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Global Energy Markets and Northeast Asia Outlooks, Challenges, Prospects

Northeast Asia International Conference for Economic Development

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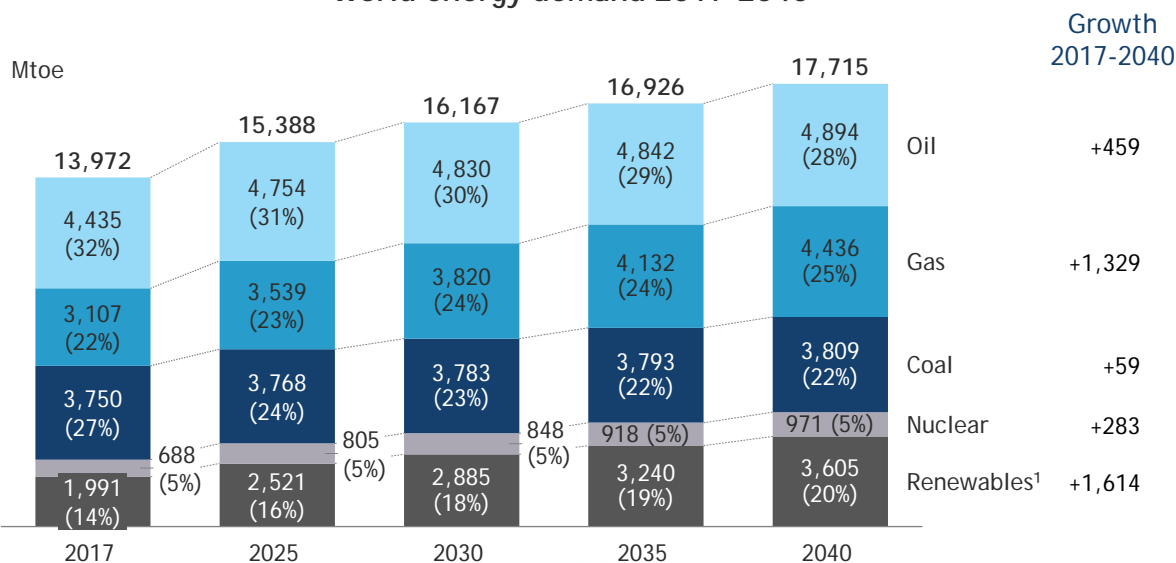
II. 3 Key Energy Market Challenges

- Premiums
- Volatility
- Investment

III. Energy Market Prospects in Northeast Asia

Oil and gas dominate growth alongside renewables that will continue to show robust expansion

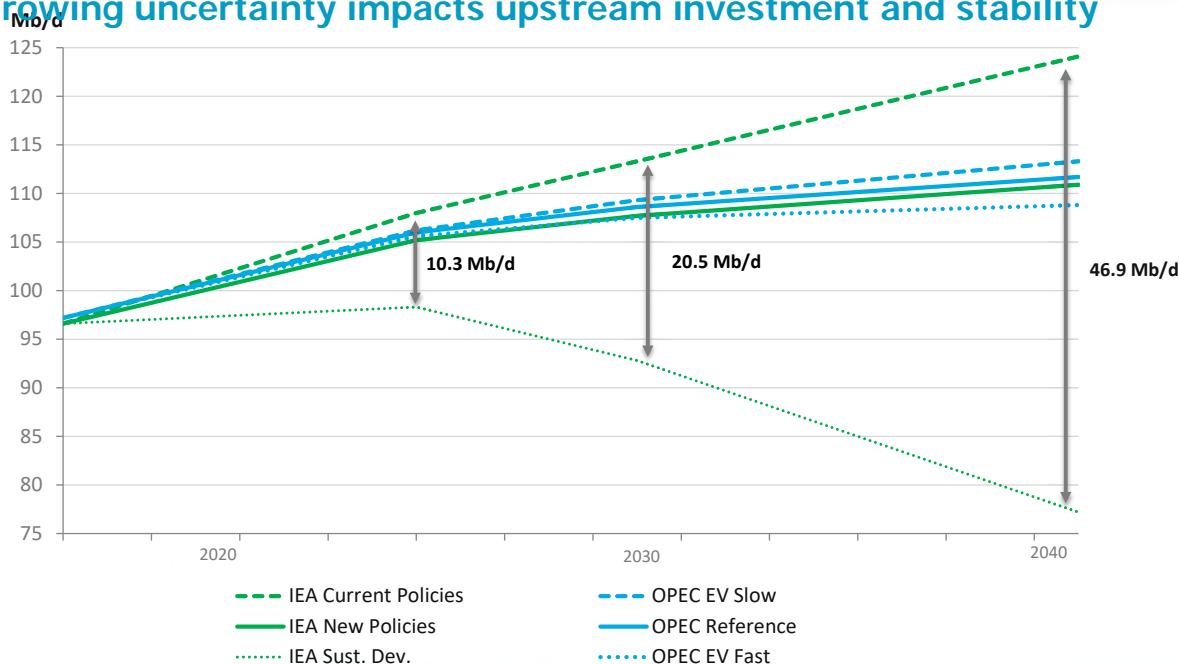
World energy demand 2017-2040



1. Hydropower, Bioenergy, Geothermal, PV, CSP, Wind and Marine
BCG Analysis Source: IEA Energy Outlook 2018 (New Policies scenario)

