



ASEAN Energy Business Forum 2015

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Global Perspective and Key Challenges for Natural Gas Development

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Hosted by:



Co-Organized by:

ASEAN Centre for Energy



Leverage International (Consultants) Inc.



Outline

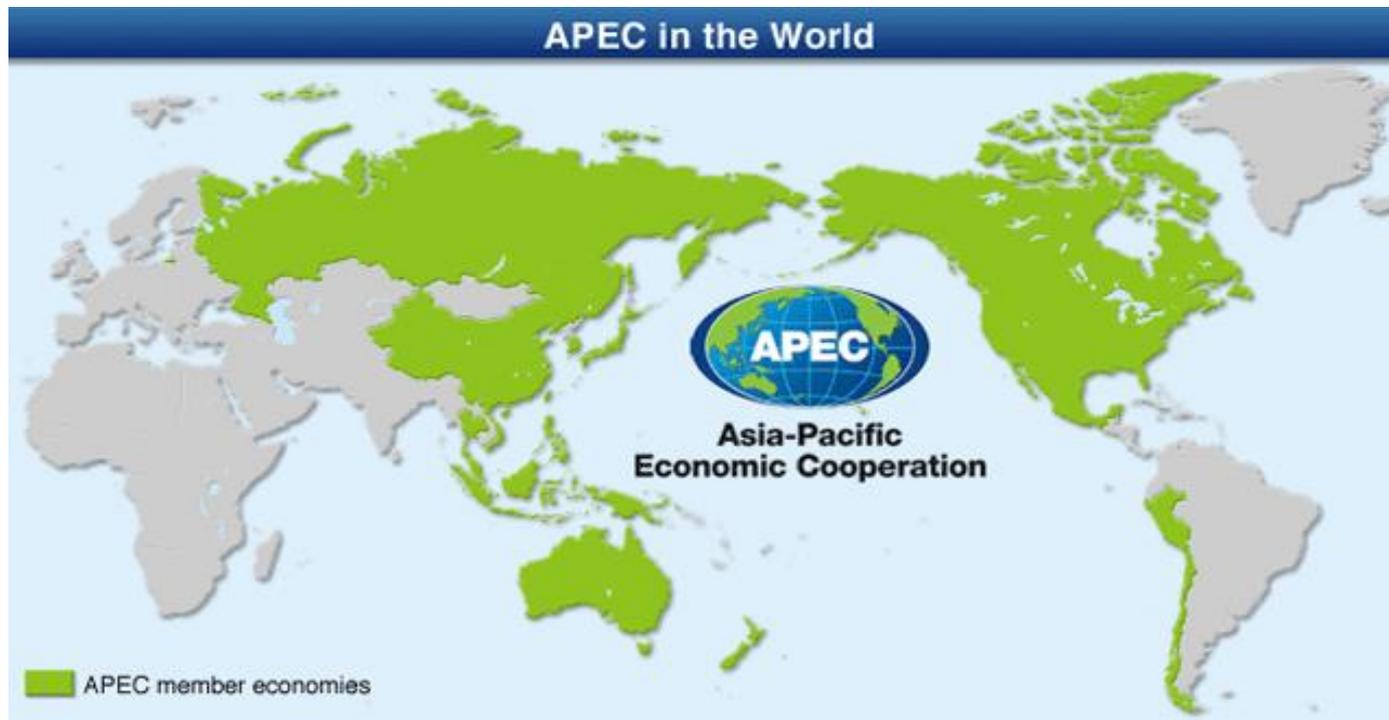
- Background
- Natural Gas Demand Outlook
- Security Challenges
- Market Challenges
- Clean Energy Challenges
- Way Forward
- Conclusion



Background: APEC, APERC & ASEAN

The Asia-Pacific Economic Cooperation (APEC) : established in 1989, a regional economic forum in the Asia-Pacific, with 21 member economies

The Asia Pacific Energy Research Centre (APERC) : established in 1996, following the directives of APEC Leaders, to serve EMM & EWG



