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ASIA and the Changing Global Gas Market

Natural Gas Pricing Policy and
Incentivizing Natural Gas Use
Versus Other Fuels

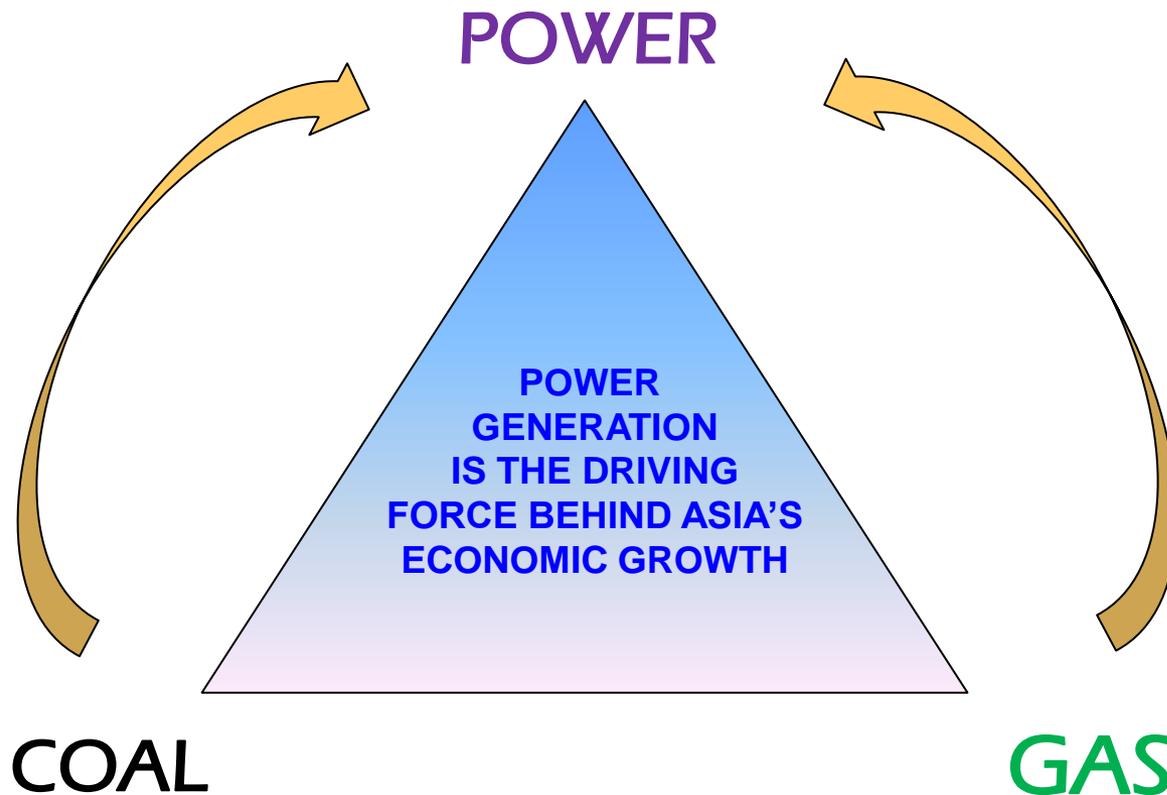
6 May 2013



Summary

- Introduction
- Rising importance of Natural Gas in Asia
- Gas pricing
 - Regional Gas Pricing
 - Asia Gas price policies roundup
 - Asia Gas Prices
- Development of Asian Gas Markets
- Influence of Unconventional Gas
- Ranking of Gas in ASIA with Alternative Fuels.
- New Gas Demand
- Conclusions

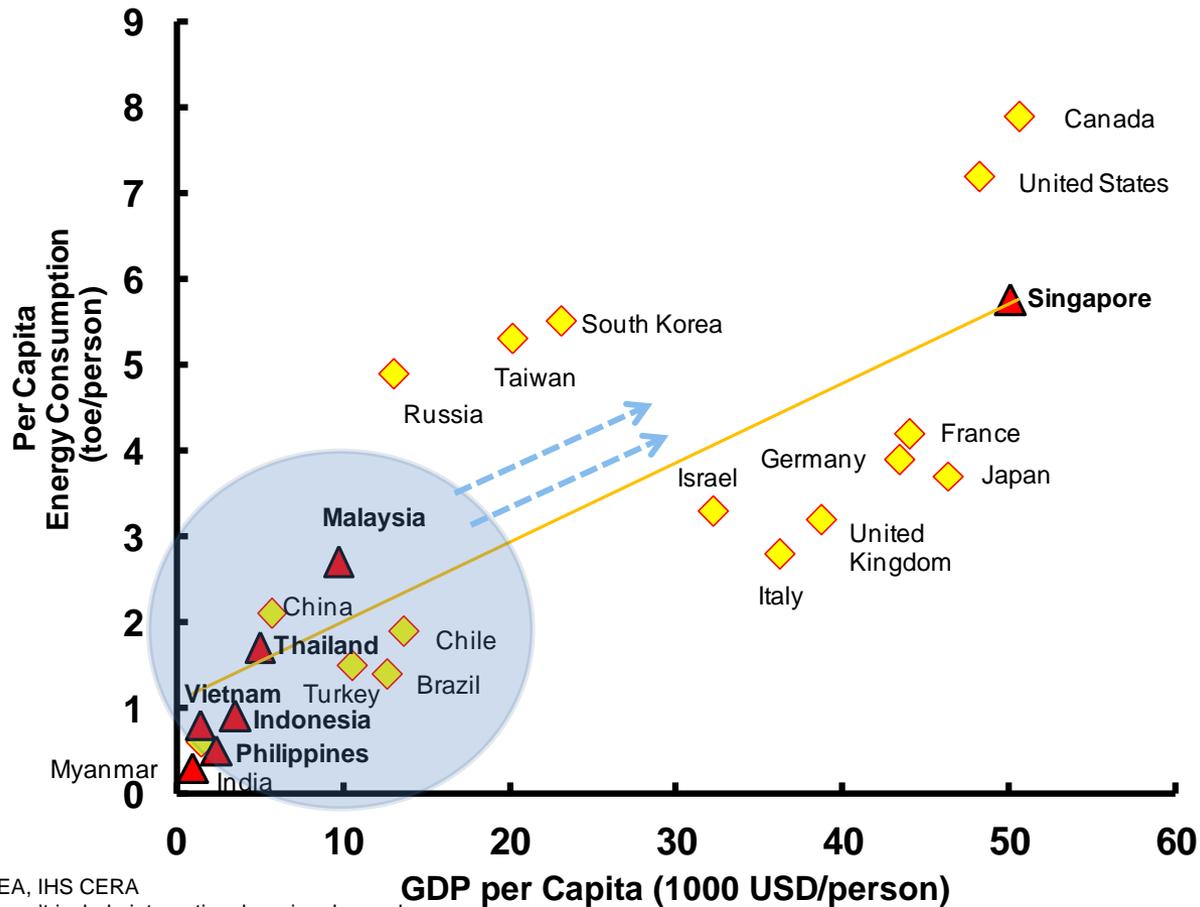
ASIA Energy Demand – Main Characteristic



