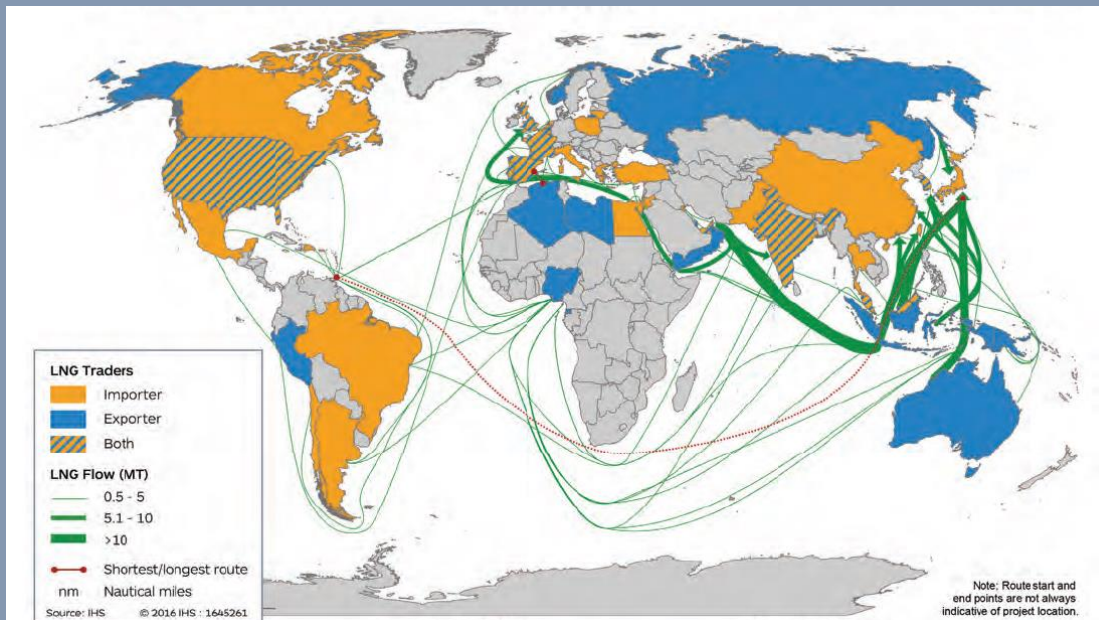


Session 2 : Market contracting in Myanmar

The global LNG market is increasingly integrated

LNG Flows, 2015



- Global LNG trade volumes reached 245 MT in 2015, up from 100 MT in 2000
- LNG represents 32% of global gas exports and 10% of global gas consumption

Source: IGU World Gas LNG Report, 2016

Key Points

Historically, the LNG market has been split into Atlantic Basin and Pacific Basin

The largest volume of trades is still within the Pacific Basin, but its share (39%) is falling

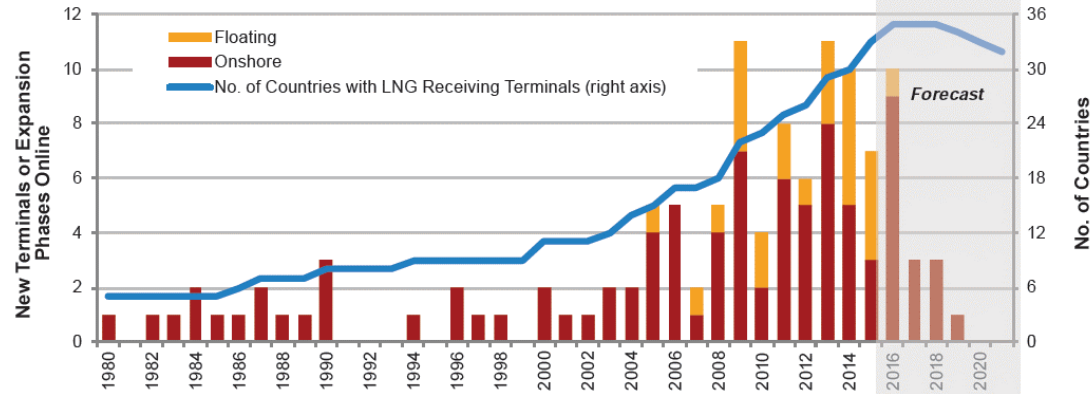
17 countries now export and 33 countries import LNG