APEC Members

Australia

Brunei Darussalam

Canada

Chile

China

Hong Kong, China

Indonesia

Japan

Republic of Korea

Malaysia

Mexico

New Zealand

Papua New Guinea

Peru

Philippines

Russia

Singapore

Chinese Taipei

Thailand

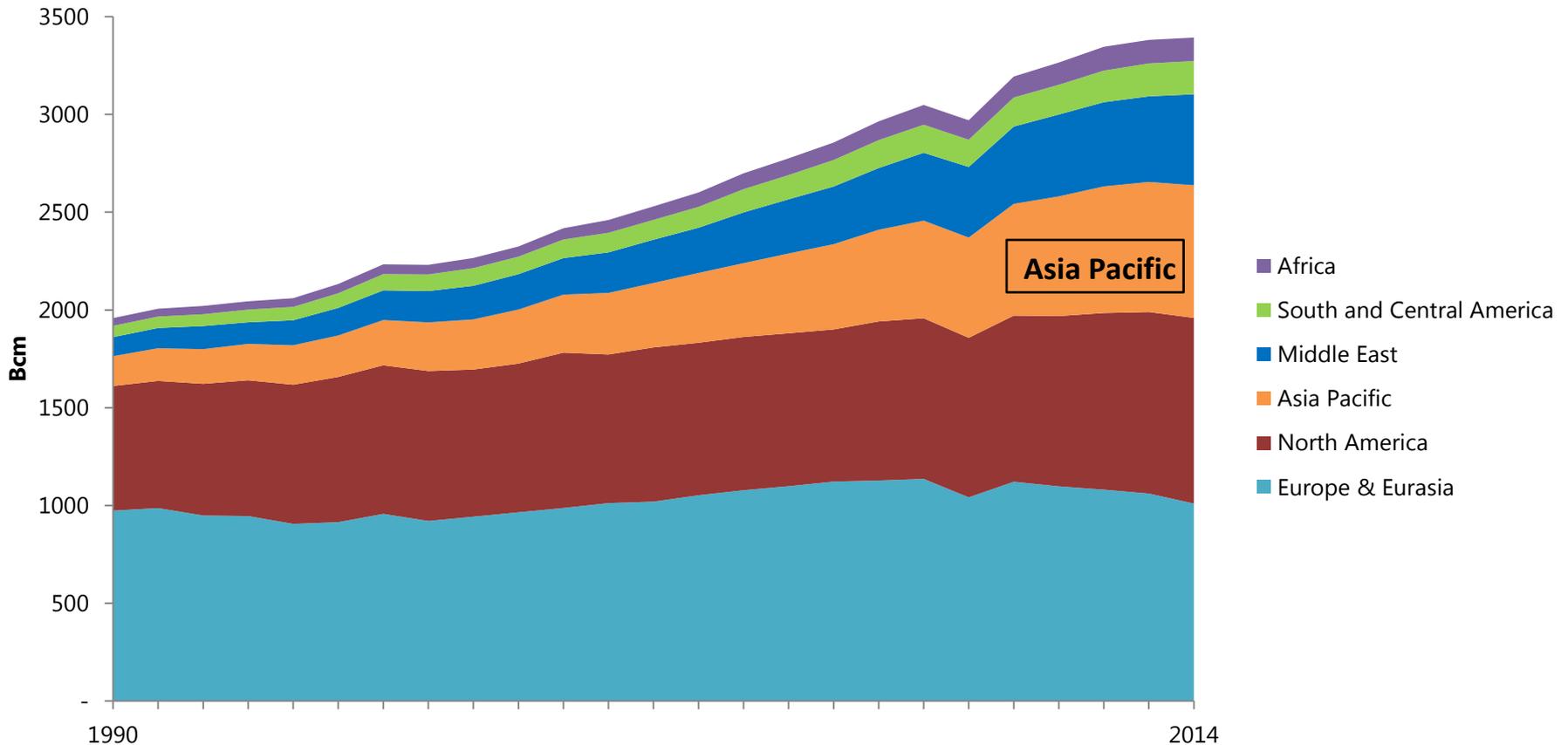
United States

Viet Nam

<Note:

