Changing Asian Gas Markets
Chong Zhi Xin, Lead Gas Analyst, South East Asia Gas & Power Research
## Contents

<table>
<thead>
<tr>
<th></th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Asia Pacific LNG outlook</td>
</tr>
<tr>
<td>2</td>
<td>Next sources of supply</td>
</tr>
<tr>
<td>3</td>
<td>Challenges facing South East Asia</td>
</tr>
</tbody>
</table>
Global LNG demand growth is forecast to be robust, driven by the Pacific Basin

Global LNG Demand Forecast

- **Pacific Basin**: CAGR: 6%
- **Atlantic Basin**: CAGR: 3%
- **Global**: CAGR: 5%

Source: Wood Mackenzie LNG Tool Q1 2013
Pacific Basin LNG demand is characterised by strong growth and increased diversity from emerging markets

Asian LNG Demand

- Japan, South Korea, Taiwan
- China
- India
- South East Asia
- Others

Demand Drivers

- Japan, South Korea, Taiwan: Impact of Fukushima had drastically changed the demand outlook for LNG
- China: Gas price reform will encourage increased LNG demand growth
- India: Reduction in domestic gas production hampers market development as less gas is available to the power & fertiliser sector
- South East Asia: South East Asia demand for LNG will increase as they face the prospect of declining production post-2020.

Source: Wood Mackenzie LNG Tool Q1 2013

© Wood Mackenzie 2013
Some of this demand is already covered by ‘contracted’ supplies

Pacific Basin Contracted and Uncontracted LNG Demand

Emerging markets drive future outlook

Japan has driven the current market imbalance

Source: Wood Mackenzie LNG Tool Q1 2013

Contracted LNG Demand  Uncontracted  Total

© Wood Mackenzie  5
<table>
<thead>
<tr>
<th></th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Asia Pacific LNG outlook</td>
</tr>
<tr>
<td>2</td>
<td>Next sources of supply</td>
</tr>
<tr>
<td>3</td>
<td>Challenges facing South East Asia</td>
</tr>
</tbody>
</table>
Near-term there is limited uncontracted supply available in the Pacific Basin, however this changes further out indicating two distinct market windows.

Pacific Basin Uncontracted LNG Supply/Demand Balance

- Pacific Basin short of supply with various options for buyer to fill the gap:
  - Atlantic Basin ‘Portfolio’ suppliers
  - Qatari “diversion volumes”
  - Redirections & reloads

- Significant potential volume within the Basin Potential for US/Atlantic volumes to come to Asia

Could create some downward pressure on long-term pricing, but cost of supply remains a critical stabilising factor.

Excludes ‘flexible’ Qatari “diversion” volumes that are ‘allocated’ to the Atlantic Basin and any other Atlantic volumes.

Source: Wood Mackenzie LNG Tool, Q1 2013
Significant gas discoveries around the world are paving the way for new entrants into the LNG club

Emerging LNG Supply Plays

- **30+ tcf gas in East Med**
  - The Levant Basin has been prolific in terms of new discoveries

- **50+ tcf gas in East Siberia**

- **100+ tcf gas in East Africa**
  - East Africa is potentially the next “big” LNG play

- **Shale gas in North America underpins numerous US and Canadian proposals**
  - >250 mmtpa US LNG exports proposed
  - >50 mmtpa Canada LNG exports proposed

Source: Wood Mackenzie Global Gas Service
## Contents

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Asia Pacific LNG outlook</td>
</tr>
<tr>
<td>2</td>
<td>Next sources of supply</td>
</tr>
<tr>
<td>3</td>
<td>Challenges facing South East Asia</td>
</tr>
</tbody>
</table>
Majority of new gas discoveries in South East Asia are located far away from demand centres

- Gulf of Thailand
- Offshore Peninsular Malaysia
- Central and South Sumatra
- Cu Long and Nam Con Son Son Vietnam
- Sabah & Sarawak
- Kalimantan, Sulawesi and Papua East Indonesia
South East Asia regasification terminals has taken off over the last few years

Source: Wood Mackenzie South East Asia Gas & Power Service
Resulting in the region exporting and importing LNG at the same time

Supply - Demand

South East Asia Gas Balance

Source: Wood Mackenzie SE Asia Gas & Power Service
South East Asia will emerge as a major LNG market but governments need to take steps to reform gas prices

South East Asia LNG Demand Forecast

Asia LNG Market Share in 2025

Source: Wood Mackenzie SE Asia Gas & Power Service

Source: Wood Mackenzie LNG Tool
Governments will have to grapple with keeping prices affordable yet attracting investments in the energy sector.

### South East Asia’s dilemma

- **Cost-Reflective**
  - Partially Subsidised
  - Cost-Reflective Economy
- **Fully Subsidised**
  - Heavily Subsidised
  - Partially Subsidised

### Strategies employed in South East Asia

- **Vietnam**
  - Subsidies in both power and gas sector will hamper foreign investment which are leading to problems in the future
- **Malaysia**
  - Electricity prices are reflective of fuel costs but PETRONAS is selling gas below their cost of production
- **Thailand**
  - Uses an average gas price mechanism that feeds into electricity tariffs
- **Singapore**
  - No subsidies in the gas and power sector. Government actively moves industries towards higher margin products
- **Indonesia**
  - Reformed gas prices to incentivise upstream exploration and production

*Source: Wood Mackenzie South East Asia Gas & Power Service*
Conclusions

Summary and Conclusions

Global LNG demand growth is led by the Pacific Basin

Supply tightness experienced this decade will be eased beyond 2019 especially as US supply delivers

South East Asia will emerge as a major LNG demand centre as governments develop the import-export model

However, countries will need to balance LNG demand with keeping prices affordable
Wood Mackenzie is the most comprehensive source of knowledge about the world’s energy and metals industries. We analyse and advise on every stage along the value chain - from discovery to delivery, and beyond - to provide clients with the commercial insight that makes them stronger. For more information visit: www.woodmac.com