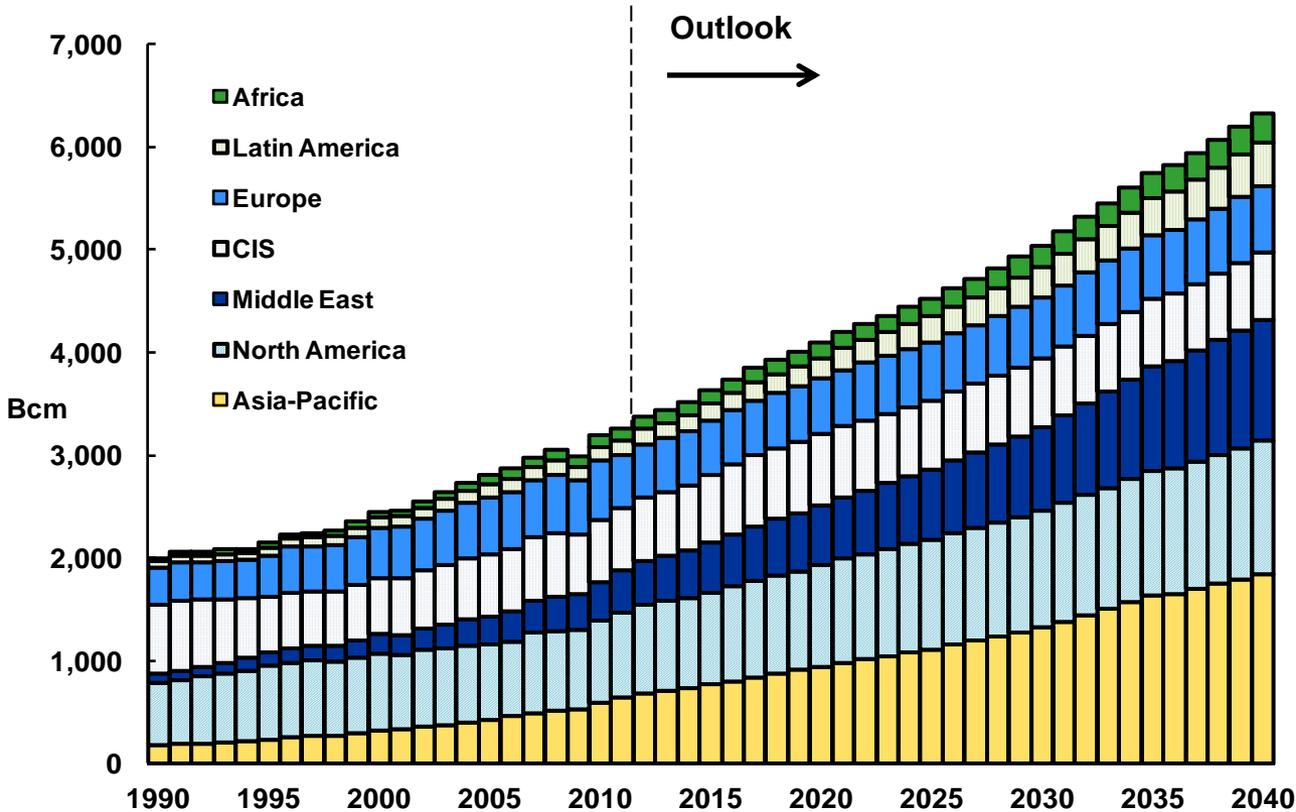
Low Cost developing Asian countries like Thailand, Malaysia, Philippines, China are moving to high income economies.

Growth of Energy Demand in ASIA

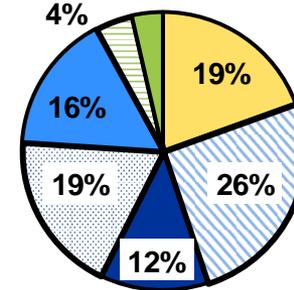
Natural Gas is helping to fuel ASIA's economic growth



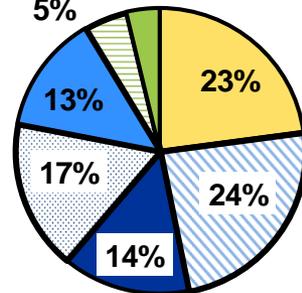
ASIA – Region of Largest Gas Demand



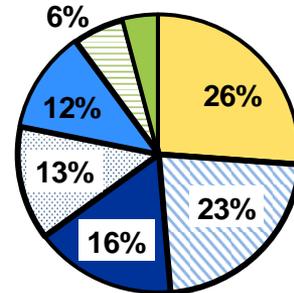
2011
(3,250 Bcm)



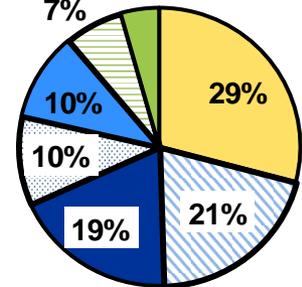
2020
(4,090 Bcm)



2030
(5,030 Bcm)



