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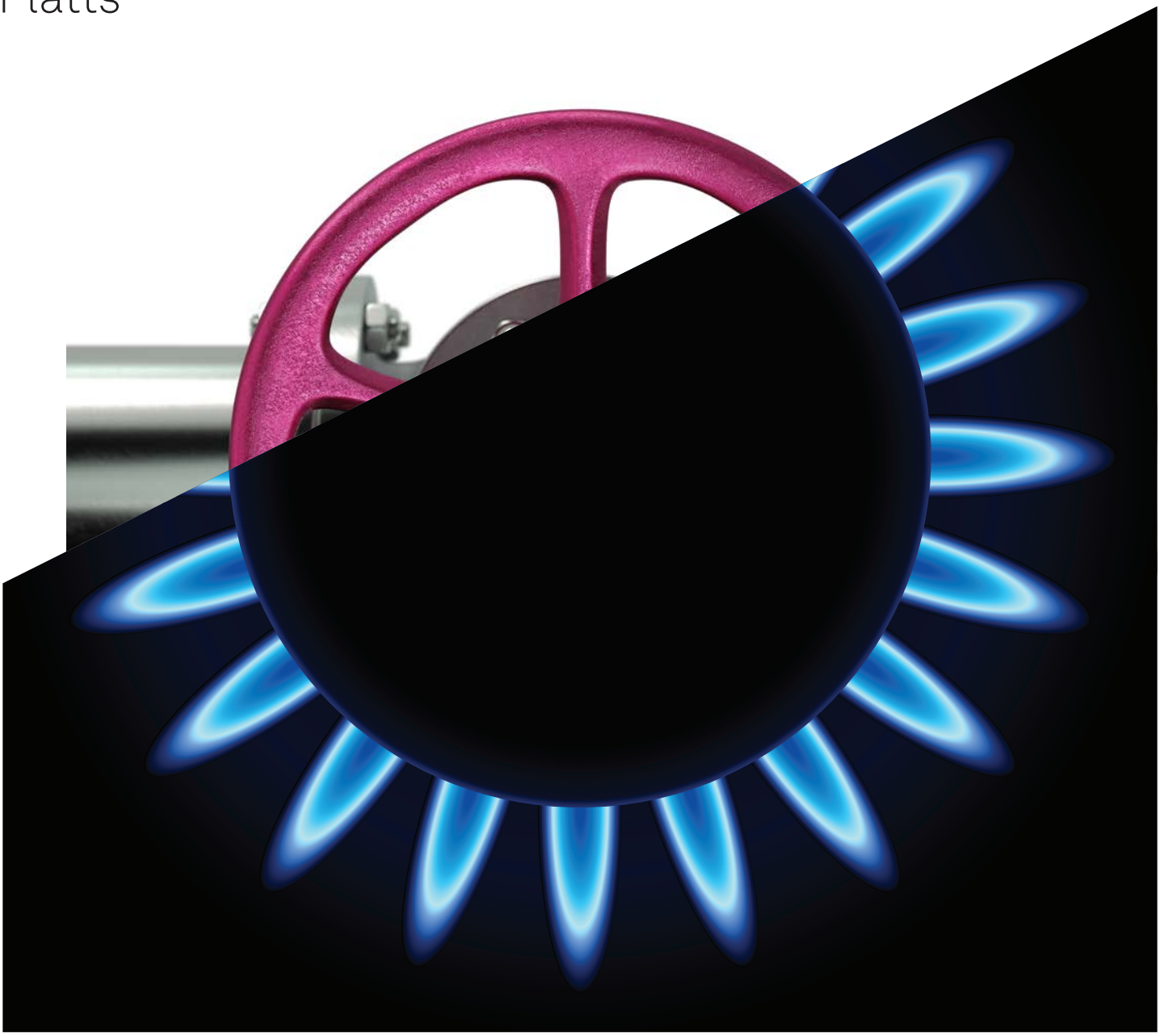


MIDDLE EAST EMERGES AS LNG DEMAND CENTER

NATURAL GAS SPECIAL REPORT

MARCH 2017

Luke Stobbart, LNG Editor

The Middle East, traditionally associated with large-scale LNG exports, has become one of the fastest growing demand centers for the commodity.