ASEAN >

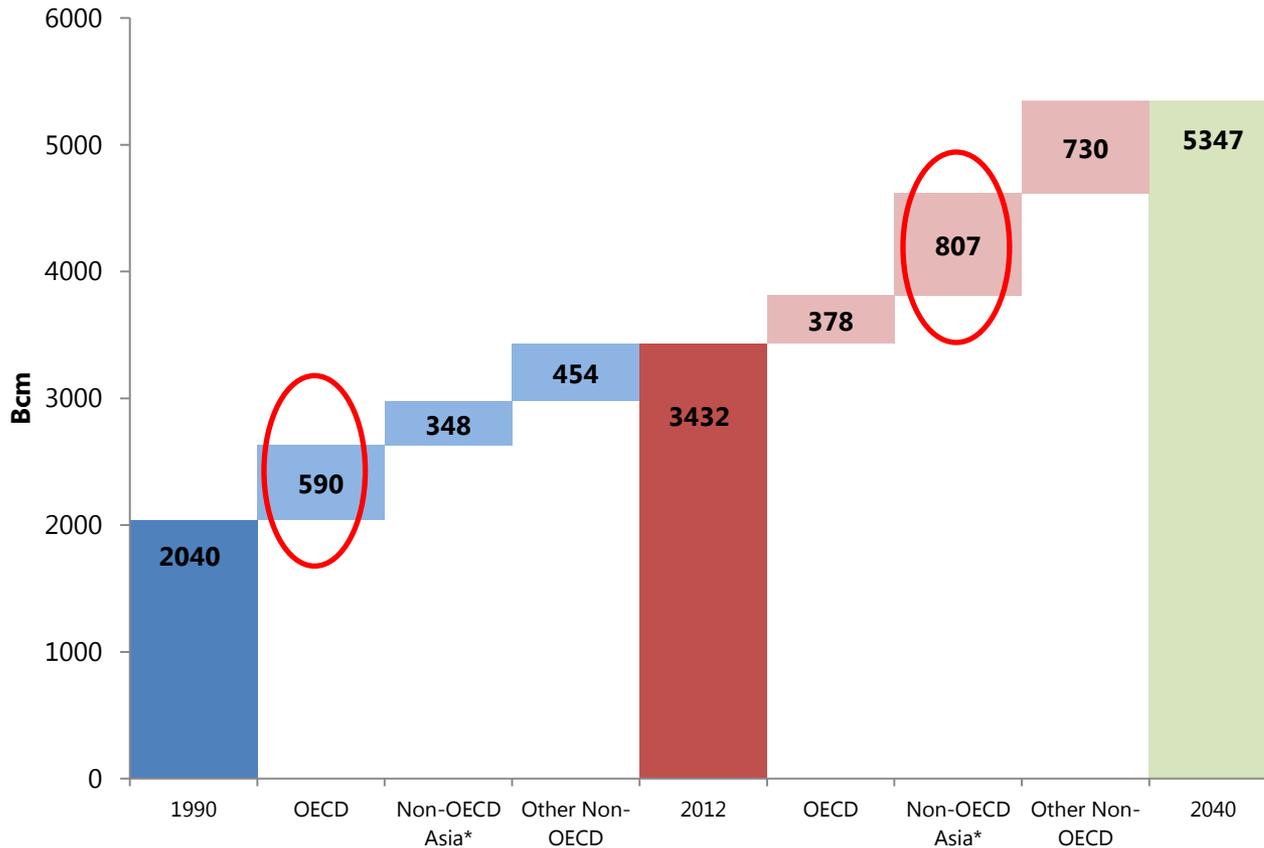
Background: Global Natural Gas Demand



Source: BP Statistical Review of World Energy 2015

Over the last 2 decades, the natural gas consumption has increased by nearly 75%.

Global Natural Gas Demand Outlook



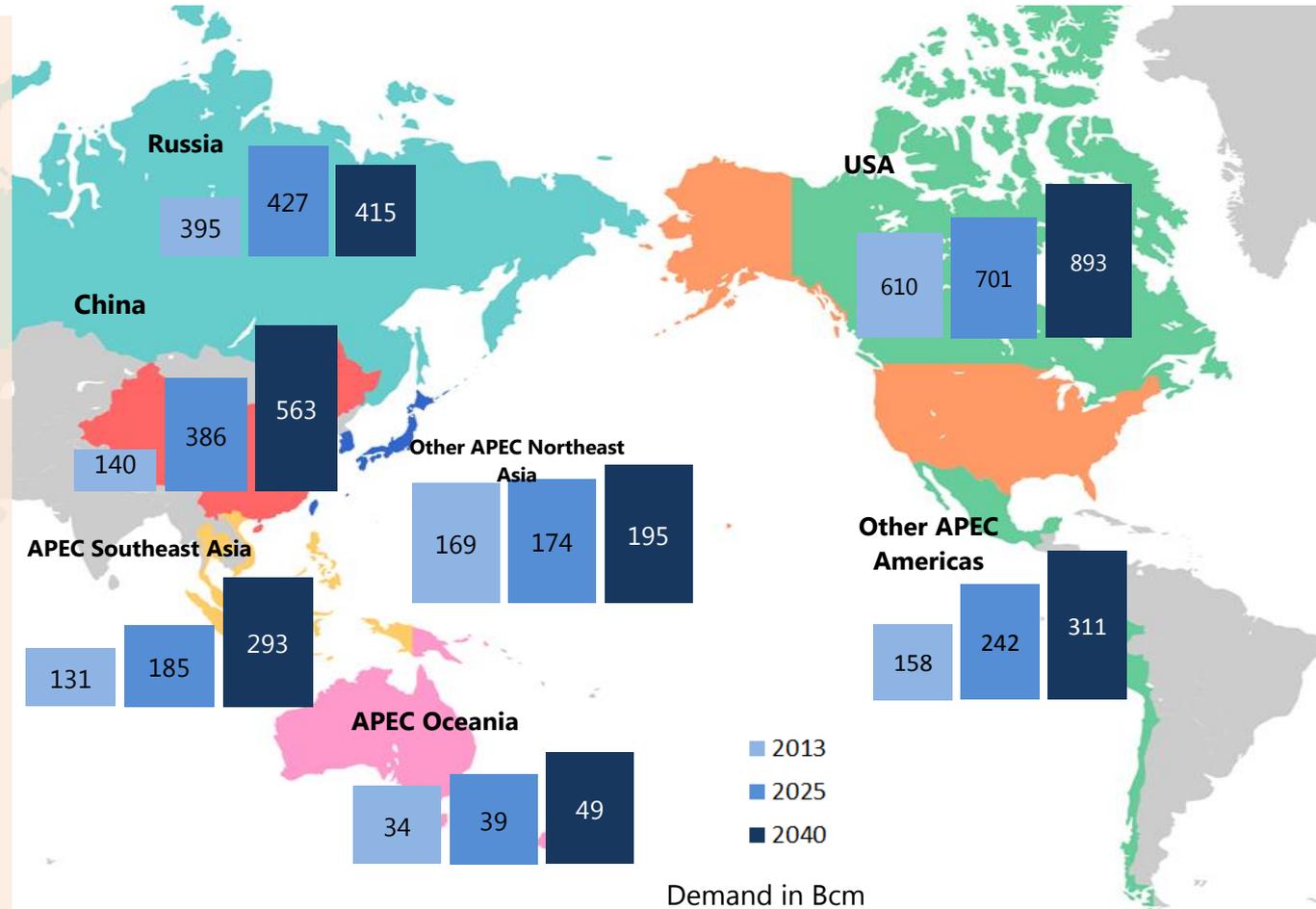
- China, India and Southeast Asia will drive the natural gas demand growth in "Non-OECD Asia"
- 40% of total growth in "Other Non-OECD" is expected to take place in Middle East
- "OECD" is expected to have slower and stable growth rate at 0.7% annually

