University of Leicester
Department of Geography

Energy security
Globalisation
Climate change
Global Energy Dilemmas

Gas Markets in Asia: current status and future prospects

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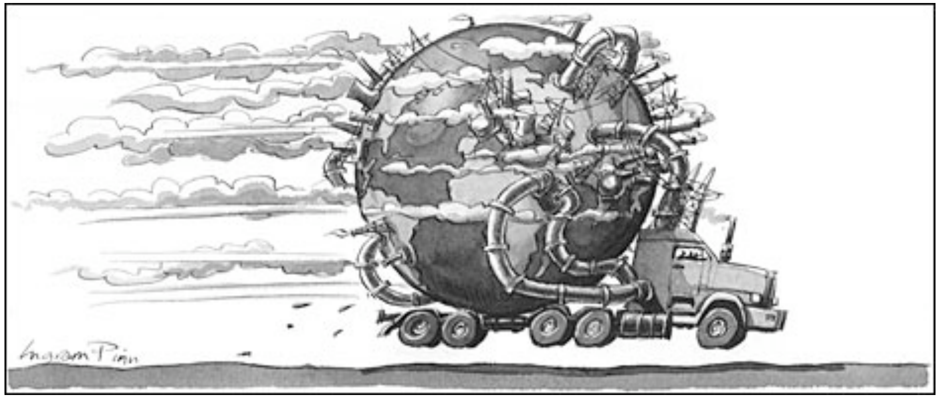
Plan



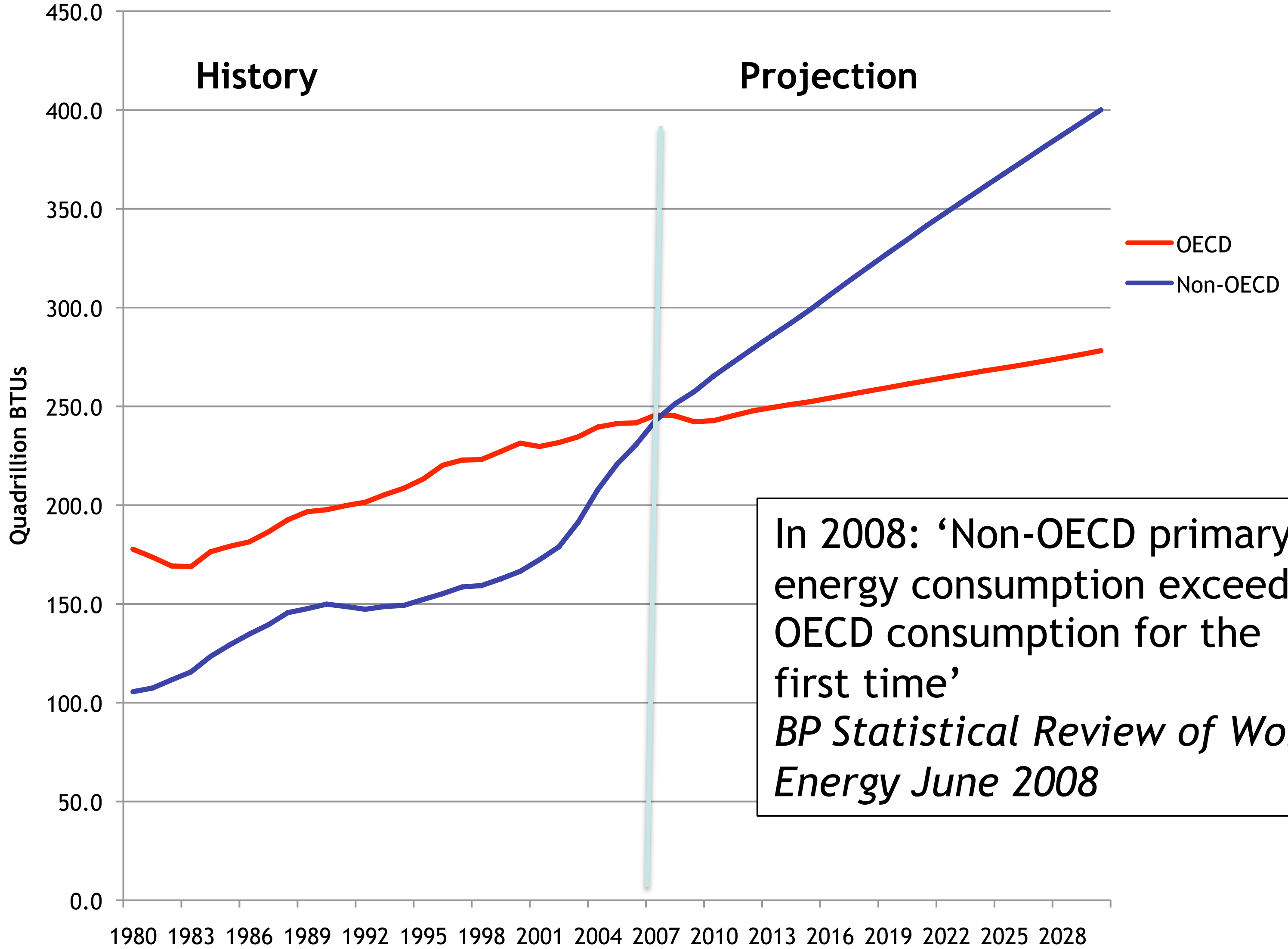
- A Global Shift in Energy Demand
- Natural Gas in the Asia-Pacific Region
- Projections of future gas demand
- Key drivers of future energy demand
- The ‘how’ and ‘where’ of future gas supply
- Conclusions