Oil demand outlooks vary more sharply overtime

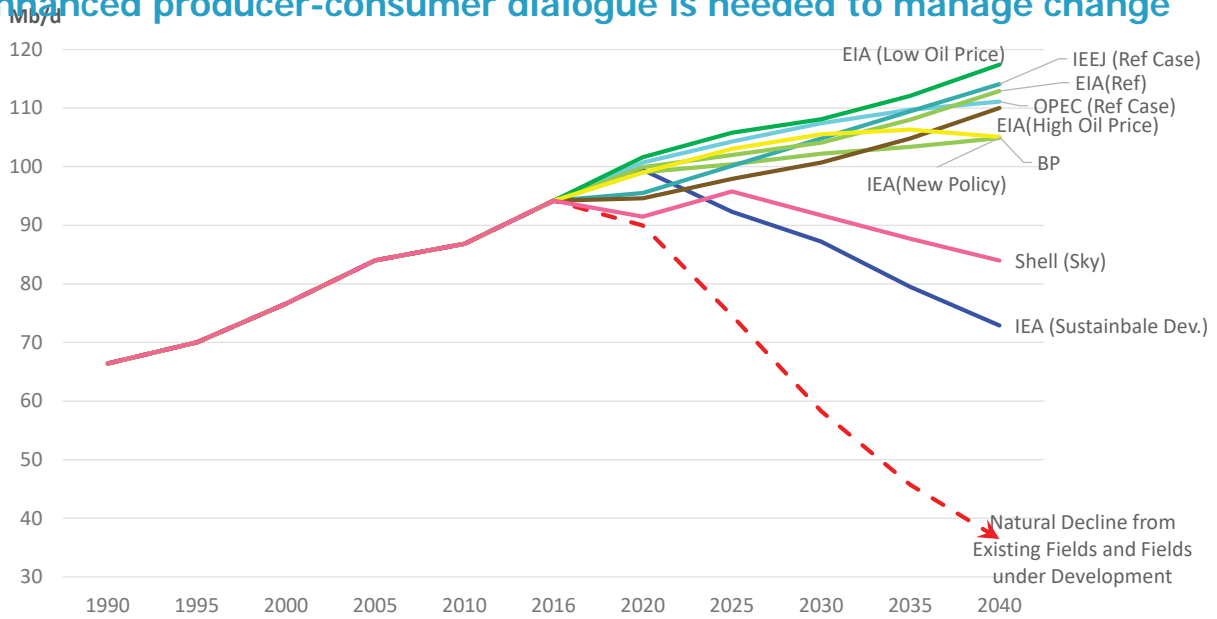
Growing uncertainty impacts upstream investment and stability



IEF-RFF Based on IEA and OPEC 2018 data

Disorderly transitions erode strategic partnerships

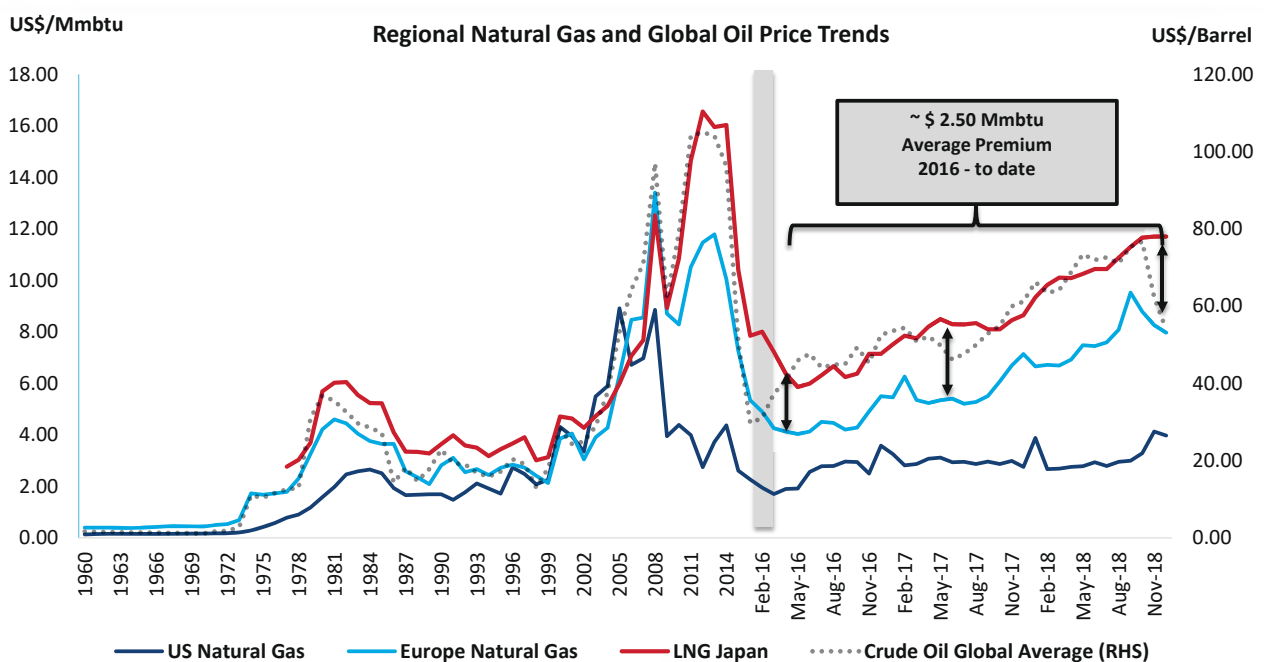
Enhanced producer-consumer dialogue is needed to manage change