*excluding Middle East

Source : IEA, World Energy Outlook 2014, New Policies Scenario

APEC Natural Gas Demand Outlook

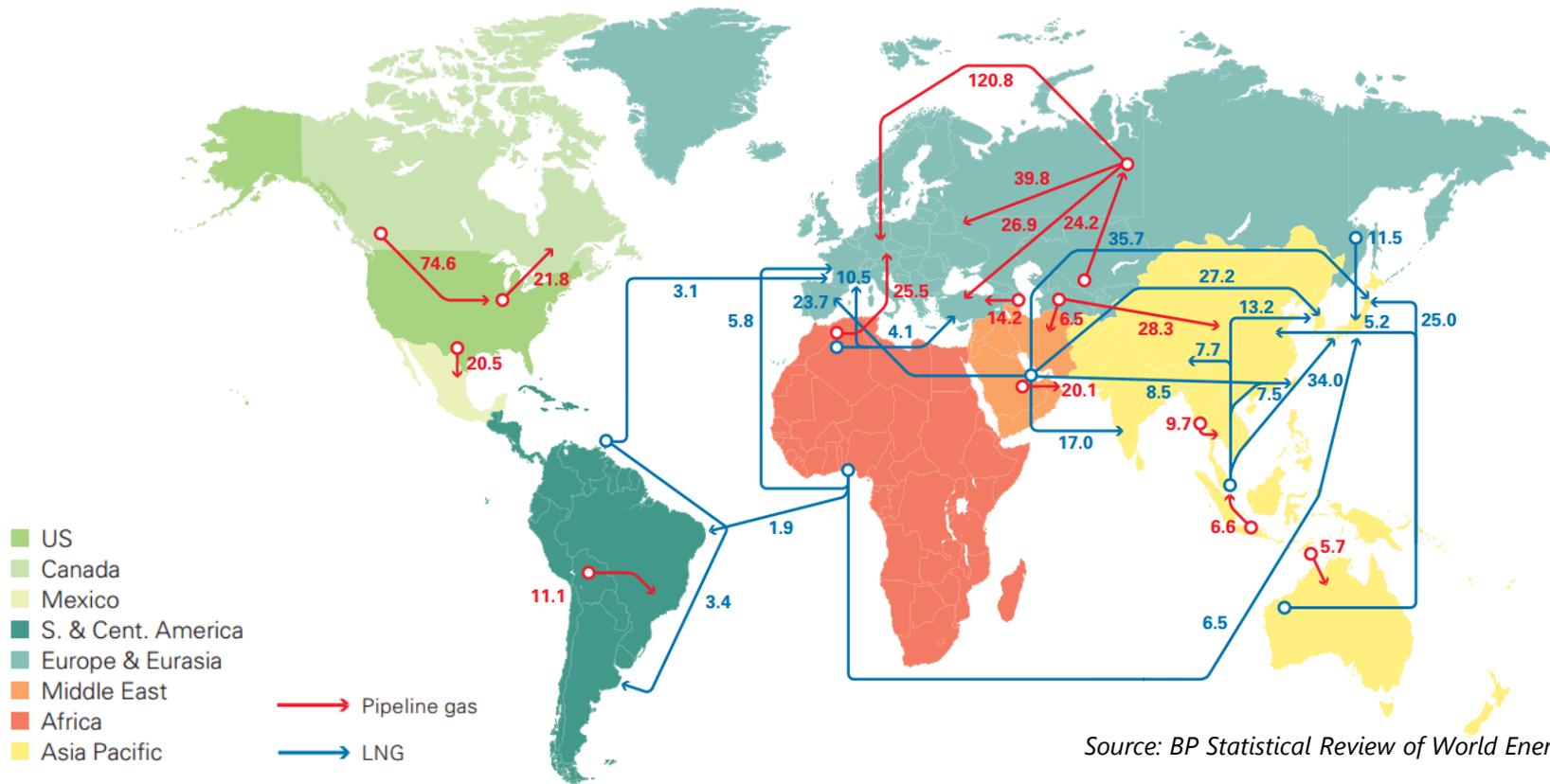
- Gas demand in China will grow by more than 3 fold while the demand in South East Asia will increase by more than 2 fold from 2013 to 2040
- Russia demand peaks around 2025
- The US and other Americas will have slow to moderate growth



Source: APEC Energy Demand and Supply Outlook 6th Edition and Draft Results or Preliminary Results

