demand in **CHINA**. With widespread efforts underway to convert residential heating from coal to gas, the market is expanding at a remarkably rapid rate.

❖ China is likely to overtake **SOUTH KOREA** this year as the world's second largest LNG importer.

Russia's Yamal comes in from the cold

❖ In early December, Novatek, TOTAL and other project partners brought online the first 5.5 MMTPA train at **YAMAL LNG**. The successful and on-time completion of Train 1 is a remarkable achievement given the harsh operating environment in the Russian arctic. Novatek claims the two remaining trains—totaling 11 MMTPA—will come online in mid-2018 and early-2019, several months ahead of the originally announced schedule.

First LNG for Christmas? Cove Point completion imminent

❖ Globally, the next LNG project to come online will be the 5.3 MMTPA **COVE POINT** in Maryland on the U.S. East Coast. The project has full approval to commence liquefaction and first LNG appears imminent—likely either in late-December or early-January. Shell will take the first batch of commissioning cargoes.

Cheniere pushes Sabine Pass operations to peak production

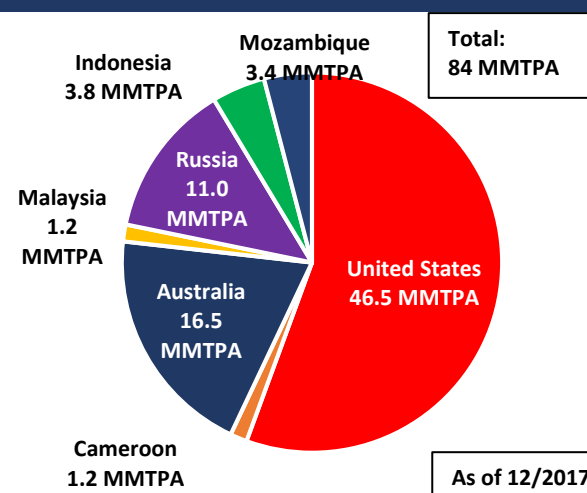
❖ Having successfully brought all four trains online at its 18 MMTPA **SABINE PASS**, Cheniere has routinely operated the project at near peak capacity through Q4 as offtakers (including Cheniere itself) seek to take advantage of rising global prices.

The art of LNG diplomacy: The President goes to China

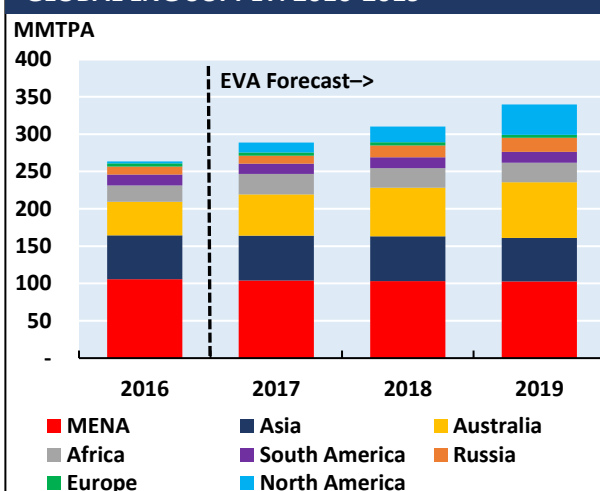
❖ President Trump visited China in early-November, with LNG being one of the key focal points. The trip resulted in a flurry of agreements (all non-binding) between Chinese buyers and U.S. LNG developers, including Cheniere, Delfin & Alaska LNG.

*Throughout the report, volumes are listed in Million Metric Tonnes Per Annum (MMTPA), the most commonly used unit for global LNG trade. MMTPA / 7.5 = BCFD.

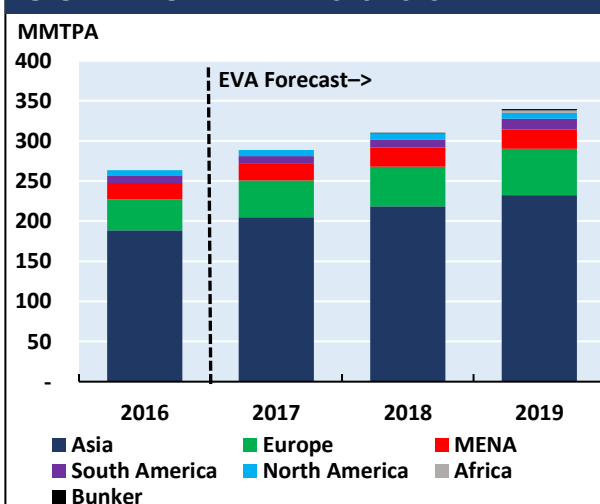
UNDER CONSTRUCTION LNG CAPACITY



GLOBAL LNG SUPPLY: 2016-2019



GLOBAL LNG DEMAND: 2016-2019



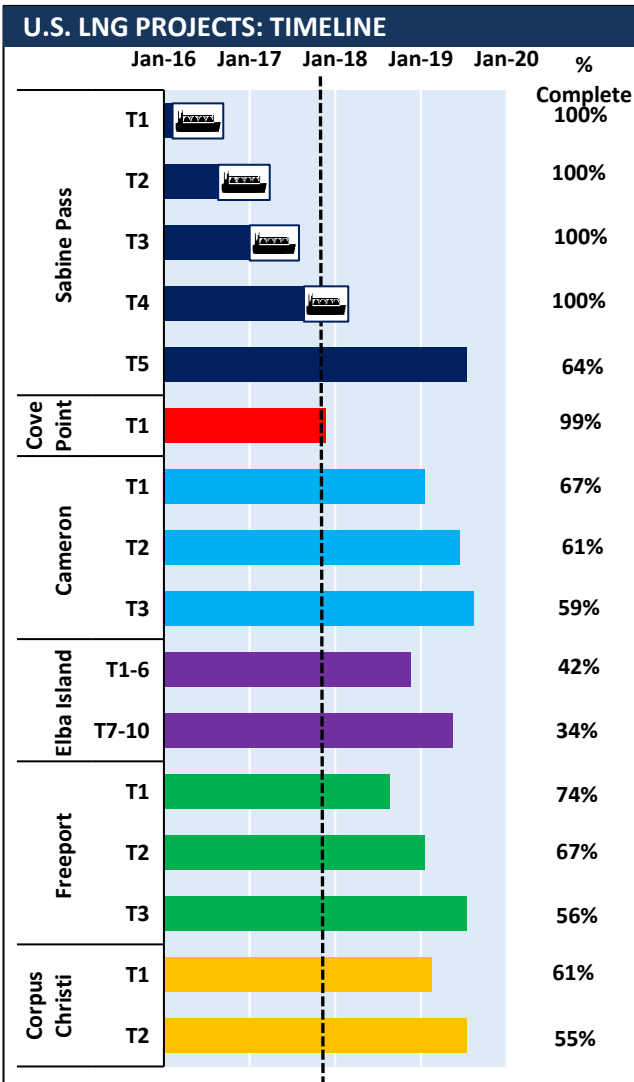
Sources: EVA, DOE, Bloomberg, IGU, GIIGNL