For the purposes of this analysis, the term Middle East when referring to LNG imports will be comprised of Egypt, Jordan, Kuwait, the United Arab Emirates, as well as Pakistan, which has been included because of the proximity of its import terminal to the mouth of the Persian Gulf.

Over the past three years, LNG imports into the region have grown by more than 380%, at a time when deliveries to traditional demand centers have been relatively stagnant or in decline.

As a proportion of total global LNG exports, the rate of demand growth is also notable. In 2014, the region imported 5.9 Bcm (4.3 million mt) of gas as LNG, or just under 2% of the global total LNG imports, according to Platts Analytics' Eclipse Energy. By the end of 2016, however, LNG imports had moved to 28.6 Bcm (20.9 million mt), or 7.9% of the global total.

INTEREST IN LNG FUELED BY DOMESTIC GAS DEFICITS

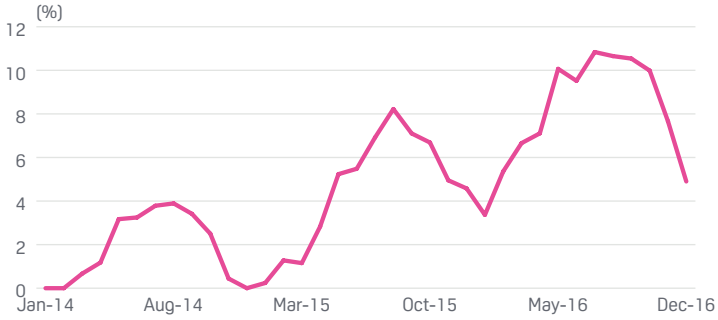
Fundamentally, the push to import LNG into the region has been driven by domestic gas demand growth outpacing available pipeline supplies. Much of the infrastructure in the Middle East has been developed around natural gas, which accounts for almost half of total primary energy consumption in the region, according to the latest data available from the International Energy Agency. Both electricity generation and industrial production in the region are heavily methane dependent. More than half of electricity generation is gas-fueled, while industry in the region is also slanted toward gas utilization, with the IEA estimating that the sector will lead the region's growth in gas consumption into 2040.

Despite the Middle East accounting for a large share of global gas reserves, about 80% of those reserves are located in just two countries, Iran and Qatar. Growing domestic demand in some countries in the region has, therefore, reached a point where production can no longer keep pace with demand. This is evident in countries like the UAE and Kuwait where gas consumption surpassed production by 12.1 Bcm and 3.6 Bcm respectively in 2014, according to the latest data available from the BP Statistical Review of World Energy. It is also illustrated in countries like Egypt, which moved from exporting 16.2 Bcm of the 61.3 Bcm it produced in 2010, to consuming almost all of the 48.8 Bcm it produced domestically in 2014.

DECLINING LNG PRICES FACILITATE IMPORTS

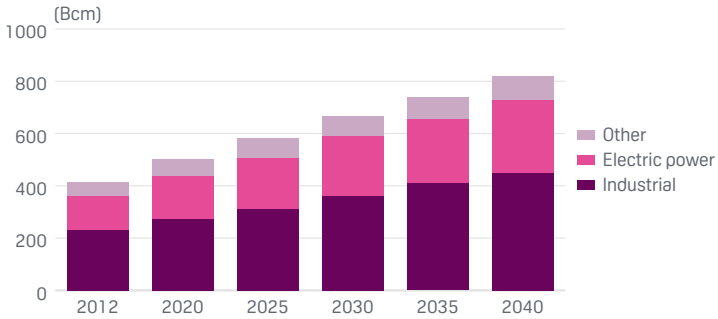
Over the past two years, countries in the Middle East have increasingly been using LNG to bridge the gap between domestic gas supplies and latent demand, turning the region into a growing import destination.