Arbitrage across markets is increasing as the number of exporters grows and flexibility in trading increases

FSRUs are becoming the favoured import technology

LNG receiving terminals start-ups

Figure 6.3: Start-Ups of LNG Receiving Terminals, 1980-2021



Note: The decline in number of countries with LNG receiving terminals is the result of FSRU charter expirations. Sources: IHS, Company Announcements

Egypt, Jordan and Pakistan all started their LNG imports in 2015 using FSRUs

14 countries now use FSRUs, 9 exclusively so

Of 7 countries planning to become new LNG importers in the next one to two years, 5 are using FSRUs

Source: IGU World Gas LNG Report, 2016

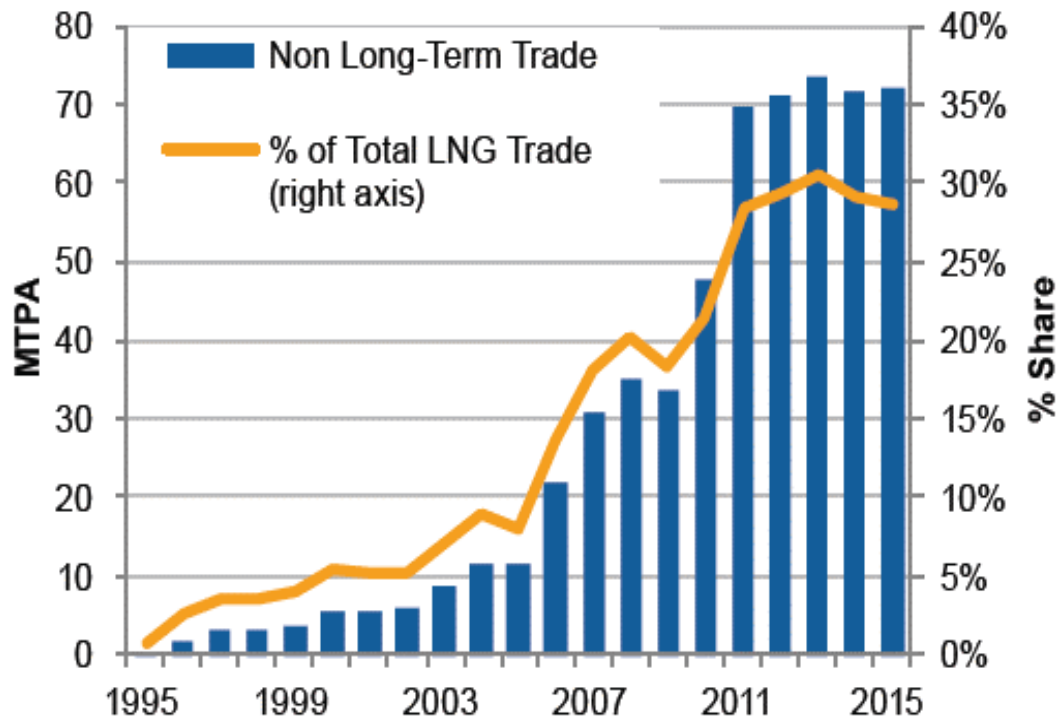
Key Points

The flexibility and speed of FSRUs is making them the favoured technology for new and smaller markets

This is creating pressures on the FSRU market with new ships becoming difficult to obtain

Short-term and spot sales are growing

Figure 3.13: Non Long-Term Volumes, 1995-2015



Sources: IHS, IGU

Source: IGU World Gas LNG Report, 2016

Key Points

Short-term (<2 years) trades reached 65.9 MT or 26% of global trade volumes in 2015

Medium-term (2-5 years) trades were a further 6 MT or 3% of global trade volumes

This growth reflects

- End of destination clauses in LNG contracts
- Over-supply in the market
- Ending of state monopolies on selling and buying LNG
- Availability of ships on spot charters

