LNG Demand Outlook in Asia; Indonesia Outlook

PT Pertamina (Persero)

JCCP-15
24 July 2018 - 1 August 2018
South Asia, ASEAN and China will drive the LNG demand growth out to 2030

LNG Outlook 2016-2030, Million tonnes per annum (MTPA)

~95% LNG Demand Growth coming from China, India and ASEAN

S. Asia

ASEAN

China

Middle East

Europe

North America

Japan Korea Taiwan

1 Includes US, Canada and Mexico
2 Include Bangladesh, India and Pakistan

Contractual preferences have moved to shorter durations and smaller volumes; oil indexation remains prevalent outside the EU

Portfolio composition
% of total LNG buyers

Key insights
• Buyers’ future preferences for long-term contracts are shifting to shorter duration and smaller volumes, while DES contracting remains prevalent.
• A straight preference for Henry Hub indexing has subsided vs. 1-2 years ago, in favor of hybrid formulas to better balance exposure.
• Marked regional differences exist in a few dimensions:
  – A preference for gas hub indexing is pervasive in Europe, in SE Asia oil linkage dominates.
  – Open tenders may prevail in M. East and S. America.

1 Includes NBP/TTF and Henry Hub

By 2030, Indonesia would need to rely on imported LNG (equivalent to ~2.5-4 bcfd) to replace the decline in domestic gas supply.

1 Contracted PNA import supply (Corpus Cristi, TGPL, Woodside, Exxon)
ASEAN countries are investing in new infrastructure development to anticipate this increase of LNG Demand

**Regas Infrastructure**

<table>
<thead>
<tr>
<th>Name</th>
<th>Capacity</th>
<th>Operated Year</th>
<th>Owner</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSRU Jawa Barat</td>
<td>3.0</td>
<td>2012</td>
<td>Pertamina</td>
</tr>
<tr>
<td>FSRU Lampung</td>
<td>3.0</td>
<td>2015</td>
<td>PGN</td>
</tr>
<tr>
<td>Arun (Aceh)</td>
<td>3.0</td>
<td>2014</td>
<td>Pertamina</td>
</tr>
<tr>
<td>FSRU Jawa Tengah</td>
<td>3.0</td>
<td>2020+</td>
<td>Pertamina</td>
</tr>
<tr>
<td>Lekas (Malaca)</td>
<td>3.8</td>
<td>2013</td>
<td>Petronas</td>
</tr>
<tr>
<td>Lahad Datu (Sabah)</td>
<td>0.8</td>
<td>On hold</td>
<td>TBC</td>
</tr>
<tr>
<td>Pengerang (Johor)</td>
<td>3.8</td>
<td>2018+</td>
<td>Petronas</td>
</tr>
<tr>
<td>Batangas FSRU</td>
<td>4.0</td>
<td>2020+</td>
<td>PNOC</td>
</tr>
<tr>
<td>Jurong Island</td>
<td>9.0</td>
<td>2013+</td>
<td>SLNG</td>
</tr>
<tr>
<td>Ma Ta Phut</td>
<td>10.0</td>
<td>2011+</td>
<td>PTT</td>
</tr>
<tr>
<td>Thi Vai</td>
<td>1.0</td>
<td>2020+</td>
<td>PV Gas</td>
</tr>
<tr>
<td>Bin Thuan</td>
<td>10.0</td>
<td>2020+</td>
<td>PV Gas</td>
</tr>
</tbody>
</table>

**Pipeline Infrastructure**

<table>
<thead>
<tr>
<th>Connected Countries</th>
<th>Capacity mmscfd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia-Malaysia-Singapura</td>
<td>150/250</td>
</tr>
<tr>
<td>Indonesia (Sumatra)-Singapura</td>
<td>350</td>
</tr>
<tr>
<td>Perbatasan Myanmar-Thai</td>
<td>410/565</td>
</tr>
<tr>
<td>Thailand-Malaysia</td>
<td>750</td>
</tr>
<tr>
<td>Malaysia-Vietnam</td>
<td>270/300</td>
</tr>
</tbody>
</table>

SOURCE: IEA, Enerdata
Pertamina is building a global LNG portfolio leveraging its capabilities (LNG infrastructure, commercial) and strong market position

Pertamina’s business model in LNG value chain

- Trusted LNG and Regas developer and operator
- Reputed LNG marketer
- Respected partner in LNG and Power value chain
- Building gas and power and Retail LNG business model
Pertamina has a comprehensive presence across the gas value chain

