Session 1 : Exploring the Opportunity

Global Unconventional Gas Opportunities

By:
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1. Introduction – Brief on IGU
2. Energy View – (Unconventional) Gas
3. Unconventional Gas Opportunities
4. Closing Remarks
IGU as THE spokesman for the gas industry

- Worldwide and non-profit organisation established in 1931
- Promotes technical and economic progress of the gas industry
- Emphasising sound environmental performance worldwide
- Increased focus on strategic, policy issues and gas advocacy
- Cooperation with IEA, United Nations, World Bank, IEF and others
IGU members represent 95% global gas sales

As of April 2011

- 74 Charter members
- 35 Associate members
- 11 Affiliated members
1. Introduction – Brief on IGU

IGU in the 2009 – 2012 Malaysian Triennium

**IGU MANAGEMENT TEAM**
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- Vice President
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Fossil fuels will still dominate for decades
Natural gas will be the fastest-growing major fuel source through 2030

Coal is abundant and cheap but environmentally unacceptable.
Most vehicles still depend on petroleum products.
Renewables are growing rapidly but remain expensive.
Gas becomes plentiful and geographically diverse
Recoverable unconventional gas resources match conventional natural gas

- With unconventional, global gas resources reach 250 years of current production.
- In each region, gas resources exceed 75 years of current consumption.

Source(s): IEA 2011
Conventional and unconventional gas recoverable gas resources can supply for 250 years of current global gas consumption.

The enormous scale of gas is necessary to meet the world’s rising energy needs.

Source(s): ExxonMobil 2010
Unconventional gas production is most likely to take off in Asia first.
Opportunities to meet domestic’s surging energy needs and for the nation’s energy security.
The share of natural gas in Asia Pacific’s energy mix accounted for 10% in 2010 as compared to the global natural gas’s share of 23%.

Accelerating economies of the Asia Pacific region have sparked a ferocious appetite for energy sources. China will be the largest gas use dominator with about 35% by 2030.
Unconventional gas now accounts for over half of total US gas production with tight gas is the leading one, and shale gas is the fastest.

Increased reliance on imported gas especially LNG that will make up for more than 1/3 of the Asia Pacific region’s gas supply in 2030.
Unconventional gas worldwide potential
The US experience highlights several key success factors need to be in-place

- Its play varies on a play-by-play basis. Understanding the above ground risks is vital!

### US Unconventionals

<table>
<thead>
<tr>
<th>Geology</th>
<th>Technology</th>
<th>Licensing &amp; Regulation</th>
<th>Land Access</th>
<th>Competition</th>
<th>Service Sector</th>
<th>Infrastructure &amp; Markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Established thick shale deposits with high organic content at accessible depths.</td>
<td>Highly competitive environment pushing technology.</td>
<td>Regulatory agencies quick to understand and react to operators needs.</td>
<td>US land owners own their mineral rights - facilitates land access.</td>
<td>Open market, multiple players. Open licensing of acreage.</td>
<td>Service sector highly developed/competitive with 600 rigs able to drill horizontal wells.</td>
<td>US gas suppliers have access to a vast liberalised pipeline transmission system.</td>
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### China Unconventionals

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<td>With only a very small number of shale gas wells drilled, we do not know the true potential.</td>
<td>Lack of a competitive environment slows the pace of transfer; limited horizontal drilling.</td>
<td>NDRC cautious and conservative. Shale gas regulation under consideration.</td>
<td>State holds mineral rights. Land ownership is complex.</td>
<td>CBM PSCs require local partner (changing?). The first shale gas licensing round has been commenced.</td>
<td>Supply chain is limited – scaling up drilling fleets will take time and add cost pressures.</td>
<td>PetroChina / Sinopec dominate – no third party access</td>
</tr>
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Source(s): Wood Mackenzie 2011, BERNSTEIN RESEARCH 2011
Unconventional gas worldwide potential
Hurdles remain to be addressed despite optimism

- Reserves certification & subsurface data
- Challenges specific to unconventional gas production
- Production ramp up, infrastructure
- Land access and environmental compliance
- Water sourcing and disposal
- Resources – technology transfer, labour, materials, and plant
- Market pricing, lack of liquids to support revenue

Source(s): Wood Mackenzie 2011
3. Unconventional Gas Opportunities

Its future outlook as the catalyst for energy mix
What unconventional gas makes possible…

- Ensures the nation’s long term energy security
- Provides implications for pipeline gas and LNG
- Enhances sentiment among local players
- Reduces climate change risk
- Creates wealth, jobs and investment
IGU Message on Natural Gas

- It is abundant, affordable and acceptable
- Clean, efficient, versatile and environmental friendly fuel
- Continue to play a substantial role in global energy demand
- Basis for a sustainable economic growth

Natural gas – major part of the long term energy solution
4. Closing Remarks

The 25th World Gas Conference (25th WGC)

“GAS: SUSTAINING FUTURE GLOBAL GROWTH”

Kuala Lumpur Convention Centre
4 to 8 June, 2012

www.wgc2012.com/, www.igu.org/

THANK YOU FOR YOUR KIND ATTENTION!