IEF-KAPSARC Based on IEA, OPEC, IEEJ, EIA, BP, Shell, and Rystad data

Asian LNG imports retain premium

When compared to liberalised and interconnected markets



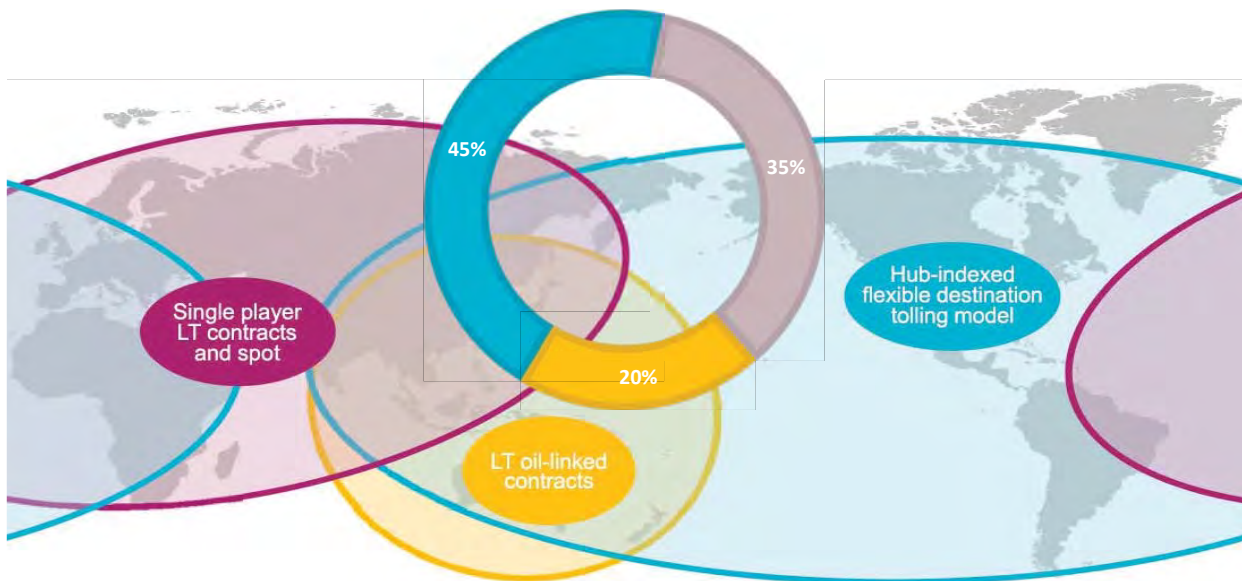
Source: World Bank Average Annual Commodity Prices to 1960-2015, and Average Monthly Commodity Prices from January 2016 to December 2018

Hubs have come to govern world's most liquid markets

Growing Asian gas liquidity and infrastructure investment will enable hub pricing

