



**Presentation to the
23rd WORLD GAS CONFERENCE**

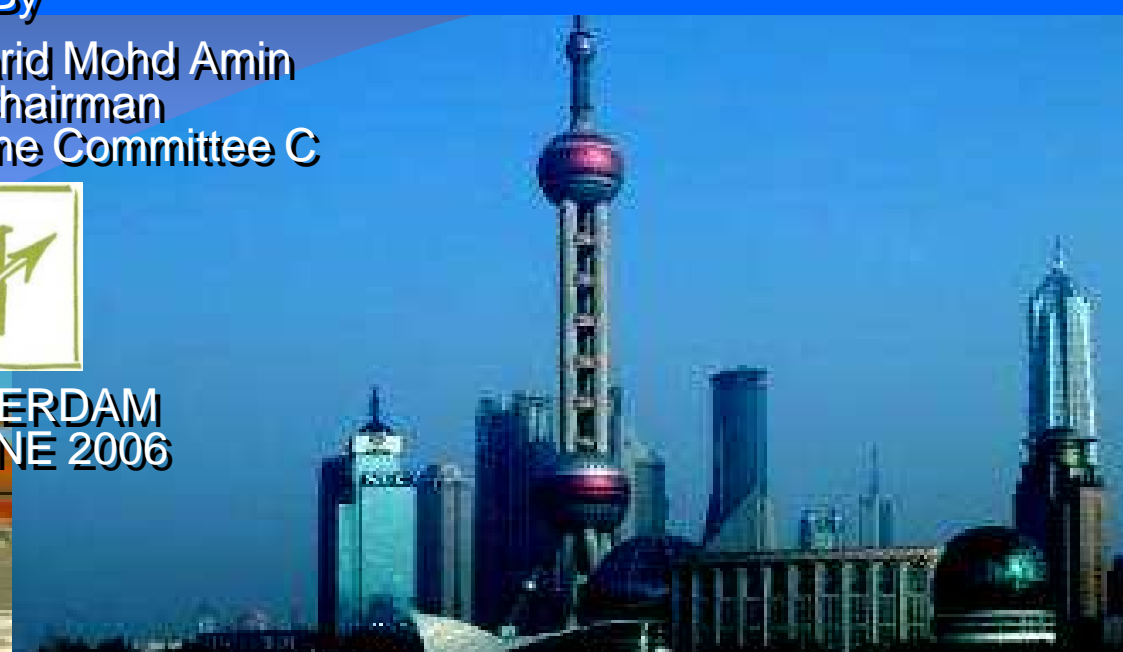
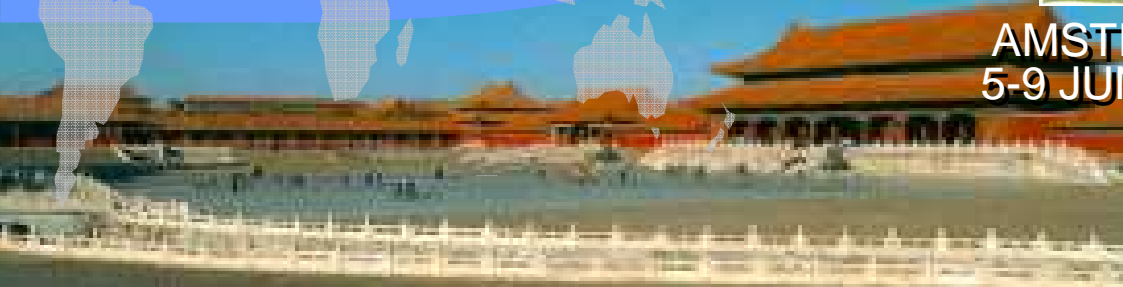
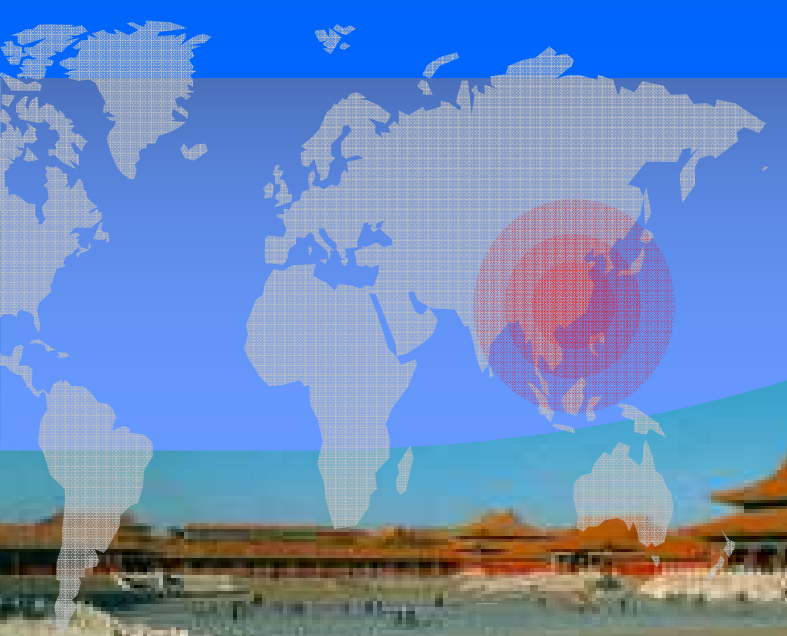
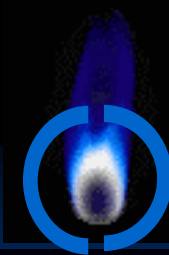
**8.1CS.01
DEVELOPING GAS MARKETS IN ASIA
- THE CASE OF CHINA”**

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Vice Chairman
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Outline of Presentation