MIDDLE EAST LNG IMPORTS AS A PERCENTAGE OF GLOBAL TOTAL



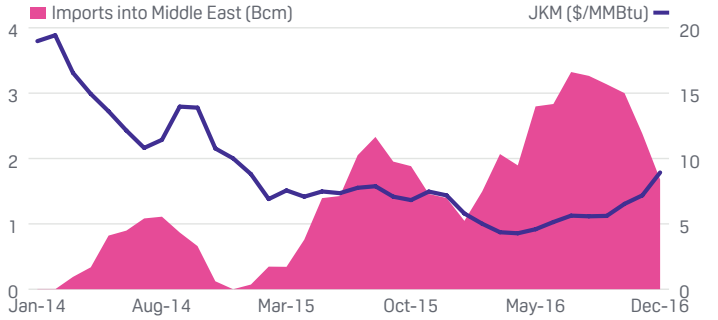
Source: Platts Analytics' Eclipse Energy

MIDDLE EAST NATURAL GAS CONSUMPTION BY END-USE SECTOR



Source: IEA

JKM vs IMPORTS INTO MIDDLE EAST



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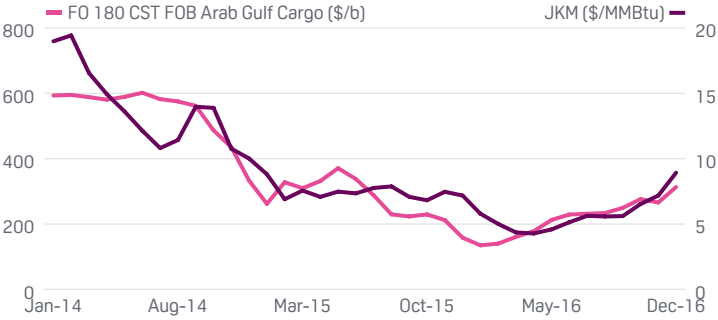
JKM vs MIDDLE EAST FUEL OIL



Source: Platts

This transition has been facilitated by a steep decline in LNG prices over the past three years. This decline has been driven by a fall in the value of oil-linked contracts, additional liquefaction capacity being brought online and milder weather in key demand regions.

The extent of the decline in past years is reflected in the Platts JKM™, which represents the value of a spot cargo delivered into the traditionally premium Northeast Asian market.

Since 2014, the annual average JKM price has fallen by more than 50%, from $13.878/MMBtu to $5.719/MMBtu in 2016.

LNG prices have also come down relative to competing oil-based generating fuels in the region, which still accounted for more than one third of electricity generation in 2014, according to IEA data. In countries like Jordan, Kuwait, and Pakistan, these oil-based products represent an even higher proportion of the generation mix.

FSRU-FACILITATED MARKET ENTRY

In addition to lower LNG prices, the availability of Floating Storage and Regasification Units has played a key role in the region's transformation into a LNG demand center. FSRUs allow for the import of LNG and for the fuel to be reconverted into a gaseous state. However, it is the speed with which they can be installed and their lower cost relative to onshore regasification facilities that have made them instrumental in the growth of the regional LNG market.

At the start of 2015, Egypt, Jordan and Pakistan all managed to install and commission FSRUs within three months of each other. Egypt subsequently secured a second FSRU in the same year, along with the United Arab Emirates, which now also has two FSRUs in operation.

Considered together, these FSRUs give the region a theoretical maximum import capacity of almost 50 Bcm (36.5 million mt) per year, with over 36 Bcm (26.28 million mt) of that capacity coming online since 2015.