WORLD VIEW

Oil indexation Gas on gas hubs Regulation and bilateral monopolies



Data Source: International Gas Union IEA Gas Marker Report 2018

GLOBAL ENERGY SECURITY THROUGH DIALOGUE

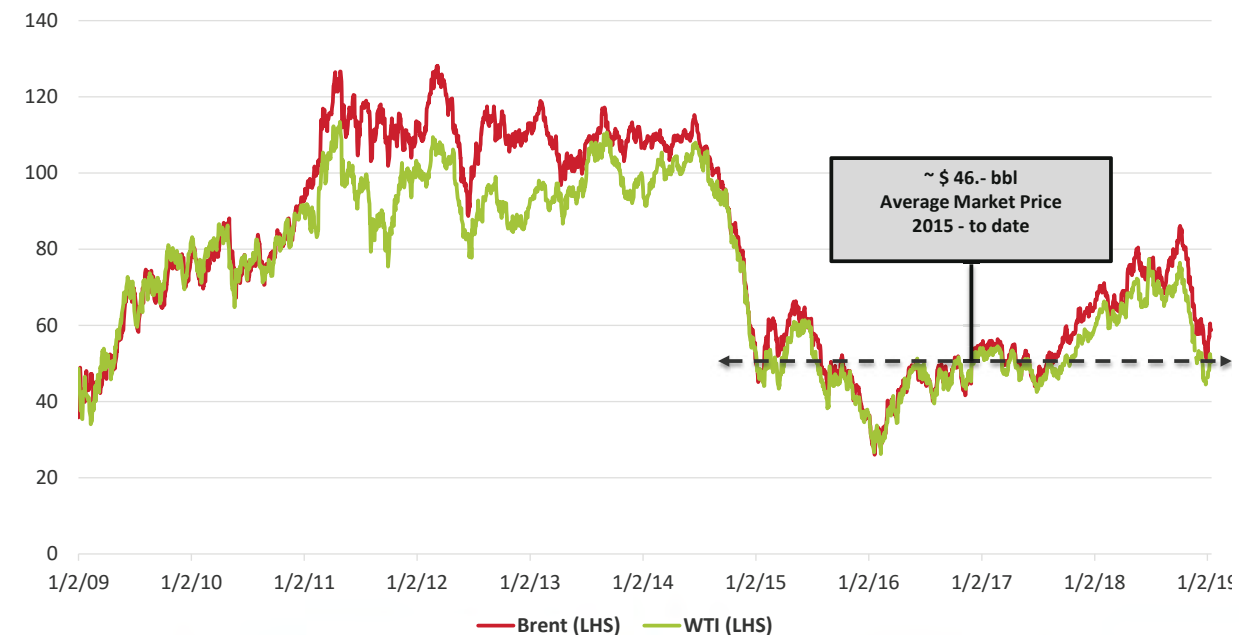


KNOWLEDGE GENERATION THROUGH DIALOGUE

Downturn leaves oil market without clear direction

Between unconventional production surges and OPEC+ agreements

Brent and WTI Oil Prices



Data Source: CBOE 2019

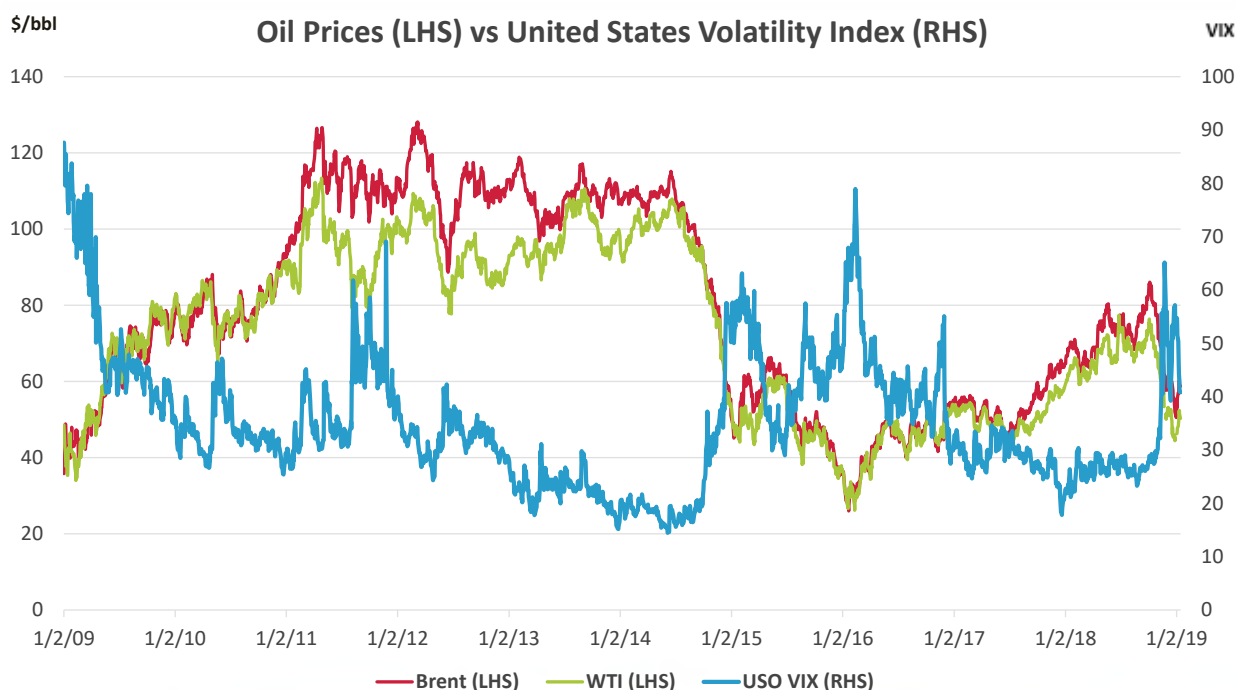
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Volatility set to increase

Until Non-OPEC and unconventional oil production plateaus?



