

China's Energy Demand, Supply, and Policies

--With a Special Emphasis on Oil and Gas

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An Outline

- ❑ Energy and the Economy
- ❑ Energy Policy
- ❑ The Petroleum Sector
- ❑ Rising Oil and Gas Imports: Present and Future
- ❑ Energy Security Strategies
- ❑ Key Factors Driving China's Energy Security

Energy and the Economy

- ❖ **Strengths of the Chinese economy:**
 - **A sizable and fast growing economy**
 - Official GDP growth was 9.1% for 2003, and 9.7% for the first quarter of 2004
 - **Rapid growth of foreign trade**
 - Exports grew by 35% in 2003, reaching \$438 billion. Growth was 33% during the first five months of 2004. Had a trade deficit of US\$8.7 billion during the same period in 2004.
 - **Foreign investment: the world's largest recipient of direct foreign investment (DFI).**
 - Total actual DFI reached a historical high of \$54 billion in 2003. Cumulative actual DFI was \$501 billion from 1979 to 2003.
 - **Huge market potential**

❖ Weaknesses of the Chinese economy:

- **Low per capita GDP**

 - **Official Per Capita GDP was \$1,090 in 2003**

- **Reform of state-owned enterprises**

- **Regional imbalance of income and developments**

- **Problems with the banking system**

- **Unemployment and social security**

- **Political reforms**

- **Energy security and environmental problems**

Key Economic Indicators for China, 1996-2003 /1

	1996	1997	1998	1999	2000	2001	2002	2003
Yearend Population (million)	1,223.9	1,236.3	1,248.1	1,259.1	1,267.5	1,276.3	1,284.5	1,292.3
Real GDP Growth (Official)	9.6%	8.8%	7.8%	7.1%	8.0%	7.5%	8.0%	9.1%
Per Capita GDP (2003 US\$)	670.1	721.8	770.7	818.2	877.9	937.2	1,005.7	1,090.6
Inflation Rate /2	8.3%	2.8%	-0.8%	-1.4%	0.4%	0.7%	-0.8%	1.2%
Urban Unemployment Rate /3	3.0%	3.1%	3.1%	3.1%	3.1%	3.6%	4.0%	4.3%
Foreign Trade Bal. (US\$ bn)	12.2	40.4	43.6	29.1	24.1	22.6	30.4	25.5
Foreign Trade Total (US\$ bn)	289.9	325.2	323.9	360.7	474.3	509.8	620.7	851.2
Growth of Total Trade	3.2%	12.2%	-0.4%	11.4%	31.5%	7.5%	21.8%	37.1%
Exports (US\$ bn)	151.1	182.8	183.8	194.9	249.2	266.2	325.6	438.4
Imports (US\$ bn)	138.8	142.4	140.2	165.8	225.1	243.6	295.2	412.8
Direct Foreign Investment								
Contractual (US\$ bn)	73.3	51.0	52.1	41.2	62.4	69.2	82.8	115.1
Actual Use (US\$ bn)	41.7	45.3	45.5	40.4	40.7	46.9	52.7	53.5
Foreign Exchange Reserves (US\$ bn, end of the year)	105.0	139.9	145.0	154.7	165.6	212.2	286.4	403.3