EXISTING LNG IMPORT INFRASTRUCUTRE IN THE MIDDLE EAST

Country	FSRU	Import Capacity (Bcm/year)	Installation Year
UAE (Dubai)	Golar Freeze*	4.9	2010
Kuwait	Golar Igloo	7.5	2014
UAE (Dubai)	Explorer	7.0	2015
Pakistan	BW Integrity	7.7	2015
Egypt	Hoegh Gallant	5.0	2015
Jordan	Golar Eskimo	7.5	2015
Egypt	BW Singapore	7.7	2015
UAE (Abu Dhabi)	Excelerate	7.0	2016

*Subsequently replaced by the Explorer

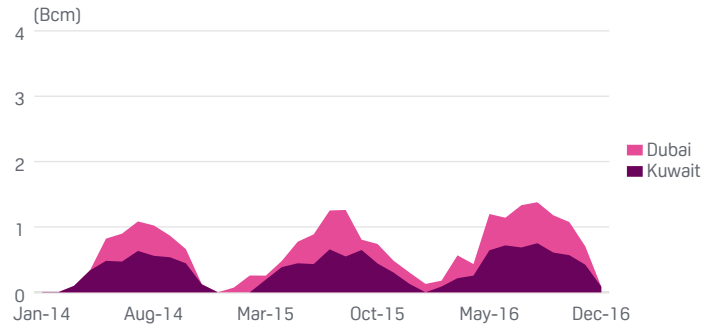
Source: Platts

RAPID LNG IMPORT GROWTH

Since the arrival of the additional FSRUs in 2015, imports into the region have grown dramatically, moving from 5.9 Bcm (4.3 million mt) in 2014 to 28.6 Bcm (20.9 million mt) in 2016, an increase of 385%.

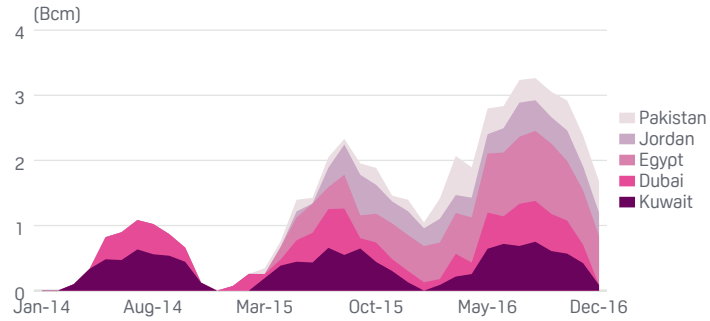
The lion's share of the increase has been due to demand from the new market entrants in the region, namely Egypt, Jordan and Pakistan, which accounted for 67% total regional LNG imports in 2016. However, deliveries to traditional importers, Kuwait and the UAE, have been increasing steadily as well, growing by almost 60% from 5.9 Bcm (4.3 million mt) in 2014 to 9.4 Bcm (6.9 million mt) in 2016.

MIDDLE EAST LNG DEMAND FROM TRADITIONAL IMPORTERS



Source: Platts Analytics' Eclipse Energy

MIDDLE EAST LNG DEMAND FROM NEW AND TRADITIONAL IMPORTERS



Source: Platts Analytics' Eclipse Energy

The new buyers in the region have followed a similar demand profile to Kuwait and the UAE, with deliveries peaking during summer months -when temperatures can reach above 40 degrees Celsius- and waning during winter months. Notably, this reduces competition with large importers in Northeast Asia, which see both demand and prices peak during winter months.

IMPACT OF MIDDLE EASTERN DEMAND ON TRADE FLOWS

As LNG demand in the Middle East has grown, so too has its impact on international LNG trade flows.

Already, buyers in the region have begun to provide an outlet for producers based in the Middle East, which are facing increasing competition from new LNG projects coming on stream in both the US and Australia.

This can be seen in the case of Qatari exports to the Middle East, which grew from only 3% of total Qatari exports in 2014 to 14%, or 15 Bcm (10.95 million mt), in 2016.