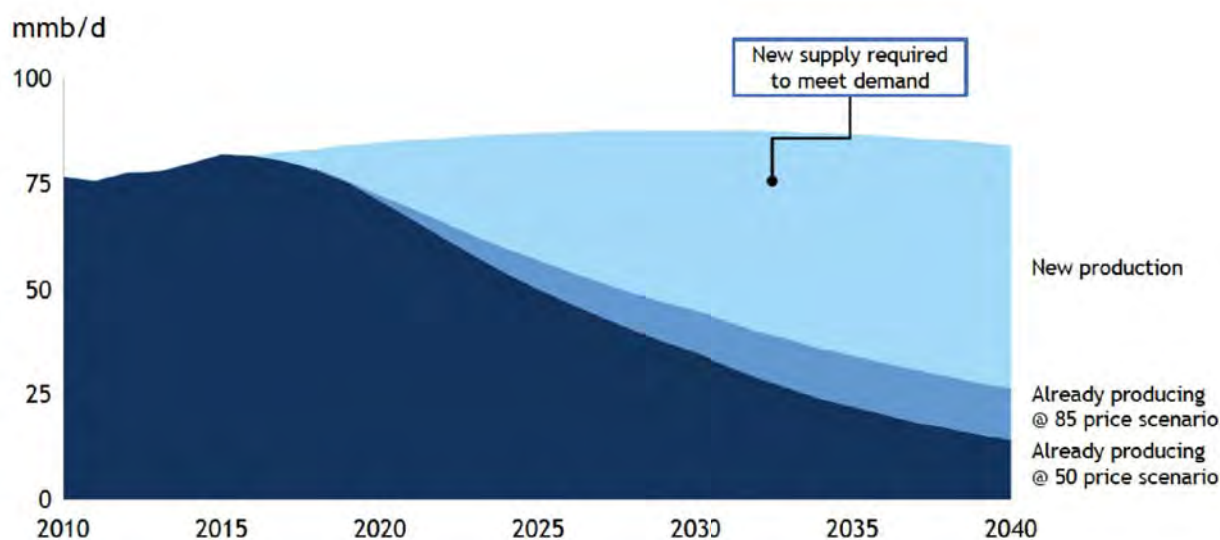
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Robust oil demand may face a supply gap

Risking a structural tightening of the market if investment does not pick up



Source: Rystad Energy BCG Analysis IEF16

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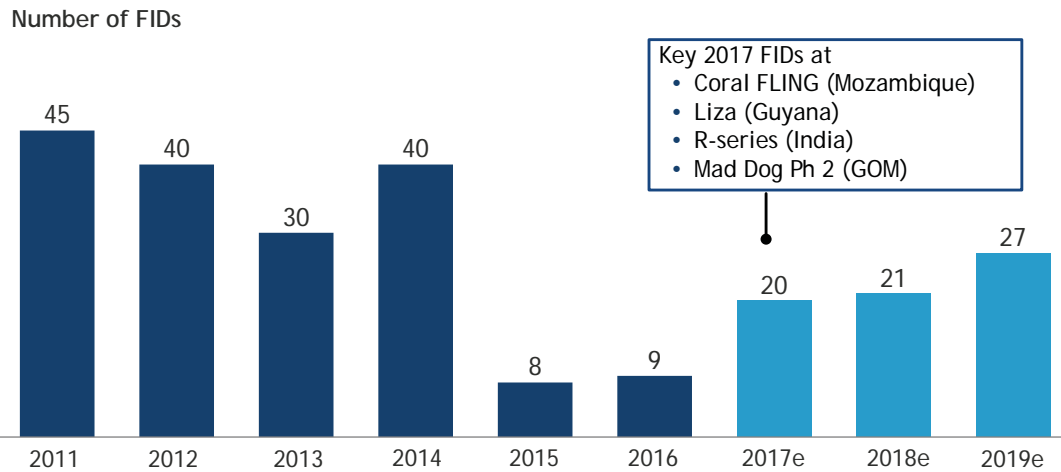


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Upstream investment in conventional oil remains low

Well below levels last seen before the oil and gas market down-turn in 2014

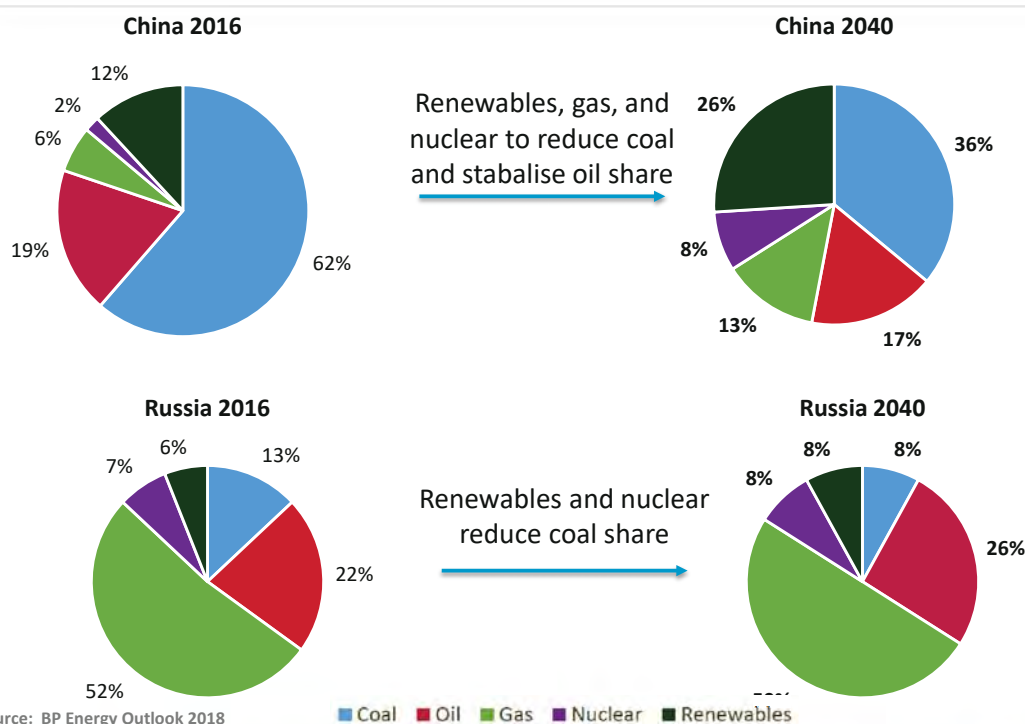
Number of Final Investment Decisions for new project development



