Asia’s Growing Energy Demand
Opportunities and Challenges

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2030
U.S. net energy imports

quadrillion Btu

History 2013 Projections

2005 2010 2015 2020 2025 2030 2035 2040

Low Oil Price

Current Trend

High Oil Price

High Oil and Gas Resource

2030 U.S. Energy Exporter

Source: EIA, Annual Energy Outlook 2015
Energy Supply Boom
Greater Efficiency
Tighter Regulations
More Renewables
North America

Asia
University of Montana
April 29 – May 2, 2015
Asia’s Energy Demand

Asia’s Demand for Leadership
Asia’s Energy Demand
“Developing Asia is making a strong contribution to global economic growth,” says ADB Chief Economist Shang-Jin Wei.

Source: Asia Development Bank

Strong Economic Growth in Asia

<table>
<thead>
<tr>
<th>Year</th>
<th>Growth Rate of GDP (% per year)</th>
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</thead>
<tbody>
<tr>
<td>2014</td>
<td>6.3%</td>
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<td>2015</td>
<td>6.3%</td>
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<tr>
<td>2016</td>
<td>6.3%</td>
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</tbody>
</table>
Asia Demand Growth Rate will outpace the World

Source: Asia Development Bank
Fossil Fuels will still be the major source of energy in Asia

Source: Asia Development Bank
From 2010 to 2035, energy consumption growth in Asia

- 2010: 34% increase
- 2035: 56% increase

World’s largest energy consumer

- 81% increase
- 200% increase
- 300% increase

Source: Asia Development Bank
Total primary energy consumption in China by fuel type, 2012

- Coal: 66%
- Oil: 20%
- Natural gas: 5%
- Hydroelectric power: 8%
- Nuclear: <1%
- Other renewables: 1%

Note: Total may not equal 100% due to independent rounding. Includes only commercial fuel sources and does not account for biomass used outside of power generation.
Source: U.S. Energy Information Administration.
China's natural gas production and consumption, 2000-2013

China LNG import sources, 2014

- Qatar: 34%
- Indonesia: 12%
- Australia: 19%
- Malaysia: 15%
- Others: 7%
- Equatorial Guinea: 4%
- Yemen: 5%
- Nigeria: 2%
- Algeria: 2%

Source: IHS Energy.
Others: Angola, Brunei, Egypt, Norway, Oman, Papua New Guinea, Russia, Trinidad & Tobago, and re-exports from Spain and South Korea.
China and the Environment
Japan's total energy consumption, 2013

- petroleum & other liquids: 44%
- coal: 27%
- natural gas: 22%
- hydro: 4%
- nuclear: 1%
- other renewables: 2%

Japan and Nuclear Power
Japan's net electricity generation by fuel, 2000-13

South Korea total primary energy consumption by fuel type, 2012

- petroleum and other liquids, 41%
- coal, 28%
- natural gas, 17%
- nuclear, 12%
- other renewables, 1%
- hydroelectric, <1%

Source: U.S. Energy Information Administration
Korea’s Oversea Energy Project

Aggressive E & P Investments
Risky Ventures?

- Constructed (2011.9)
- Scheduled

Russia

Sakhalin

Khabarovsk

Vladivostok

China

Khasan

Rajin

North Korea

South Korea

Japan
Competition for the Asia-Pacific Basin

- Qatar LNG
- Russia
  - Sakhalin Island LNG
  - Pipeline: 3.2 – 6.4 bcf/day
- Alaska LNG
  - Kitimat LNG
    - Douglas Island, BC
- Canada?
- China, Korea, Japan, India
- Papua New Guinea
- Mozambique, Indonesia, Malaysia, Others
- United States
  - Sabine Pass
  - Freeport LNG
  - Cameron LNG
  - Cove Pont LNG
  - Others?
- Australia
Oil’s Curve Ball

Lower oil prices undercut gas prices

Lower profitability of gas slows projects
Asia’s Demand for Leadership
Energy Security
U.S. Leadership Needed

Protect Regional Stability
  – Middle East
  – International Sea Lanes

Promote Diversification
  – Reform the global market
  – Build foreign relations

Promote Multilateral Cooperation
Recommendations

• Invite Asian policy and business leaders to the table to promote mutual learning, cooperation and innovation

• Support small and medium size businesses on how to access Asia energy market

• Support our universities to have mutual exchanges, promote policy/technical innovation and technology cooperation
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