Middle Eastern demand has, however, also attracted cargoes from locations as far afield as the US and

Australia. And the number of countries that supply cargoes to the region has more than doubled, moving from nine in 2014 to 19 in 2016.

Atlantic-sourced cargoes as well, have increasingly been finding their way to the Indian Ocean, which is geographically closer than traditionally premium markets in Northeast Asia.

Flows from African liquefaction plants now represent the second largest source of cargoes to the Middle East, growing from only 0.7 Bcm (0.5 million mt) in 2014 to over 6.4 Bcm (4.7 million mt) in 2016.

A similar outcome is being observed in the European reload market, where the Middle East now accounts for just over 50% of re-exports from both Northern and Southern Europe, or 2.4 Bcm (1.8 million mt) in 2016. At the same time, Middle Eastern deliveries to Europe have been declining, as more of those volumes remain region bound.

MIDDLE EAST LEANS TOWARDS SHORTER-TERM CONTRACTS

The increased diversity of source locations for cargoes into the Middle East is partially due to a reliance on shorter-term supply contracts and spot tenders in the region that has tended to favor traders which usually have no fixed source of supply.

This pattern of buying represents a departure from traditional LNG supply agreements, which typically last for a minimum of 10 years, with most averaging between 15 and 20 years.

Recent supply agreements into the Middle East are, however, noticeably shorter in tenure, typically lasting no longer than five years.

Egypt typifies this new paradigm, and has fulfilled its demand mainly through short-term tenders, seeking cargoes for delivery no more than two years ahead.

Pakistan, however, is the notable exception to this trend, having signed two contracts with Qatargas with durations of 15 and 20 years, and more recently, a 15-year contract with Eni.

In addition to supply contracts and longer duration tenders, each of the new buyers in the region has used spot tenders to fill gaps in their supply schedule. These are typically for fewer than ten cargoes, and tend to be awarded to traders.

Due to the amount of trader-driven spot activity in the Middle East in sourcing cargoes, there is greater opportunity for price discovery as cargoes have been known to change hands several times before reaching their final destination.

MIDDLE EASTERN DEMAND GOING FORWARD

Going forward, LNG demand in the region is expected to continue to grow over the next two years, before stabilizing above 40 Bcm (29.2 million mt) per year, according to forecasts from Platts Analytics' Eclipse Energy.

Egypt is expected to remain the largest importer of LNG in the region over the next two years, after which domestic gas supplies from Zohr and other smaller gas fields is set to displace much of the demand for LNG.

Even with declining requirements from Egypt, regional demand is forecast to remain relatively stable -averaging between 40 and 45 Bcm (29.2 and 32.9 million mt) between 2018 and 2021. This is due mainly to expectations of higher imports into Pakistan and Kuwait.

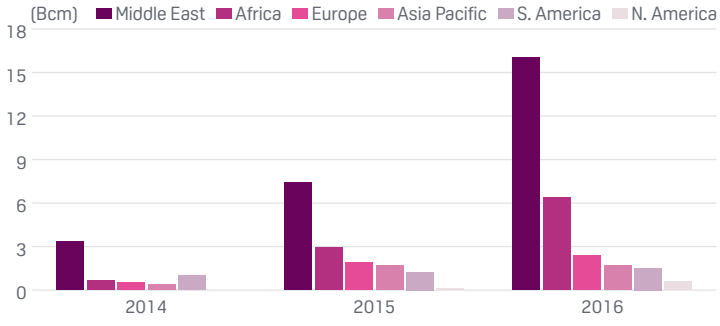
Pakistan is set to become the largest regional importer by 2019, based on the expected installation of an additional two FSRUs by early 2018.

Meanwhile, Bahrain will be the next Middle Eastern country to enter the LNG market, with a planned 8.2 Bcm (6 million mt) per year capacity Floating Storage Unit-based import facility expected to come online in July 2018.