A Global Shift in the Growth of Energy Demand

Country	Pop. Growth	Population (millions)		GDP Growth	Vehicle use millions		Energy Consumption per person	
	Per annum	2005	2030	Per annum	2005	2030	Urban (mtoe)	National (mtoe)
China	0.4%	1310	1460	6.1%	23	230	2.6	1.4
India	1.1%	1100	1450	6.4%	10	125	n/a	n/a
Middle East	1.7%	190	300	4.3%	18	75	n/a	n/a
US	0.8%	303	370	2.1%	160	225	7.6	7.6
EU	0%	489	505	1.8%	225	295	3.5	3.7

Malcolm Wicks (2009) *Energy Security: A National challenge in a changing world*. DECC: London, p. 26.

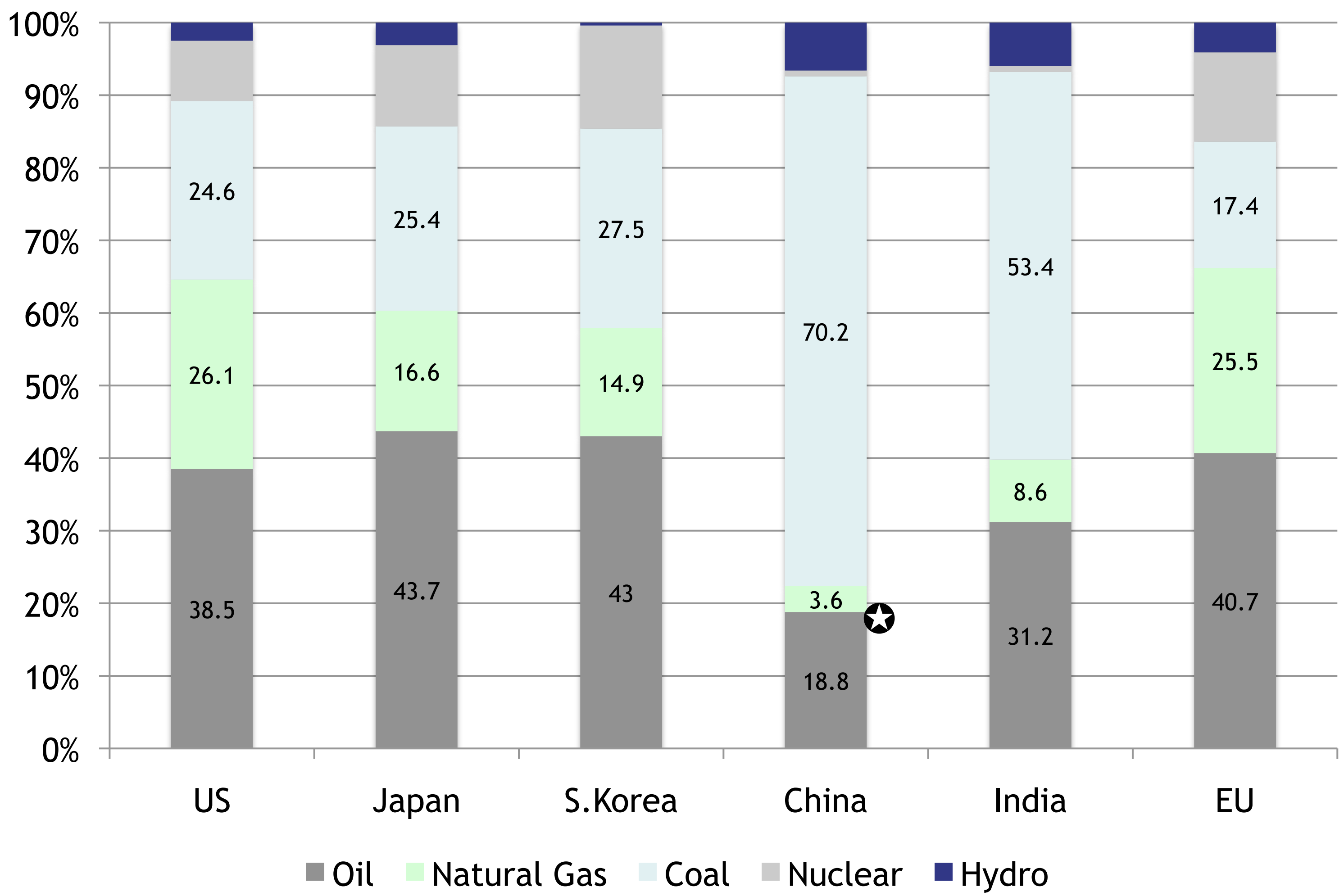
World Marketed Energy Consumption OECD and Non-OECD, 1980-2030