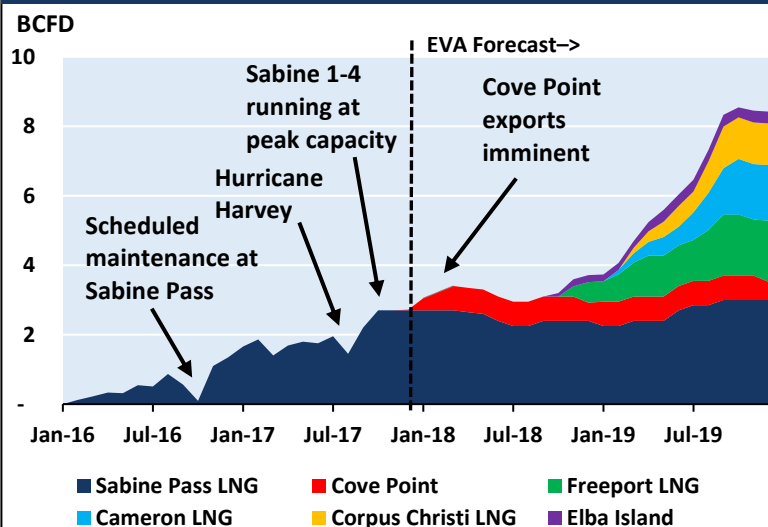
U.S. LNG: EXISTING & UNDER CONSTRUCTION PROJECTS

RECENT DEVELOPMENTS

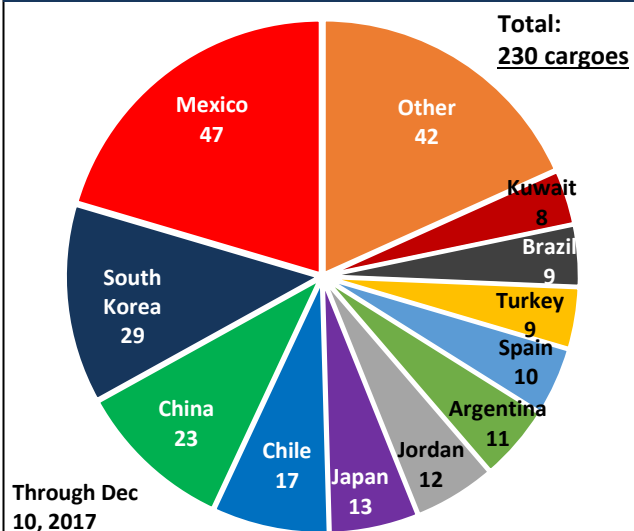
- ❖ A total of **18 MMTPA** of LNG export capacity is now online in the U.S. L-48. An additional **46.5 MMTPA** is under construction.
- ❖ EVA projects exports for 2017 will total **13.4 MMT**, making the U.S. the world's 6th largest exporter (up from 17th largest in 2016).
- ❖ All existing capacity is limited to Cheniere's **Sabine Pass** project on the Gulf Coast, where four trains are online and have been operating near full capacity since mid-Sept (i.e., post-Harvey).
- ❖ In total, more than 230 cargoes have been exported from Sabine Pass, including 58 in 2016 and 172 so far in 2017. Assuming no mechanical issues, the project can be expected to export ~22 cargoes/month.
- ❖ By a considerable margin, **Mexico** remains the largest importer of U.S. LNG, taking in 47 cargoes total, including 39 in 2017 alone. Imports are driven by surging power demand and declining domestic production, as well as some delays and obstacles in the construction of inter-regional domestic gas pipelines.
- ❖ Summer cargoes were split between **Asia** and **Mexico**, with relatively few going to **Europe**, a trend that continued heading into winter. **South Korea** has emerged as the second largest recipient of U.S. LNG, largely as a result of the KOGAS Sabine Pass contract going into effect in June. The GAIL contract begins in March, which will likely direct more cargoes to **India**.
- ❖ Beyond Sabine Pass, **Cove Point** will be the next U.S. project to come online. The 5.3 MMTPA project, located in Maryland and operated by Dominion, has been approved to begin commissioning and is scheduled for first LNG in late-December or early-January.
- ❖ Construction on most other U.S. projects has largely remained on schedule, with most projects targeting 2019, when exports will jump from 3.7 BCFD to 8.6 BCFD. Only a few trains are expected online in 2018, including the first phase of **Elba Island** and perhaps the first train at **Freeport LNG**.



U.S. LNG EXPORTS BY PROJECT: 2016-2019



U.S. LNG EXPORTS BY DESTINATION (# cargoes)





U.S. LNG: PRE-FID PROJECTS

KEY TRENDS & HIGHLIGHTS

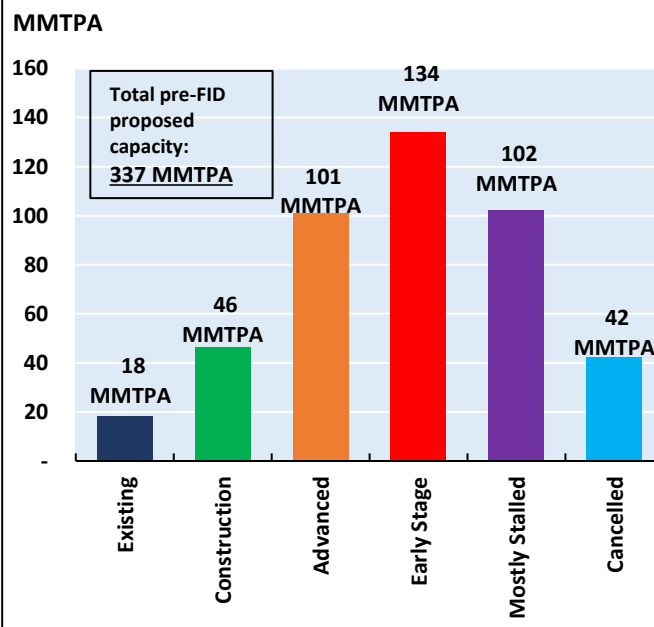
- ❖ Several second wave U.S. LNG projects made clear, if preliminary, commercial steps in late-2017—the first positive signs in at least two years. With global demand exceeding expectations, there's a growing realization that new LNG supply will be needed sooner rather than later, and early signs of interest among LNG buyers are beginning to emerge.
- ❖ Venture Global LNG, the developer of **Calcasieu Pass LNG**, signed a SPA with Edison for 1 MMTPA for 20 years, beginning upon the completion of the project (scheduled for 2021).
- ❖ Several other deals were announced during President Trump's visit to China in early-November. These include:
 - ❖ **Delfin FLNG** signed a non-binding MOU with China Gas Holdings for 3 MMTPA starting in 2021. The project has additional MOUs with BTG Pactual and Litgas, though those were signed a few years ago and may have lapsed.
 - ❖ Cheniere signed a non-binding MOU with CNPC for LNG offtake from either **Sabine Pass T6** or **Corpus Christi T3**. Details regarding volume or duration were not disclosed.
 - ❖ The state of Alaska and Sinopec (China's largest NOC) signed agreements to cooperate on development of the massive **Alaska LNG**. The deal follows a similar agreement with KOGAS signed in June, but the proposed \$43 billion project and associated 800-mile pipeline still faces serious obstacles.