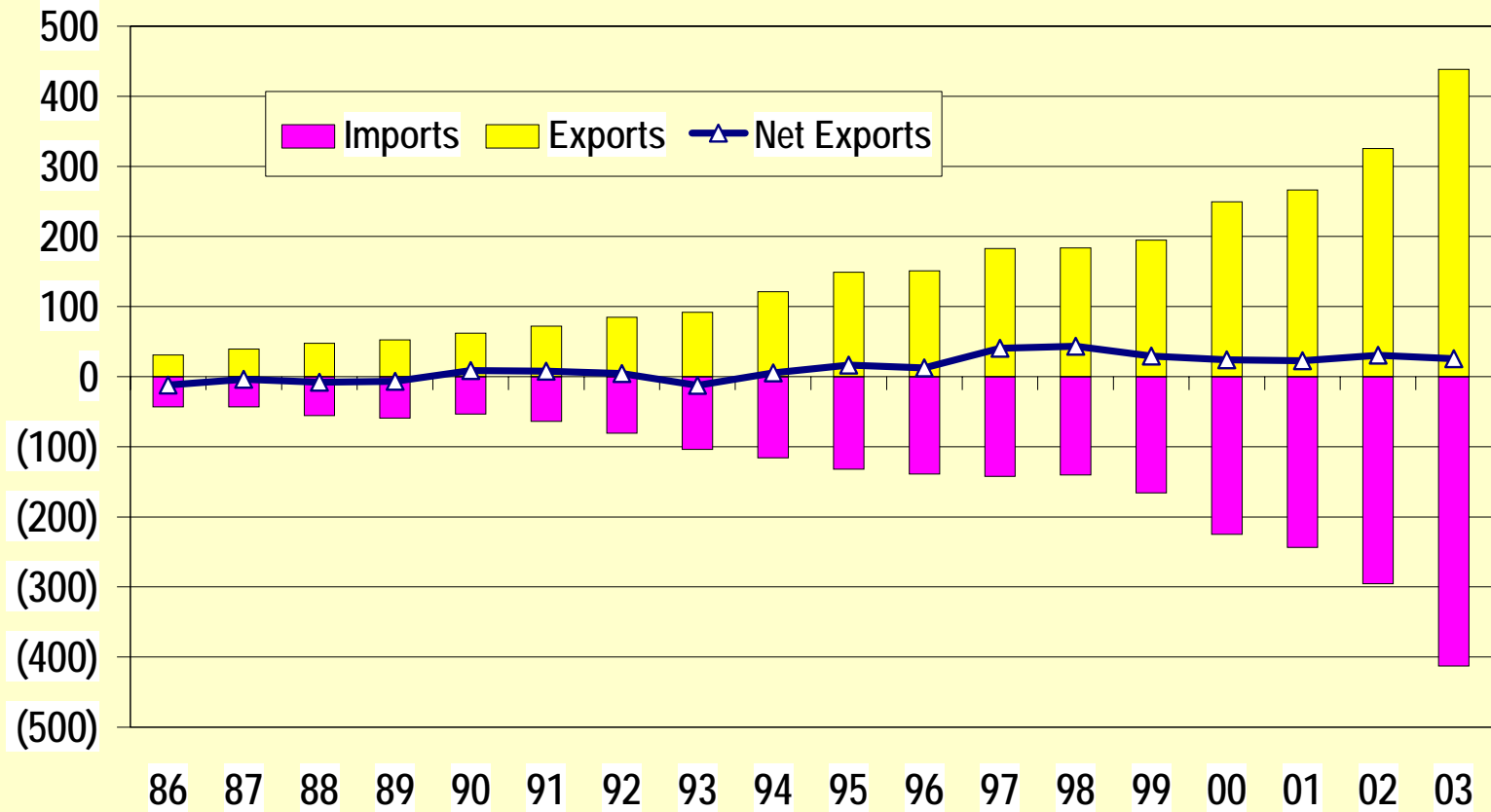
1. 1996-2003: final.