1. Chart at right excludes anticipated unconventional project sanctions
Source: Wood Mackenzie; Goldman Sachs Investment Research; BCG CEI

Long-term energy consumption trends

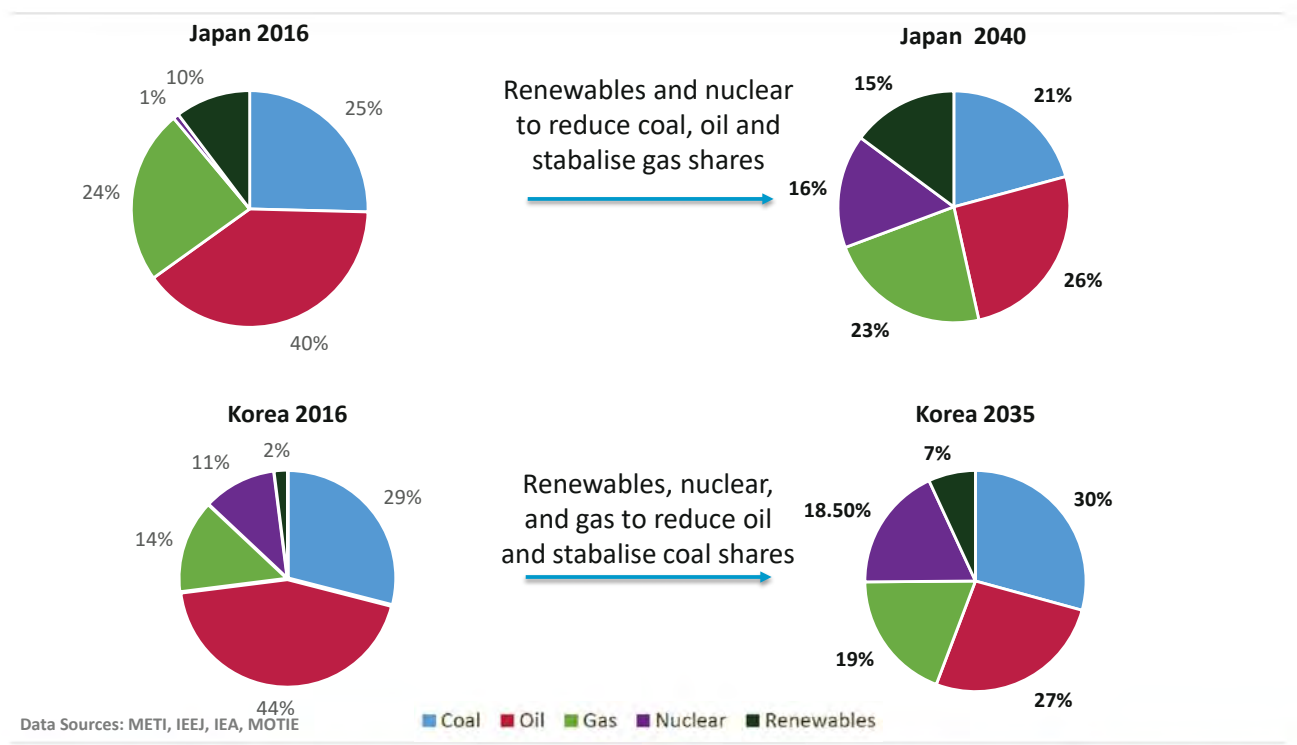
In Major North East Asian Countries: China and Russia TPED 2016-2040