In 2008: 'Non-OECD primary energy consumption exceeded OECD consumption for the first time'
BP Statistical Review of World Energy June 2008

US Energy Information Agency, *Energy Projections* (2009)

Natural Gas in the APR Energy Mix (2008)



✪ The Chinese Government expects natural gas to grow to 8-10% by 2020

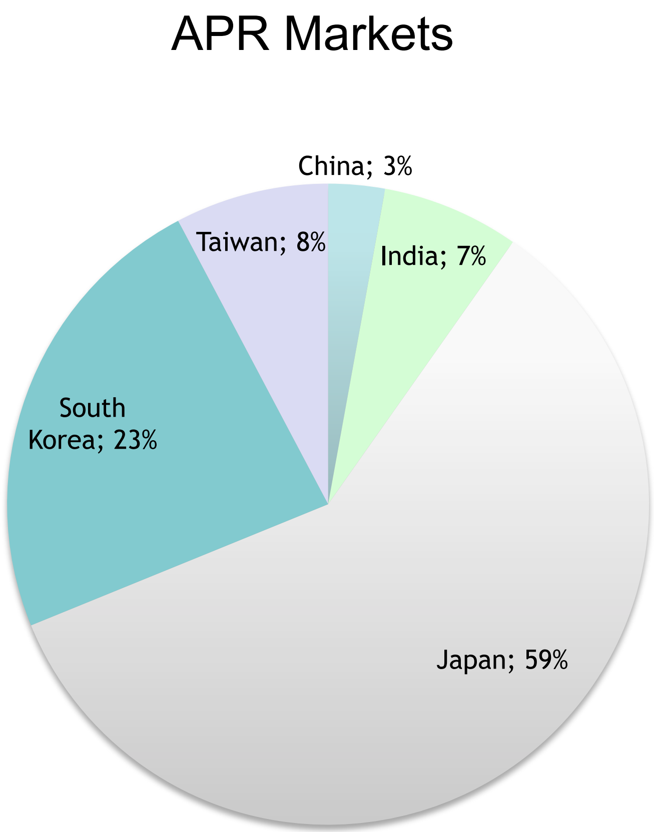
Source: *BP Statistical Review of World Energy June 2009*

