Growing Oil Demand and SPR Development in Asia

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Outlook of World Oil Demand

(Reference Case)

Source: IEEJ (Asia/World Energy Outlook 2012)
Competition for Access to Energy Resources

Outlook of Oil Import in Asia

- Growing import dependence is perceived as “vulnerability”
- Strategy being taken as a counter measure:
  - Domestic energy resource development
  - Energy diversification
  - Overseas resource development
  - Promotion of NOCs
- Excessive (exclusive) pursuit of “Mercantilist” approach may lead to politicize and destabilize world energy markets
- Behavior of emerging giants attracts attentions in global energy community

Oil import in China will increase to 13.1 million B/D in 2035, followed by India (7.0 million B/D) and other developing Asia, mainly ASEAN.

Source: IEEJ (Asia/World Energy Outlook 2012)
Recent Oil Price Volatility

Crude oil price remains volatile throughout 2011-2012

- Brent futures price average in 2012 resulted in 111.7$, WTI for 94.2$
- Price fluctuation at “high level” in the last two years
- Brent topped 120$ during Feb-Mar 2012 due to impacts of geopolitics
- Euro Zone crisis put downward pressure after May 2012
- Brent stayed at about 110$ (WTI at 80-90$) after Oct 2012

Source: NYMEX data, etc.

- Continued up-swing in prices
- Sharp drop after Rehman shock
- Price rise under geopolitical tensions
- Rebound from the bottom
- Box range fluctuation
- Price drop under Euro crisis
- Euro Zone crisis hit oil price

Graph showing oil price fluctuations from Jan-07 to Dec-13.
Instability in the Middle East

Uncertainty over Middle East Peace issues

Iraqi situations after the war

Tensions on Iran Nuclear development

Rising energy demand and its impacts

Impacts of “Arab Spring”

Growing Anti US sentiments in Arab and Islam society

Domestic challenges for existing rulers and regimes

Terrorism, threats to energy production and exports

Source: Prepared by IEEJ
SPR Program in China

- Phase 1: A total storage capacity of 103 Million Barrels (MB) at four sites was completed in March 2009.
- Phase 2: (under construction since September 2009)
  - Original plan: A total storage capacity of 169 MB at eight sites and expected to be completed in 2015.
  - Upgrade plan: Capacity upward revision to about 210 MB to be completed in 2013.
  - Latest update: Capacity downward revision to about 177 MB to be completed in 2015.
- SPR fill rate is expected at about 200 KBD with considerable lower/higher range band.
- Phase 3: (Plan from now on)
  - A total storage capacity of about 177 MB is set to begin in 2013, expected to be completed by 2020.

(Note) Phase 1: blue-colored box, Phase 2: yellow-colored box
SPR Program in India

- All the projects are delayed by various reasons.
  - Visakhatnam of 0.3 MT portion is expected to be completed in March 2013
  - Mangalore is expected to be completed in December 2013
  - Padur is expected to be completed in April 2014

- Additional 12.5 MT capacity construction is being planned for Padur (5MT) and Chandikhol, Rajkot and Bikaner (2.5MT each)

<table>
<thead>
<tr>
<th>Site</th>
<th>Planned Completion year</th>
<th>Capacity (Million tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visakhatnam</td>
<td>2012</td>
<td>1.33</td>
</tr>
<tr>
<td>Mangalore</td>
<td>2012</td>
<td>1.5</td>
</tr>
<tr>
<td>Padur</td>
<td>2012</td>
<td>2.5</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>5.33</td>
</tr>
</tbody>
</table>
### ASEAN Oil Stockpile Roadmap

<table>
<thead>
<tr>
<th>Country</th>
<th>Inventory Level 1,000KL (Year)</th>
<th>Inventory Level Day cover</th>
<th>Stockpile Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td>90 (2010)</td>
<td>30 days</td>
<td>• To maintain current 30 days stock obligation</td>
</tr>
<tr>
<td>Indonesia</td>
<td>3,510 (August 2011)</td>
<td>21 days</td>
<td>• To maintain current 23 days stock obligation</td>
</tr>
<tr>
<td>Laos</td>
<td>50 (2010)</td>
<td>25 days</td>
<td>• To increase stock day cover up to 30 days in 2020, and further up to 40 days in the future</td>
</tr>
<tr>
<td>Myamme r</td>
<td>260 (2010)</td>
<td>71 days</td>
<td>• To increase stock level up to 500,000 KL to cover 86 days in 2020, and further up to 520,000 KL in 2025</td>
</tr>
</tbody>
</table>
| Phillipines | 2,060 (2010)             | 43 days                   | • To maintain current stock obligation (15 days for oil company)  
• A plan is being discussed to establish 30 days national stockpile |
| Thailand | 6,800 (June 2010)             | 45 days                   | • To maintain current 36 days stock obligation  
• A plan is being discussed to increase stock obligation up to 45 days in 2013, and further up to 90 days in the future |
| Vietnam  | 1,800 (2010)                  | 37 days                   | • National Stockpile Master Plan is approved by PM  
• Stockpile level to be increased to cover 90 days import in 2015, and stock level to be further increased to maintain 90 days import cover |