Cargoes can now be contracted at short notice

Example spot tender

National Electric Power Company of Jordan

Contract Requirements

Total Contract Volume	Two cargoes of LNG
Delivery Timing	Cargo #1 06 October 2015 through 07 October 2015. Cargo #2 12 October 2015 through 13 October 2015.
Delivery Point	LNG is to be provided on a DES (Delivered Ex-Ship) basis to the Terminal
Contract Quantity	3.0 – 3.6 Tbtu per cargo
Delivered LNG Volume	No greater than 155,500 m ³ per cargo <i>(i.e. equivalent to 160,000m³ LNGC)</i>
Other Terms and Conditions	As detailed in the MSA executed between the Bidder and NEPCO

RfP release date	12 August 2015
Deadline for NEPCO to receive MSA signed by Bidder	16 August 2015
Bid Submission Window	11:00 to 12:00 (Jordan time), 18 August 2015
Confirmation Notice executed by NEPCO	No later than 18:00 (Jordan time) on 20 August 2015

Key Points

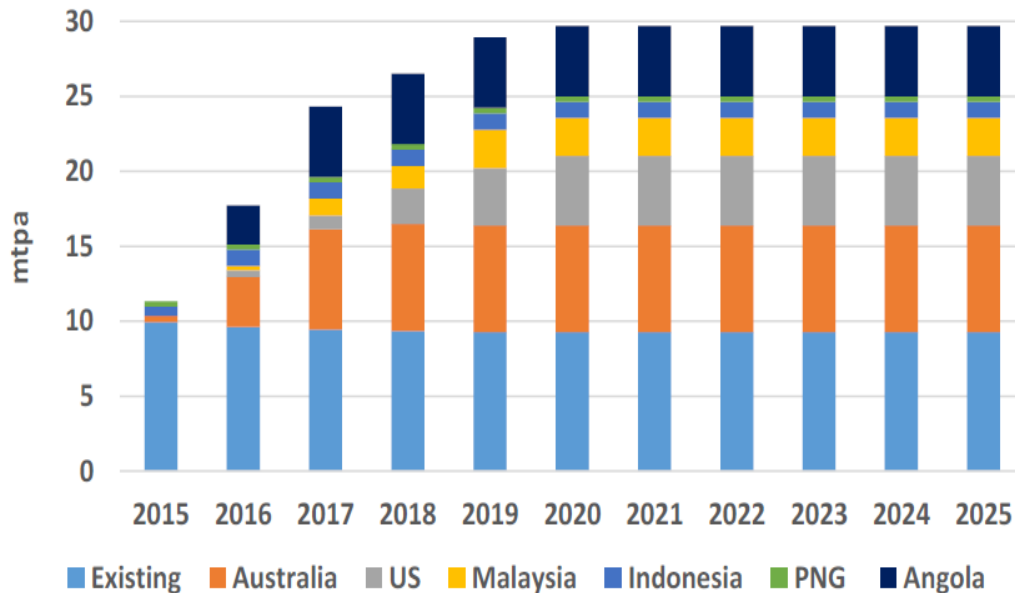
Standard terms and conditions are set out in a Master Sales and Purchase Agreement (MSPA), which must be signed by all bidders

Tenders are then issued for individual cargoes

Evaluation is on compliance with tender terms and offered prices. Preference may be given to bidders requiring less onerous credit support

Forecasts are for rises in uncontracted volumes

Figure 3 Estimated uncommitted LNG supply, 2015-25



Source: author's research. Existing includes existing uncommitted volumes from Australia, Malaysia and Indonesia.