REGULATORY UPDATE

KEY TRENDS & HIGHLIGHTS

- ❖ In December, Ohio congressman Bill Johnson introduced two LNG-related bills for consideration. The first would negate the need for separate approval from DOE following FERC approval. The second would expedite the approval process for small-scale LNG projects. While both bills would likely meet solid bipartisan support, it's unclear whether they will be a priority.
- ❖ Cheniere initiated the process of amending its FERC application for the expansion at its **Corpus Christi** project. Two 4.5 MMTPA trains are already under construction, and a third has full approval, but the expansion capacity will instead employ up to seven small-scale (1.4 MMTPA) modular trains. Like other developers pursuing smaller-capacity trains, Cheniere believes it will allow for easier marketing and streamlined, incremental development.
- ❖ In September, the proposed **Jordan Cove** project submitted a complete FERC application after initiating pre-filing earlier in the year. The Oregon proposal had previously been rejected by FERC, but developer Pembina (formerly Veresen) has elected to re-start the process.
- ❖ Also in September, the DOE announced it would evaluate its permitting process for LNG export projects and move to eliminate any burdensome and unnecessary requirements. It also proposed a rule to streamline small-scale LNG projects.

U.S. LNG CAPACITY BY DEVELOPMENT STAGE



U.S. LNG REGULATORY PROCESS

★	Fully FERC Approved, pre-FID	
	Golden Pass Cameron T4-5	Magnolia LNG Sabine Pass T6 Delfin FLNG*
		Lake Charles Corpus Christi T3
↑	Under Full FERC Review (submitted application)	
	Gulf LNG Texas LNG Annova LNG Alaska LNG	Calcasieu Pass LNG Rio Grande LNG Freeport T4 Plaquemines LNG
		Jordan Cove Port Arthur LNG Driftwood LNG
↑	FERC Pre-Filing (no complete application)	
	Corpus Christi T4-5 Fouchon LNG	Driftwood LNG Commonwealth LNG
↑	Yet to begin FERC process	
	Main Pass Energy Barca LNG Gasfin LNG Gulf Coast Alturas LNG	Eos LNG Monkey Island CE FLNG Gen. American LNG G2 LNG

* As a floating LNG project located offshore, Delfin FLNG required regulatory approval from the U.S. Maritime Administration (MARAD). MARAD approved the project in March, 2017.

GLOBAL LNG PRICES

KEY TRENDS & HIGHLIGHTS

- ❖ **LNG spot prices** fell over the summer, but did not stay as low as long as many expected. NE Asian summer demand surprised to the upside, as did Southern European demand, which kept spot prices only slightly below \$6/MMBTU.
- ❖ Spot prices have surged since October as the market moves rapidly toward peak winter demand. December prices are around \$9.00/MMBTU, with **January prices expected to rise to \$10.50/MMBTU—the highest level in three years** and well above peak prices in 2016.
- ❖ Even at current levels, global prices appear sufficient for U.S. LNG offtakers to sell their cargoes at a profit, even when including full fixed costs (i.e., the tolling fee). For most of the last few years, the differential between global and Henry Hub prices has only worked on a variable netback basis (i.e., ignoring sunk costs).
- ❖ **NW EUROPEAN** hub prices have also surged heading into winter, hovering around \$7.50/MMBTU. Access to Russian and Norwegian gas will keep European prices below global spot prices, though recent outages at the gas hub in Austria as well as the North Sea Forties pipeline have introduced additional upside price risk.
- ❖ Regardless, with spot prices exceeding European prices, LNG flows are likely to be dominated by importing markets in Asia, as sellers pursue the highest margin markets.
- ❖ An exception may be NBP prices in the **U.K.**, whose winter price peaks could outpace those on the continent due to the pending closure of the Rough gas storage facility. This in turn, could pull in more winter cargoes to the U.K. than in years past—an outcome made more probable given a cold start to December.
- ❖ While spot prices have a greater impact on the ultimate destination of U.S. LNG cargoes, the bulk of global LNG trade remains linked to oil. Oil prices have spiked over the past few months, which will increase the price of oil-linked LNG—though most contracts include a lag of a few months.