INTRODUCTION

OVERVIEW OF CHINA

OVERVIEW OF ENERGY POLICY, INSTITUTIONAL STRUCTURE AND KEY PLAYERS IN CHINA

ENERGY AND GAS SUPPLY AND DEMAND IN CHINA

KEY DRIVERS INFLUENCING THE GAS MARKET IN CHINA

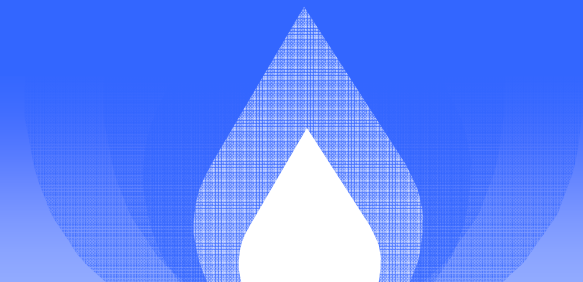
DEVELOPING GAS MARKETS WITHIN CHINA

KEY NATURAL GAS PROJECTS IN CHINA

EFFORTS IN SECURING OTHER SOURCES OF ENERGY SUPPLIES

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SWOT ANALYSIS



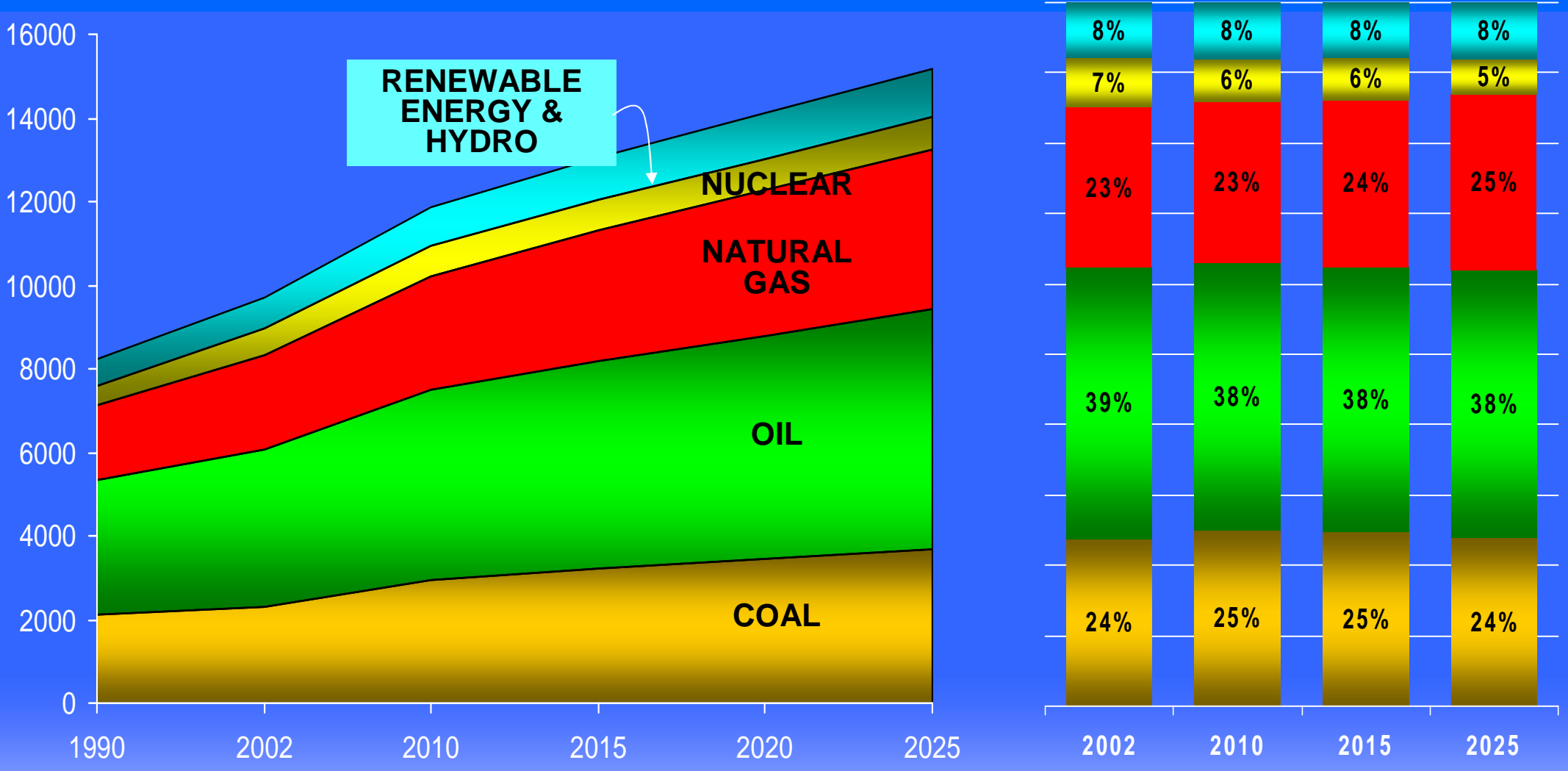


While oil will still be the dominant fuel up to 2025, natural gas is the fastest growing form of energy through 2025, reflecting the increasing global importance in natural gas



MTOE

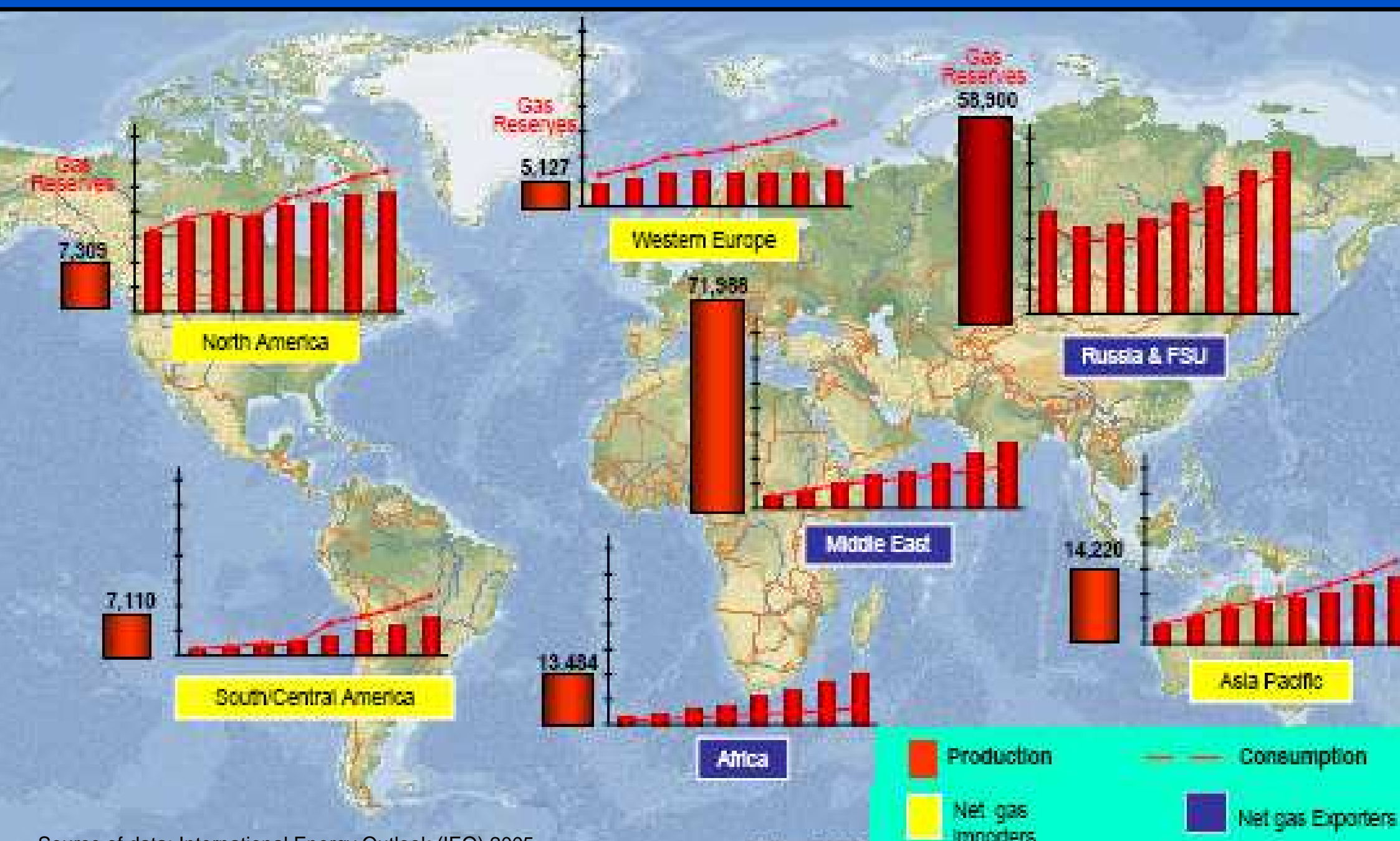
WORLD PRIMARY ENERGY CONSUMPTION BY FUEL



Source of data: International Energy Outlook (IEO) 2005

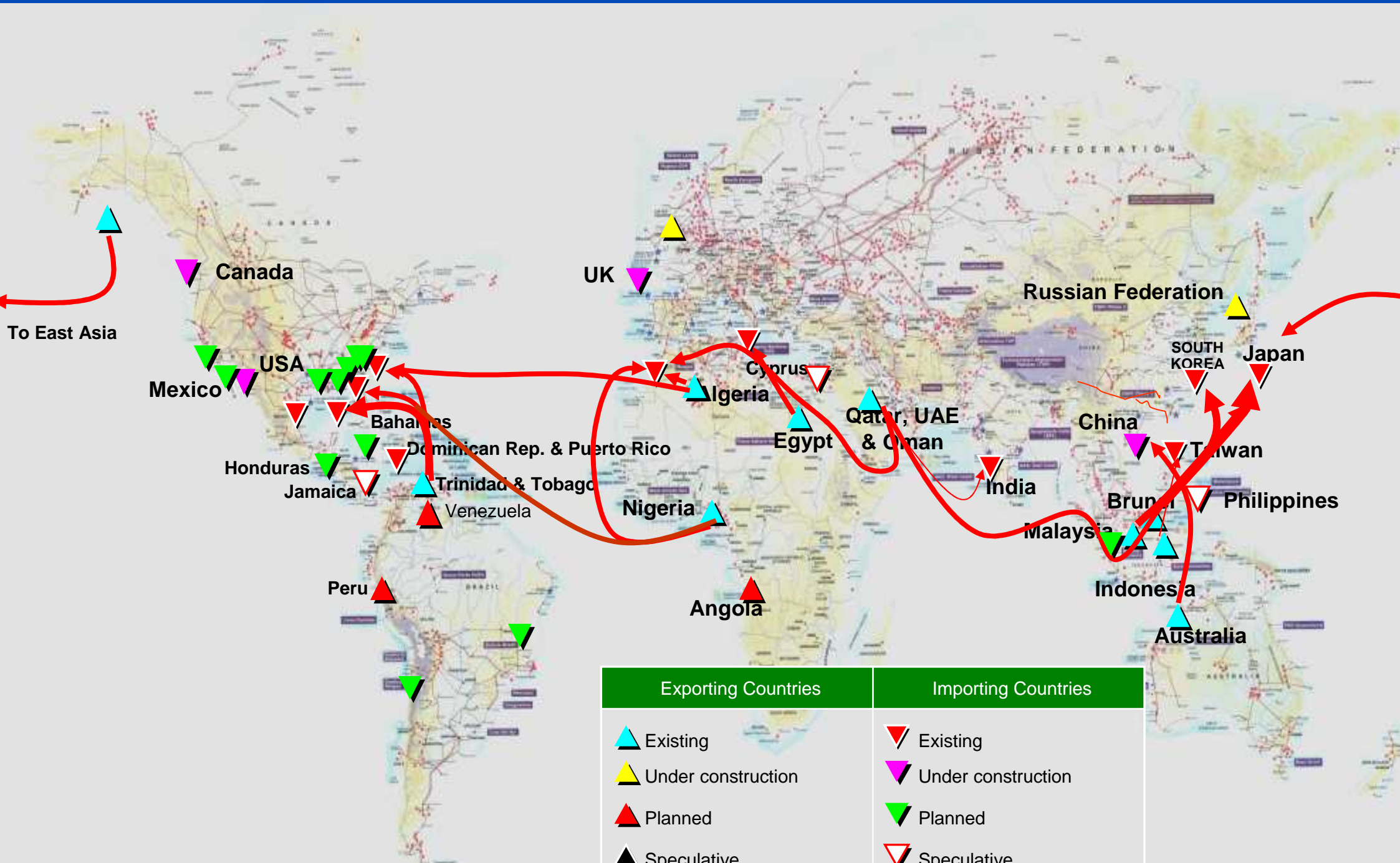


Natural gas reserves are primarily located in Russia, FSU and Middle East, rather far from the gas demand centres in North America, Europe, Asia Pacific and South America