Source: Corbeau A and D Ledesma, LNG Markets in Transition, 2016

Key Points

Much of the new Australian and US supply is not committed to specific markets

This is a combination of aggregators being willing to take on market risk and buyers being unwilling to sign new long-term contracts

The various US export terminals are being developed on a 'tolling' basis, separating the LNG seller from the terminal owner

New importers now have more flexible options

Staged development of LNG imports into Pakistan

The first six cargoes were procured on a spot basis from Qatar Gas (FOB basis)

Following this, a series of short-term contracts were competitively tendered (DES basis)

- These tenders were initially from one to six cargoes at a time with up to two cargoes delivered per month
- The first such tender was issued in early-May 2015 with the first cargo arriving in mid-July 2015

In December 2015, two tenders were issued for 60 cargoes each for delivery from January 2016 until 2020

- The winners were Shell and a Swiss-based trading company, which offered prices of 13.83% and 13.37% indexation to Brent oil prices (~\$6.5/MMBTU)

In February 2016, Pakistan State Oil signed a 15-year LNG supply contract with Qatar Gas

Key Points

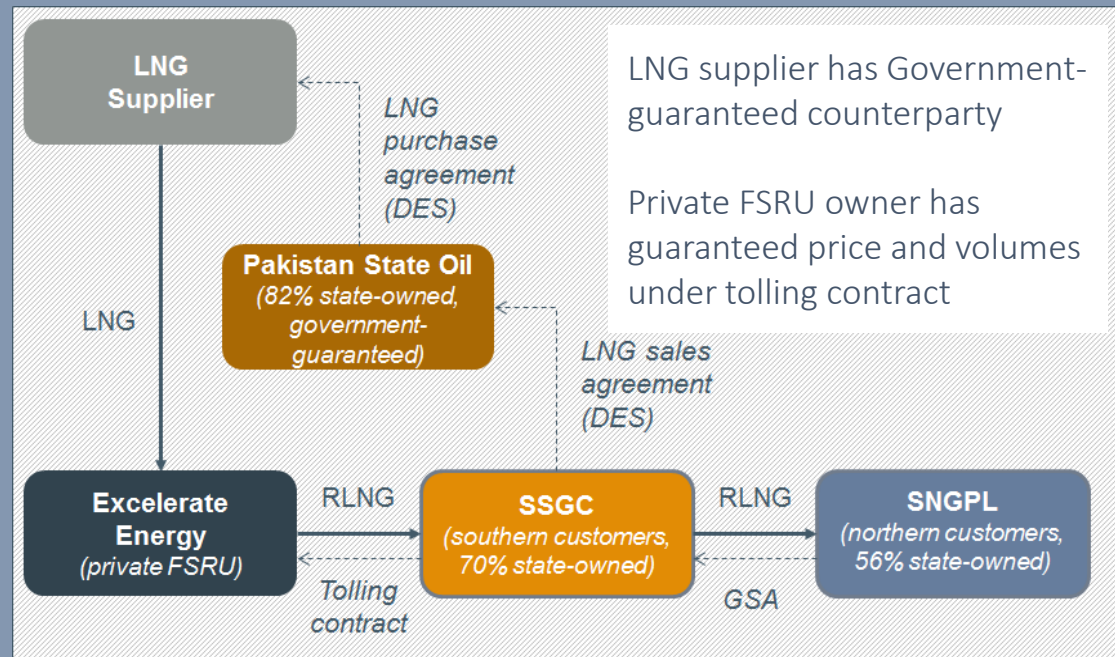
The availability of chartered FSRUs and spot and short-term LNG trades has greatly increased flexibility for LNG importers

In 2015, the new importing countries of Egypt, Pakistan and Jordan (for two-thirds of demand) all relied on short-term contacts

However, this flexibility also increases risks to investors

Pakistan's LNG policy originally anticipated that private firms would both develop LNG terminals and act as importers

In practice, risk concerns have led to Government guaranteeing terminal owners and LNG suppliers