U.S. LNG COSTS: DECEMBER SNAPSHOT

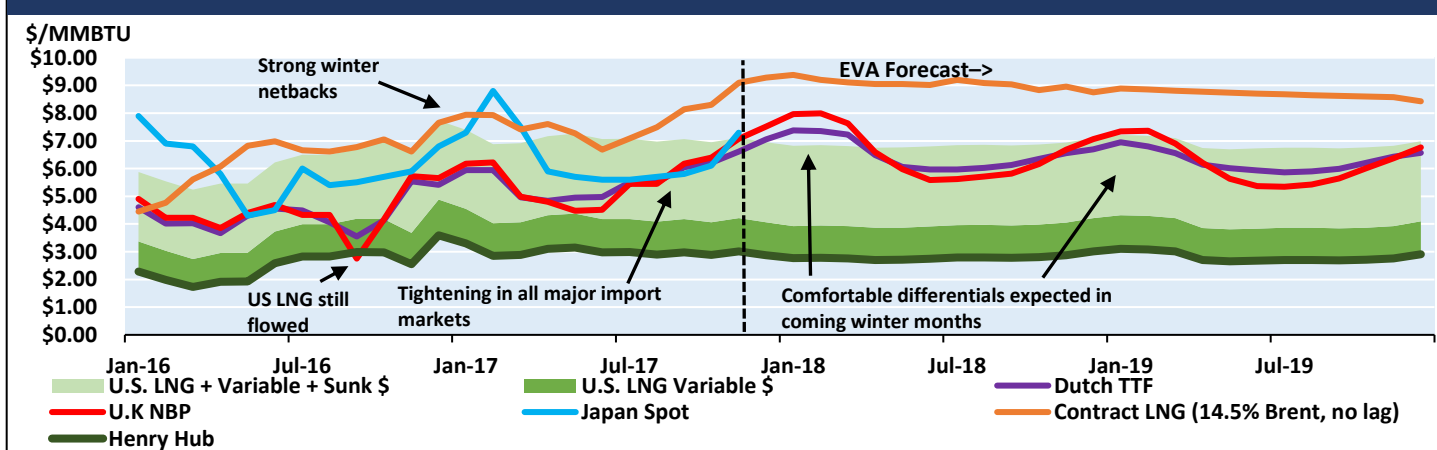
December 2017 (\$/MMBTU)		FOB Cost	
Henry Hub		\$2.89	
15% Surcharge		\$0.43	
Tolling Fee		\$2.89	
Total FOB Cost		\$6.21	
Destination		To Europe	To Asia
Shipping + Regas		\$0.75	\$1.50
Total Landed Cost		\$6.96	\$7.71
Avg. Regional Spot Price		\$7.52	\$9.80
Fixed Costs		\$2.89	\$2.89
Variable Netback (excl. fixed costs)		\$3.45	\$4.98
Full Netback (incl. fixed costs)		\$0.56	\$2.09

Note: The above represents the structure of Cheniere's SPA for most trains at Sabine Pass. Subsequent projects have slightly different structures. Shipping costs vary depending on specifications of ship and charter contract. Offtakers are assumed to make shipping decisions excluding sunk costs (i.e., tolling fees).

CURRENT DRIVERS OF MARKET PRICES

Henry Hub
Little sign of up upward price movement as winter starts mild and production hits new record highs.
NW Europe
High summer temps in South and storage demand in North has bumped forward curves above \$7/MMBTU.
Oil-Linked LNG
Sharp late-summer uptick likely to be sustained as OPEC agrees to extend production cut through 2018.
Spot LNG
NE Asian heating demand, especially in China, pushing prices to \$10/MMBTU with winter only just beginning.

COMPETITIVENESS OF U.S. LNG IN GLOBAL MARKETS: 2016-2019



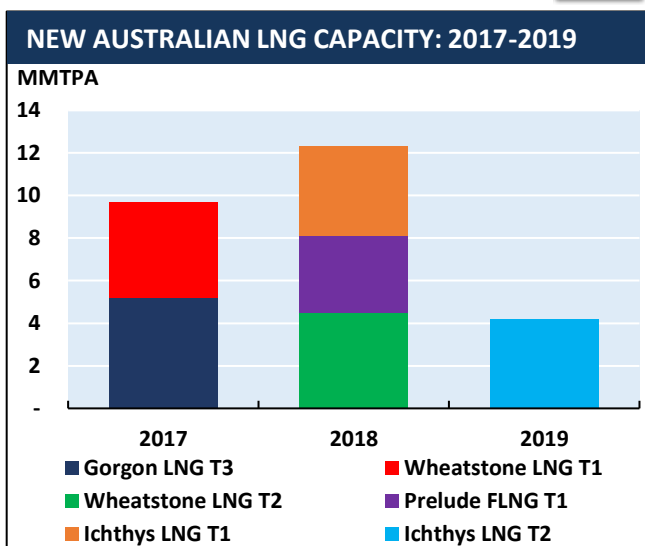
Note: Chart above uses EVA's Henry Hub and oil price forecasts, as well as forward curves (as of Sept. 10) for TTF & NBP. Variable costs include 15% of Henry Hub plus \$0.45/MMBTU shipping to Europe and \$0.30/MMBTU for regas. Shipping to Asia averages \$1.20/MMBTU. Japan spot prices from METI.

NEW LNG SUPPLY: AUSTRALIA



KEY TRENDS & HIGHLIGHTS

- ❖ As of December 2017, Australia has 68 MMTPA of existing LNG export capacity and another 16.5 MMTPA under construction. EVA projects Australia will export 55.4 MMT in 2017, rising sharply to 65.2 MMT in 2018. This represents an enormous increase over 2015, when exports totaled only 29.5 MMT.
- ❖ Most recently, in late-October Chevron brought online the first 4.5 MMTPA train at its **Wheatstone** project in western Australia. Like many projects in Australia, it had previously suffered from repeated delays and cost overruns, but the ramp-up has so far gone smoothly. The second 4.5 MMTPA train is scheduled for completion in early-2018.
- ❖ Shell's 3.6 MMTPA **Prelude FLNG** made considerable strides over the summer. The massive vessel is now on-site and the mooring has been completed. First LNG is scheduled for mid-2018.
- ❖ The threat of domestic gas shortages in Australia has faded from view as the market shifts away from peak summer demand. Still, the issue remains critical to the outlook for the three East Coast projects, with account for 27% of the country's total LNG export capacity (existing & under construction).
- ❖ In late-November, Shell and PetroChina agreed to develop 5 TCF of gas in the Surat Basin, which would be used to supply QCLNG.