2. Defined as annual percentage change of overall retail price index.

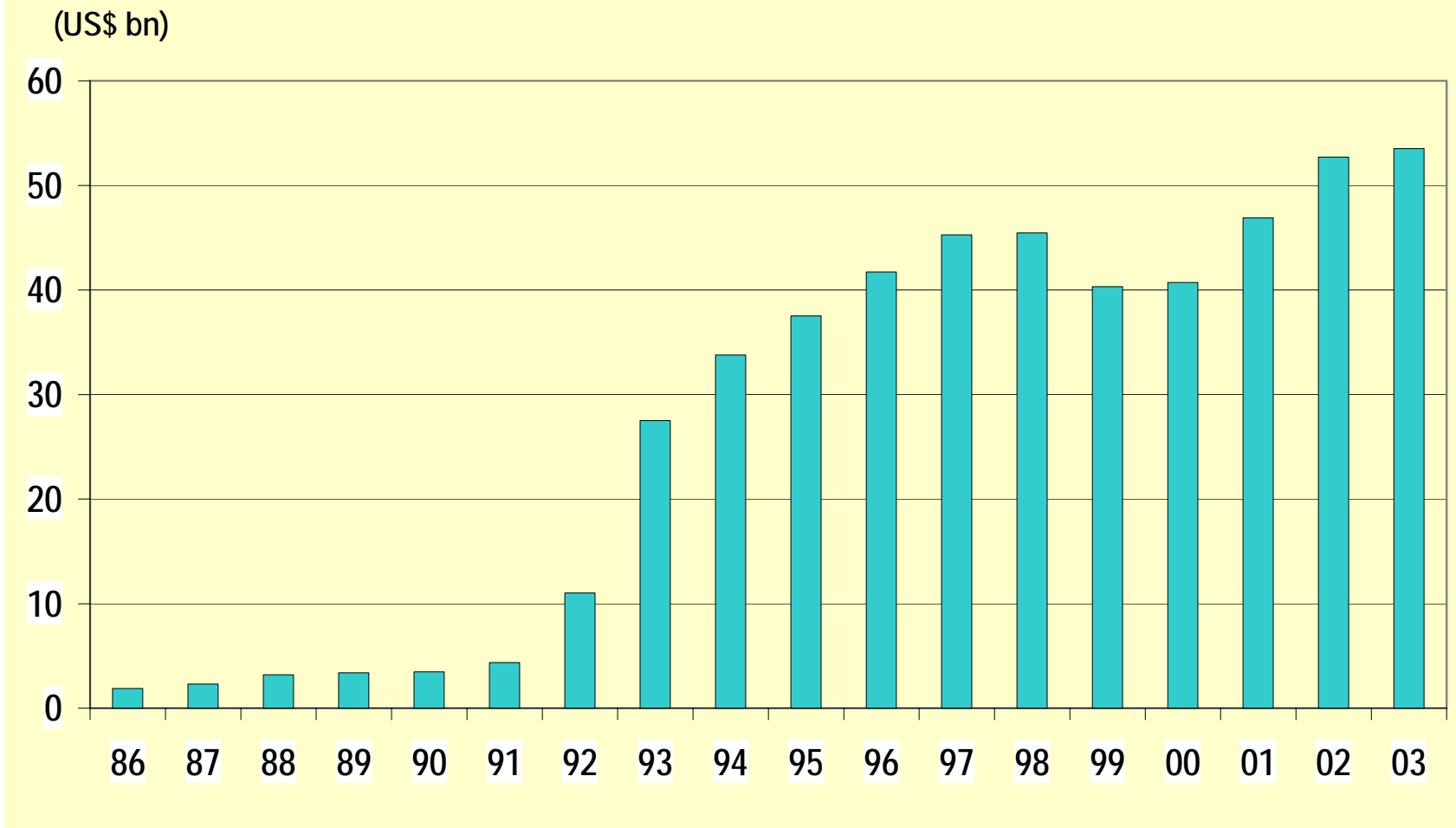
3. Officially registered. If job-losing state workers are included, actual rates are larger.

China's Merchandise Exports, Imports, and Balance 1986-2003

(US\$ bn)