Key Points

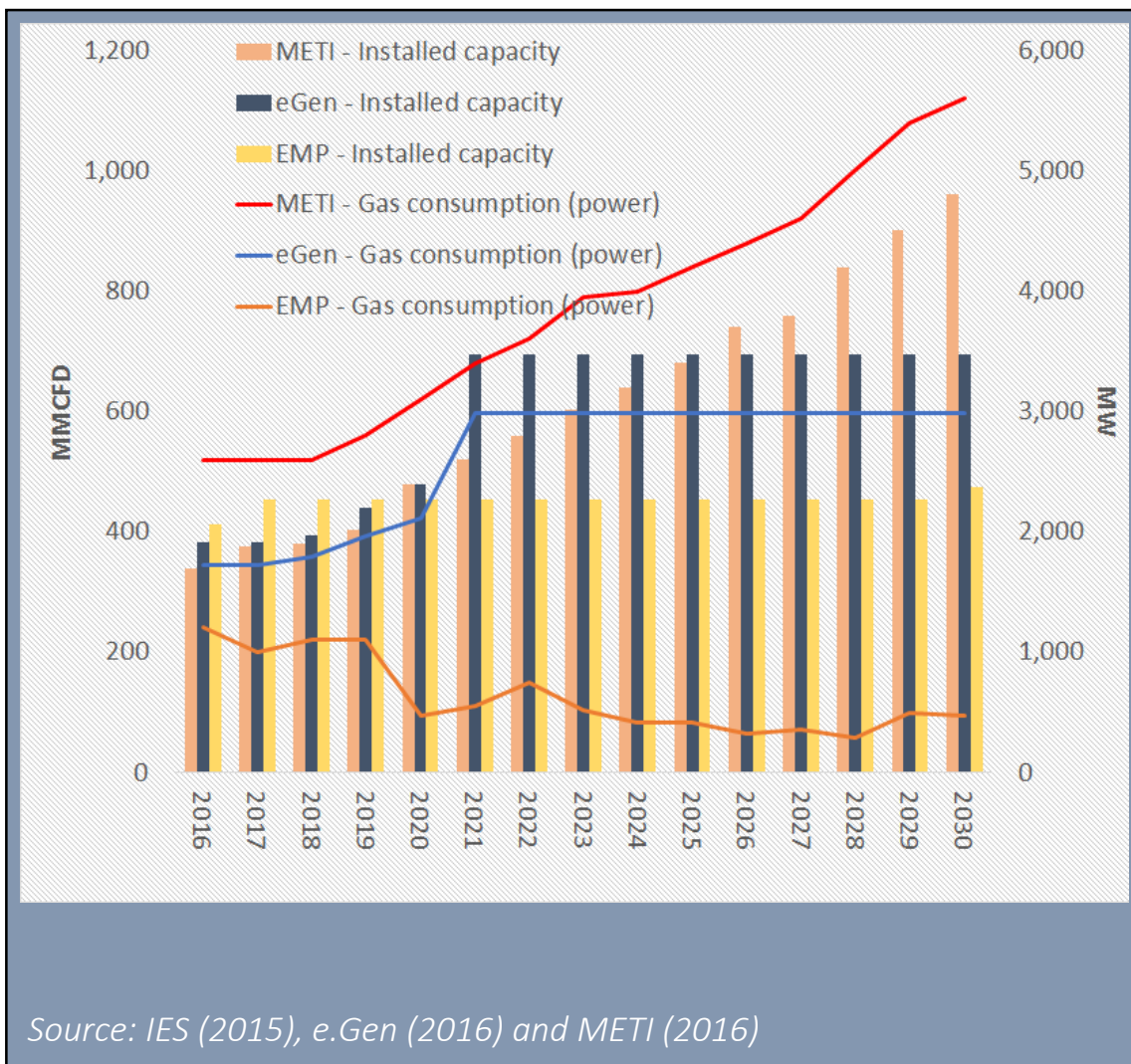
Pakistan's LNG policy originally expected private firms to be integrated LNG importers

However, no private firms were willing to assume the market and credit risks

Under the model actually implemented, the LNG terminal is privately owned under a tolling agreement