Data Source: BP Energy Outlook 2018

Long-term energy consumption trends

In Major North East Asian Countries: Japan and Korea TPED 2016-2035/40



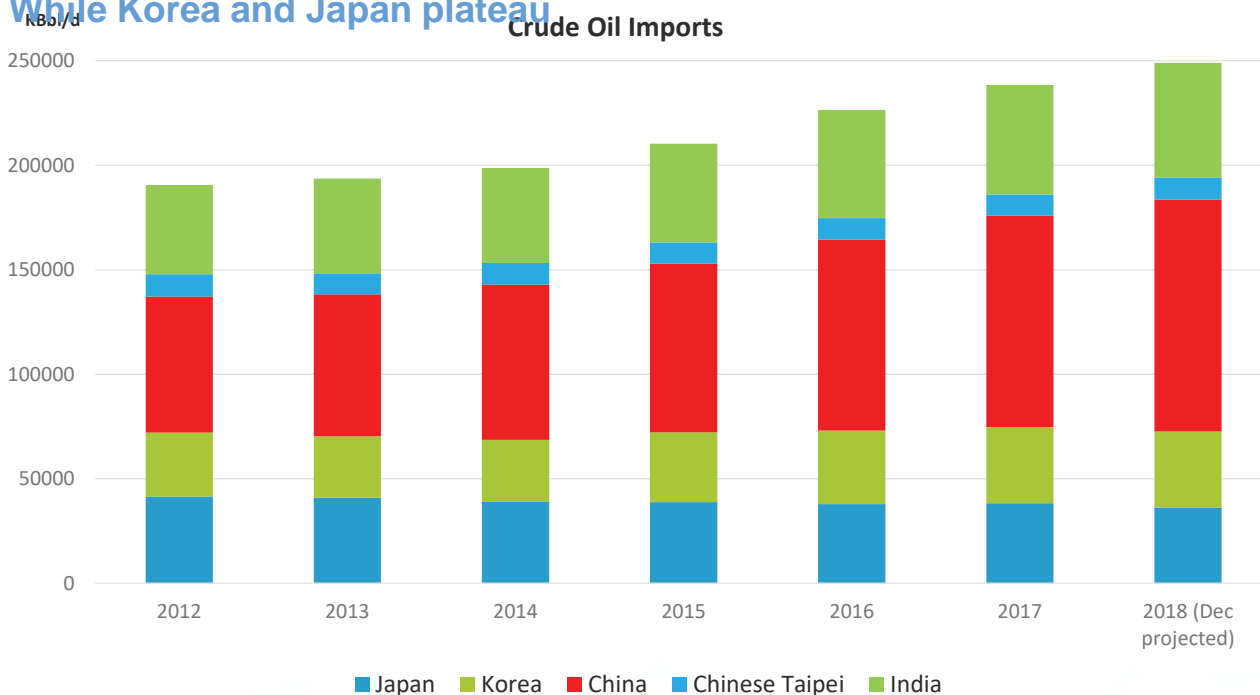
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China and India will continue to grow oil imports

While Korea and Japan plateau



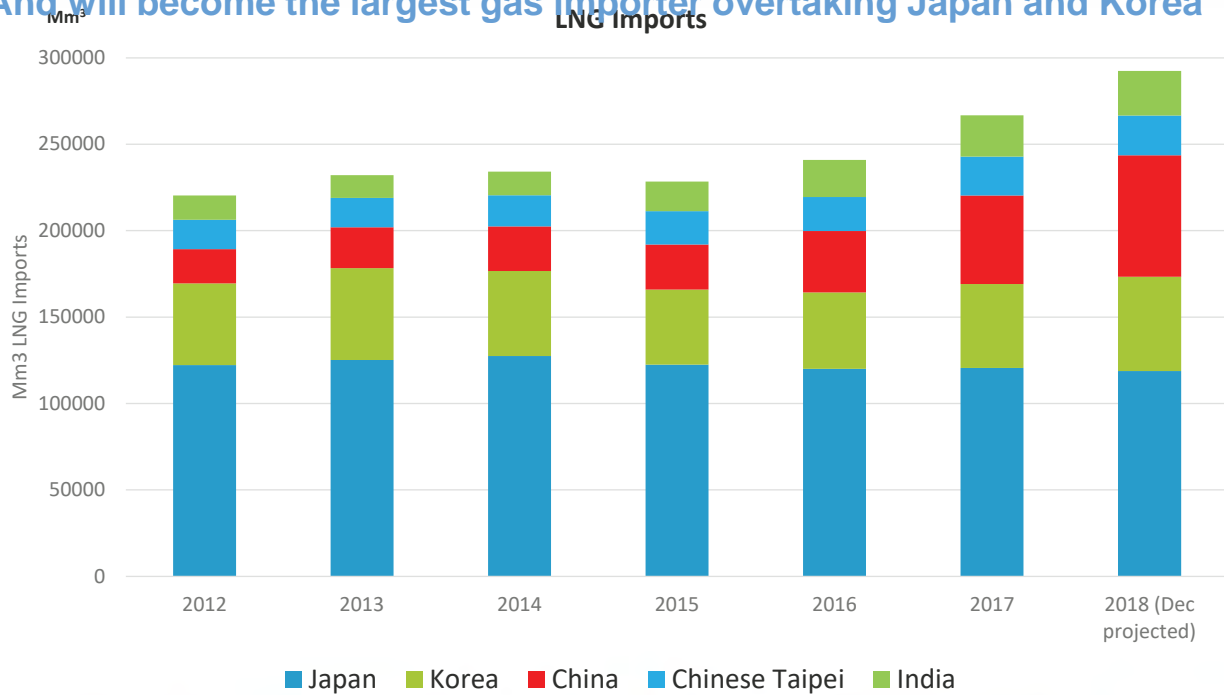
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China LNG imports surge for more sustainability