Security Challenges

Global Natural Gas Trade Flows

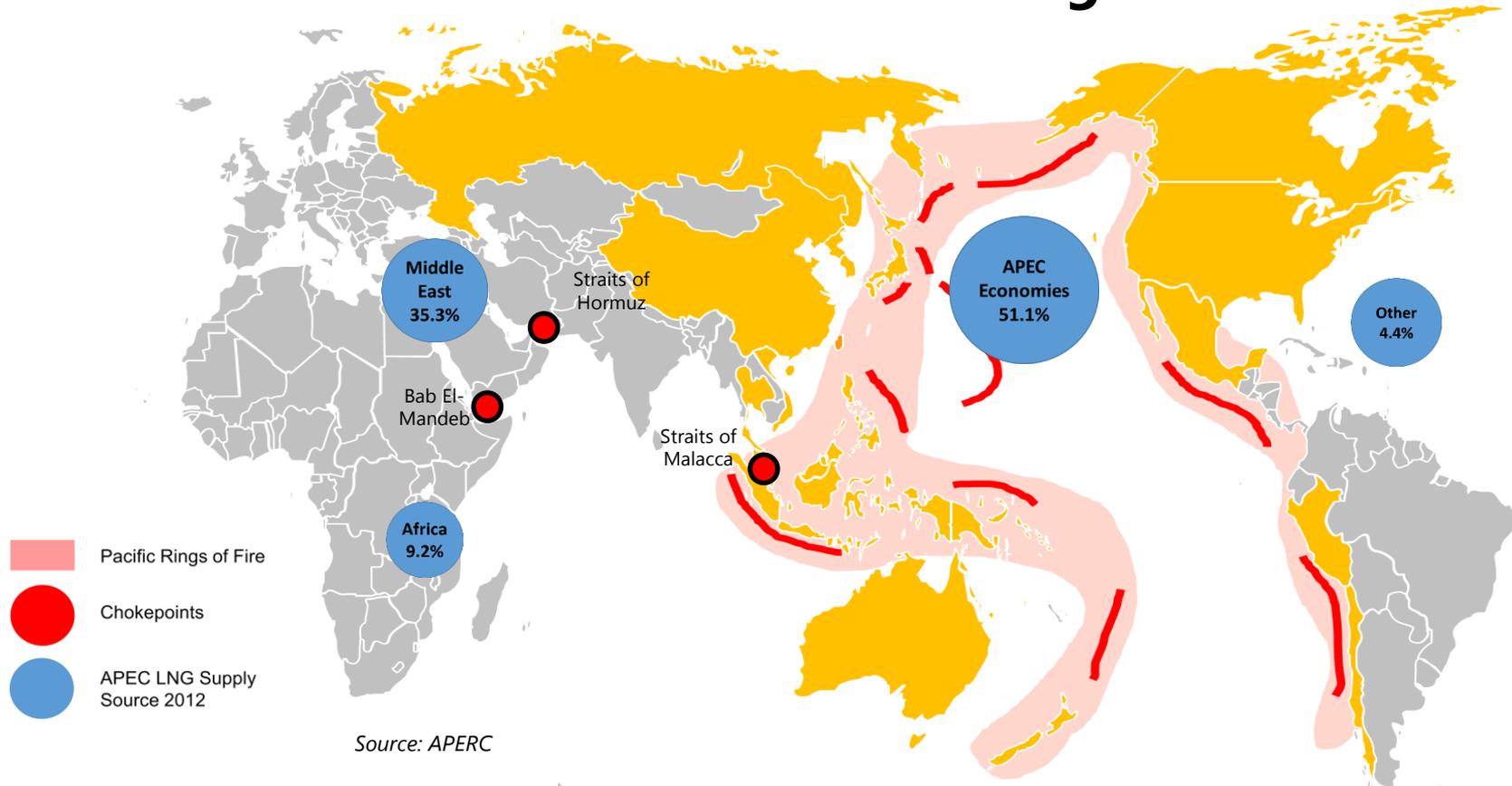


Source: BP Statistical Review of World Energy 2015

Continued rise in cross-border gas flows creates greater energy security challenges

Security Challenges

LNG Trade in the APEC Region



APEC LNG imports face geopolitical challenges due to high dependency on maritime routes through extremely busy straits and politically unstable regions

Security Challenges

Shale Gas Development In APEC

Tcm	Shale gas resources*	Proven Reserves
China	39.4	4.4
Canada	20.2	2.4
US	20.0	11.2
Mexico	19.3	0.6
Australia	15.4	1.5
Russia	10.1	59.6
Indonesia	1.6	3.8
Thailand	0.2	0.4
APEC	126.3	84.0

- APEC region is endowed with rich unconventional gas. (US, Canada, Mexico, China, Australia)
- Increasing regional supply and decreasing reliance on external sources of gas.
<Lesser chokepoints, Shorter routes>
- More intra APEC gas trade, diversification of sources lead to secured supply of energy.

*unproved wet shale gas technically recoverable resources (TRR)
Source: U.S. Energy Information Administration (EIA), 2013

Further reading: Pathways For Shale Gas Development In Asia-Pacific was recently published by APERC
http://aperc.ieej.or.jp/file/2015/8/7/APERC_Pathways_to_shale_gas_development.pdf

Security Challenges

Measures in response to Security Challenges



<http://www.telegraph.co.uk/finance/newsbysector/energy/oilandgas/9357796/BP-safety-back-in-spotlight-as-explosion-kills-worker-in-US.html>