A Government-guaranteed SOE is responsible for imports to address credit risk

Gas demand and supply is uncertain in Myanmar



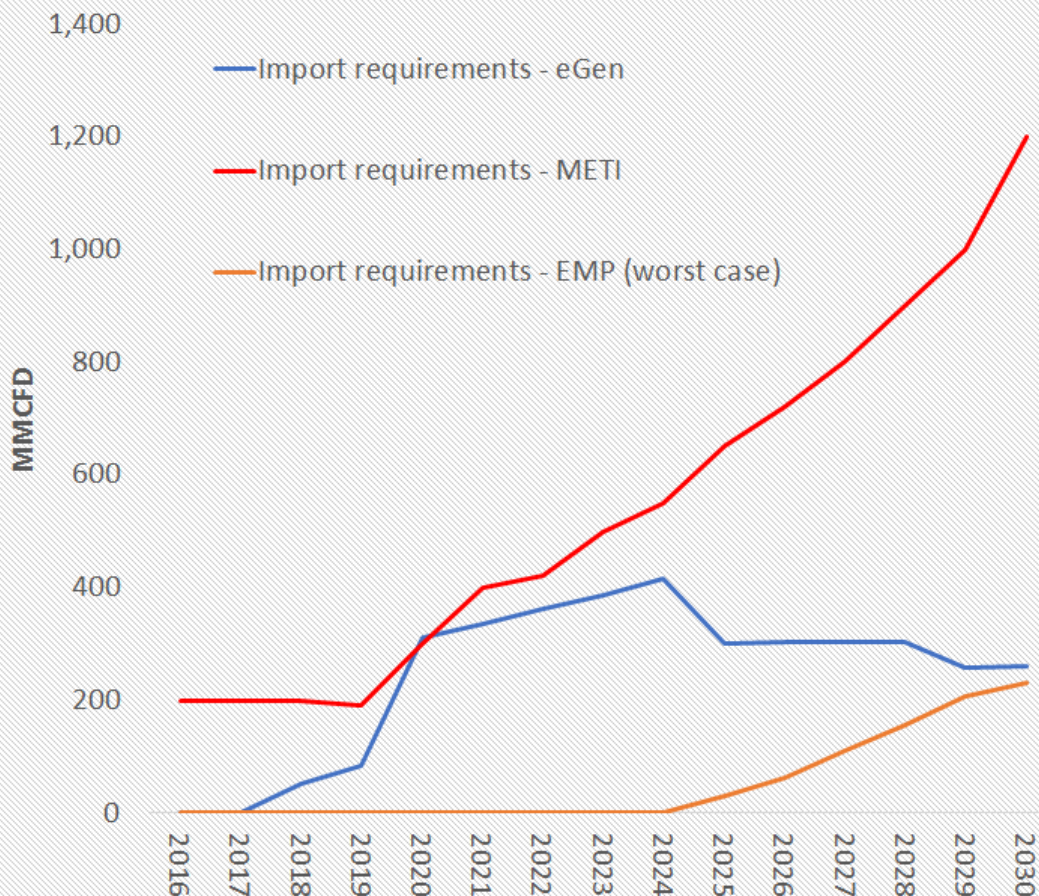
Key Points

Projections of future gas demand differ greatly across studies

Much of this is due to uncertainties over the future power expansion plan

At the same time, the rate of decline of existing fields and development of new fields is unclear

Consequently, flexibility is critical



Source: IES (2015), e.Gen (2016) and METI (2016)