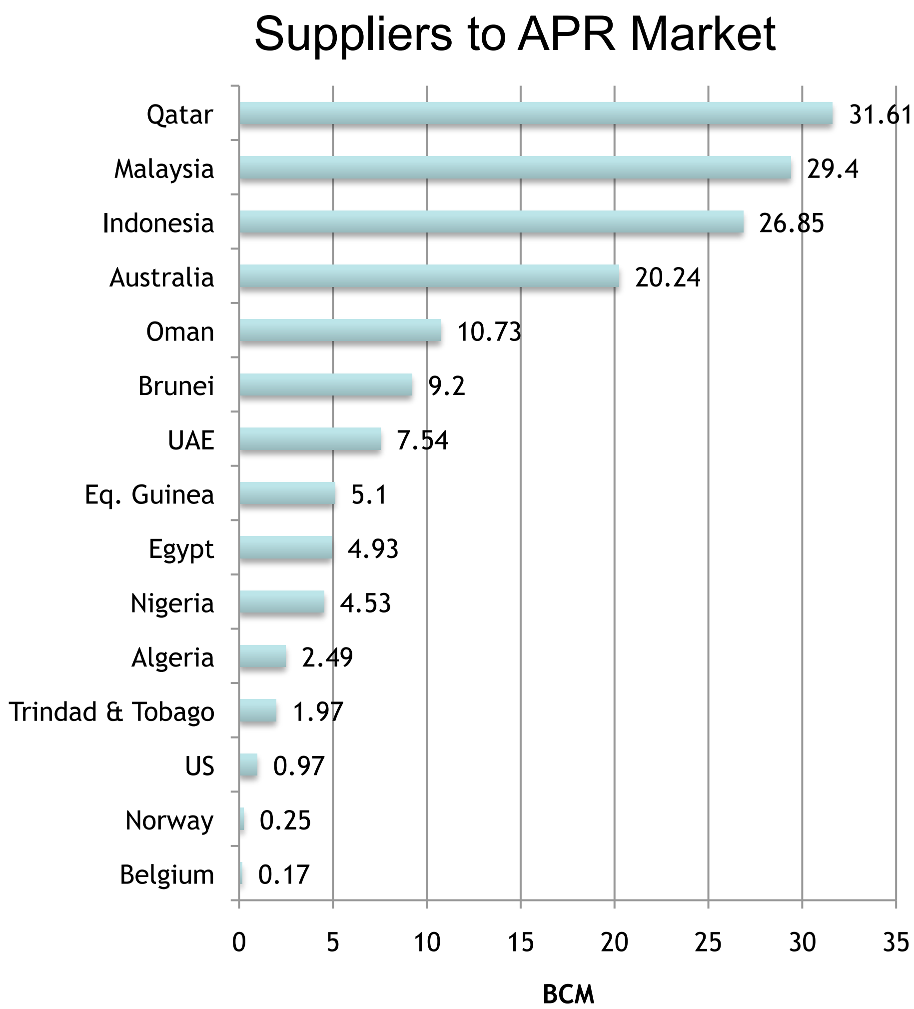
Current LNG Supply to the APR in 2008 (BCM)

Supplier	Japan	India	China	S.Korea	Taiwan
US	0.97	--	--	--	--
Trinidad & Tobago	0.67	0.24	--	0.84	0.22
Belgium	--	0.09	--	0.08	--
Norway	0.17	0.08	--	--	--
Oman	4.25	0.35	--	6.04	0.09
Qatar	10.91	7.98	--	11.62	1.10
UAE	7.41	0.13	--	--	--
Algeria	1.12	0.65	0.17	0.47	0.08
Egypt	2.21	0.26	0.25	2.13	0.08
Eq. Guinea	1.64	0.44	0.16	1.33	1.53
Libya	--	--	--	--	--
Nigeria	2.36	0.41	0.24	0.16	1.36
Australia	15.94	0.16	3.61	0.53	--
Brunei	8.22	--	--	0.98	--
Indonesia	18.79	--	--	4.06	4.00
Malaysia	17.47	--	0.01	8.31	3.61