And will become the largest gas importer overtaking Japan and Korea



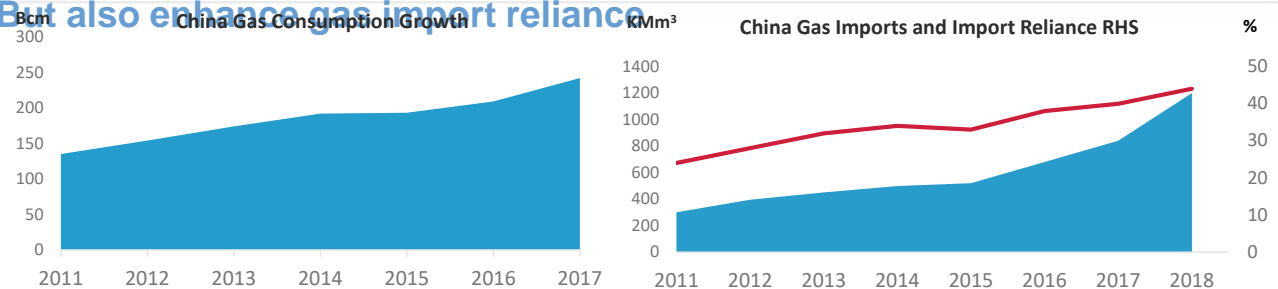
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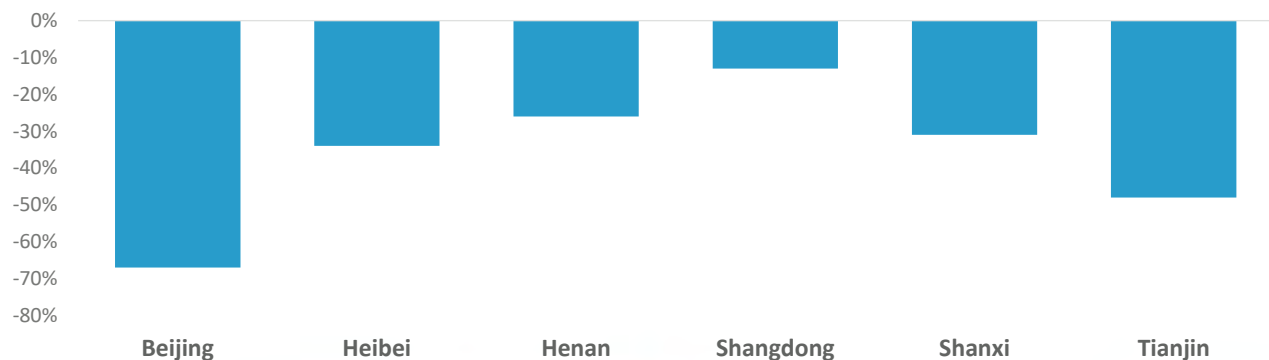
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China's air quality measures stimulate demand

But also enhance gas import reliance



Particulate Matter 2.5 year on Year Reductions in North China December 2017



Data Sources: NDRC China, BCG, IGU, Cedigaz SNAM-IGU-BCG Global Gas Report 2018

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Regional cooperation in North East Asia

China's power long-term power grid interconnection plans will boost regional energy security



State Grid Corporation of China 2016 and OIES 2018



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Key findings

Global Energy Security

- Oil demand and supply outlooks vary more sharply overtime
- Growing uncertainty on transition pathways impacts investment and market stability
- Market reforms and increased oil and gas market liquidity will reduce oil price linkages reducing Asian premiums
- Downturn leaves market without clear direction while volatility has increased
- Despite growing unconventional production and OPEC+ interventions, upstream investment in conventional production suffers
- More dialogue is needed to reduce volatility and resolve uncertainties stemming from diverse transitions, geopolitical risks, and a slow down in global growth

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Key findings

Northeast Asia

- Northeast Asian countries play an ever larger role in global energy sector transformations to advance sustainable growth in the region and for the world.
- While transition pathways vary in accordance with policy preferences and outlays for oil, gas, coal, renewables and nuclear, Northeast Asia is rapidly modernizing energy matrices.
- Energy security, a healthy living environment, and emission reductions go hand in hand through new technologies such as LNG, Renewables, CCUS, Hydrogen, and efficiency gains.
- As Northeast Asian import dependencies and reliance on the Middle East will continue to grow, East-East relations will become more important in oil and gas trade.
- Regional cooperation on interconnections to integrate gas and renewables, and on joint stockpiles will improve price signals and stability on Northeast Asian energy markets.

Key Questions

- 1 How can Northeast Asia achieve more secure and sustainable energy futures?
- 2 What measures must be considered to respond to the challenges that population growth, urbanization and climate change impose?
- 3 What are the key vectors in the energy policy and technology pathways that Northeast Asian countries follow?

2019/20 Key Dialogue Meetings

1. **9th IEA-IEF-OPEC Symposium on Energy Outlooks**
27 February 2019 | Riyadh
2. **5th IEF-KAPSARC Thought Leaders' on Competitive and Sustainable Energy Supply** 28 February 2019 | Riyadh
3. **4th IEF – OFID Symposium on Energy Poverty**
7-8 May 2019 | South Africa
4. **8th Asian Ministerial Energy Roundtable**
9-10 September 2019 | Abu Dhabi
5. **17th International Energy Forum Ministerial**
2020 | China



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