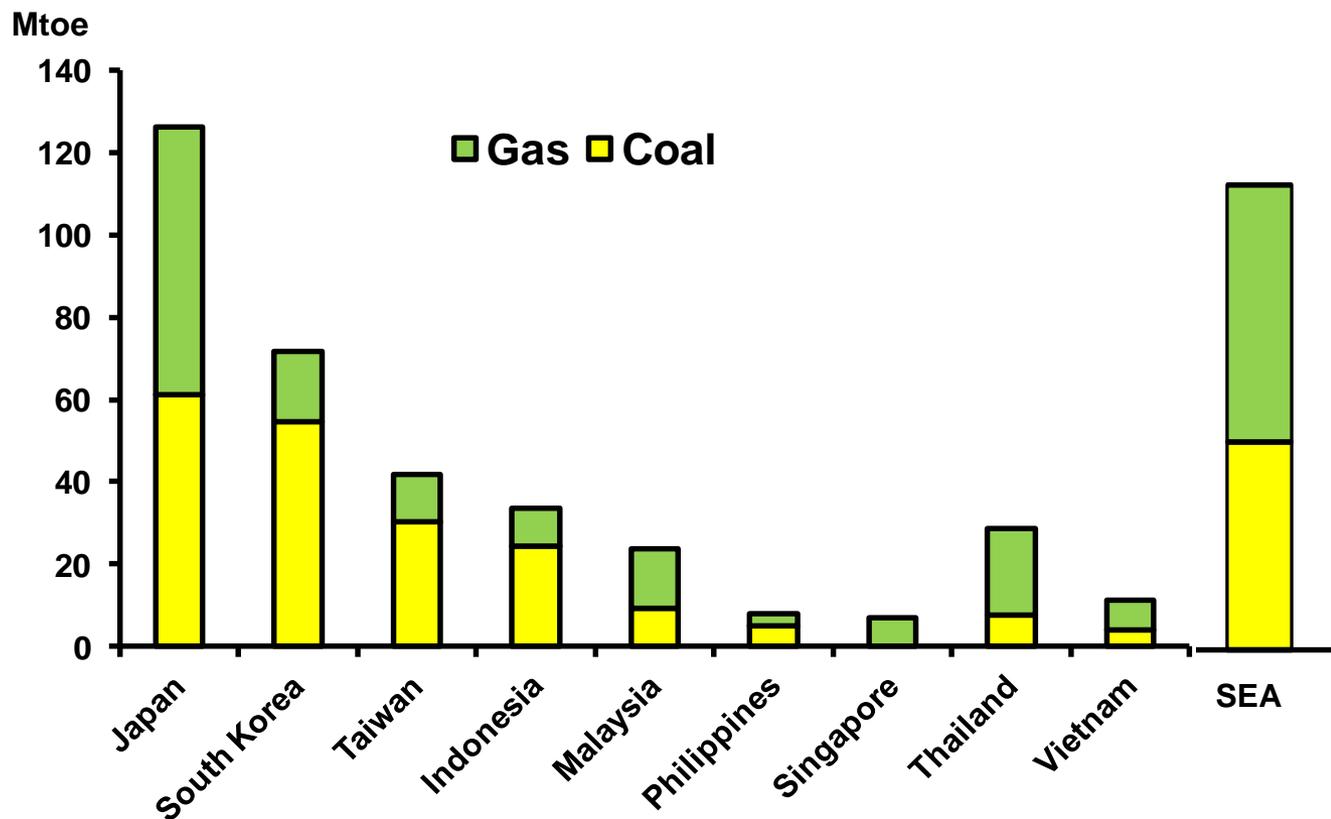
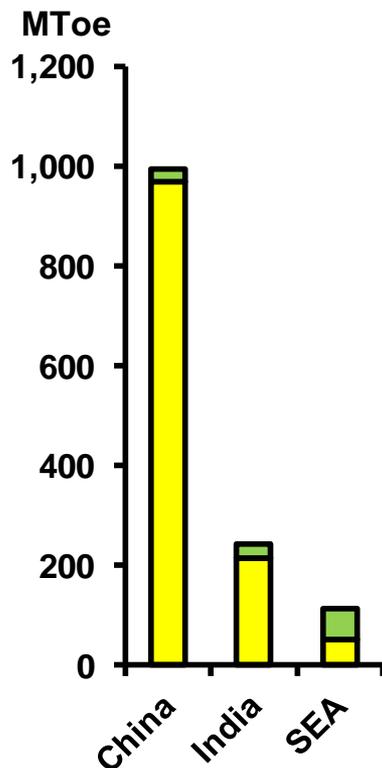
2040
(6,320 Bcm)



Source: IHS .

Gas and Coal demand in ASIA

2012

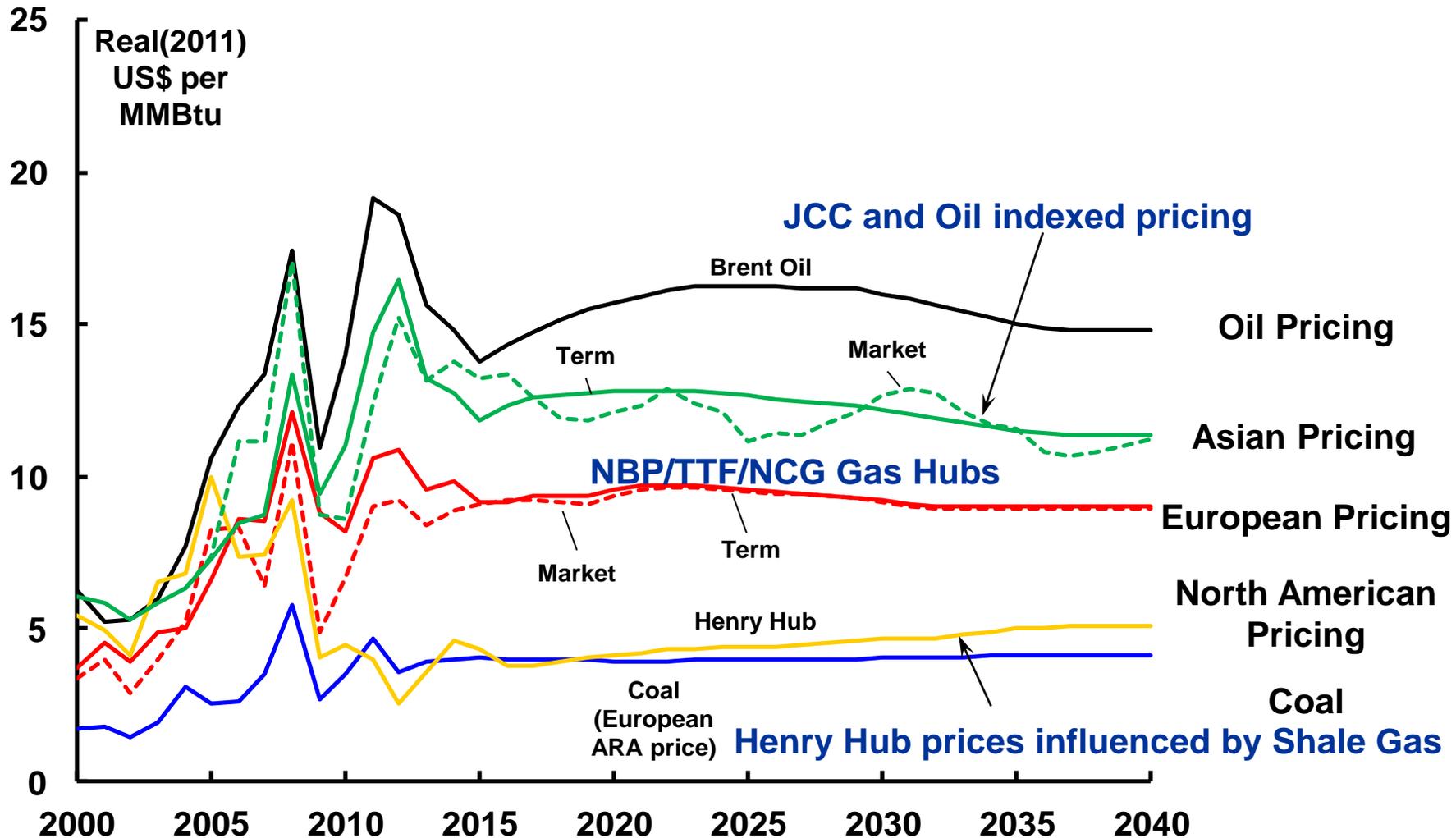


Source: IHS

Power dominates gas demand in Asia but coal is the dominant fuel for power.