<Short Term Measures>

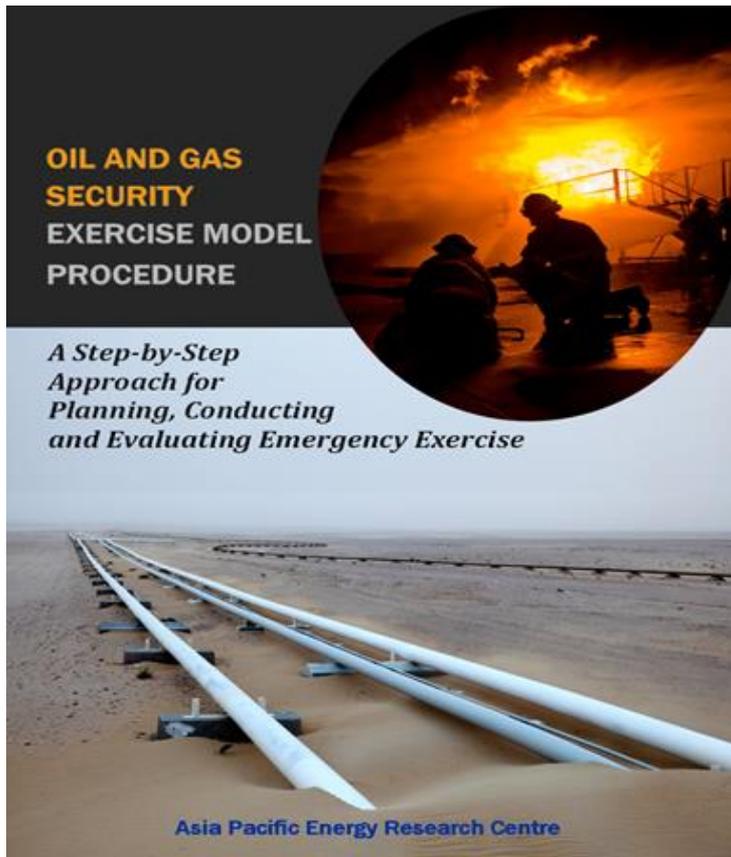
- Emergency response

<Mid. and Long Term Measures>

- Diversification of import gas sources
- Combination of pipe gas and LNG
- Diversification of energy mix
- Electricity grid interconnections
- Energy efficiency and conservation
- Other economic and structural policies

Security Challenges

Global/Regional & Bilateral/Multilateral Cooperation



- APEC Oil & Gas Security Initiative **(OGSI)**
- ASEAN Petroleum Security Agreement / Coordinated Emergency Response Measures **(APSA/CERM)**
- IEA's Oil and Gas Emergency Response such as oil stockpiling etc.
- Bilateral and multilateral cooperation framework may also resolve regional disputes
- G7 and other fora will pursue measures to face future gas security challenges

Market Challenges

PRICE

Volatile world gas price may hamper investment



INVESTMENT

Exploration and infrastructure



TECHNOLOGY

Tech. & cost barriers for unconventional & deep water



INSTITUTIONAL/ REGULATORY

Government support on developing Natural Gas



MARKET ACCESS

Framework that facilitates infrastructure & market development

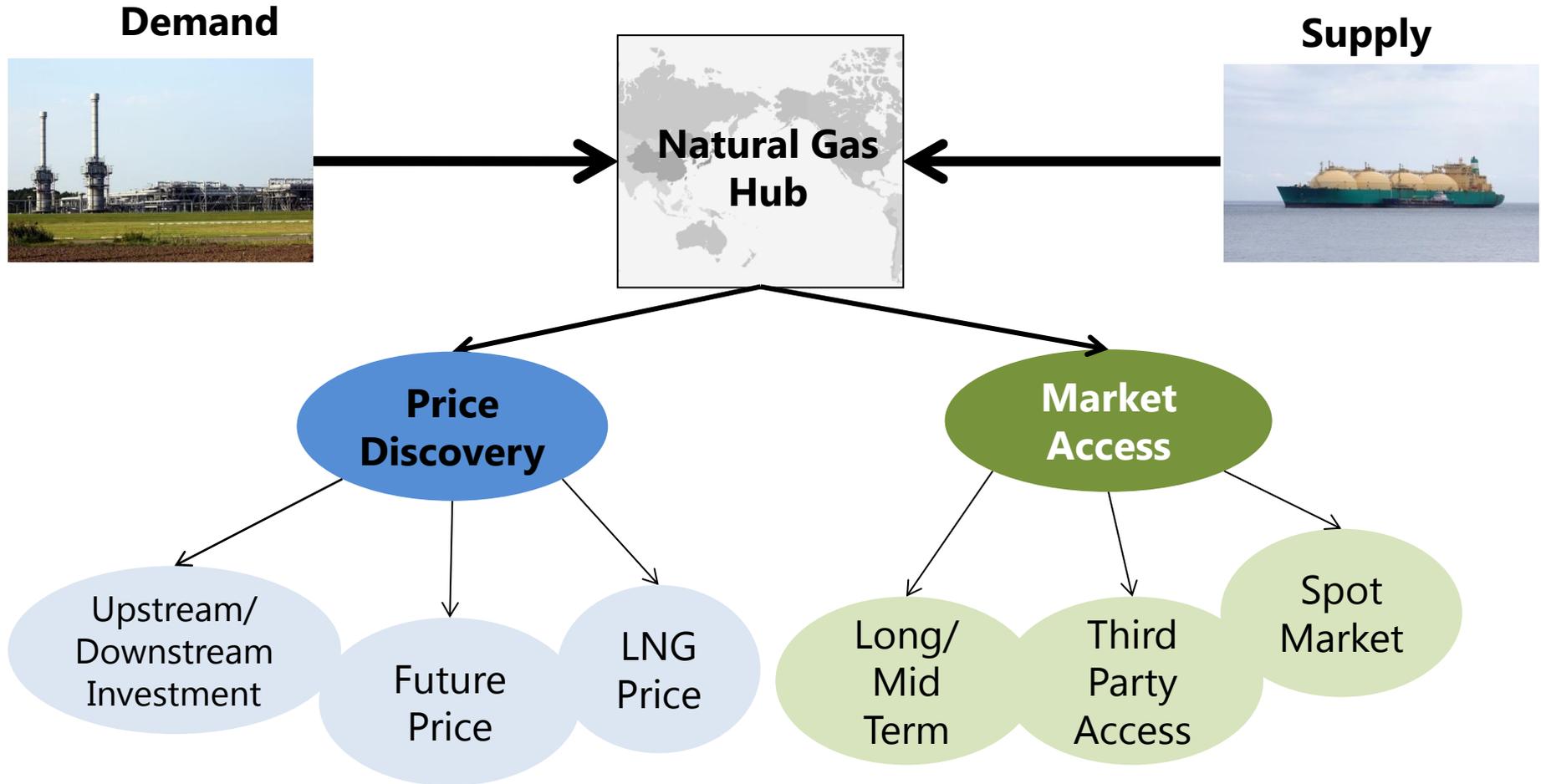


ACCEPTANCE

Not in my back yard (NIMBY)