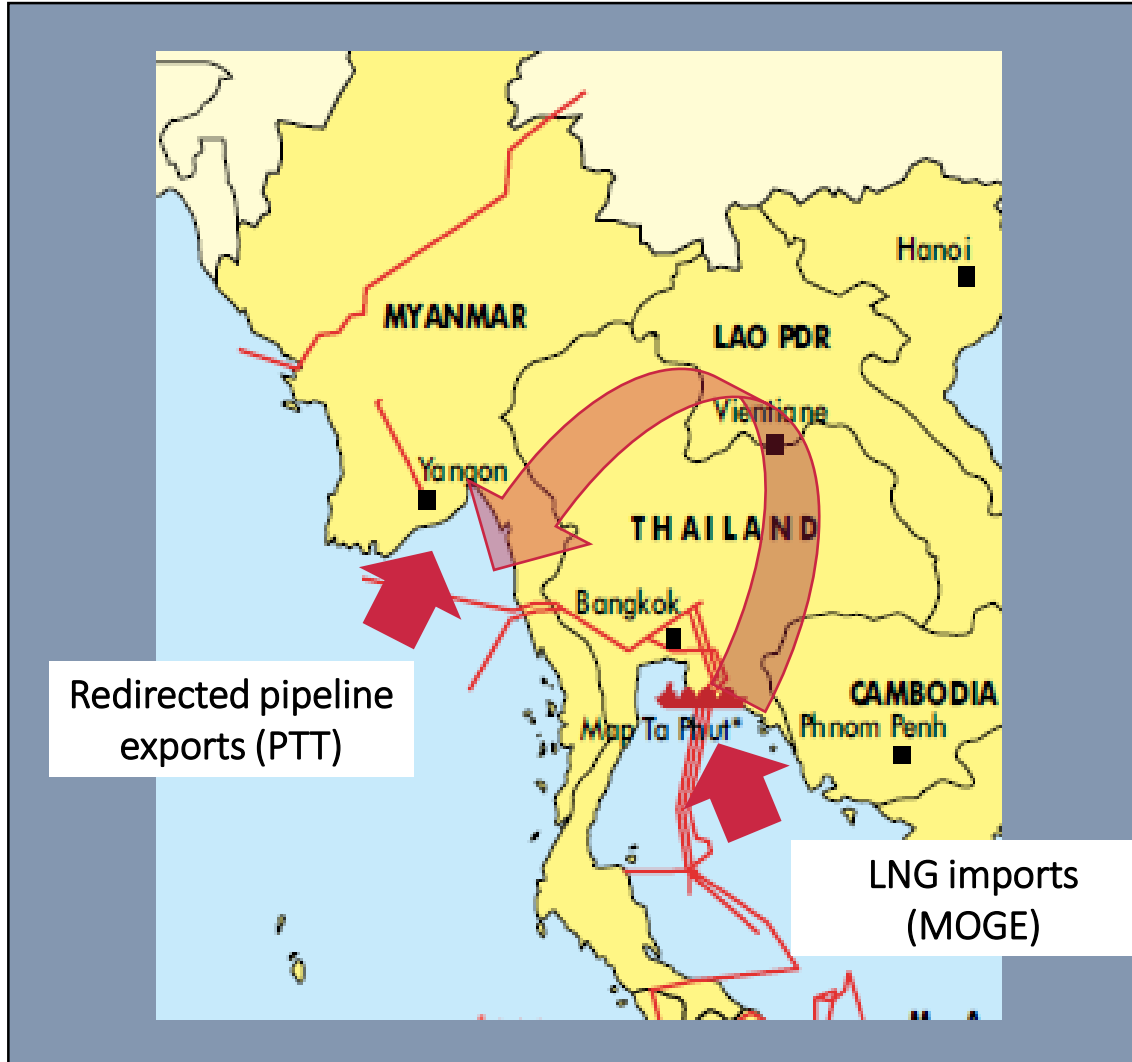
Key Points

Will the need for LNG imports rise or fall post-2020?

Under alternative projections, by 2030 Myanmar could need 1.8 MTPA or 8.4 MTPA in LNG imports

This is equivalent to the difference between 2 and 12 LNG cargoes per month

Swaps are not the solution to the short-term gap



Key points

MOGE lacks a track record in LNG procurement, meaning high risks to PTT

PTT's network does not support flowing increased LNG imports to Ratchaburi

Myanmar's own pipeline network cannot deliver increased volumes from Yadana or Zawtika to Yangon