Source: BP, 2009, *BP Statistical Review of World Energy June 2009*, 30

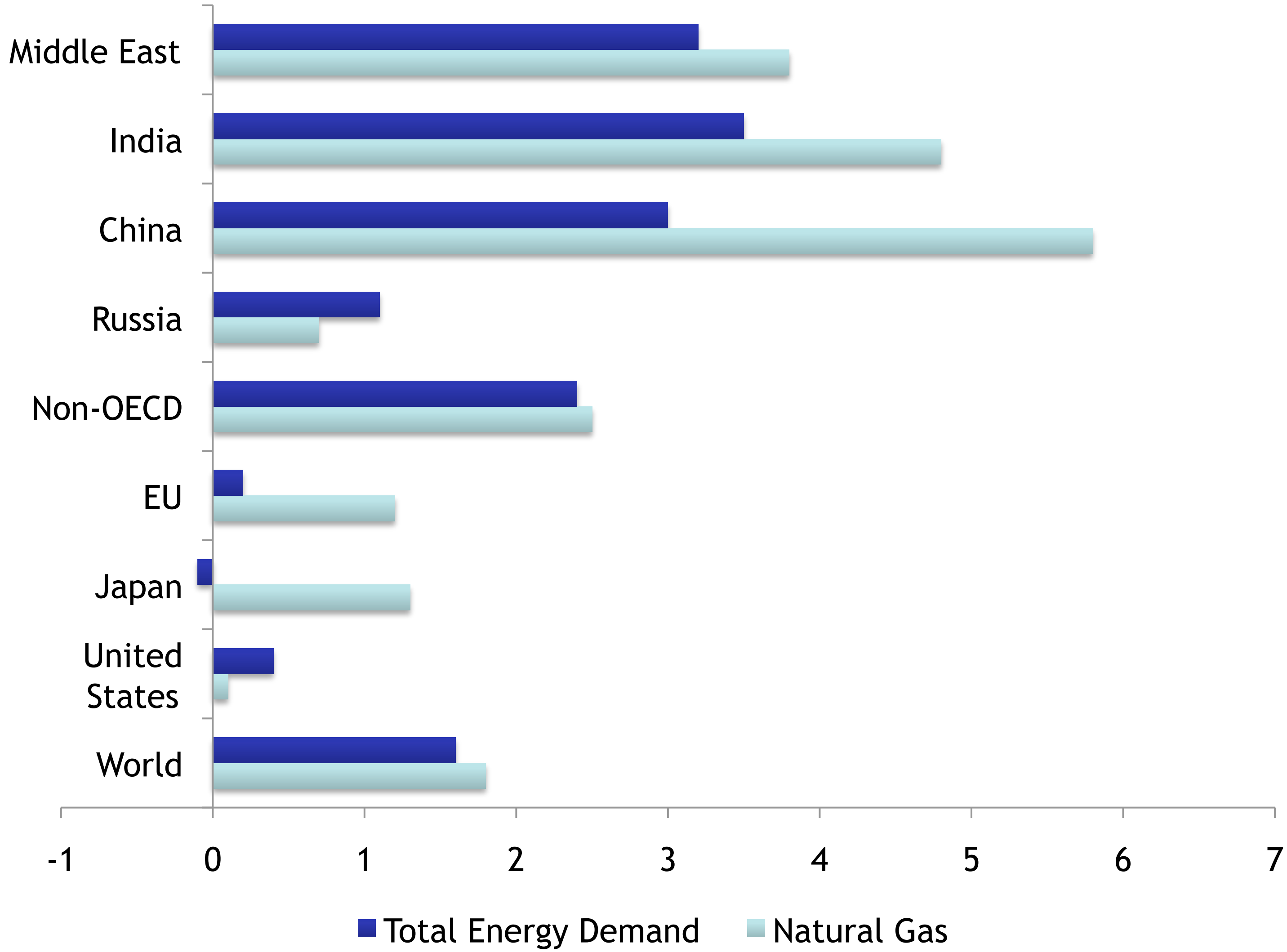
LNG Markets and Suppliers, 2008





Source: BP, 2009, *BP Statistical Review of World Energy June 2009*, 30

IEA Projections for Total Energy and Gas Demand Growth 2006-2030: Reference Scenario (%)



Source: IEA 2008, *World Energy Outlook 2008*.