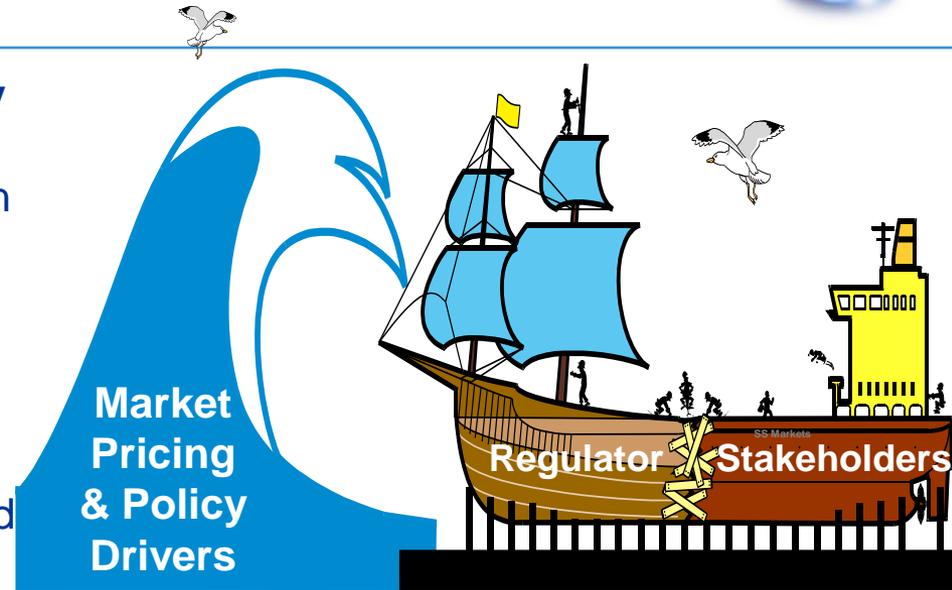
Regional Pricing



Source: IHS

Potential Market Reforms in Gas

- **Developing concerns with energy security issues** - reliance on coal and gas is set to increase further as rapid economic expansion continues.
- **Focus on energy policy** - Many resource producing countries in SEA and ASIA are starting to experience depletion, and will need a sustainable energy policy roadmap.
- **Subsidy and market based pricing** – many markets in SEA and ASIA historically relied on an administered price regime, and struggled with retail price subsidies for energy products. Policy reforms are required to address subsidies and motivate power infrastructure investments and new sources of domestic fuel supplies and migrate to market based pricing.



Evolving Energy Policies in ASIA

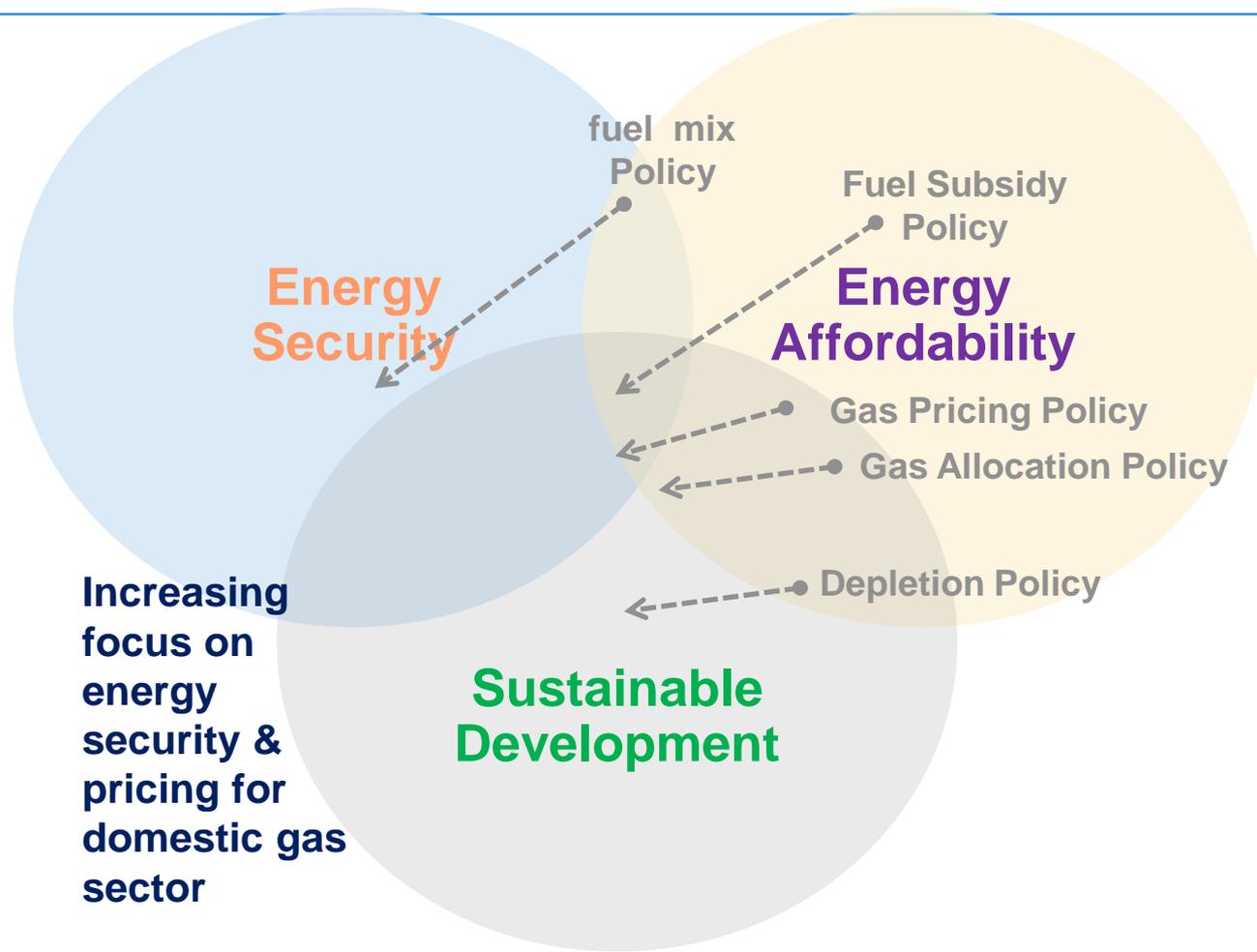
From
To ← ● How have country policies moved since 1997

