Natural Gas and Geopolitics

23rd World Gas Conference
9 June 2006

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http://pesd.stanford.edu/
Overview of the Study

- Collaboration between the James A. Baker III Institute for Public Policy, Rice University and Program on Energy and Sustainable Development, Stanford University

- Research partners conducted seven historical case studies (see supplemental slides)

- New book from Cambridge University Press
Gas Resources and Potential Demand

White: where the lights are on, satellite imagery
Blue → Red: Gas resources, with increasing size (USGS)
Overview of this Presentation

1. Changing roles for governments
   - Winning suppliers are rich in gas and governance

2. Supply security and gas cartels
   - Few interruptions
   - Gas cartel unlikely

3. Risks to the ‘Gas Vision’
1. Changing Roles for Governments

• “Old World”
  • State-owned enterprises
  • Tightly regulated monopolies
  • Oil-indexed gas prices

• “New World”
  • Private operators, financing, and contracting
  • Contestable, multiple markets
  • Gas-on-gas competition

• The “Real” Hybrid World
  • National champion energy companies
  • Managed markets
  • Mixed pricing regimes
From States to Markets

<table>
<thead>
<tr>
<th>Year</th>
<th>Project</th>
<th>Country 1</th>
<th>Country 2</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>Yabog</td>
<td>Bolivia</td>
<td>Argentina</td>
<td>1972</td>
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<td>Indonesia</td>
<td>Japan</td>
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<td>Belarus</td>
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<td>Belgium</td>
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<td>GasBol</td>
<td>Belarus</td>
<td>Turkey</td>
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<td>Turkmenistan</td>
<td>Russia</td>
<td>Iran</td>
<td>1997</td>
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<td></td>
<td>Bluestream</td>
<td>Russia</td>
<td>Turkey</td>
<td>2002</td>
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</tbody>
</table>
Confidence for Investors: The Success of Trinidad and Failure of Venezuela
Projected Gas Trade Between Regions

Source: Baker Institute World Gas Trade Model (BIWGTM)
Projected US and European LNG Imports

Source: BIWGTM, Base Case Results
2. **Supply Security**

- Rising attention to “gas security”

- How many interruptions? And by whom?

- Could a gas cartel form?
# Gas Trade Interruptions

## Examples from 7 Case Studies

<table>
<thead>
<tr>
<th>Initiating Party</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Algeria (1981 to 1983). “Gas Battle” with Italy, the United States and others.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Transit Country</th>
<th>User</th>
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</thead>
<tbody>
<tr>
<td>2. Ukraine (mid-1990s) disputes with Gazprom over volumes and payments for gas shipments.</td>
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<td>4. Gazprom (2005-2006) cuts supplies to Ukraine during a pricing dispute but tries to keep supplies flowing to Europe through cross-Ukraine pipelines.</td>
<td></td>
</tr>
</tbody>
</table>

2. YABOG (1987). Argentina refuses to take or pay for full Bolivian shipments. |
3. GasBol (2001). Brazil refuses full volumes contracted from Bolivia |
A Gas Cartel Is Unlikely

Distribution of Proved Gas Reserves Implies Concentration

- Iran 15%
- Qatar 7%
- Saudi Arabia 4%
- UAE 4%
- United States 3%
- Russia 32%
- Others 35%

US EIA; Proved gas reserves (2002)
3. **Risks to the ‘Gas Vision’**

- Will supplies materialize?
  - Incredible governments, politicized resources

- Will demand materialize?
  - Competition from coal and nuclear for electric power
  - Emerging gas markets in China and India
Russian Natural Gas Production: Historical & Projections

Credibility: The ‘Commitment Problem’

1. State supplies credibility
   - “Old World”: state provides capital, enforcer, guarantor (e.g. Transmed)
   - “New World”: credibility through transparency, reputation
   - “Real” World: one-off deals, erratic credibility

2. Realign incentives
   - Partner with locals → political leverage AND exposure

3. Engage international institutions?
   - Provide capital and leverage broader relationship (e.g. GasBol)
   - External accounts
Will Demand Materialize?

Projected European Gas Consumption

Source: IEA-WEO 2004
Gas Growth in Major Developing Countries

Sources: China: IEA; India: Hydrocarbon Vision 2025
Conclusions:

• Governance drives investment

• “Real” world is a hybrid market

• A fungible, global market delivers security?

• Where governments aren’t credible, gas is left in the ground

• Gas-to-power highly uncertain
Natural Gas and Geopolitics
From 1970 to 2040

Edited by
David G. Victor,
Amy M. Jaffe,
and Mark H. Hayes

CAMBRIDGE
Supplemental Slides
## Seven Historical Case Studies

<table>
<thead>
<tr>
<th>Built Projects</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Indonesia LNG to Japan</td>
<td>Lewis &amp; von der Mehden</td>
</tr>
<tr>
<td>2. Algeria to Italy</td>
<td>Hayes</td>
</tr>
<tr>
<td>3. Russia to Poland and Germany</td>
<td>Victor &amp; Victor</td>
</tr>
<tr>
<td>4. Turkmenistan (to Iran, to Russia, to Pakistan &amp; India)</td>
<td>Olcott</td>
</tr>
<tr>
<td>5. Qatar to Japan</td>
<td>Hashimoto</td>
</tr>
<tr>
<td>6. Trinidad LNG to U.S.</td>
<td>Shepherd &amp; Ball</td>
</tr>
<tr>
<td>7. Southern Cone (Bolivia to Argentina; Argentina to Chile; Bolivia to Brazil)</td>
<td>Mares</td>
</tr>
</tbody>
</table>
The Importance of Governance: Why many gas resources don’t get monetized

<table>
<thead>
<tr>
<th>Export Rank</th>
<th>Export Rank</th>
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</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Reserves and Resources* (Tcm)</th>
<th>% world</th>
<th>General Investment Risk Index</th>
<th>Gas Production (Bcm)**</th>
<th>Total Exports (Bcm)**</th>
<th>Export Rank</th>
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<tbody>
<tr>
<td>1</td>
<td>Russia</td>
<td>83.0</td>
<td>24.0%</td>
<td>5.5</td>
<td>578.6</td>
<td>113.8</td>
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<td>2</td>
<td>Iran</td>
<td>33.6</td>
<td>9.7%</td>
<td>5.8</td>
<td>79.0</td>
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<td>Saudi Arabia</td>
<td>32.4</td>
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<td>7.2</td>
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<tr>
<td>4</td>
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<td>30.0</td>
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<td>8.7</td>
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<td>NA</td>
<td>55.1</td>
<td>4.9</td>
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<td>7.5</td>
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<td>2.8</td>
<td>19.2</td>
<td>11.8</td>
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<tr>
<td>15</td>
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<td>5.9</td>
<td>1.7%</td>
<td>5.5</td>
<td>10.1</td>
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*Reserves and resources data from USGS (2000); **Production and exports from BP (2004).