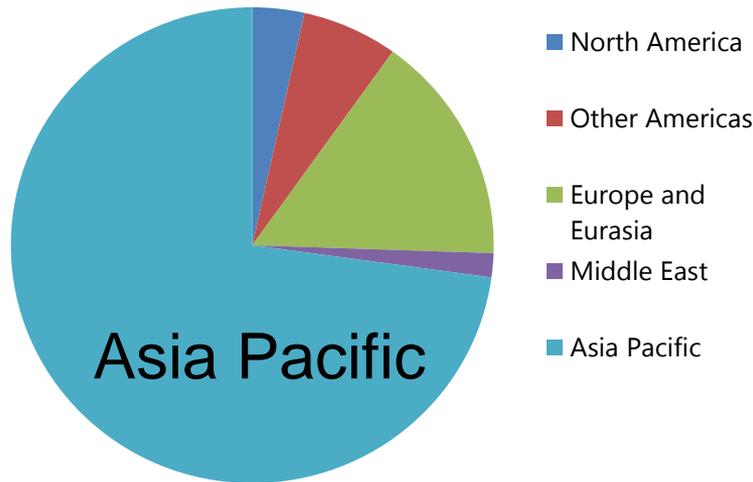
Market Challenges



Market Challenges

LNG

GLOBAL LNG IMPORTS IN 2014



Source: BP Statistical Review Of World Energy

CHALLENGES

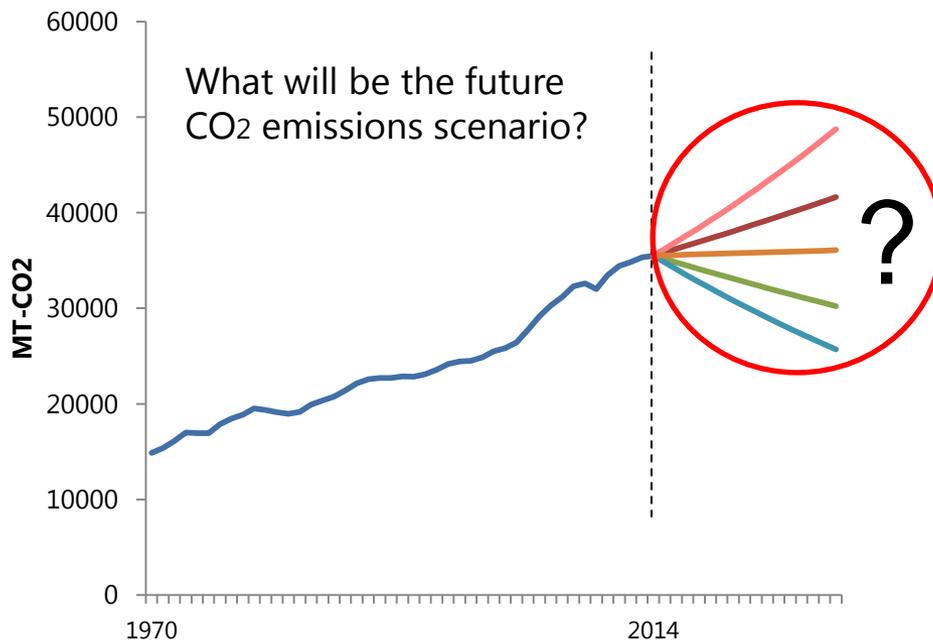


- Large scale investment
- Asia Premium
- Oil-indexation
- Traditional terms of contract
- Destination clause