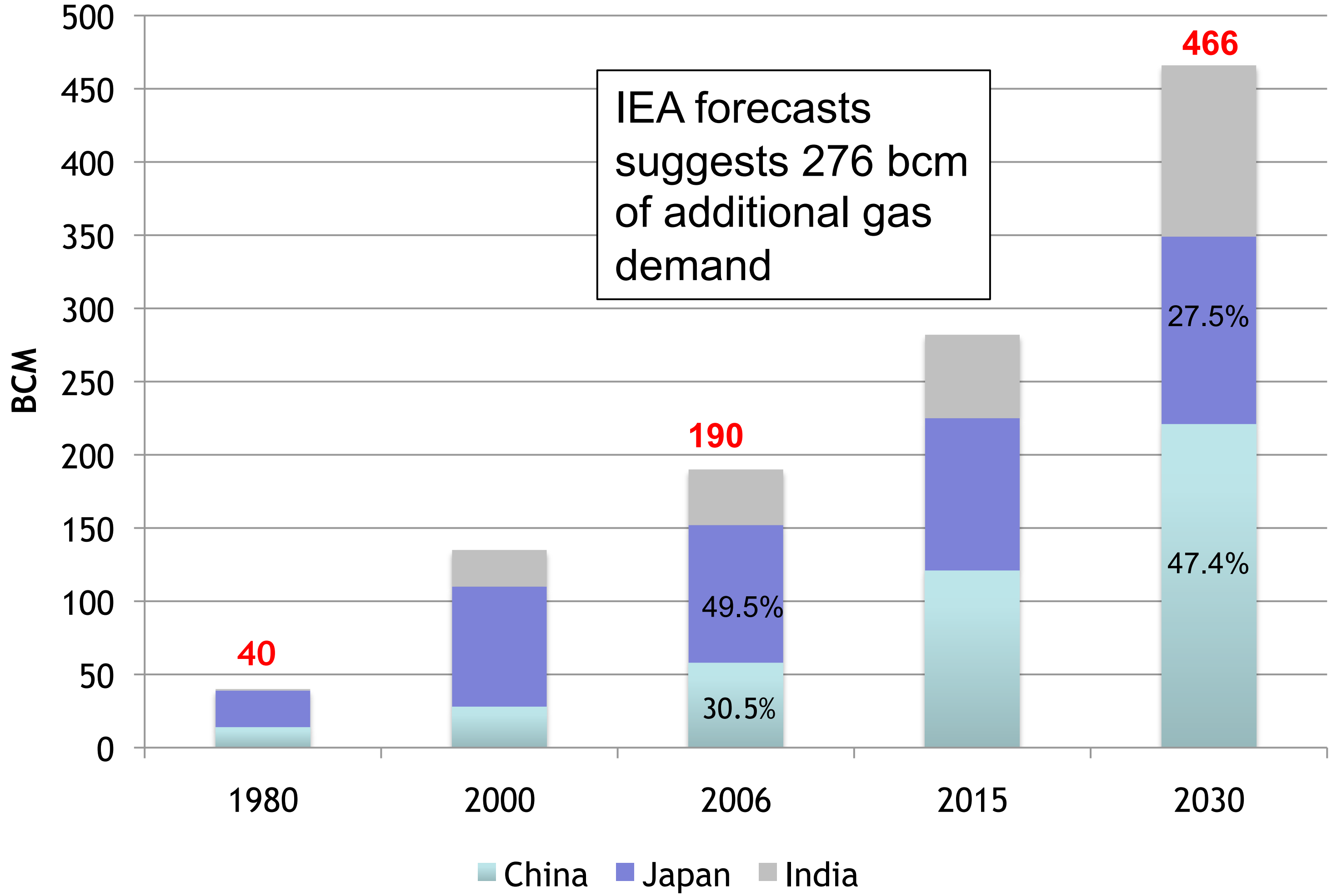
Forecasts for APR Gas Demand in the IEA 2008 Reference Scenario (BCM)

	1980	2000	2006	2015	2030	2006-30 Annual % Growth	
						IEA	EIA
OECD Pacific	35	130	158	183	225	1.5	1.0
(Japan)	25	82	94	104	128	1.3	0.5
China	14	28	58	121	221	5.8	5.2
India	1	25	38	57	117	4.8	4.2
World	1517	2541	2916	3512	4434	1.8	1.6
EU	n.a.	482	532	606	681	1.0	1.0*