Increasing cross-border natural gas and LNG trade globally





Developing gas markets in South East Asia, South & North East Asia





The Trans-ASEAN Gas Pipeline Network in Association of South East Asia Nations (ASEAN)





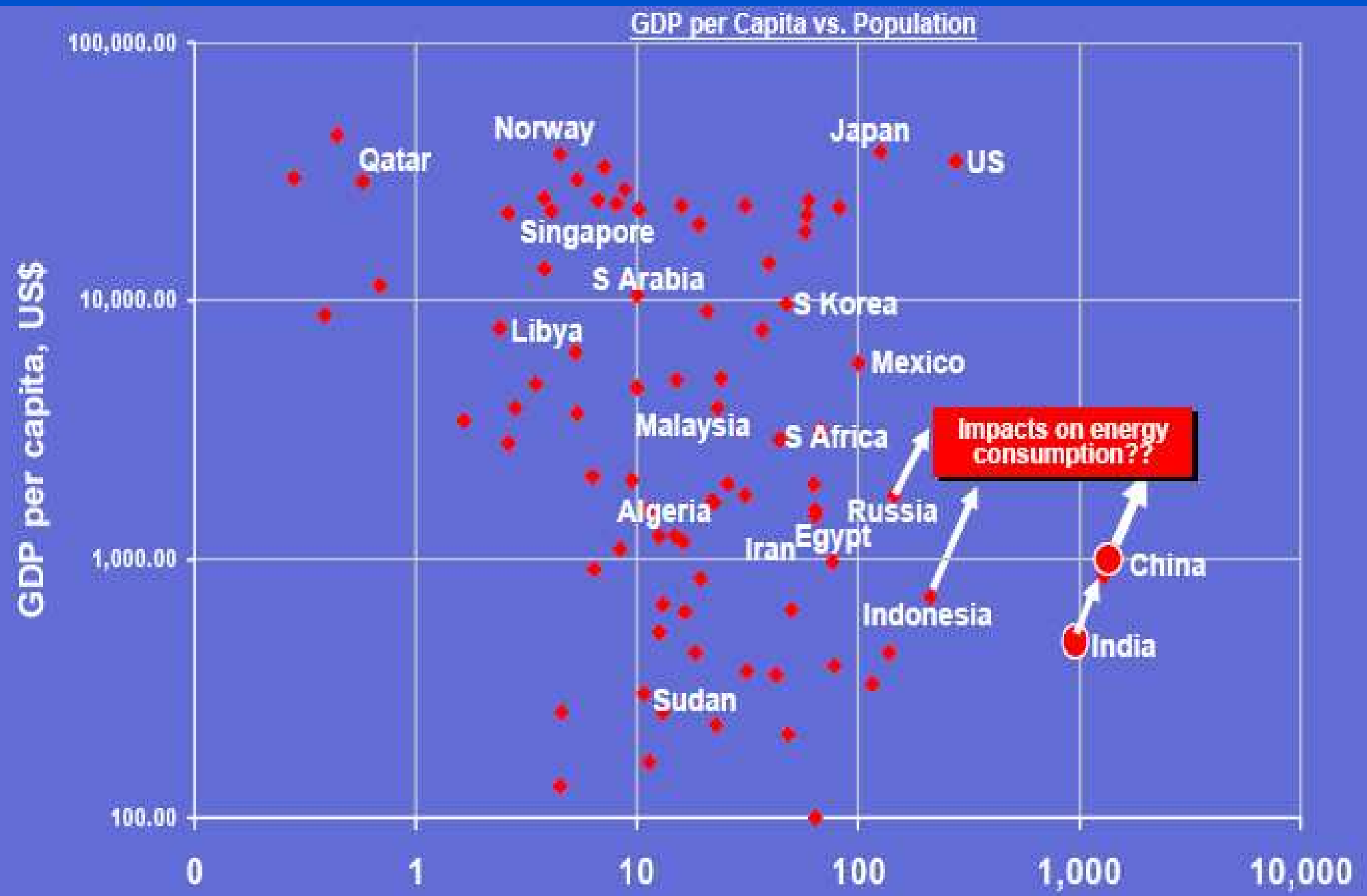
China can be categorized into eight major regions



- Northeast
- North Region
- Northwest
- Lower Yangtze
- Middle Yangtze
- South
- Southwest
- West



China is expected consume more energy as its economy continues to grow





Energy in China's tenth 5-year plan (2001-2005) focuses on energy supply structure including infrastructures and supporting management system



In meeting the energy needs of national economic and social development, the main objectives for the energy sector during the Tenth 5-Year Plan (2001-2005) were:

To achieve substantive progress in the rationalization of the energy supply structure;

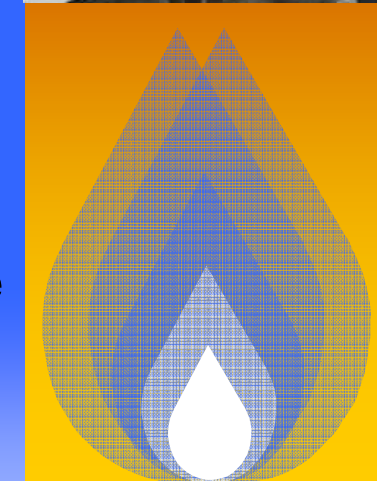
To further improve energy efficiency;

To build a modern energy management system that is compatible with the country's socialist market system;

To build competitive systems in energy infrastructure design, equipment manufacturing, energy transportation; and

To achieve visible progress in developing the western and the middle regions of the country.

Energy Supply Structure





Key energy policy orientation for the gas industry focuses on higher utilisation of gas and supply of gas from West-East China



Higher utilisation of natural gas in the energy mix

- The strengthening domestic and international E & P in natural gas in addition to oil
- The acceleration of work on gas pipelines and downstream networks and gas end-users.

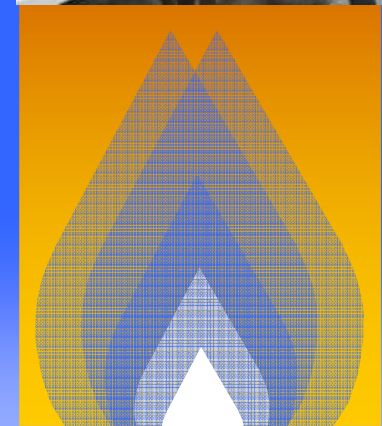
Extending development to the western regions; improving pipeline links between the west and the east of the country is a key pillar in this strategy of economic integration.

The high priorities on the “West-East” gas transportation pipeline and the Guandong LNG import terminal.