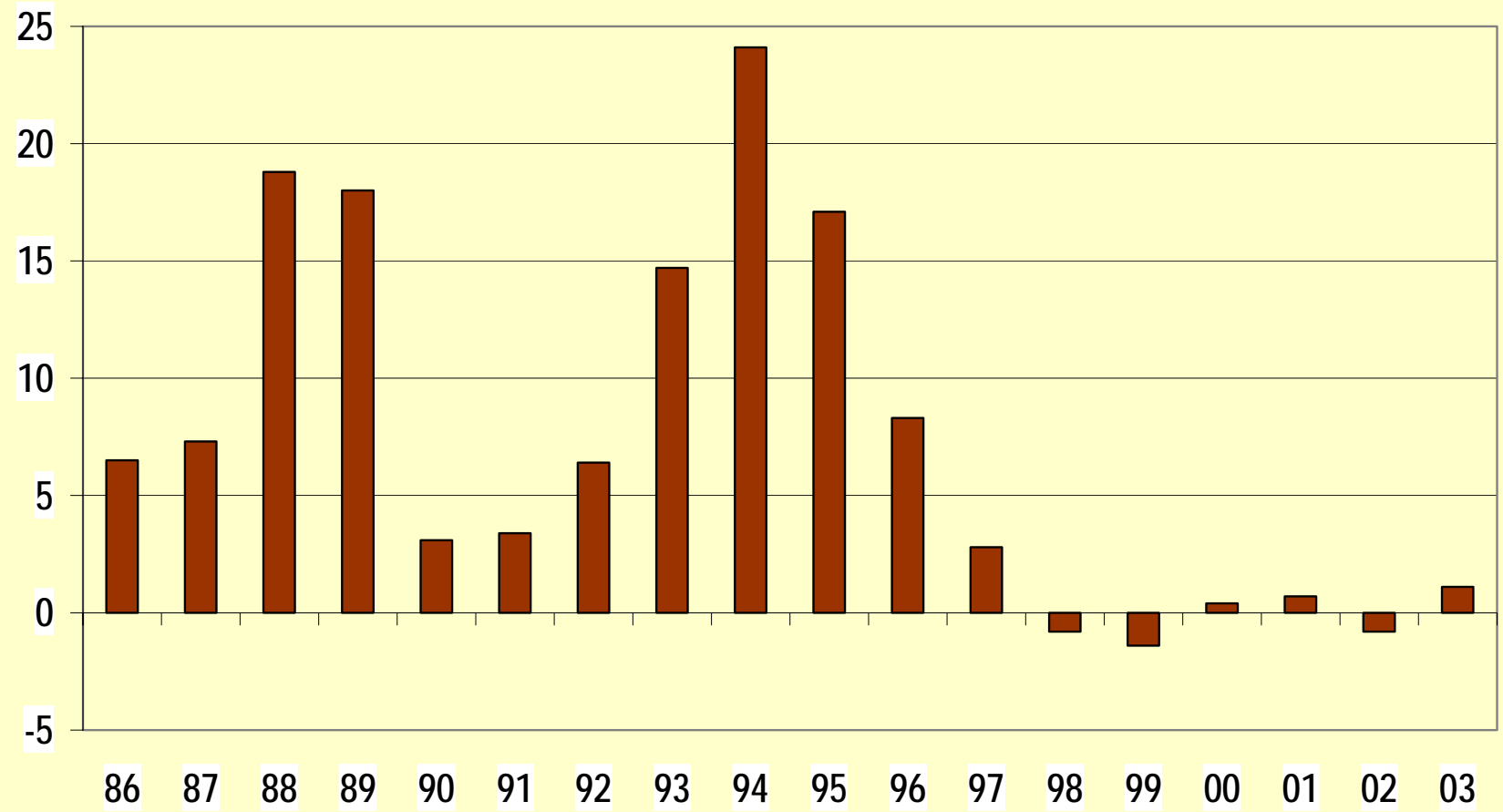


China's Actual Direct Foreign Investment, 1986-2003



Changing Consumer Price Index in China, 1986-2003

(percent)