Currently, pipelines in Myanmar are constrained

250 MMCFD limit



Source: METI, 2016

Key points

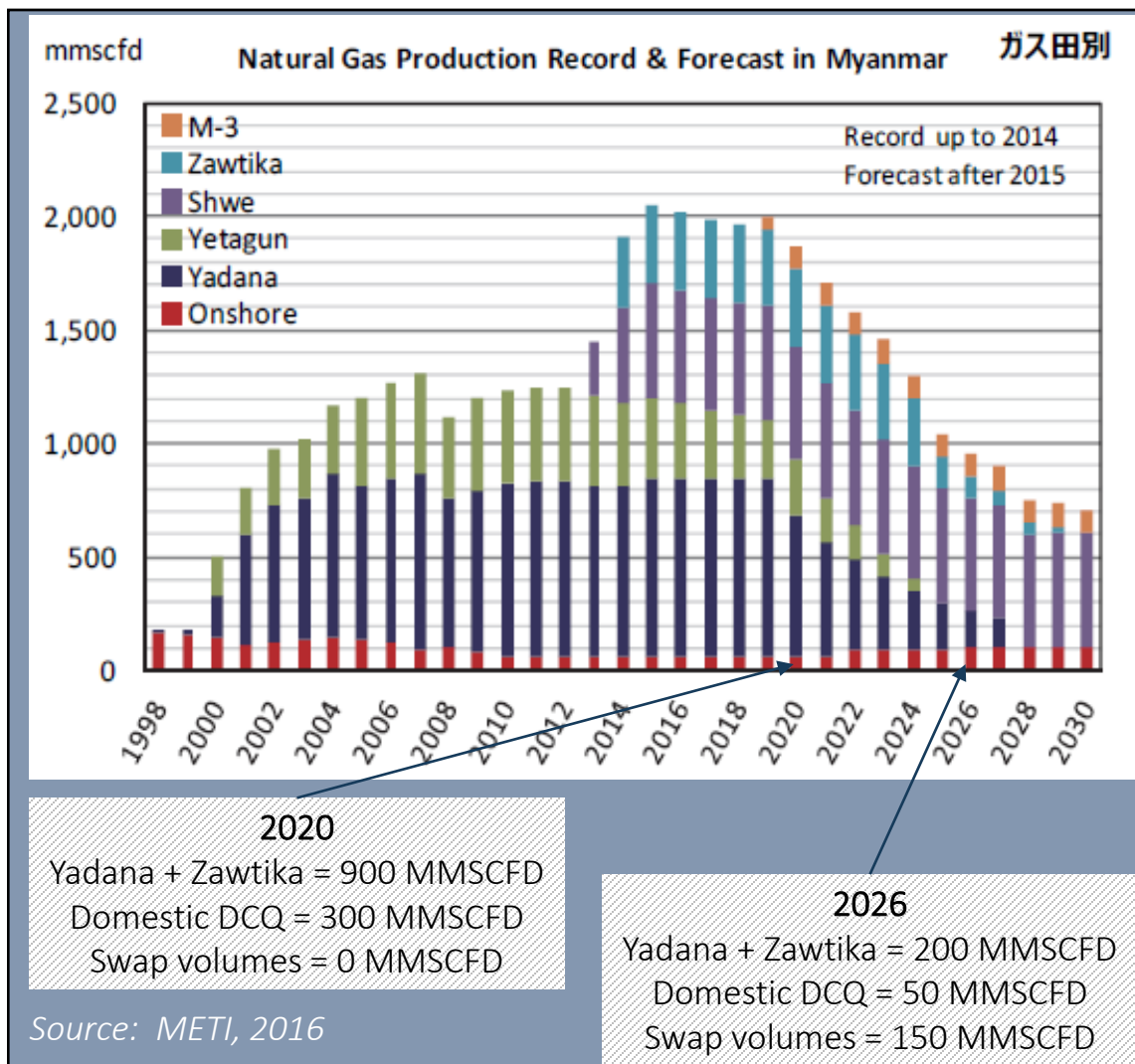
The Yadana-to-Yangon pipeline is limited to 250 MMCFD (onshore section)

The onshore pipeline from Kanbaw is limited to 100 MMCFD due to its poor condition

Both pipelines are fully utilised in peak demand months

100 MMCFD limit

In the medium-term, swaps become technically feasible



Key points

Additional LNG cargoes are imported into PTT's proposed import terminal in Myanmar

These substitute for pipeline exports, allowing redirection of this gas

However, the advantages to Myanmar are limited. Production from Yadana and Zawtika is declining, meaning the volumes of swapped gas rapidly reduce

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