Energy Supply Structure

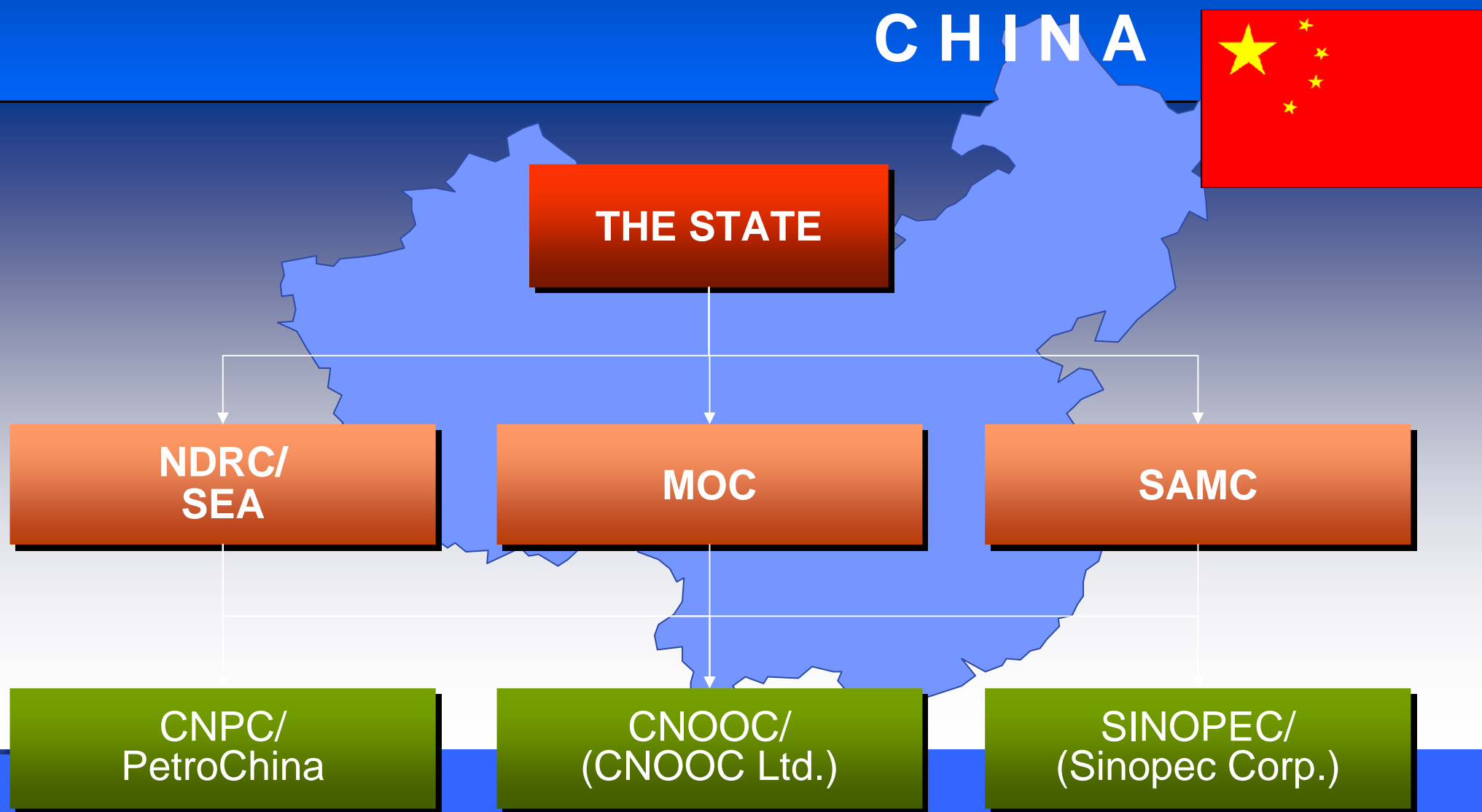
Oil Industry

Gas Industry





The China's 10th National People's Congress (NPC) in March 2003 restructured the institutional set up of the petroleum industry





Geographical partition of Chinese oil and gas companies after the re-organisation

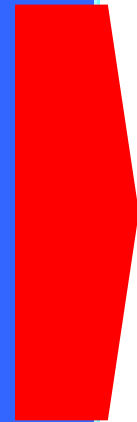
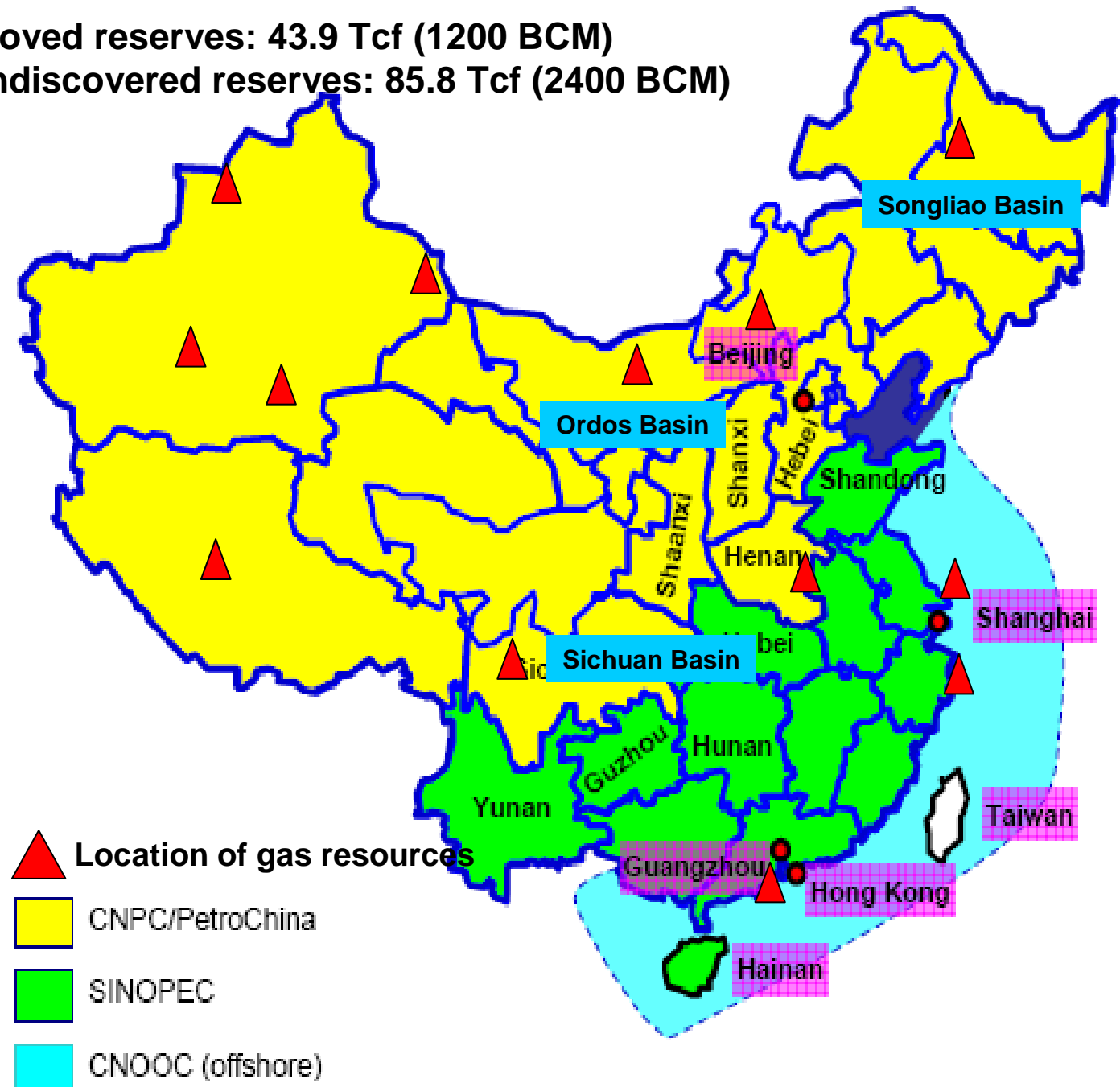


Proved reserves: 43.9 Tcf (1200 BCM)
Undiscovered reserves: 85.8 Tcf (2400 BCM)

CNPC Group operate in the north and west of China. CPNC holds 87% of the onshore reserves

SINOPEC Group operate mainly in the east and south of China

CNOOC operates all the offshore areas in the South-China, East-China Seas and the Gulf of Bohai