AUSTRALIAN LNG EXPORT CAPACITY

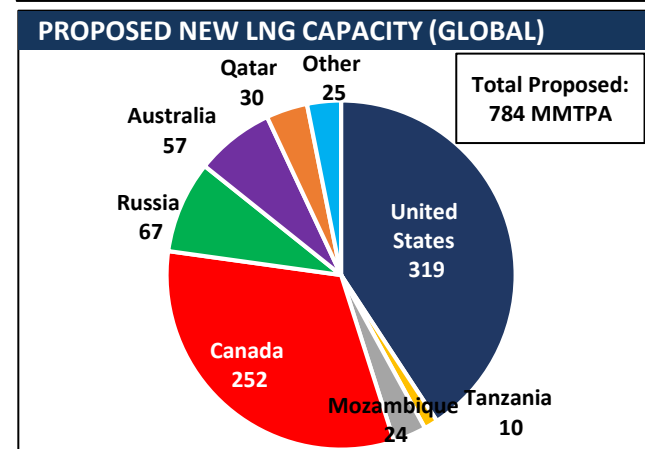
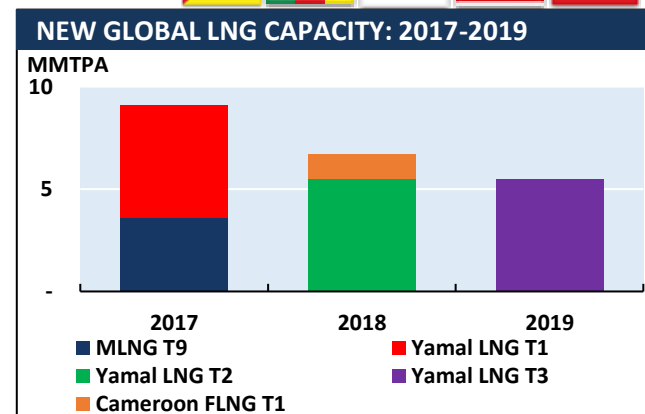
MMTPA	2016	2017	2018	2019
Existing	59.9	59.9	69.6	81.9
New	-	9.7	12.3	4.2
Total	59.9	69.6	81.9	86.1

NEW LNG SUPPLY: GLOBAL (EXCL. U.S./AUSTRALIA)



KEY TRENDS & HIGHLIGHTS

- ❖ As of December 2017, there is 80 MMTPA of LNG capacity under construction. Beyond the U.S. and Australia, it's located in Russia (Yamal), Malaysia (PFLNG 2), Cameroon (Cameroon LNG), Indonesia (Tangguh T3) and most recently, Mozambique (Coral FLNG).
- ❖ In early-December, **RUSSIA'S** Novatek and partner TOTAL successfully brought the first 5.5 MMTPA train at **Yamal LNG** online. Despite the extremely difficult operating environment in the remote Arctic, the train was completed largely on-time and on-budget. Novatek said Trains 2-3 (totaling 11 MMTPA) will be finished ahead of schedule in mid-2018 & early-2019, respectively.
- ❖ Yamal is Russia's second LNG project—the first, Sakhalin, came online in 2009 and is owned by Gazprom. More recently, Novatek is advancing plans on the 16.5 MMTPA **Arctic LNG**, proposed to come online in 2023 (though it's in very early stages of development).
- ❖ In **CANADA**, **Woodfibre LNG** announced it would delay construction on the 2.1 MMTPA project until mid-2018. Developers said it was struggling to bring costs down to workable levels. The project remains the most likely Canadian project to move forward.
- ❖ In October, **IRAN'S** NOC (NIOC) confirmed it was negotiating with Exmar to take possession of the FLNG vessel originally completed for the 0.5 MMTPA **Caribbean FLNG** project in Colombia. The vessel was completed in 2015, but the project sponsor went out of business shortly thereafter and never took possession. The deal may not be finalized and the project is small, but it would still mark a rapid and unexpected emergence of Iran as an LNG exporter.



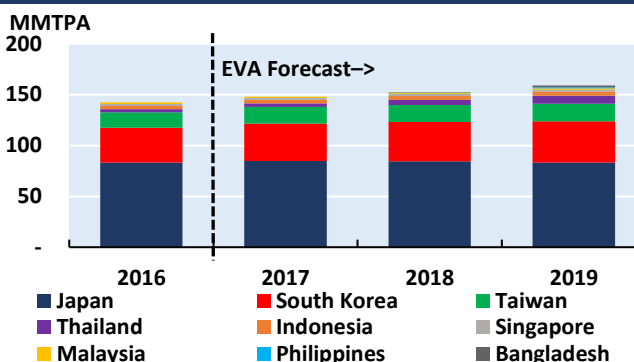
LNG DEMAND: JAPAN, KOREA, TAIWAN & S.E. ASIA



KEY TRENDS & HIGHLIGHTS

- ❖ LNG demand in **KOREA** is set to reach the highest levels since 2014. The country is the second largest recipient of U.S. LNG, bringing in 29 cargoes, including 21 since June 2017, when the KOGAS offtake contract with Sabine Pass went in effect. The deal calls for KOGAS to take 3.5 MMTPA from the project for 20 years.
- ❖ Korea's run as the world's second largest LNG importer may soon be coming to an end as a result of surging demand in China, but demand still has considerable upside as a result of the presidential elections earlier in the year. President Moon has offered strong support to renewable energy and gas-fired power and plans to limit coal and nuclear generation.
- ❖ In August, a large-scale blackout in **TAIWAN** highlighted the chronic power supply shortages plaguing the country. With nuclear outages becoming more common and emerging regulations designed to limit coal use, LNG imports are set to hit a record high in 2017 and continue growing through 2020.
- ❖ Of all the emerging importers, **BANGLADESH is increasingly seen as presenting the largest upside for new LNG demand.** Government officials project LNG imports could rise from zero to 20 MMTPA by the early-2020s. That magnitude is largely unfeasible, but EVA expects meaningful imports as early as 2018.

JKT & S.E. ASIA LNG DEMAND: 2016-2019



JKT LNG DEMAND: 2016-2019

MMTPA	2016	2017	2018	2019	CAGR
Japan	83.3	84.8	84.6	83.2	0%
Korea	34.2	36.8	38.5	40.5	6%
Taiwan	15.1	16.2	16.7	17.4	5%
Thailand	3.0	3.6	5.2	7.8	37%
Indonesia	3.2	3.5	3.8	4.1	8%
Singapore	2.1	2.0	2.0	2.1	0%
Malaysia	1.3	1.2	1.2	1.2	-2%
Philippines	-	-	0.1	0.8	N/A
Bangladesh	-	-	0.1	2.1	N/A
Total	142.2	148.1	152.2	159.1	4%
% Global Demand	54%	51%	49%	47%	--