Asia Pacific Region has been importing more than 70% of world's LNG demand

Clean Energy Development Challenges

SUSTAINABLE DEVELOPMENT



Source: BP Statistical Review Of World Energy

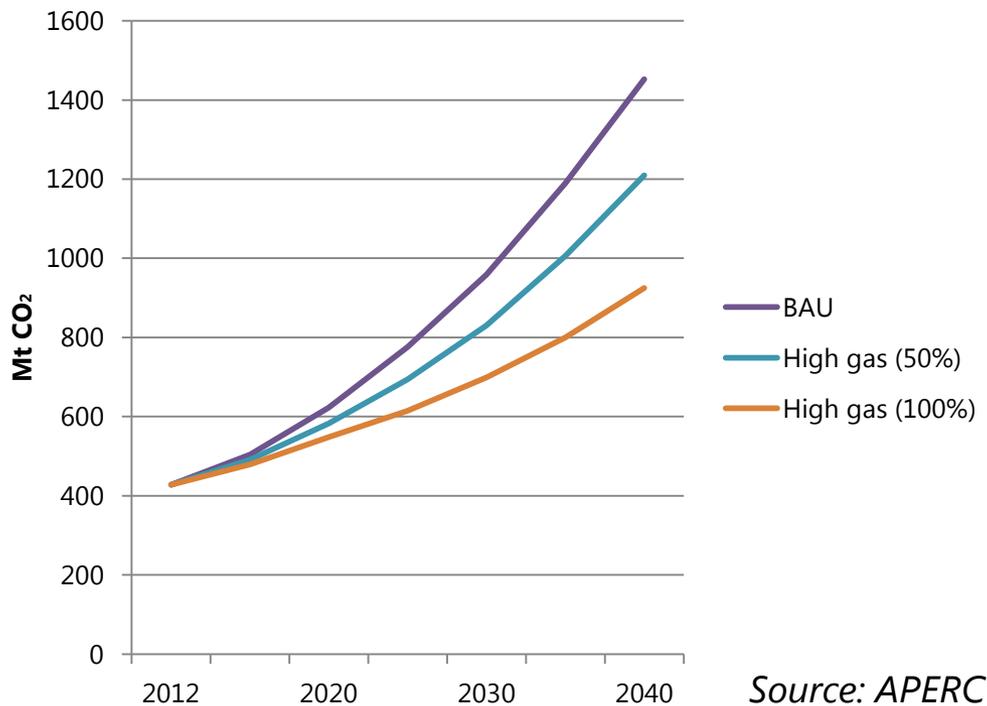
CHALLENGES

- Cheaper competing fuel such as coal
- Lack of policies that support the market to switch fuels
- Regulatory framework
- Geopolitical issues

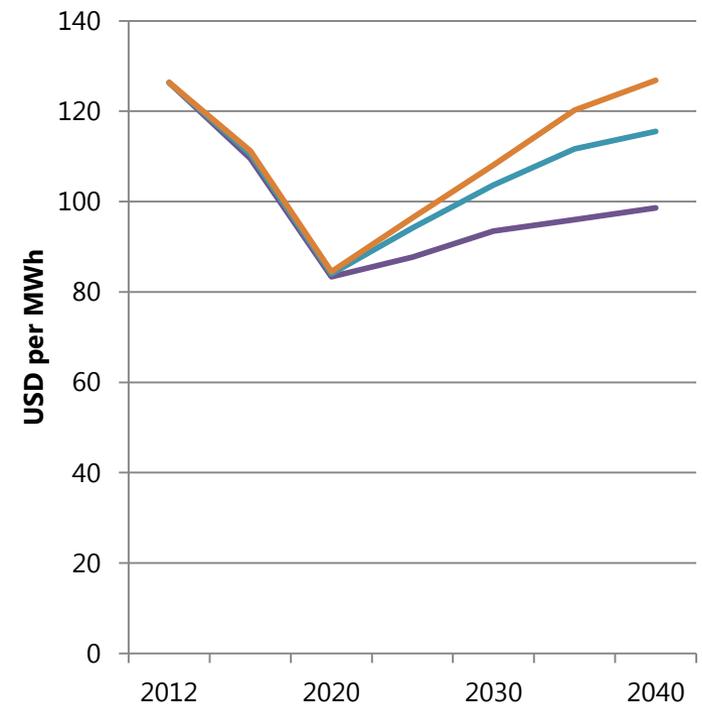
- Over the past 4 decades, the global CO₂ emissions increased at annual rate of 1.9%.
- Gas, clearly a cleaner fuel option among fossil fuels, can help to mitigate emissions.

Clean Energy Development Challenges

Emission Release from Power Sector in APEC Southeast Asia



Average Cost of Generation per MWh in APEC Southeast Asia



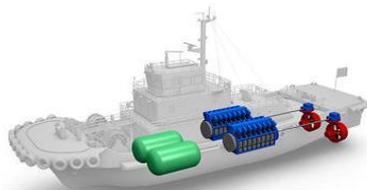
The CO₂ emissions will be reduced by 500 million tons by substituting future coal power plant with gas, but it comes with a price.

Clean Energy Development Challenges

LNG AS TRANSPORTATION FUEL

CLEANER FUEL

Exploration and extraction of gas



Maritime Journal

AVAILABILITY

LNG availability and reliable supply chain



CHALLENGES

INFRASTRUCTURE

Increasing in infrastructure development parallel with demand



The Rootselaar Group



TECHNOLOGY

Commercialization of proven and reliable engine technology

ENGINE & FUEL SYSTEM COST

Developing new technology

REGULATORY

Requires framework that facilitates infrastructure and market development



Source: Shell Eastern Petroleum Pte Ltd.

Way Forward

Transparency and Data Sharing

JodiGas 



JODI-Gas World Database

JODI-Gas World Database: 1st update on 21 September 2015 - Data up to July 2015

- 52 countries updated the database with the most recent July 15 data (M-1 data).

[JODI Gas World Database](#)

[Gas Data Country Availability](#)

- Transparency is essential for efficient, liquid and competitive gas markets.
- Data transparency will help in developing gas market integration
- Businesses require robust and transparent data to make informed investment decisions

Way Forward

Cooperation among All Stakeholders



Regional/global cooperation will foster better understanding between gas producers, importers, consumers, businesses and governments.

Conclusion



- Strengthening regional and global cooperation will be the key in overcoming gas security challenges
- Robust and transparent gas market will facilitate gas demand growth in the future
- Natural gas can be fuel of choice due to its abundant reserves and cleanest fossil fuel. With right policy framework and regulatory support, natural gas can help to promote clean energy and reduce CO₂ emissions
- Natural gas can make a major contribution to improving energy security, facilitating economic growth and providing a cleaner and more efficient energy system for future generations



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