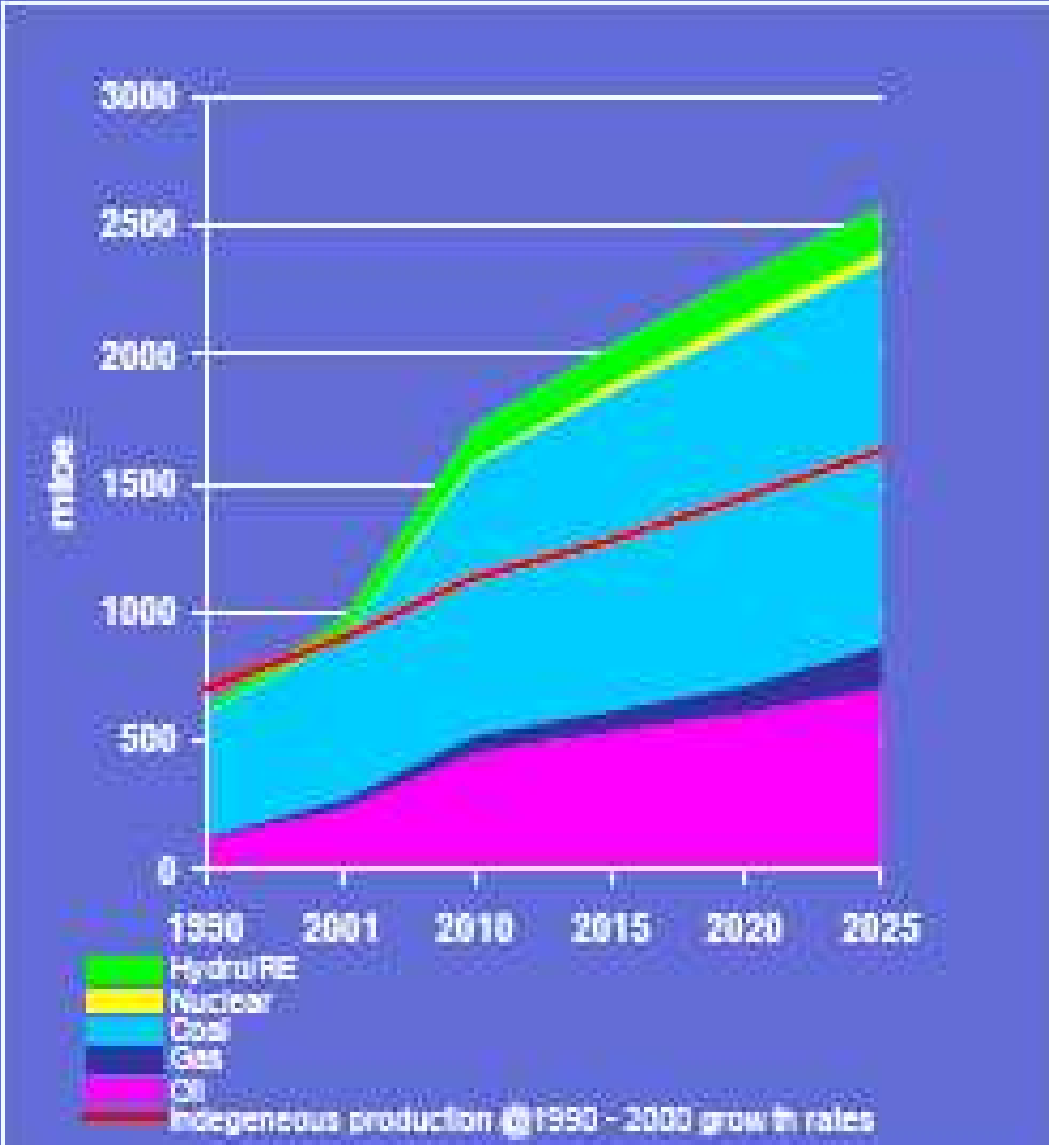




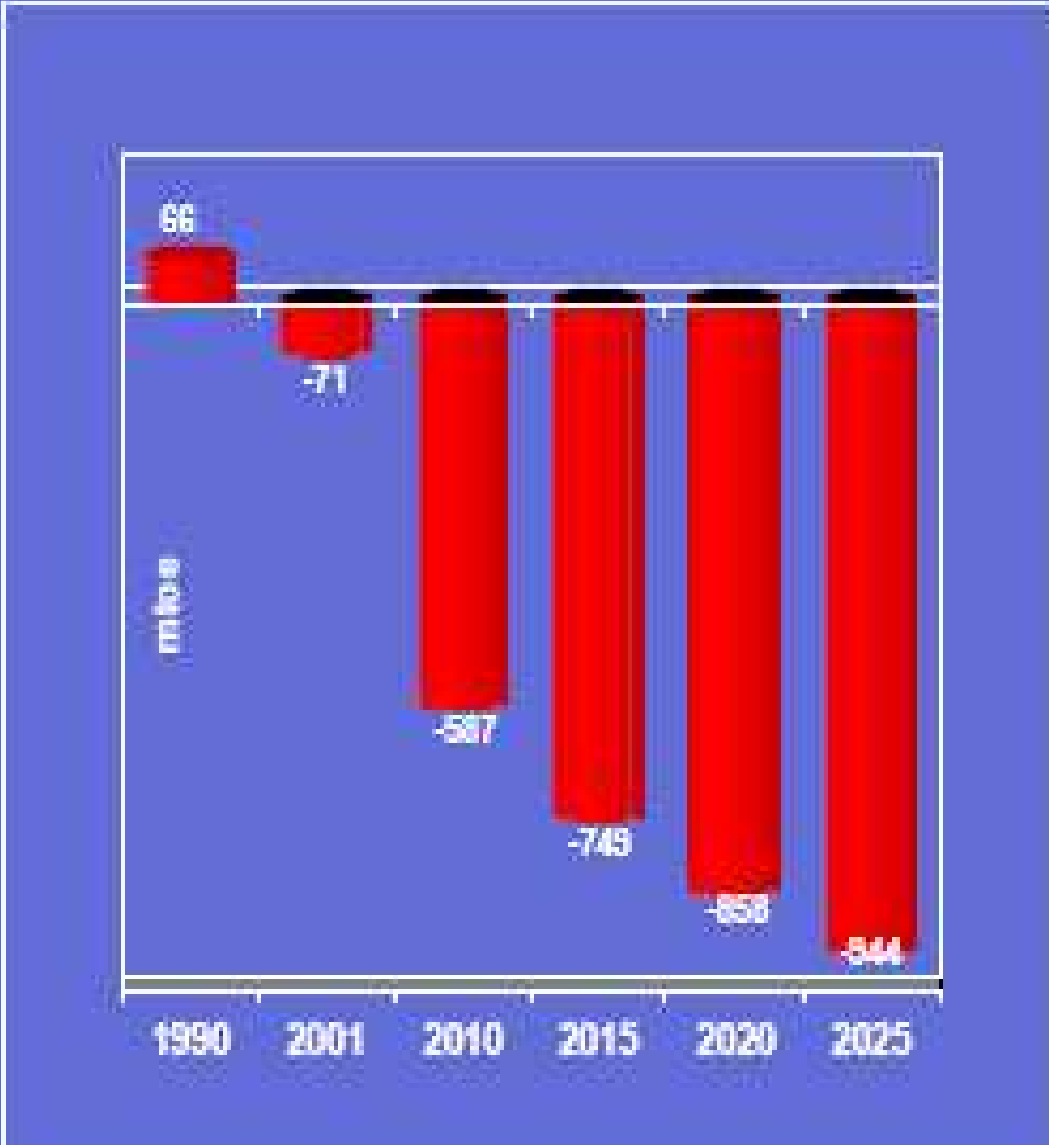
Indigenous energy production is not able to meet with the total primary energy demand of China



China Primary Energy Demand (1990-2025)



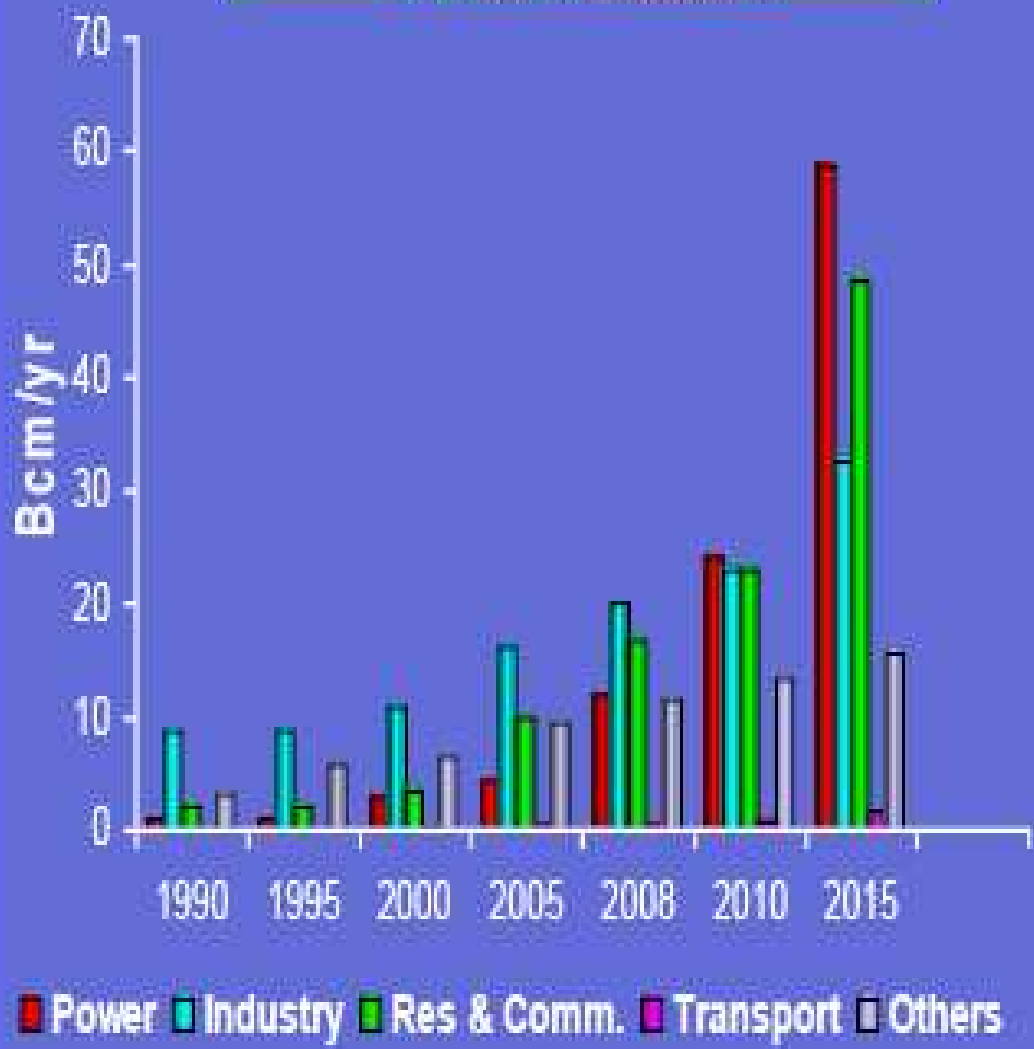
Net Import Requirements (1990-2025)