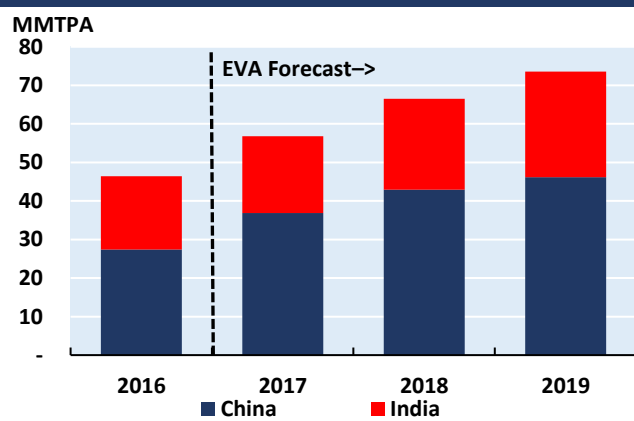
LNG DEMAND: CHINA & INDIA

KEY TRENDS & HIGHLIGHTS

- ❖ The pace and magnitude of China's surging demand has been the single most important LNG market trend in 2017. It was universally recognized that demand would rise, but the increase has blown past even the most bullish projections. **EVA projects 2017 imports into China will reach 37 MMT, a full 10 MMTPA (+35%) increase over 2016.**
- ❖ The surge in Chinese demand will almost certainly push it ahead of Korea as the world's second largest LNG importer. It will remain far behind Japan for several more years, but with import capacity at 65 MMTPA and rising, the country is in prime position to take advantage of new supply hitting the water over the next few years.
- ❖ **CHINA** has also emerged as a leading importer of U.S. LNG, behind only Mexico and South Korea. The relationship is deepening as a result of overt diplomacy on behalf of the Trump administration to foster greater LNG cooperation between the two countries.
- ❖ **INDIAN** LNG demand has been surprisingly flat through 2017. Growth will be stronger in 2018. India has also led the charge among buyers to renegotiate long-term deals to reduce the price.
- ❖ **GAIL**, India's primary LNG importer, is one of the main LNG offtakers from the first two U.S. projects, contracting for a combined 5.8 MMTPA from Sabine Pass and Cove Point (both contracts go into effect in early-2018). GAIL has had difficulty finding domestic downstream buyers and is reportedly looking to modify its Cove Point contract, though Dominion has repeatedly said the contract is not open to renegotiation.



CHINA & INDIA LNG DEMAND: 2016-2019



CHINA & INDIA LNG DEMAND: 2016-2019

MMTPA	2016	2017	2018	2019	CAGR
China	27.4	36.9	42.9	46.2	19%
India	19.0	19.9	23.6	27.3	13%
Total	46.4	56.8	66.5	73.5	16%
% Global Demand	18%	20%	21%	22%	--

CHINA & INDIA LNG IMPORT CAPACITY

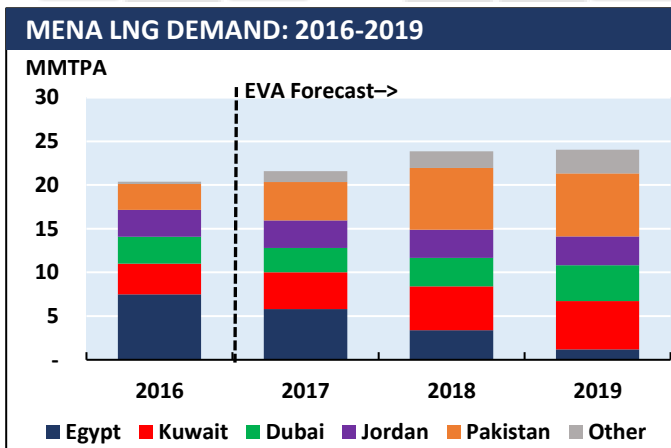
MMTPA	As of end-2010	As of end-2016	Under Construction	Forecast for end-2019
China	14.7	48.4	22.9	86.0
India	15.0	27.0	21.0	63.0

LNG DEMAND: MIDDLE EAST/NORTH AFRICA



KEY TRENDS & HIGHLIGHTS

- ❖ **PAKISTAN** inaugurated its second FSRU import terminal in late-November. The 4.5 MMTA facility in Karachi expands the country's import capacity to 8.3 MMTA. The first FSRU came online in 2015 and has been heavily utilized.
- ❖ Pakistan—a case study in the value of FSRUs over onshore terminals—will be MENA's largest importer by 2019. **Pakistan will also be watched closely by LNG developers and sellers hoping for new markets during the coming oversupply.**
- ❖ With gas demand soaring in the populous country, the government is incredibly optimistic about LNG, projecting demand to reach nearly 30 MMTA by the early-2020s. Political issues will likely slow development, as will the need for pipeline additions linking inland regions with the coast.
- ❖ After bringing in 7.5 MMT in 2016 (a remarkable 188% increase over 2015), **EGYPT's** transition from LNG exporter to importer is quickly reversing. Imports in 2017 will fall to 5.8 MMT and almost be eliminated by 2019 as a result of new domestic gas production—especially from the massive Zohr field, which started production in mid-December.
- ❖ MENA has imported 23 U.S. cargoes in 2017, up from 7 in 2016. The imports are concentrated in peak demand summer months.

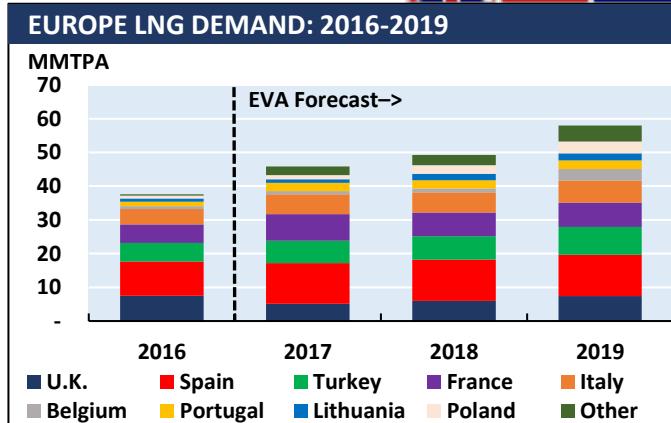


MMTPA	2016	2017	2018	2019	CAGR
Egypt	7.5	5.8	3.4	1.2	-45%
Kuwait	3.5	4.2	5.0	5.5	16%
Dubai	3.1	2.8	3.3	4.1	10%
Jordan	3.1	3.2	3.2	3.3	3%
Pakistan	3.0	4.4	7.0	7.2	34%
Other	0.3	1.3	1.9	2.7	112%
Total	20.4	21.6	23.8	24.0	6%
% Global Demand	8%	7%	8%	7%	--

LNG DEMAND: EUROPE

KEY TRENDS & HIGHLIGHTS

- ❖ Because LNG markets remained tighter, imports into Europe—in theory, the global backstop market—have not surged to the degree initially expected, though the region is still set to import the most LNG since 2012.
- ❖ Through the summer, Southern Europe was the bright spot, with LNG demand in **SPAIN, ITALY, PORTUGAL** and **TURKEY** all showing meaningful increases compared to last year, the result of an abnormally hot summer, low hydro output and reduced pipeline imports from Algeria.
- ❖ Heading into winter, European LNG imports are likely to increase considerably due to rising demand and lower than average storage levels. **FRANCE**, already on pace to import the most LNG since 2012, could see even larger spikes as a result of recently announced outages at four large nuclear power plants.
- ❖ The **U.K.** may also see a considerable spike in winter LNG imports as a result of colder than normal weather and reduced output from the country's primary gas storage facility. Still, U.K. imports through 2017 have surprised to the downside and are likely to finish at the lowest levels since 2008.
- ❖ **GERMANY** announced plans to install its first LNG import terminal, a 2.5 MMTA facility located in Hamburg. The proposal is in very early stages and would not be completed until late-2022 at the earliest.
- ❖ **FINLAND** opened its second LNG import terminal, though like the other first, it is very small scale (a third is in development).