From
To ← ● Likely roadmap for policy development

- Placement on chart indicates relative emphasis of government

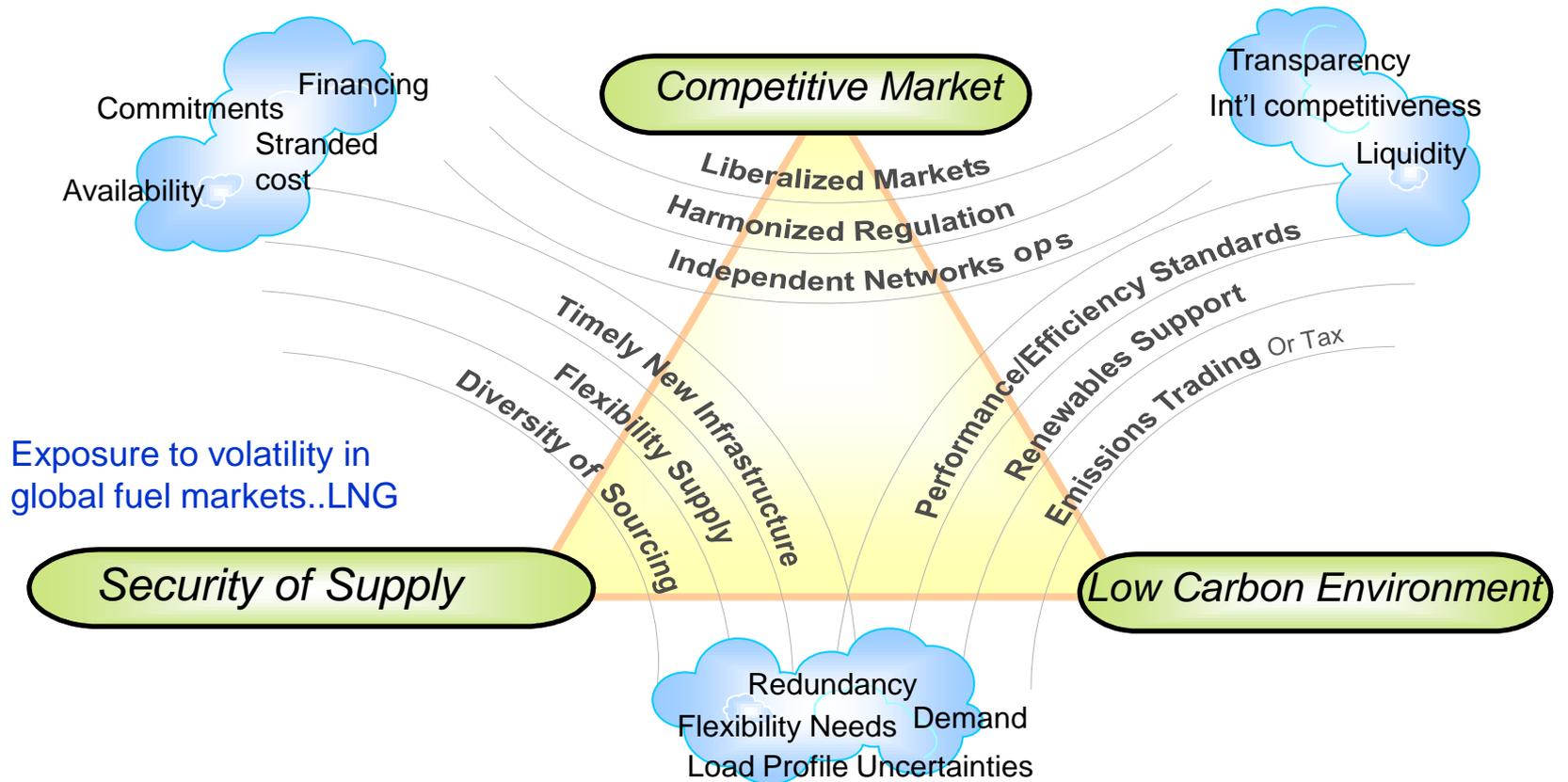
Definitions:

- **Energy Security** = Emphasis placed on securing supplies of fuel, diversifying sources, stocking requirements, etc
- **Affordability** = Emphasis placed on low cost fuel supply, sensitivity of political process to populist concerns over cost, etc
- **Sustainable Development** = Emphasis placed on environmental sustainability/impact