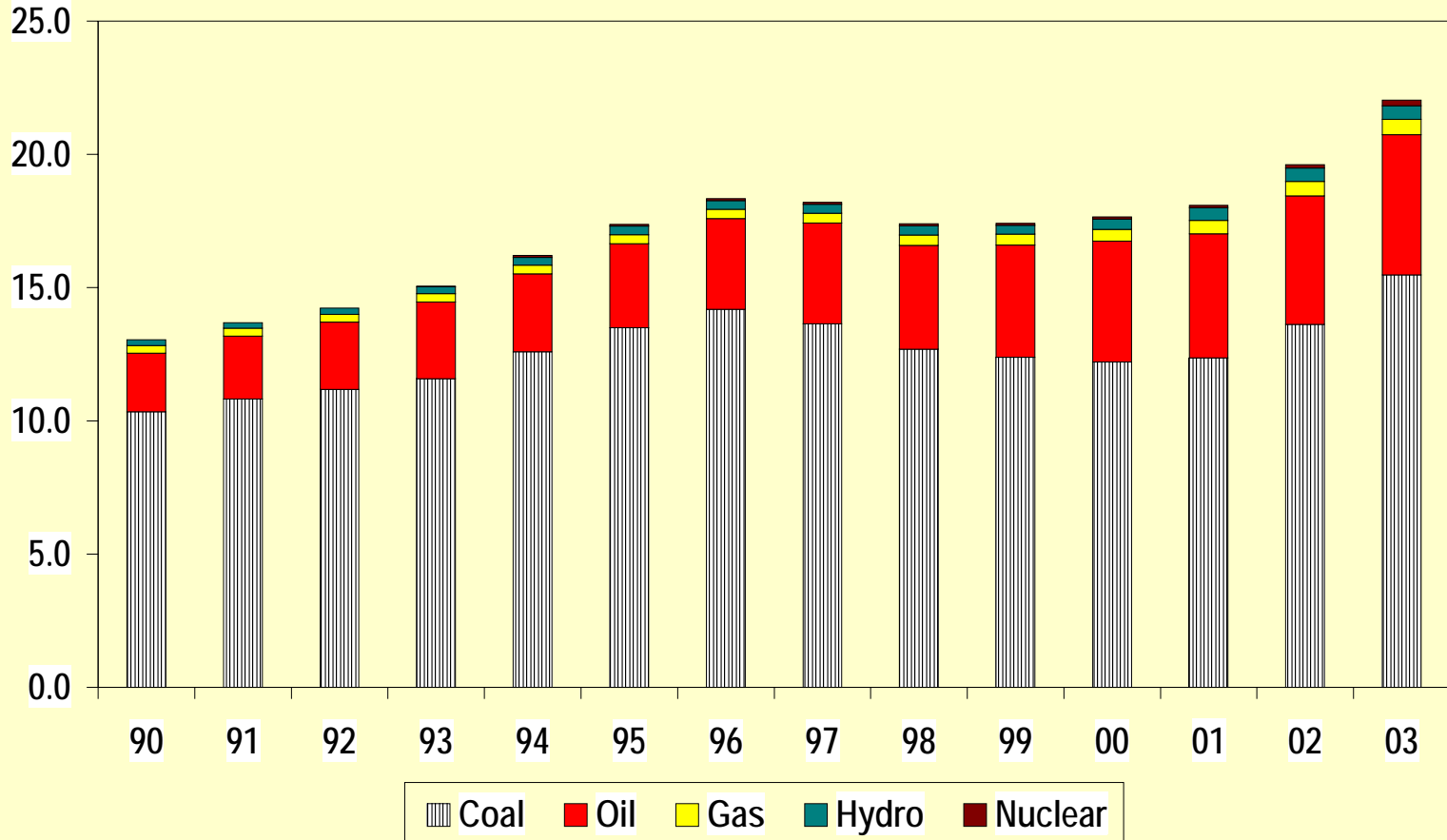


❖ Energy Sector Issues:

- Super strong energy demand growth in 2003
- Huge energy production and consumption
 - China is currently the world's second largest primary energy consuming country after the U.S. and the third largest primary energy producer after the U.S. and Russia.
- After a significant decline between 1996 and 2000, coal production and consumption rebounded in 2001, followed by strong growths in 2002, 2003, and 2004.
- Oil demand growth is strong
- Natural gas demand has been strong overall
- Structure of primary energy use will continue to change significantly over the next fifteen years