Kuwait, which is already an existing LNG importer, is scheduled to complete construction of an onshore regasification terminal by 2020, at which point demand is expected to grow to above 7.5 Bcm (5.5 million mt) per year.

Imports into the UAE are expected to continue to increase as well, with the delivery of the country's second FSRU to Abu

LNG EXPORTS TO MIDDLE EAST BY REGION



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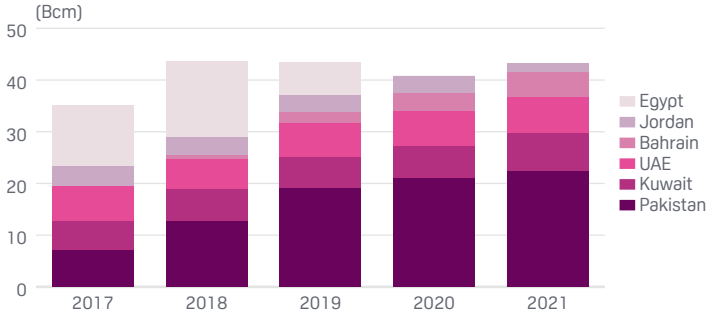
MIDDLE EASTERN LNG DEMAND FORECAST



Source: Platts Analytics' Eclipse Energy

Dhabi in 2016 and a third import terminal set to be installed in the emirate of Sharjah in mid-2018.

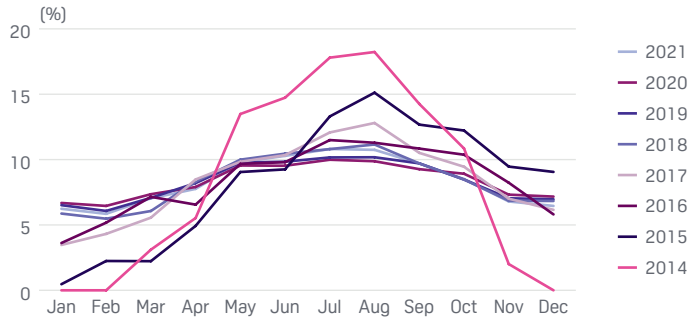
The summer peak that is currently observed with Middle Eastern importers is expected to continue, though the steepness of that peak is set to flatten over the next five years. This is mostly due to scale of baseload demand forecast in Pakistan.

PRICE TRANSPARENCY

The Middle East has proven to be one of the fastest growing demand centers for LNG, and demand is expected to continue to grow up until 2022, under current assumptions.

This demand growth and the high level of trader activity currently seen in the region are likely to lead to greater price transparency in the Middle East.

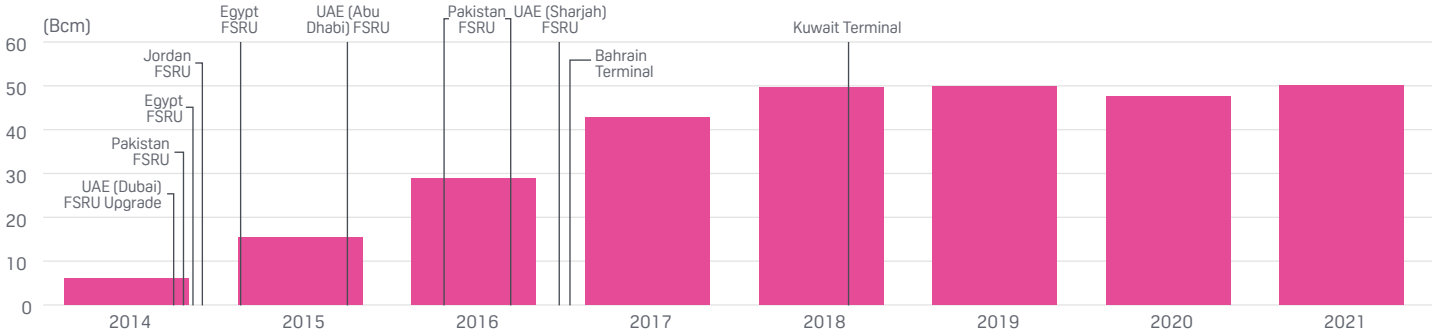
SEASONALITY OF MIDDLE EASTERN LNG DEMAND FORECAST



Source: Platts Analytics' Eclipse Energy

To this end, S&P Global Platts has responded with a new Middle East price assessment, the DES Middle East Marker, which tracks spot pricing in the region.