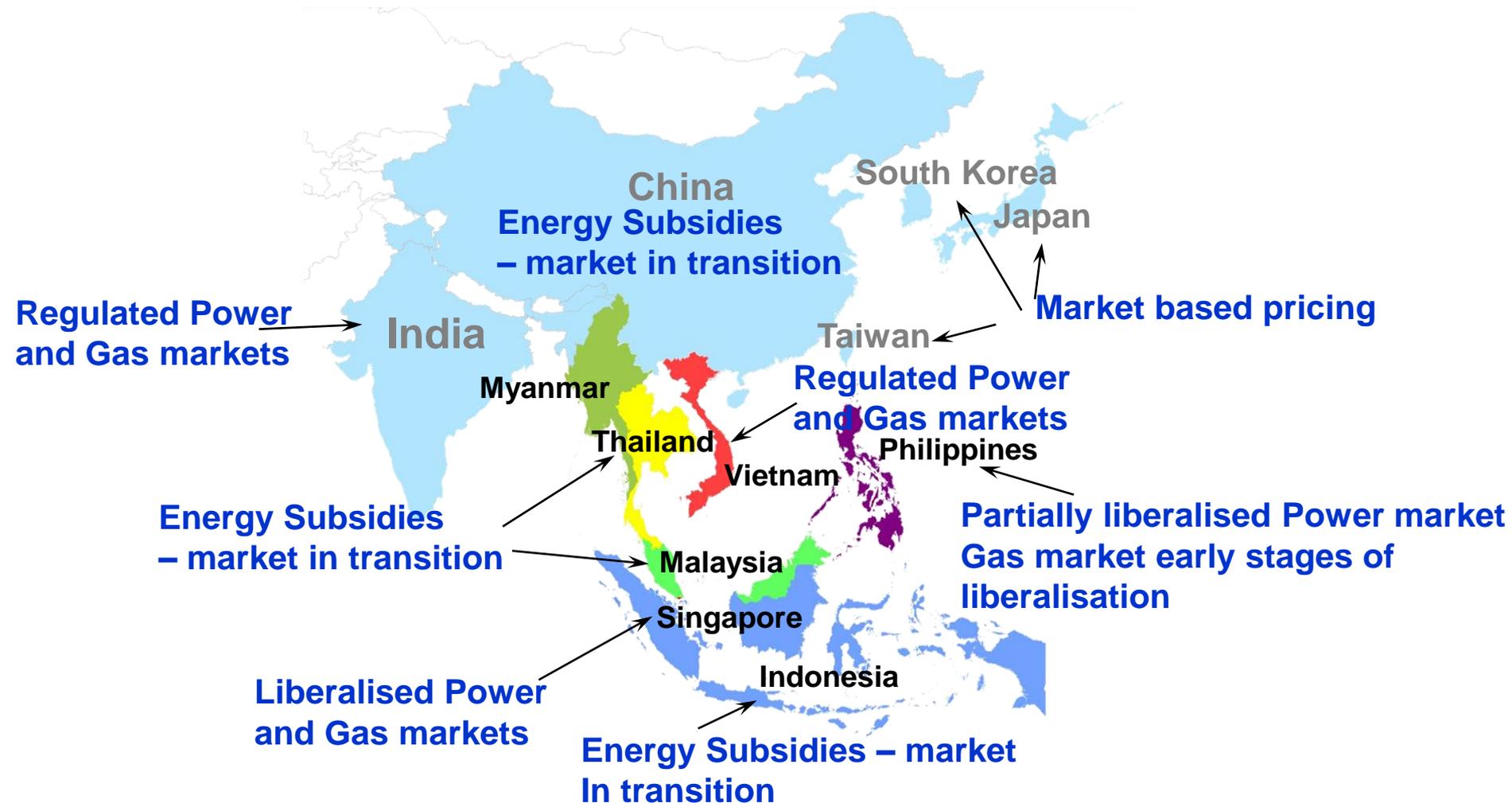


Source: IHS

ASIA Gas Price Policies - 1



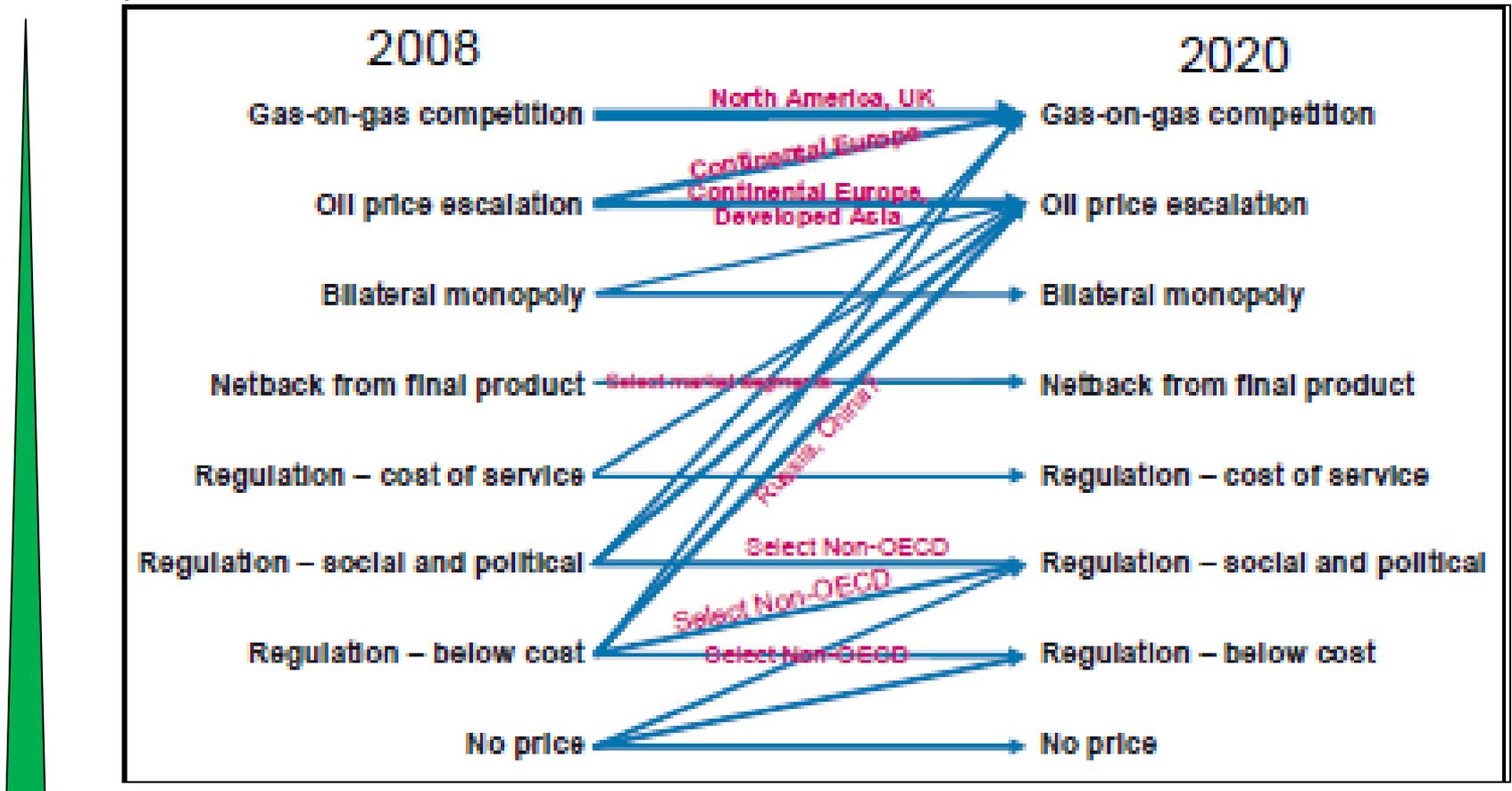
ASIA Gas Price Policies - 2



Source: IHS

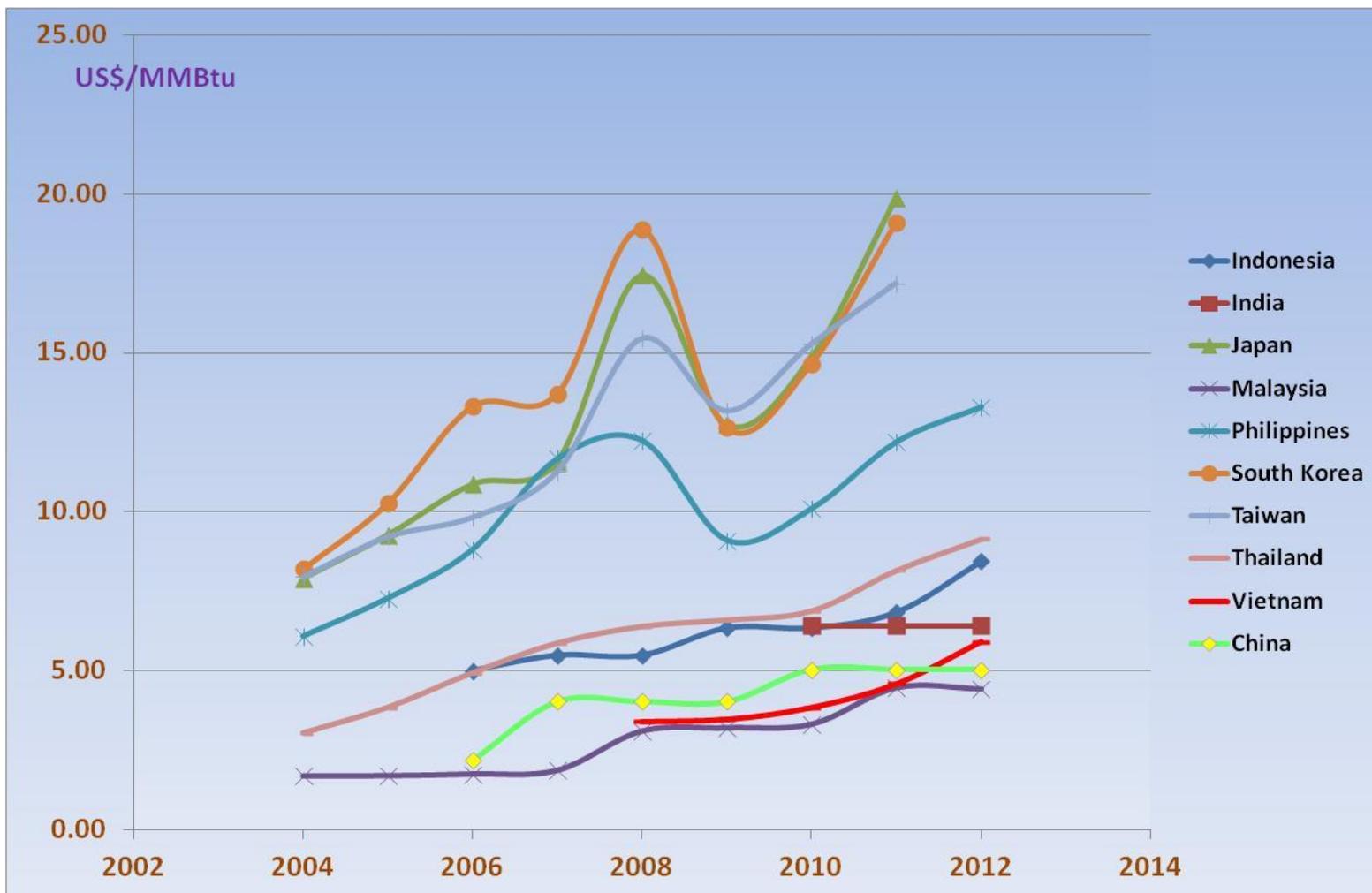
ASIA Gas Price Policies - 3

Market Maturity



Source: IGU

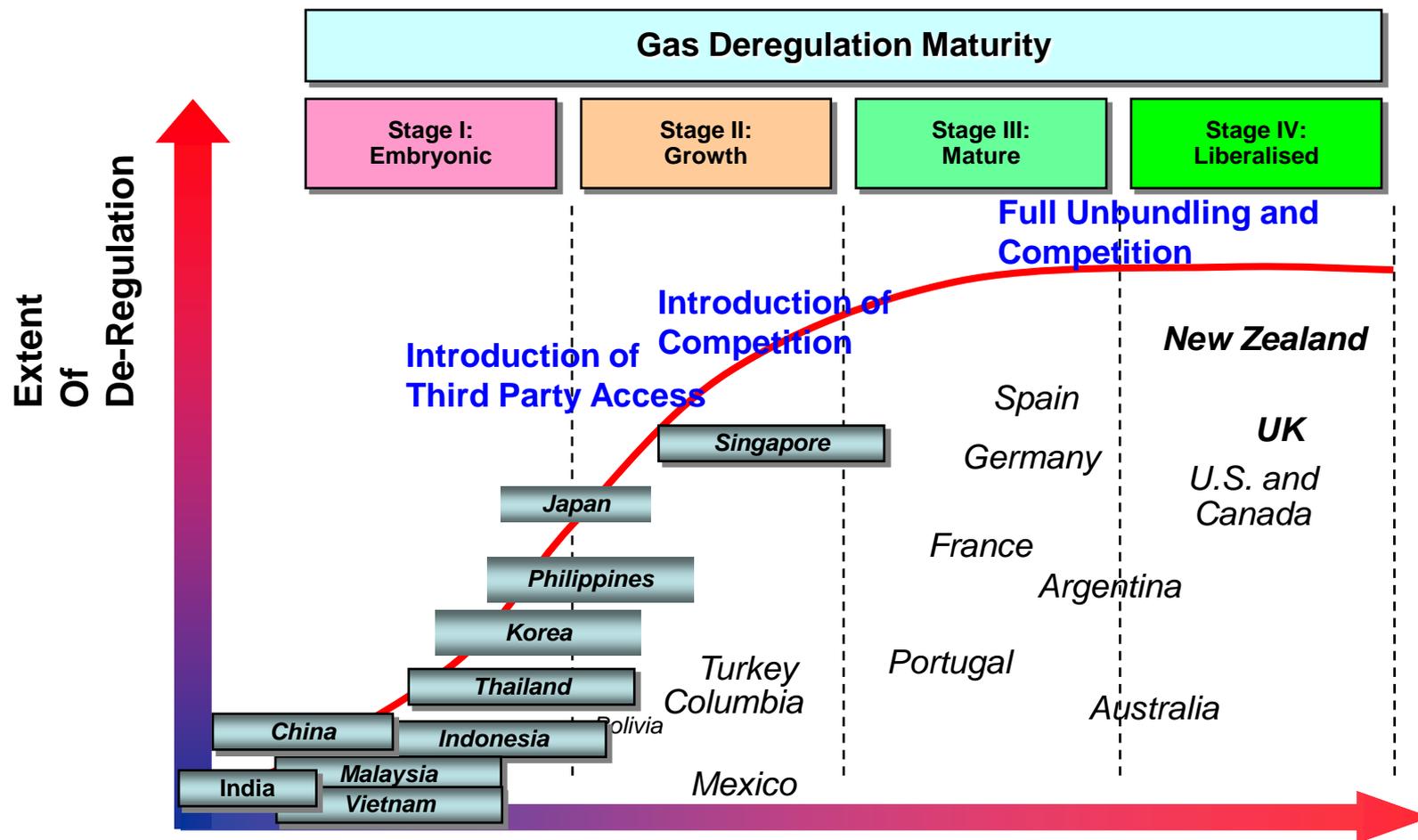
ASIA Gas Price Comparisons



Power generation gas price

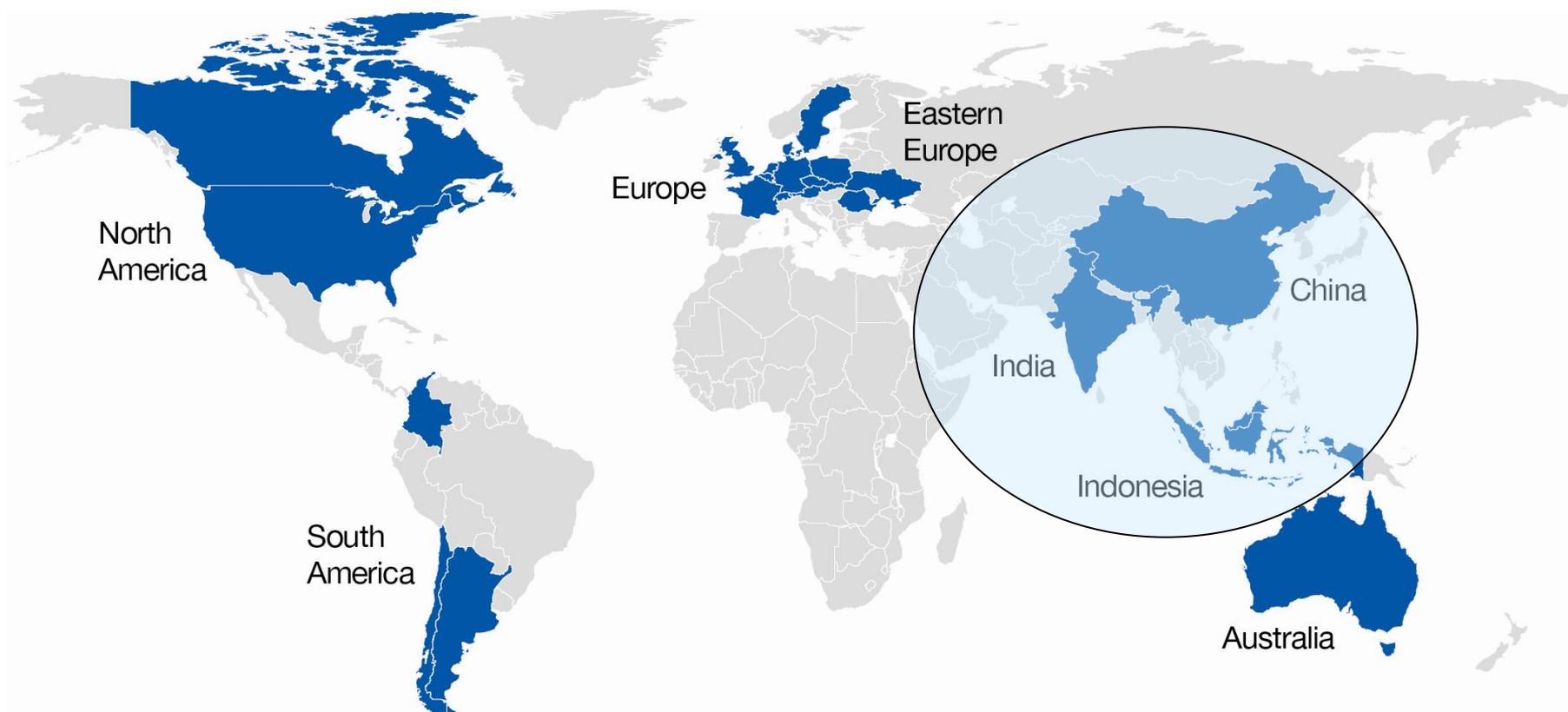
Source: IHS

Development of Gas Markets - 2



Source: IHS

Unconventional Gas – ASIAN Source



- Unconventional gas could change the supply dynamics and pricing in ASIA
- What price is realistic to provide initial investment and sustain supply?
- What Regulatory regime would support the development of Shale Gas in Indonesia, China and India?

Source: IHS

Simplified Ranking of Gas in ASIA with Alternative Fuels



Attribute	Gas	Coal	Hydro	Solar	Wind	Biomass	Geothermal
Cost	7	8	5	6	6	5	7
Accessibility	7	9	3	6	4	10	3
Infrastructure	4	8	3	8	8	8	4
Flexibility	9	7	4	2	2	8	8
Environmental	6	1	10	10	10	4	3
Chemical processing	7	3	0	0	0	2	0
Storage	6	10	4	1	0	8	8
Sustainable	10	10	5	3	3	5	8
TOTAL	56	56	34	36	33	50	41

