Electricity & Gas
Energy & Energy Services

International Development

Executive Training Programme for Young Energy Leaders

Energy Charter Secretariat

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INTRODUCTION

- Some facts about electricity & gas
- Energy Systems & Regional Integration
- Doing business in the international arena
- Investment approach
- Conclusions
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Global exchanges intensify, mainly through LNG

Main natural gas exchanges in the world in 2011 (Gm³)

Sources: Cedigaz, CISStat, GIIGNL, Waterborne
Gas prices remain regional despite the growth of LNG

<table>
<thead>
<tr>
<th>Region</th>
<th>Pricing System</th>
<th>Markets</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Very low gas prices in the US</strong></td>
<td>3-6 $ / Mbtu*</td>
<td>EU - Canada, South America</td>
</tr>
<tr>
<td>European Union - Canada</td>
<td>Liquid market, &quot;gas to gas&quot; competition approach, Benchmark market Henry Hub</td>
<td></td>
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<tr>
<td><strong>Two more pricing systems in Europe</strong></td>
<td>8-12 $ / Mbtu*</td>
<td>United Kingdom and the Netherlands, Rest of Europe</td>
</tr>
<tr>
<td>United Kingdom and the Netherlands</td>
<td>Liquid market model, Benchmark market: TTF (Netherlands), UK: &quot;gas to gas&quot; NBP market price</td>
<td></td>
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<tr>
<td>Rest of Europe</td>
<td>But a convergence toward market benchmarks, with the exclusion of a few poorly interconnected zones</td>
<td></td>
</tr>
<tr>
<td><strong>In Asia, oil indexing that is being challenged, but doesn’t seem to have an alternative at this stage</strong></td>
<td>14-16 $ / Mbtu*</td>
<td>Japan – South Korea – Taiwan, China - India</td>
</tr>
<tr>
<td>Japan – South Korea – Taiwan</td>
<td>Importer approach, (transfer of costs to the customer), Oil indexation very much in the majority</td>
<td></td>
</tr>
<tr>
<td>China - India</td>
<td>Important growth in electricity demand, affecting needs in fuel, including gas</td>
<td></td>
</tr>
</tbody>
</table>

* Mbtu: Million de british thermal unit (1 Mbtu = 22.5 tonnes of oil equivalent) Sources: CEEME / GDF SUEZ
E&P full cycle present a long time to market. Average discovery to production time in the industry is >10 years for oil and >30 years for gas.
Large difference in electricity needs between global regions

Trends in electricity consumption (TWh)

Sources: Actuals: Enerdata – Forecasts: IEA, WEO 2012
Specific electricity mixes by region depending on energy resources and policies

Breakdown of electricity installed capacities in 2010

- **World**: 5,124 GW
  - **North America**: 1,172 GW
    - 29% Hydralic, 15% Nuclear, 10% Gas, 4% Oil, 5% Coal, 1% Wind
  - **EU**: 887 GW
    - 21% Hydro, 16% Gas, 15% Coal, 10% Wind, 7% Oil, 3% Nuclear, 1% Solar
  - **Latin America**: 315 GW
    - 48% Wind, 29% Hydralic, 14% Oil, 14% Coal, 1% Nuclear
  - **Africa**: 142 GW
    - 31% Gas, 18% Hydralic, 14% Coal, 1% Oil, 3% Nuclear, 1% Wind
  - **Asia**: 1,937 GW
    - 50% Gas, 19% Wind, 12% Coal, 11% Oil, 3% Nuclear, 5% Hydralic

Source: Enerdata
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Globalization, a reality? ... less than we think (1)
<table>
<thead>
<tr>
<th>World View</th>
<th>World 0.0: “Wild world”</th>
<th>World 1.0: “Walled world”</th>
<th>World 2.0: “One world”</th>
<th>World 3.0: “A workable world”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period of emergence</td>
<td>Prehistoric</td>
<td>Age of Enlightenment</td>
<td>Late 20th century</td>
<td>The third millennium</td>
</tr>
<tr>
<td>Level of market integration</td>
<td>Subnational markets: local integration</td>
<td>National markets: national integration</td>
<td>Global markets: complete global integration</td>
<td>Semiglobal markets: partial global integration</td>
</tr>
<tr>
<td>Geographic structure</td>
<td>Local borders</td>
<td>National borders</td>
<td>None</td>
<td>Borders plus distance: spatiality</td>
</tr>
<tr>
<td>Governmental policies</td>
<td>Minimal</td>
<td>Regulator of market failures</td>
<td>Integrator (limited role)</td>
<td>Integrator plus regulator</td>
</tr>
<tr>
<td>Business strategies</td>
<td>Local</td>
<td>Domestic / multidomestic</td>
<td>Global standardization</td>
<td>AAA strategies to adjust to, overcome, and harness differences</td>
</tr>
<tr>
<td>Individual mindsets</td>
<td>Communitarianism</td>
<td>Nationalism</td>
<td>Cosmopolitanism</td>
<td>Rooted cosmopolitanism (cultural distance)</td>
</tr>
</tbody>
</table>

*Source: World 3.0 - Global prosperity and to achieve it*  
*By Pankaj Ghemawat*
... where national borders and other differences continue to affect the intensity of interactions
... but its businesses are in essence local, regional or national

Combined heat and power business in Map Ta Phut, Thailand

Mejillones power plant, Chile

Wise County power plant, Texas, US

Gasoducto Norandino, Chile-Argentina
We pursue a transnational strategy, which we implement through a matrix organisational structure.
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THANK YOU

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