Primary Commercial Energy Consumption in China, 1990-2003

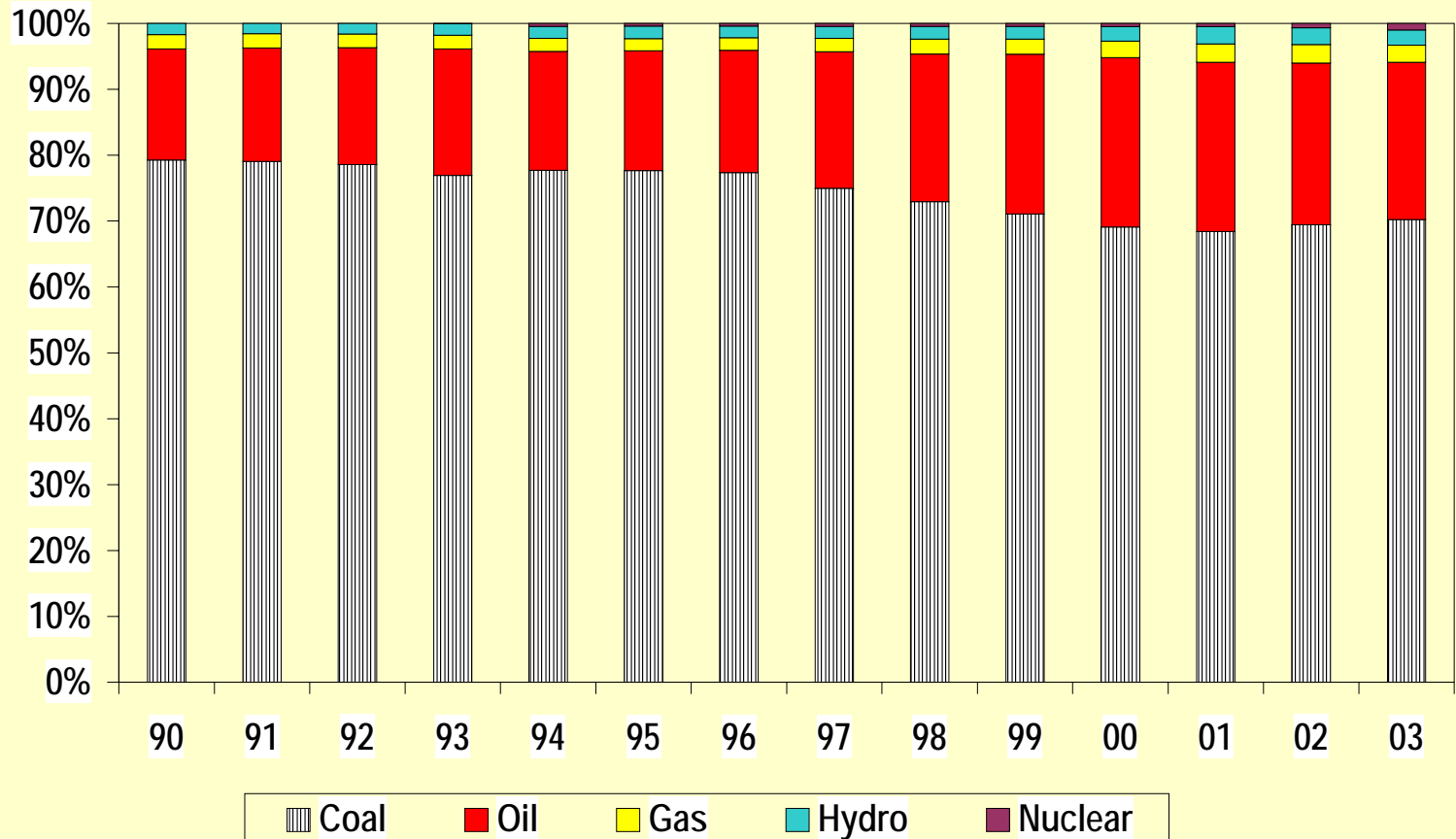
(mnboe/d)