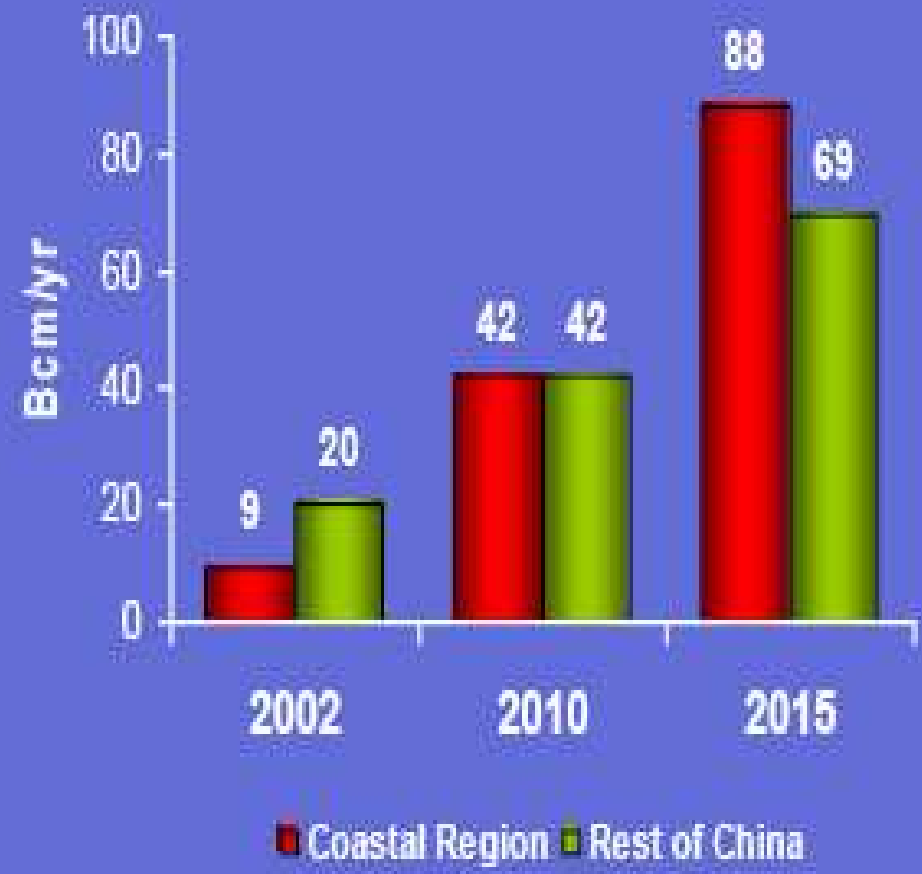


The future demand of gas will be driven mainly by the power sector particularly in the coastal region where growth is more robust

China Gas demand projection (by Sector) : 1990-2015



China Gas demand projection (by Region) : 2002-2015

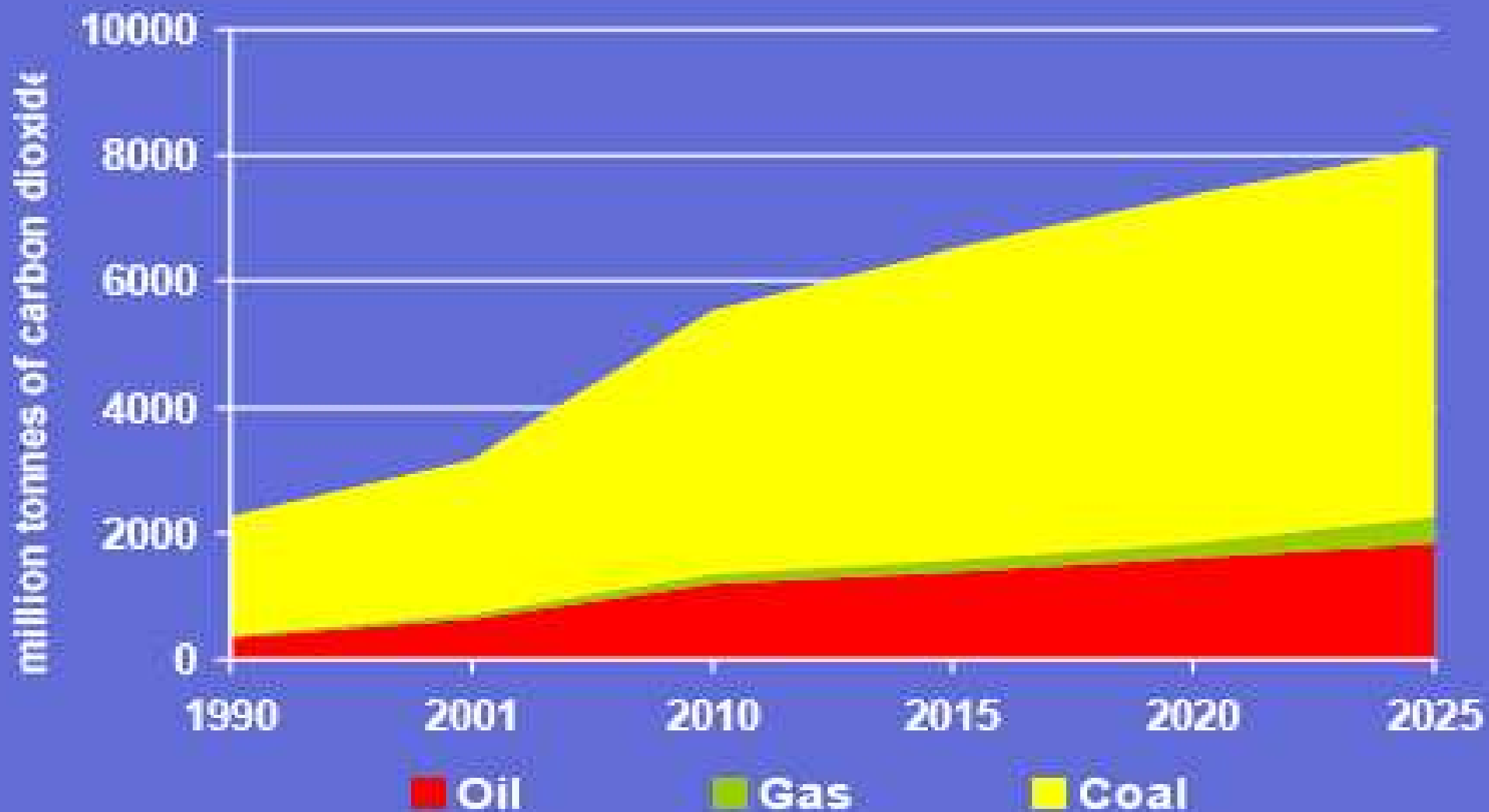




Environment: China's carbon emissions are expected to increase about 3% annually through 2025 driven by economic growth and increase in coal consumption



Likely CO2 Emission in China by Fuel Type

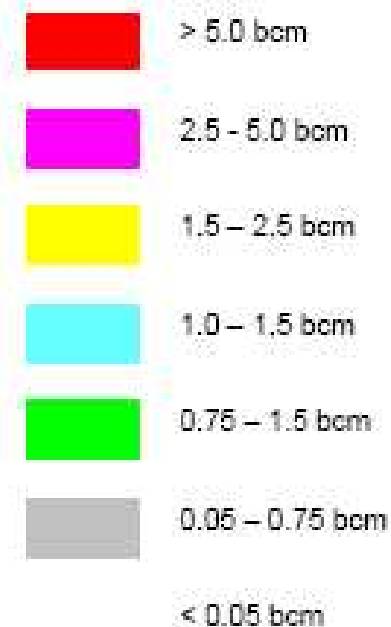
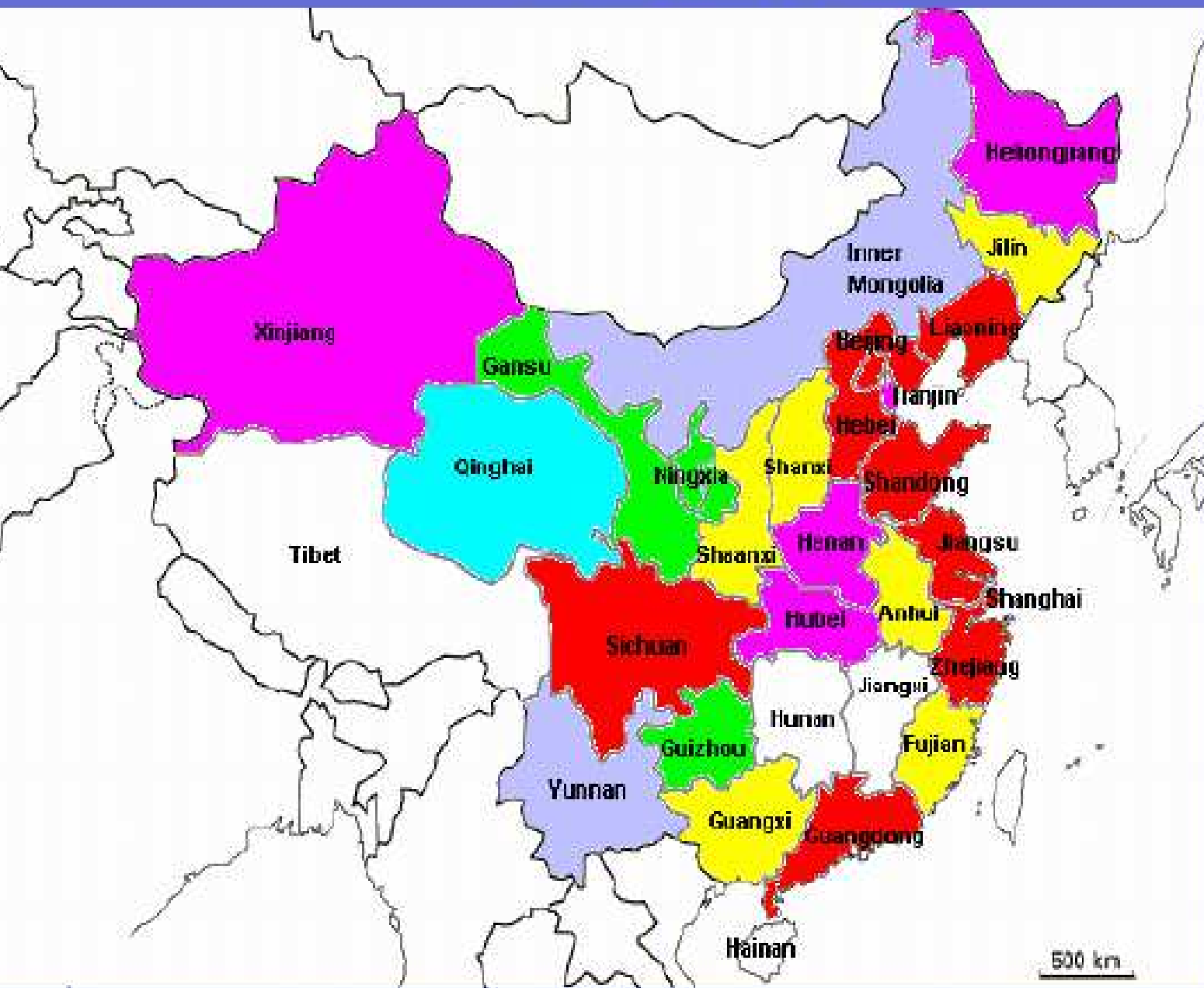