MMTPA	2016	2017	2018	2019	CAGR
U.K.	7.5	5.1	6.0	7.4	0%
Spain	10.2	12.1	12.2	12.2	6%
Turkey	5.5	6.6	6.9	8.3	15%
France	5.6	7.9	7.0	7.2	9%
Italy	4.6	5.9	6.0	6.5	12%
Belgium	0.8	1.0	1.2	3.5	63%
Portugal	1.3	2.4	2.4	2.5	24%
Lithuania	1.0	1.1	1.9	2.1	28%
Poland	0.8	1.3	2.5	3.5	61%
Other	0.4	2.6	3.0	4.8	123%
Total	37.6	45.9	49.2	58.0	15%
% Global Demand	14%	16%	16%	17%	--

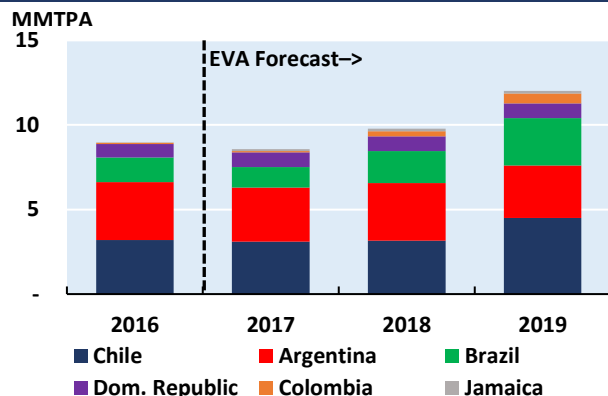
LNG DEMAND: SOUTH AMERICA

KEY TRENDS & HIGHLIGHTS

- ❖ In 2016, South America was the leading recipient of U.S. LNG from Sabine Pass, taking in 21 of 58 cargoes, or 36%. The trend has not held through 2017, with only 12% of U.S. cargoes directed to the region this year. Total regional LNG demand, already low in 2016, has fallen further in 2017, driven mostly by strong hydro output.
- ❖ The relationship with hydro is most apparent in **BRAZIL**, where imports fell from 4.8 MMT in 2015 to 1.5 MMT in 2016 and are set to fall to 1.2 MMT in 2017—the lowest levels since 2011.
- ❖ Demand in **CHILE** has been stable through 2017. Import capacity is currently limited to 4.2 MMT, but several new terminals, totaling 8.4 MMTPA, are in development. Not all will move forward, but with gas demand rising and few alternative supply options, LNG imports are projected to increase in 2019 and beyond.
- ❖ **ARGENTINA** was South America's largest importer in 2016 and will remain so through 2017. Demand has little upside however, as the country is still moving quickly to develop its Vaca Muerte shale play.
- ❖ As expected, the **PANAMA CANAL** has become a vital point of transit for U.S. LNG cargoes heading to Asia. However, shippers have been frustrated by constraints, including rules limiting LNG transit to the daytime. Canal authorities have said these constraints will be removed by mid-2018, when transits would be allowed to double.



SOUTH AMERICA LNG DEMAND: 2016-2019



SOUTH AMERICA LNG DEMAND: 2016-2019

MMTPA	2016	2017	2018	2019	CAGR
Chile	3.2	3.1	3.2	4.5	12%
Argentina	3.4	3.2	3.4	3.1	-3%
Brazil	1.5	1.2	1.9	2.8	24%
Dom. Republic	0.8	0.9	0.9	0.9	3%
Colombia	0.1	0.1	0.3	0.6	114%
Jamaica	0.0	0.1	0.2	0.2	144%
Total	9.0	8.6	9.8	12.0	10%
% Global Demand	3%	3%	3%	4%	--

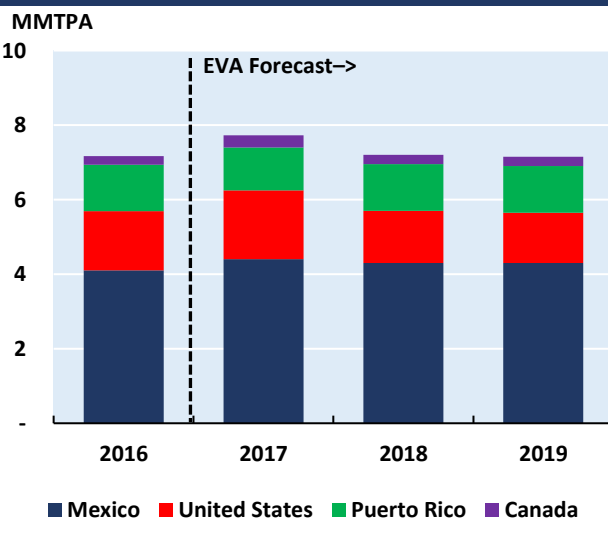
LNG DEMAND: NORTH AMERICA

KEY TRENDS & HIGHLIGHTS

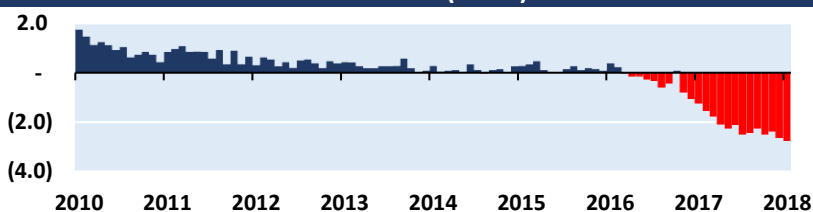
- ❖ **MEXICO** remains by far the largest importer of U.S. LNG, bringing in a total of 47 cargoes through Dec. 2017. The bulk of these cargoes (39) have been delivered in 2017. About 70% of the 2017 cargoes have been delivered to the Manzanillo terminal on the west coast.
- ❖ Mexico's LNG demand has surprised to the upside, as it had previously been expected to steadily decline as a result of increased access to low-cost U.S. pipeline gas. However, several pipelines have been delayed, and those completed have been insufficient to keep up with surging demand from the power sector, or make up for declining domestic production. Indeed, Mexico's 2017 LNG demand is set to be higher than 2016, though there is limited upside beyond this year.
- ❖ In the **U.S.**, Engie has continued to import ~4 cargoes/month from Trinidad to its Everett terminal in Boston.
- ❖ Historically, LNG demand in **PUERTO RICO** is very stable, hovering very close to 1.3 MMTPA. Hurricane Maria devastated the small island's electrical grid, with many remaining without power. However, LNG imports do not appear to have been impacted as of yet.