* OECD Europe

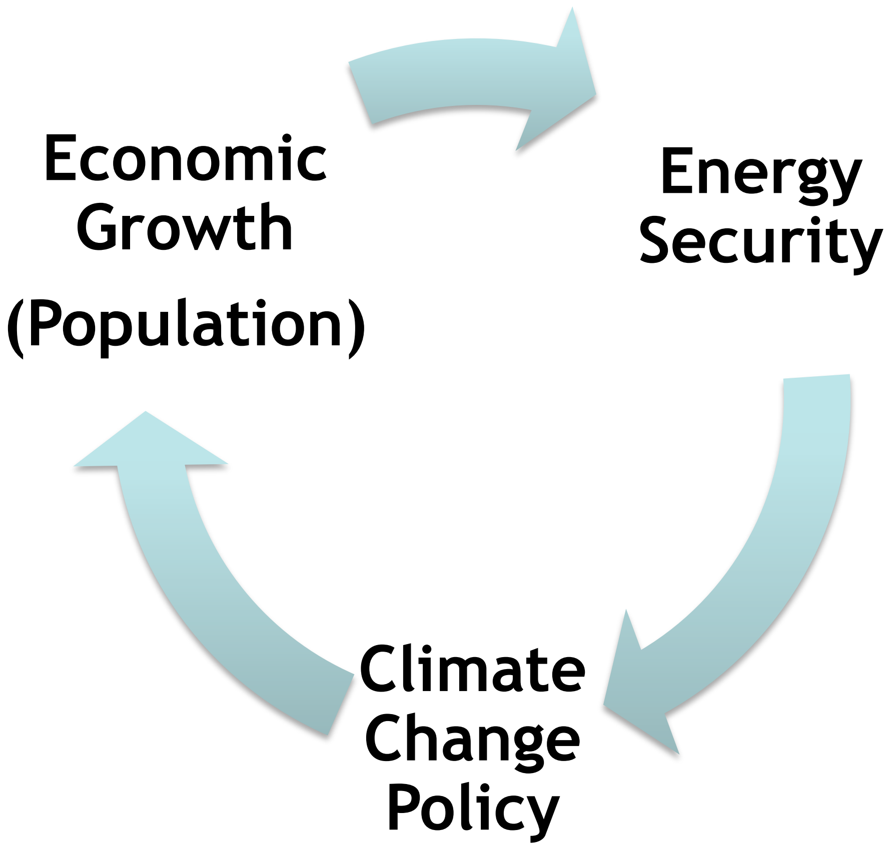
International Energy Agency (IEA) 2008, *World Energy Outlook 2008*, 110 & Energy Information Agency (EIA) 2009, *International Energy Outlook, 2009*, 127

Forecasts for APR Gas Demand in the IEA 2008 Reference Scenario (BCM)



International Energy Agency (IEA) 2008, *World Energy Outlook 2008*, 110

Key drivers of future demand



The Energy Security-Climate Change Nexus

Energy Security

- ***Diverse Energy Mix***: suggests a growing role for natural gas in the APR.
- ***Multiple sourcing***: suggests a need to strike a balance between Asia and Middle East producers.
- **Flexibility**: favours LNG over pipeline supply infrastructure.

Climate Change

- ***Decarbonisation***: suggests a growing role for natural gas in the energy mix, particularly in relation to electricity generation.
- **Bridging fuel:** to a low carbon future (instead of nuclear or coal).
- ***Demand destruction***: longer-term challenge for all producers and consumers.

