



APEC Expert Group on Clean Fossil Energy

Tokyo, Japan, 9 March 2018

Oil and Gas Security Studies (OGSS) in 2017/2018

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Three studies were performed by IEEJ and APERC

- **APEC investments in the natural gas supply chain in a low price environment**
- **Energy security of APEC economies in a changing downstream oil environment**
- **APEC oil and gas supply security indexation 2017**

Natural gas investment study key takeaways

- **Investment in the natural gas sector is critically important for energy security for the Asia Pacific**
 - APERC forecasts natural gas primary energy demand the Asia Pacific will grow by 1.7 times from 2013 to 2040.
 - The region will require USD 2,234 billion investments from 2015 to 2030 to sustain such demand growth.
- **The role of government is very important**
 - Private companies take the lead in natural gas projects, but natural gas projects also require public support.
- **Developers must identify, reduce, and allocate risks to promote investments**
 - Effective management of risks is a critical condition for sustained investments in natural gas infrastructure.

Identifying risks of natural gas investments

- Major risks associated with natural gas investments are as follows:
 - ✓ **Market risk:** whether a sufficient return on investment can be obtained
 - ✓ **Political risk:** from government changes to policy and regulation
 - ✓ **Financial risk:** whether sufficient capital can be procured,
 - ✓ **Environmental risk:** from the effects of construction and operation on the environment,
 - ✓ **Engineering, procurement and construction (EPC) risk:** cost increases during construction.
- Although it is difficult to foresee all potential risks before making an investment decision, developers must identify as many potential risks as possible to prepare for smooth execution of a project.

Downstream oil environment study summary

- **Traditional oil security**
 - Direct foreign investment in oil fields of oil producing economies
 - Diversification of crude oil import partners
 - Petroleum refining in consuming economies
 - Strategic oil stockpile
- **Changing oil security environment**
 - Increase of crude oil supply from non-OPEC economies
 - Change of strategy in OPEC
 - Increase in trade volume of petroleum products
- **New oil security**
 - Adding refining capacity on the Pacific coasts and utilizing surplus capacity
 - Constructing a highly liquid product market
 - Reviewing the role of stockpiling

Suggested midstream oil security policies

	Develop own capacity	Utilize oil market	Utilize excess capacity
Australia		✓	
Brunei	(✓)	✓	
Canada	✓		
Chile	✓		
China	✓	✓	
Chinese Taipei			✓
Hong Kong		✓	
Indonesia	✓		
Japan			✓
Korea			✓
Malaysia	✓		
Mexico	✓		
New Zealand		✓	
PNG	(✓)	✓	
Peru	✓		
Philippines	✓		
Russia			✓
Singapore			✓
Thailand	(✓)	✓	
United States			✓
Viet Nam	✓		

Oil supply security index study key takeaways

- Overall oil supply security for APEC improved slightly in 2015 compared with 2013.
- The diversity of primary energy, oil self sufficiency, and lower risk at chokepoints contributed to the improvements.
- Risk in the reserve-to-production (R/P) ratio of oil, higher share of oil to primary energy, and a slight increase in exporter stability offset some the overall risk reduction.
- Papua New Guinea recorded the high risk reduction in oil supply security, as more gas is being used in the economy. The Philippines and Viet Nam recorded the highest risk increases, as demand for oil increased rapidly while local production was not enough or was barely enough to meet demand.

Gas supply security index study key takeaways

- Overall gas supply security for APEC deteriorated slightly in 2015 when compared with 2013.
- Two indicators contributed to the risk increase – Gas R/P ratio and LNG (production) terminal utilization. The latter indicator might be a bigger issue in the future if no major investment is made now.
- LNG sources were a bit more diverse in 2015 than 2013, while gas consumption per capita and intensity decreased, which subsequently offset the increase in supply security risk.
- Higher intra-APEC LNG trade managed to reduce the chokepoints risk.
- Papua New Guinea had the most deterioration in gas supply risk, as more gas was being used in the energy mix. Korea, on the hand, managed to reduce the supply risk because of a lower share of gas-to-primary-energy and lower gas consumption per capita.



Thank you for your kind attention

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