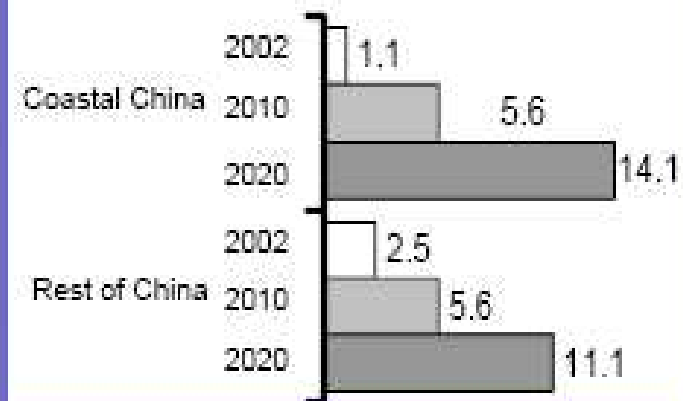
Demand from coastal region: Gas consumption from this area is expected to increase to 5.6 bscf/d by 2010 and 14.1 bscf/d by 2020



TOTAL DEMAND IN 2010 : 100 BCM



Gas demand (bscfd)

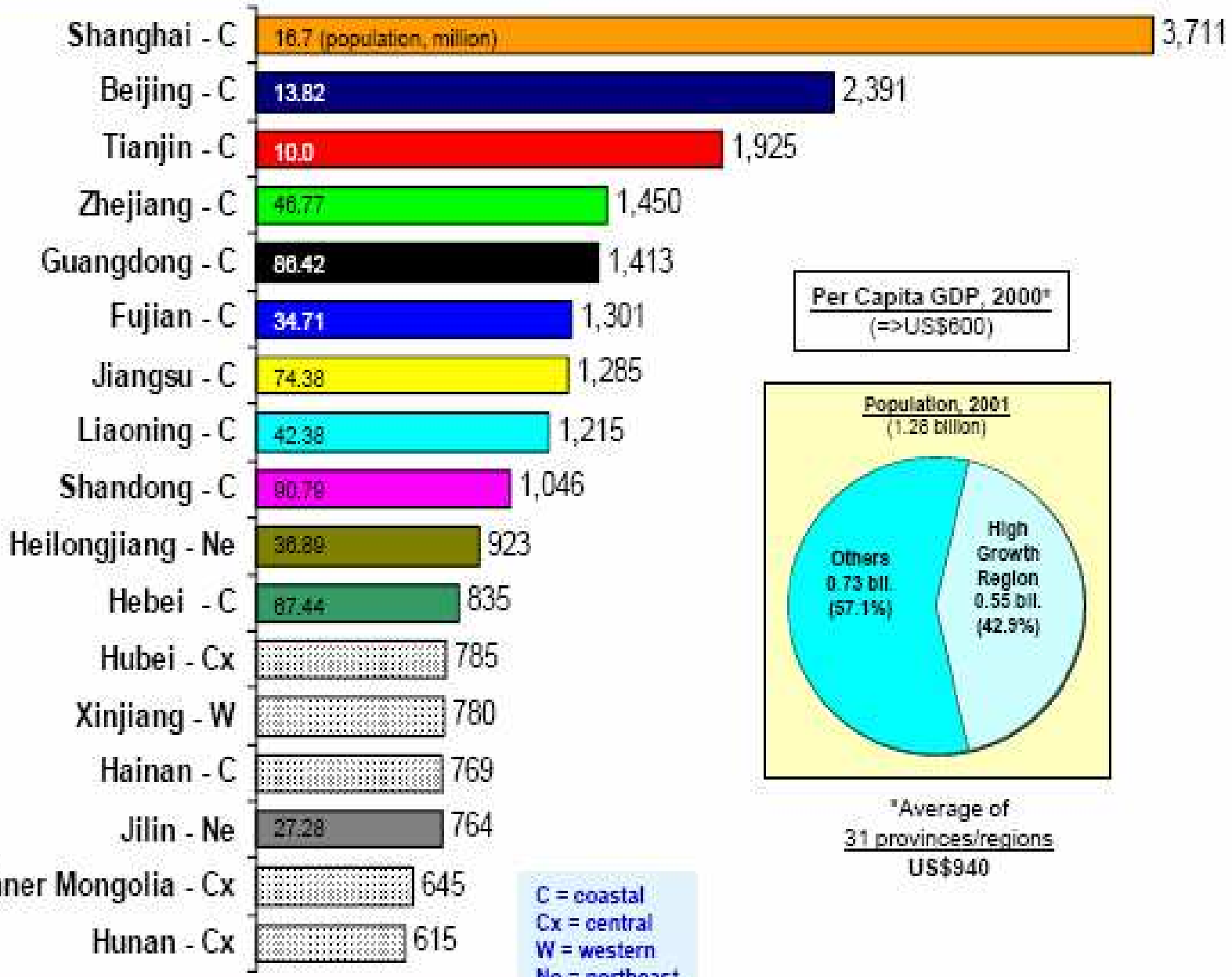




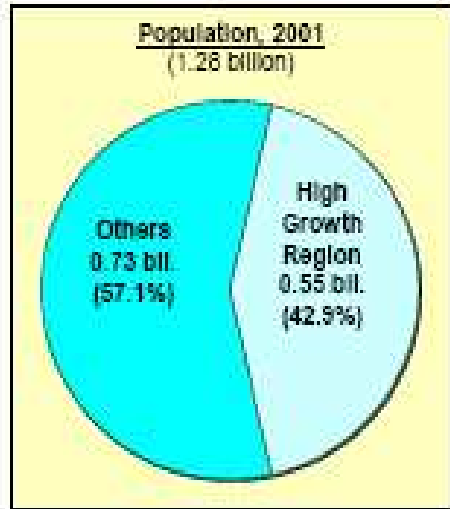
China's high growth demand centers are located in the eastern provinces



Coloured provinces (TZ) = high growth regions



Per Capita GDP, 2000*
(=>US\$600)



*Average of 31 provinces/regions
US\$940





China's West-East gas pipeline project completed one year ahead of schedule. PetroChina reportedly considering a feasibility of 26 bcm/yr pipeline alongside the current West-East gas pipeline



The West-East gas pipeline is one of the key infrastructure projects in China's 10th Five-Year Plan (2001-2005)

The pipeline is designed to transport natural gas from the Tarim basin in Xinjiang and the Ordos basin in Shanxi. The 3,900 km, 40-inch pipeline was developed in two sections. The eastern section, which runs for 1,500 km. from Jingbian (Shaanxi Province) to Baihe town (Shanghai). The western section, from Lunnan (Xinjiang autonomous region) to Jingbian, which is 2,400 km in length.



At the same time, a number of cross-border pipeline projects are being promoted to meet the increasing domestic gas demand i.e. supplies from Russia, Turkmenistan and Kazakhstan





There are 6 LNG terminals approved by the government authorities – although more than 10 have been proposed. Guangdong LNG and Fujian LNG are the two most advanced LNG project in China.