NO. AMERICA LNG DEMAND: 2016-2019 (GROSS)



NET U.S. LNG DEMAND: 2010-2017 (BCFD)



NOR. AMERICA LNG DEMAND: 2016-2019 (GROSS)

MMTPA	2016	2017	2018	2019	CAGR
Mexico	4.1	4.4	4.3	4.3	2%
United States	1.6	1.9	1.4	1.4	-5%
Puerto Rico	1.3	1.2	1.3	1.3	0%
Canada	0.2	0.3	0.3	0.3	3%
Total	7.2	7.7	7.2	7.2	0%
% Global Demand	3%	3%	2%	2%	--

Appendix: Country by Country LNG Demand & Supply Forecast: 2016-2019

LNG DEMAND FORECAST BY COUNTRY: 2016-2019				
MMTPA	2016	2017	2018	2019
Japan	83.3	84.8	84.6	83.2
Korea	34.2	36.8	38.5	40.5
China	27.4	36.9	42.9	46.2
India	19.0	19.9	23.6	27.3
Taiwan	15.1	16.2	16.7	17.4
Thailand	3.0	3.6	5.2	7.8
Indonesia	3.2	3.5	3.8	4.1
Singapore	2.1	2.0	2.0	2.1
Malaysia	1.3	1.2	1.2	1.2
Pakistan	3.0	4.4	7.0	7.2
U.K	7.5	5.1	6.0	7.4
Spain	10.2	12.1	12.2	12.2
Turkey	5.5	6.6	6.9	8.3
France	5.6	7.9	7.0	7.2
Italy	4.6	5.9	6.0	6.5
Belgium	0.8	1.0	1.2	3.5
Portugal	1.3	2.4	2.4	2.5
Netherlands	0.4	0.8	0.8	1.3
Greece	0.5	1.1	1.3	2.2
Lithuania	1.0	1.1	1.9	2.1
Norway	0.2	0.2	0.2	0.2
Finland	0.0	0.1	0.1	0.1
Sweden	0.2	0.2	0.2	0.3
Mexico	4.1	4.4	4.3	4.3
Brazil	1.5	1.2	1.9	2.8
Argentina	3.4	3.2	3.4	3.1
Chile	3.2	3.1	3.2	4.5
United States	1.6	1.9	1.4	1.4
Puerto Rico	1.3	1.2	1.3	1.3
Dom. Rep.	0.8	0.9	0.9	0.9
Canada	0.2	0.3	0.3	0.3
Kuwait	3.5	4.2	5.0	5.5
Egypt	7.5	5.8	3.4	1.2
Dubai	3.1	2.8	3.3	4.1
Jordan	3.1	3.2	3.2	3.3
Israel	0.3	0.5	0.8	0.8
Poland	0.8	1.3	2.5	3.5
Colombia	0.1	0.1	0.3	0.6
Jamaica	0.0	0.1	0.2	0.2
Ghana	-	-	0.3	1.9
Abu Dhabi	-	0.8	1.0	1.0
Philippines	-	-	0.1	0.8
Malta	-	0.4	0.4	0.4
Gibraltar	-	0.0	0.1	0.1
Uruguay	-	-	0.2	1.0
Bahrain	-	-	0.2	1.0
Ivory Coast	-	-	0.1	1.0
Bangladesh	-	-	0.1	2.1
El Salvador	-	-	-	0.2
Panama	-	-	0.2	0.4
Bunker Fuel	-	-	0.8	1.9
Total	263.6	288.8	310.3	339.9

LNG SUPPLY FORECAST BY COUNTRY: 2016-2019				
MMTPA	2016	2017	2018	2019
Algeria	11.4	11.4	11.4	11.7
Eq. Guinea	3.4	3.8	3.6	3.6
Nigeria	17.8	19.9	18.9	18.5
Norway	4.5	4.1	4.1	4.0
Trinidad	10.5	9.9	10.5	10.9
UAE	5.9	5.2	5.1	4.9
Oman	8.1	8.0	8.1	8.1
Qatar	79.6	78.5	77.9	77.1
Yemen	-	-	-	-
Australia	44.9	55.4	65.2	74.2
Brunei	6.3	6.2	6.1	6.1
U.S.	2.6	13.4	21.3	40.7
Indonesia	20.0	19.2	19.8	19.8
Malaysia	25.1	26.4	25.8	24.4
PNG	7.7	8.2	8.0	8.0
Peru	4.0	3.8	3.9	3.9
Russia	10.7	10.9	15.8	18.8
Egypt	0.5	0.8	0.9	1.1
Libya	-	-	-	-
Angola	0.8	3.8	3.9	4.2
Total	263.6	288.8	310.4	339.9

LNG DEMAND FORECAST BY REGION 2016-2019				
MMTPA	2016	2017	2018	2019
Asia	188.6	204.9	218.7	232.7
Europe	38.5	46.0	49.3	57.7
MENA	20.4	21.6	23.8	24.0
North America	7.2	7.7	7.2	7.2
South America	9.0	8.6	10.2	13.6
Africa	-	-	0.4	2.9
Bunker	-	-	0.8	1.9
Total	263.6	288.8	310.3	339.9

LNG SUPPLY FORECAST BY REGION 2016-2019				
MMTPA	2016	2017	2018	2019
Asia	59.0	60.0	59.8	58.3
Australia	44.9	55.4	65.2	74.2
Europe	4.5	4.1	4.1	4.0
MENA	105.6	103.8	103.3	102.9
North America	2.6	13.4	21.3	40.7
South America	14.5	13.7	14.5	14.8
Russia	10.7	10.9	15.8	18.8
Africa	21.9	27.4	26.4	26.3
Total	263.6	288.8	310.4	339.9

Note: If you have any questions, comments or feedback on this report, or are interested in hearing more about EVA's LNG offerings, please contact **Dustin Meyer**, EVA's lead LNG analyst, at: dustin.meyer@evainc.com