MIDDLE EASTERN IMPORTS



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COUNTRY PROFILES

Jordan

Jordan began importing LNG in 2015 in response to the cessation of pipeline gas flows from Egypt in 2014, which forced the country to depend on relatively more expensive oil products for electricity generation. The country's National Electric Power Company chartered the Golar Eskimo FSRU for a period of 10 years, giving the country the capacity to import up to 7.5 Bcm (5.5 million mt) of gas equivalent per year. Today, upwards of 80% of the electricity generation is now fueled by LNG, some of which has been secured through a short-term and medium-term supply contract with Shell for over 1.60 Bcm and 1.5 Bcm (1.2 and 1.1 million mt) per year, respectively. NEPCO also uses shorter-term tenders seeking spot cargoes to fulfil its more immediate needs. Going forward, however, pipeline imports from Israel's Leviathan gas field are set to dampen the scope for LNG imports into the country. Production from the gas field is expected to begin after 2018, and NEPCO recently signed a deal with shareholders in the project for the supply of 45 Bcm (32.9 million mt) over 15 years.

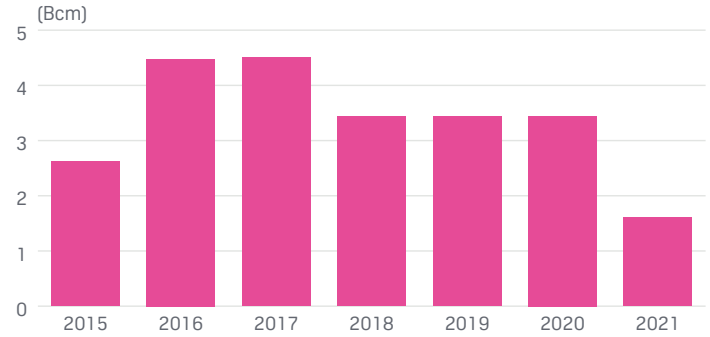
Egypt

Egypt is currently the largest importer of LNG in the Middle East, employing two FSRUs with a combined regasification capacity of around 13 Bcm (9.5 million mt) per year. Natural gas in the country is primarily used for power generation, though there is some direct demand from industry and for use in petrochemical production. While regular precise public data on Egyptian domestic gas demand is unavailable, the energy ministry in Q2 2016 stated that gas supply currently stood at 113 million cubic meters per day, while demand was significantly higher at 147 million cu m per day. This supply deficit represents a reversal of fortunes for the Egyptian gas industry, as the country was once a major gas and LNG exporter. In 2012, the country's two export terminals at Idku and Damietta exported a total of 6.9 Bcm (5 million mt). However, due to increasing domestic demand and declining production, feed gas to LNG export facilities was curtailed and eventually stopped all together. The SEGAS Damietta plant stopped producing in early 2013, while the ELNG Idku project ceased regular exports in 2014. By 2015, not only had exports stopped, but sustained domestic demand for gas necessitated LNG imports. Egypt's first FSRU the Hoegh Gallant, arrived at the port of Ain Sukhna in April 2015, and was followed shortly after by the BW Singapore in September of the same year. With the arrival of these FSRUs, Egypt shifted from being a traditional LNG exporter to a net importer, as the country still exports the occasional cargo from its Idku facility. Today, even with LNG imports the country has been unable to meet the entirety of its power demand, especially in summer months, when power outages can be frequent. Plans to charter a third FSRU were put on hold in late 2016, due to expectations of domestic gas projects coming online in the near future. The most significant of these is the Zohr field, which is currently the largest gas discovery in the Mediterranean and is expected to have peak production around 27.9 Bcm (20.3 million mt) per year. Most of the gas from the Zohr field is expected to be sold on the Egyptian market, according to the latest announcement from ENI, which owns the majority of the concession containing Zohr.