Ranking criteria : 10 is favourable, 1 is unfavourable
Excluding Nuclear and Oil

- Ranking is subjective
- Fuel of choice is dependent on indigenous resources, accessibility, flexibility and alternative uses
- Taxation will encourage/discourage use of fuels.



New Gas Demand

- Two new uses for LNG which could significantly increase demand in ASIA :-
 - LNG as a Ship bunker fuel,
 - LNG as transport fuel for vehicles
- Marine Environment Protection Committee of the International Marine Organisation (IMO) adopted the revised Annex VI, Prevention of Air Pollution from Ships to the MARPOL 73/78 Convention, which sets limits on nitrogen oxide and sulphur dioxide emissions from ship exhausts, with consequent control of bunker fuel sulphur content being imposed. LNG fuel for shipping is gradually replacing
- LNG bunkering projects and LNG as a marine fuel gained significant momentum during 2012. In April 2012, there were 27 LNG-fuelled ships in operation, and 29 to be delivered. Legislation on bunker fuel has not yet been imposed on ASIA, but the Shipping industry appears to be heading that way. At 40 mt per annum, Singapore is the biggest bunker market in the world ..
- LNG as a transport fuel is growing in momentum. There is a fast growing market in LNG fuelled trucks. Also, in China, where the transportation market is expanding rapidly, several cities already use LNG-powered buses.



Conclusions

- Natural Gas is a key fuel in the development of the economy in ASIA
- Coal is a competing fuel to gas for power generation and is likely to remain the dominant fuel for some years.
- Fuel choice is dependent on a number of factors – natural gas is an efficient reasonably priced fuel –the most environmentally acceptable of all fossil fuels.
- Future gas supplies to ASIA are increasingly likely to come from LNG
- Depleting indigenous gas reserves and the economic development of ASIAN nations (Thailand, Indonesia, Malaysia, Philippines, China) will increase pressure to move to market based pricing and limited market deregulation.
- Unconventional (Shale Gas) from local sources could influence gas price formation.
- LNG as bunker fuel and LNG for transport in trucks could impact ASIAN gas demand.

Thank You

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