- 1. Guangdong LNG
- 2. Fujian LNG
- 3. Zhejiang (Ningbo) LNG
- 4. Qindao (Shandong) LNG
- 5. Shanghai LNG
- 6. Jiangsu (Rudong) LNG





The first cargo for Guangdong LNG has left Australia for China mid-May 2006. It was scheduled to arrive end of May.



-  LNG Terminal
-  City Gate
-  Phase I Trunkline
-  Phase II Trunkline
-  Subsea Lines (by customers)

Shareholders	CNOOC (33%), BP (30%), Local consortium (37%)
Capacity. Source	3.7 MTPA, Australian North West Shelf
Price at End-Users:	<ul style="list-style-type: none"> • Floor : US\$ 3.66/mmBtu • Ceiling: US\$ 4.81/mmBtu

Four other projects approved by government are Zhejiang LNG, Qingdao LNG, Shanghai LNG and Jiangsu LNG. Guangdong expansion is likely.

Jiangsu (Rudong) LNG (PetroChina)

- 3.5 mtpa with likely expansion to 6-8 mtpa
- Planned for 2010
- PO&G planned to build liquefaction plant in E. Kalimantan to supply to this terminal

Zhejiang (Ningbo) LNG (CNOOC)

- 3 mtpa with likely expansion to 10 mtpa
- Piling work has started
- Initially planned for 2008
- Delays are expected (2010?) if sources of supply not confirmed

Guangdong Expansion (CNOOC)

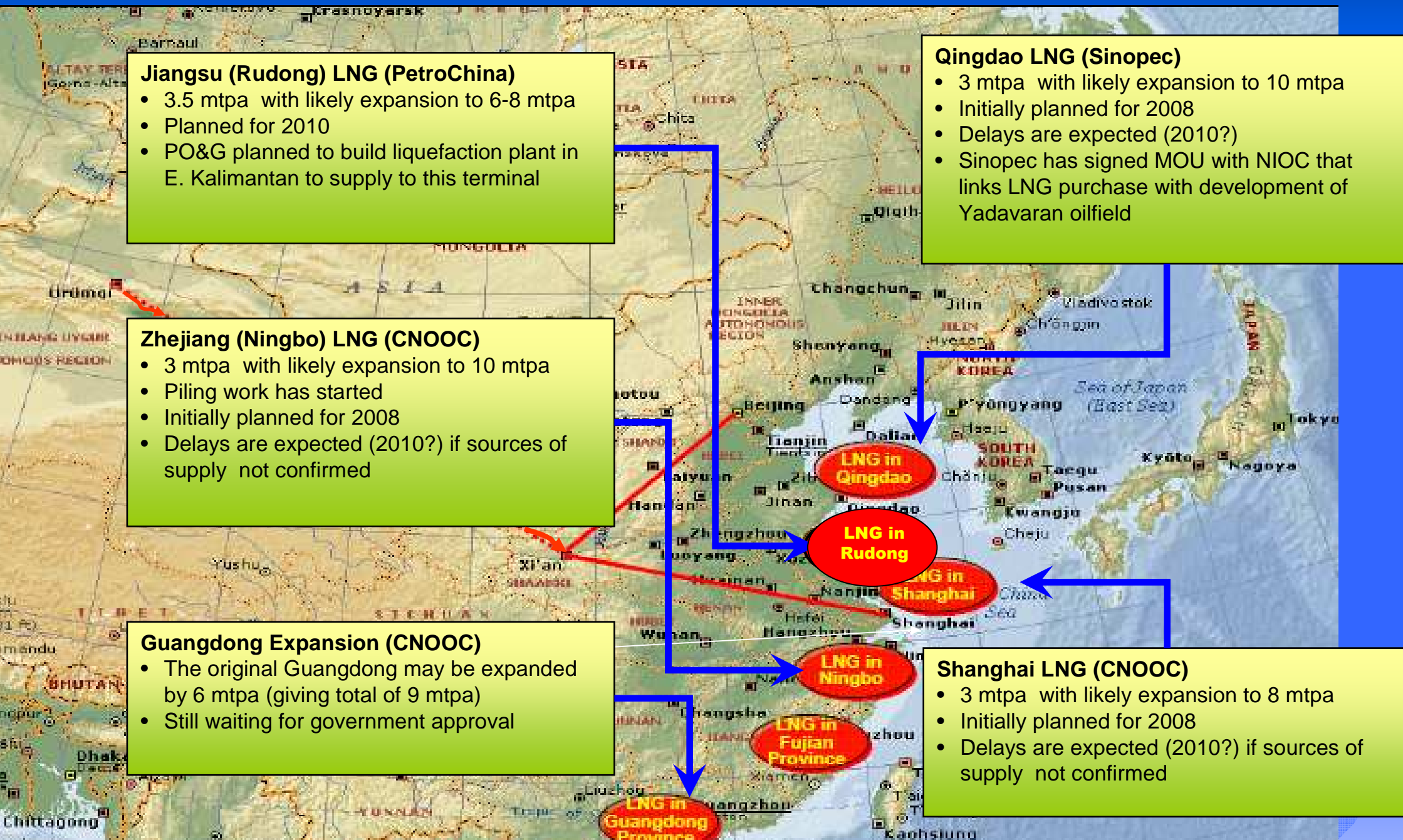
- The original Guangdong may be expanded by 6 mtpa (giving total of 9 mtpa)
- Still waiting for government approval

Qingdao LNG (Sinopec)

- 3 mtpa with likely expansion to 10 mtpa
- Initially planned for 2008
- Delays are expected (2010?)
- Sinopec has signed MOU with NIOC that links LNG purchase with development of Yadavaran oilfield

Shanghai LNG (CNOOC)

- 3 mtpa with likely expansion to 8 mtpa
- Initially planned for 2008
- Delays are expected (2010?) if sources of supply not confirmed





Supply cost position – Imported LNG vs. Indigenous resources



FOB (ex-Tangguh)
~ **US\$ 3.40/mmbtu**

Wellhead
U~S\$ 3.00/mmbtu



SHIPPING
+ ~ **US\$ 0.70/mmbtu**

Processing and Transmission
+ ~ **US\$1.70/mmbtu**



Landed price
~ **US\$ 4.10/mmbtu**

Receiving Terminal
(Storage and Regasification)
+ ~ **US\$ 0.50 /mmbtu**



Transmission
+ ~ **US\$ 0.15/mmbtu**

End Users
~ **US\$ 4.75/mmbtu**

End Users (Eastern China)
~ **US\$ 4 - US\$ 4.72/mmbtu**
(average)



Other than its efforts in gas projects, China is currently going through a quest for securing energy supplies



● Australia and China signed deal on uranium trade

- The parties signed a nuclear safeguards agreement for uranium exports to Beijing for its power industry



● Chinese NOCs pursue overseas oil and gas assets

- CNPC : Kazakhstan, Sudan, Venezuela, Peru, Indonesia, Algeria, Russia, Turkmenistan, Azerbaijan, Syria, Mauritania, Oman, Brazil, Nigeria
- CNOOC : Indonesia, Australia, North America
- SINOPEC : Iran, Algeria, Kuwait, North Caspian, Brazil, Bolivia, Canada Yemen, Egypt, Myanmar, Oman Nigeria
 - NOTE: Sinopec's MOU with NIOC on Yadavaran oil field is related to Iran's intent to export LNG to China (10mtpa) for 25 years.



STRENGTHS

- Gas demand centers are clearly defined (i.e. eastern coastal province is a potential market for LNG and other regions are potential market for piped gas).
- Although coal is still the predominant fuel, China is promoting use of natural gas to address issues and concerns relating to the environment
- China's economy is likely to be gradually liberalised following its accession into WTO.

WEAKNESSES

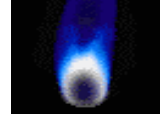
- China's gas reserves are relatively small and located far away from demand centers.
- Chinese gas market is an emerging market where gas pipeline infrastructures are still less developed.
- Most of end-consumers are still not ready to purchase natural gas at market-oriented prices, one of the key barriers to develop and grow the gas market.

OPPORTUNITIES

- China will increase the share of natural gas mix to increase energy security and improve air quality.
- Emerging opportunities in gas related projects such as:
 - LNG receiving terminal.
 - Gas separation plant
 - LPG production
 - Gas supply to power generation plants
 - Gas transportation and distribution
 - Supply in goods and services in construction of gas pipelines and gas-related infrastructures.

THREATS

- Gas faces stiff competition with other cheaper alternative fuels such as coal, hydro etc.
- Potential investors face some uncertainties due to lack of transparency in regulatory framework to develop gas industry.
- New foreign players will be in competition with the NOCs and more established players in both upstream and downstream sectors.



N.B.: It was not possible for the Study Group to address the full range of key issues that this Case Study deserves without participation of IGU members from China. Nevertheless, this Paper was presented earlier to IGU Members in China in conjunction with the IGU Council Meeting, held in Tianjin China, 19 Oct. 2005.

THANK YOU