Gas business

**Pertamina Gas**
- Transportation of natural gas through pipeline network
- ~2,130 km of gas pipelines
- Subsidiary in gas trading business: Pertagas Niaga

**PT Badak (Bontang)**
LNG provider Kalimantan

**Donggi Senoro (DS) LNG**
LNG provider Sulawesi

**PT Nusantara Regas**
JV Co with PGN, operating floating storage facilities and regas terminals

**PT Perta Daya Gas**
LNG provider East Indonesia
Mini LNG storage and regas

**PT Pertamina Power Indonesia**
Gas and NRE power plants

**PT Pertamina Gas**
- LNG receiving terminal and regasification

**PT Perta Arun Gas**
LPG, NGL and CNG plant
Key priorities for Pertamina Gas business

**Set up affordable gas infrastructure and innovative solution**
- 2120 kms of Transmission and distribution lines
- 800 mmScfd Regas infrastructure
- LNG parcel in portable tanks

**Competitive sourcing of LNG molecules**
- Balanced portfolio in term of contract duration, indexation and sources

**Accelerate domestic gas commercialization**

**Provide reliable and affordable gas to end customer**
- Cost effective construction of distribution pipelines

**Increase Pertamina Global LNG footprint**
- Minority share ownership in LNG-backed infrastructure
- Partnership with global players
Pertamina is bringing LNG parcel in portable tank to the customer gate (virtual pipeline)
Pertamina has established itself as global LNG portfolio player

LNG & Gas supply

- International LNG Supply
- Domestic LNG Supply
- Domestic Pipelines Gas

Pertamina as Global portfolio LNG player:
- Secure long term LNG and Gas supply
- LNG Spot trading, short term and long term
- Taking calculated risks to deliver profit

LNG & Gas Offtakers

- Electricity Demand
- Captive Refinery Demand
- Domestic Industry
- Existing International Buyers
- Emerging LNG markets

Source: Pertamina
Main challenges in the gas industry in Indonesia

Pipeline Gas
- Limited long-term gas supply
- Mismatch between supply-demand locations
- Field development timeline is not in line with market needs
- Field economics not compatible with price regimes in domestic gas market

LNG
- Long-term supply commitments must be decided and finalized 4-5 years before delivery to ensure alignment with development of LNG infrastructure
- Inadequate infrastructure
- Overlap in infrastructure development: planning and utilization of infrastructure not optimized yet
- Complex land acquisition process
- Gas infrastructure master plan is not aligned with supply-demand profile
- Difficult to make long-term demand projections
- Anchor customers are more likely to be traditional consumers
- Demand is strongly influenced by:
  - Electricity supply plan by PLN
  - Global prices (not Indonesia-specific) for fertilizer

- Unavailability of gas/LNG import policy in Indonesia
- Currency exchange risks
- Absence of fiscal incentives
- Absence of regulations that will govern reasonable margins

- Fixed price with annual escalation
- Price indexation with the crude oil price
- Indexation of the product price

Pricing
Regulation
Demand
Infrastructure
Supply
Challenges
HUMAN CAPITAL DEVELOPMENT as A FUNDAMENTAL to SUPPORT GAS GROWTH IN PERTAMINA

MAN POWER STRENGTH (GAS DIVISION)

Staffing Status

33.82% Occupied
66.18% Vacant

By Age

Occupied Vacant

26-30 31-35 36-40 41-45 46-50 51 above

Commercial

51
26

Engineering

39
20
Main Challenge – Human Capital Development

1. Demographic Issue

Generation Gap
✓ About 10% of the employee will retire in the next 5 years
✓ Competency Acceleration in order to overcome the gap generation

2. Culture
✓ Silo wall within organization in Pertamina
✓ How to break silo?

3. Global LNG Business
✓ How to Survive in the VUCA World?
  V = Volatile
  U = Uncertainty
  C = Complexity
  A = Ambiguity
✓ Agility as a new core competency
Talent Development Acceleration in Pertamina

ENTRY LEVEL
- General Skill
- Technical Skill

MID LEVEL
- Technical Skill
- Leadership Skill

HIGH LEVEL
- Global Leadership

Development Program
- EPDP (Early Professional Development Program)
- LNG Global Venture Academy
- People Leader Development Program
- PGEDP (Pertamina Global Executive Development Program)
Able to compete both regionally and internationally, support growth through investment, build cost effective and performance oriented culture.

Involve in national economic development as a pioneer in State owned Enterprises’ reformation, and build national pride.

Focus on customers and commit to give the best service to customers.
2018年7月25日プレゼンの様子@JCCP