Pakistan

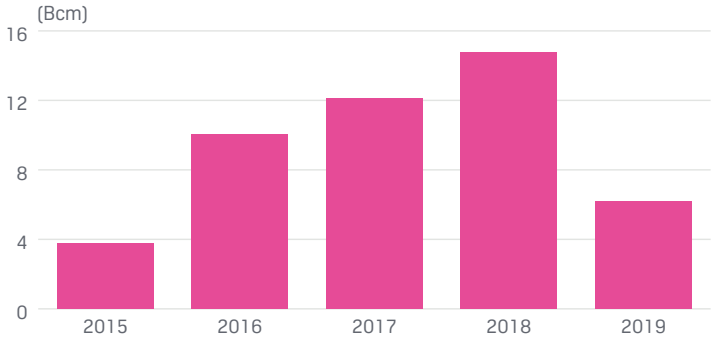
Pakistan began importing LNG in 2015 in response to growing domestic gas demand and stagnating domestic production. Natural gas makes up approximately 50% of the country's energy mix, and is currently supplied mainly through domestic production, which has hovered just above 40 Bcm (29.2 million mt) since 2010. The country's gas deficit has been estimated at 21.0 Bcm (15.33 million mt) per year, given current infrastructure, according to Platts Analytics' Eclipse Energy. Resultant power outages were estimated to cost local economy approximately 7% of annual GDP in 2015. Fundamental latent demand, however, is estimated to be as high as 43.8 Bcm (32 million mt) per year. Pakistan imported a total of 4.7 Bcm (3.4 million mt) over 2016, up more than 230% from the 1.4 Bcm (1 million mt) imported the previous year. The majority of cargoes delivered to date have come from long-term Qatargas contracts and short-term tenders. BW Group is set to deliver a second FSRU in mid-2017, which is expected to bring LNG imports to 8.0 Bcm (5.8 million mt) in 2017 and to 12.5 Bcm (9.1 million mt) in 2018, according to forecasts from Platts Analytics' Eclipse Energy. However, state-owned Pakistan LNG has said that imports could reach over 27 Bcm (19.7 million mt) by 2018, based on the potential installation of additional FSRUs. The feasibility of employing this extra import capacity, however, is dependent on the speed with which pipeline infrastructure can be connected between LNG terminals in the south and major population and industrial centers in the country's north.

JORDANIAN LNG DEMAND FORECAST



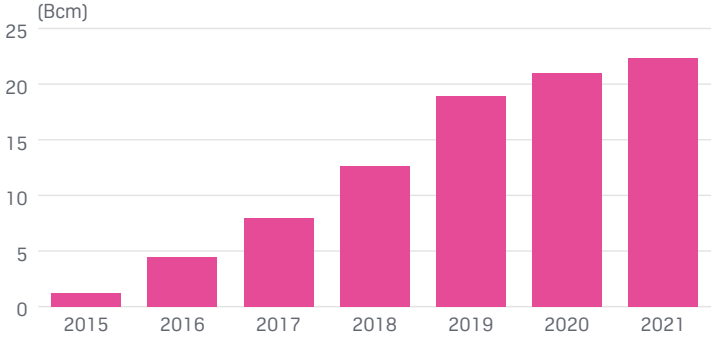
Source: Platts Analytics' Eclipse Energy

EGYPTIAN LNG DEMAND FORECAST



Source: Platts Analytics' Eclipse Energy

PAKISTANI LNG DEMAND FORECAST



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