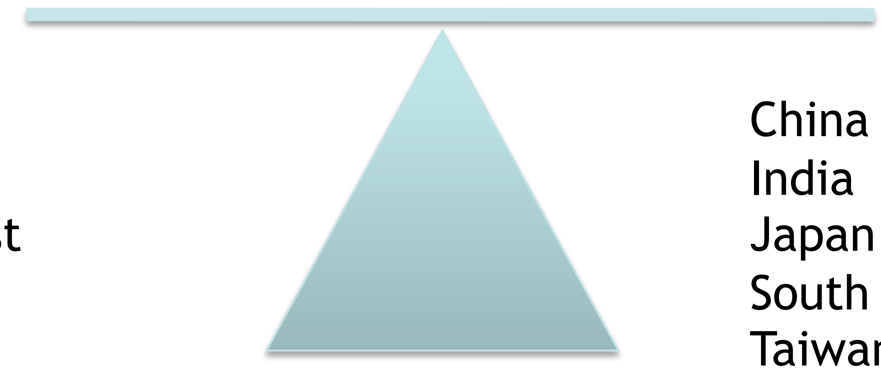
The APR Gas Balance

Export Capacity

Production - Domestic Demand

Import Demand

Domestic demand – Domestic Production



Australasia
Southeast Asia
Russian Far East
Middle East
North Africa
West Africa

China
India
Japan
South Korea
Taiwan
West Coast USA

Getting gas to market

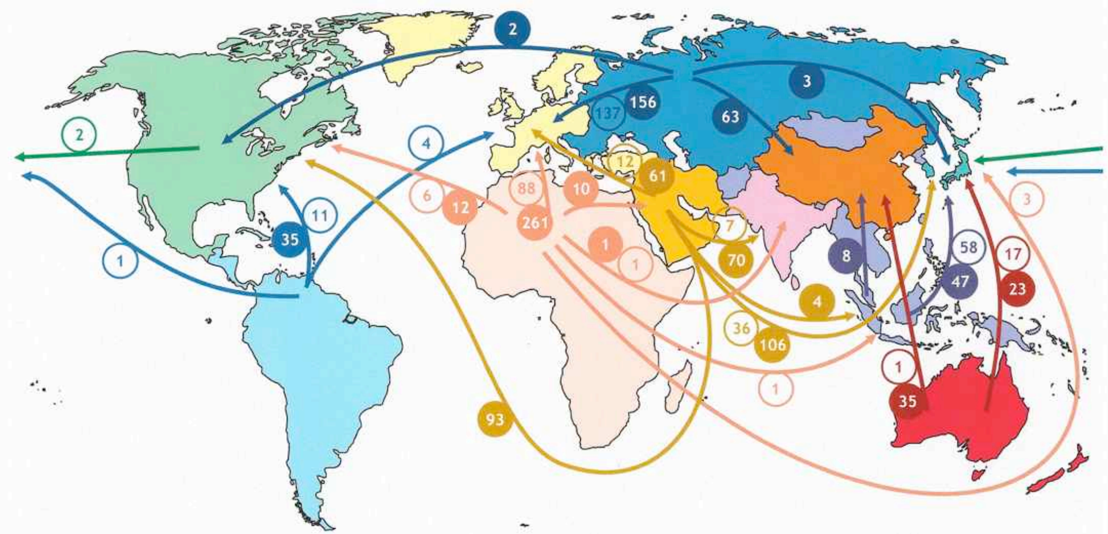
Market	LNG	Pipeline
Russian Far East	✗	✔
China	✔ (coastal)	✔ ? (interior)
Japan	✔	?
Korea	✔	✔ ? (after China)
India	✔	✗

- LNG from Sakhalin can add to energy security and reduce reliance on the Middle East and transit via the Straits of Malacca (so can Australia).

- Pipeline gas from Sakhalin/Far East can gain a competitive advantage in China and South Korea.

Where to get your gas?

Figure 4.6 • Main net inter-regional natural gas trade flows in the Reference Scenario, 2006 and 2030
(billion cubic metres per year)



2 2006 3 2030

- OECD North America
- Latin America
- OECD Europe
- Eastern Europe/Eurasia
- Africa
- Middle East
- India
- OECD Asia
- China
- Other Asia
- OECD Oceania

The boundaries and names shown and the designations used on maps included in this publication do not imply official endorsement or acceptance by the IEA.

Conclusions: Prospects for Sakhalin Gas Exports

- Limited in the short-term due to a shortage of exportable surplus.
- Good in the medium to long-term:
    - LNG as an alternative to Middle East supply (but will face competition from Australia).
    - A clear competitive advantage in terms of pipeline gas to China /South Korea (but in competition with gas from East Siberia and Sakha-Yakutia).