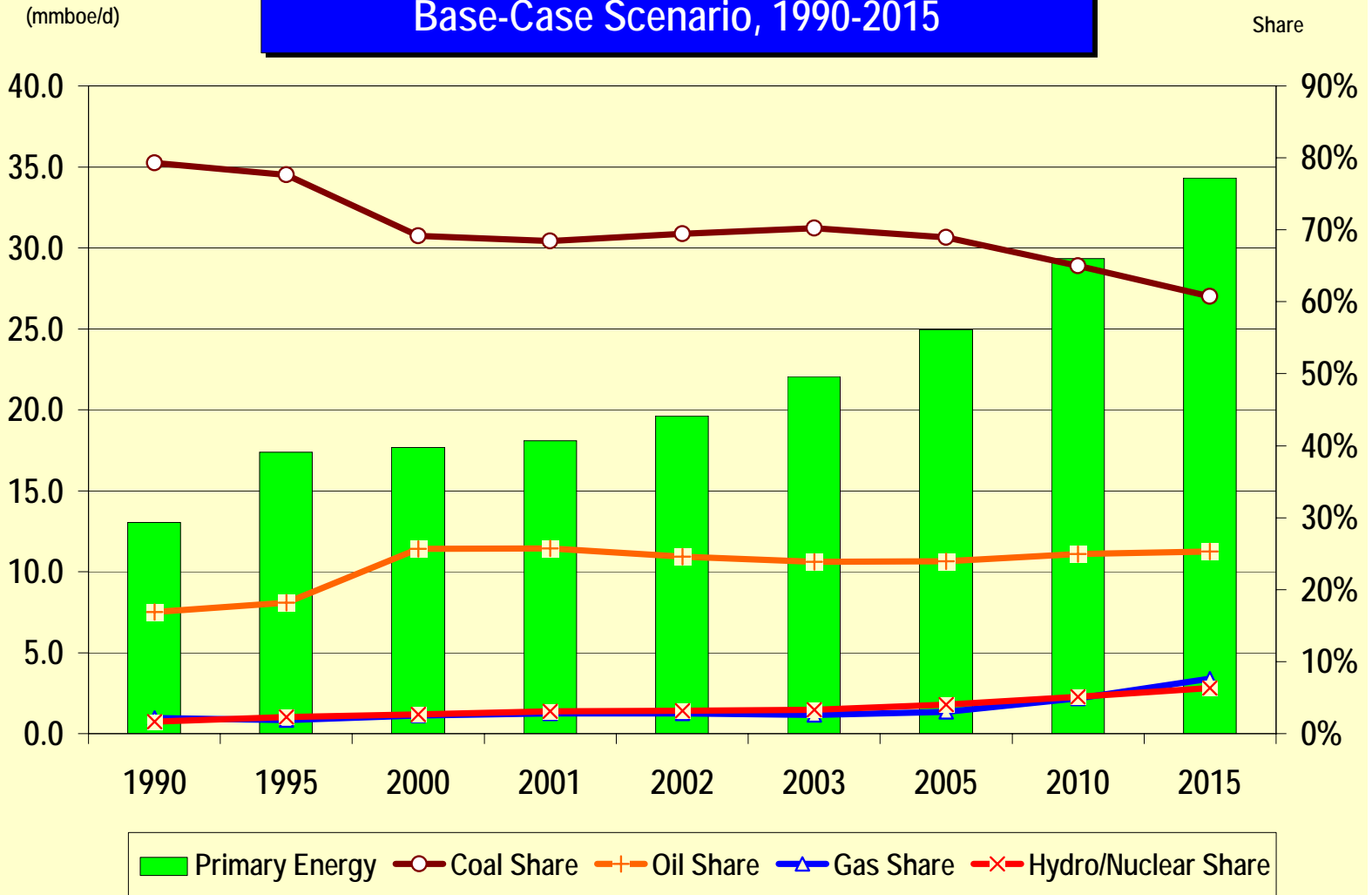
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Structure of Primary Energy Consumption in China, 1990-2003



Primary Energy Consumption Forecast for China Base-Case Scenario, 1990-2015



Energy Policy

❖ Evolving energy policies:

- ❖ 1980s: moving away from the centrally-planned economy
- ❖ 1990s: restructuring
- ❖ 2000s: long-term energy supply and security

❖ Energy policies for individual sources:

- ❖ Coal: economy of scale, efficiency, safety, and transportation
- ❖ Power: long-term supply, structural and market reforms, and fuel mix/substitution

❖ Energy policies for individual sources (cont'd):

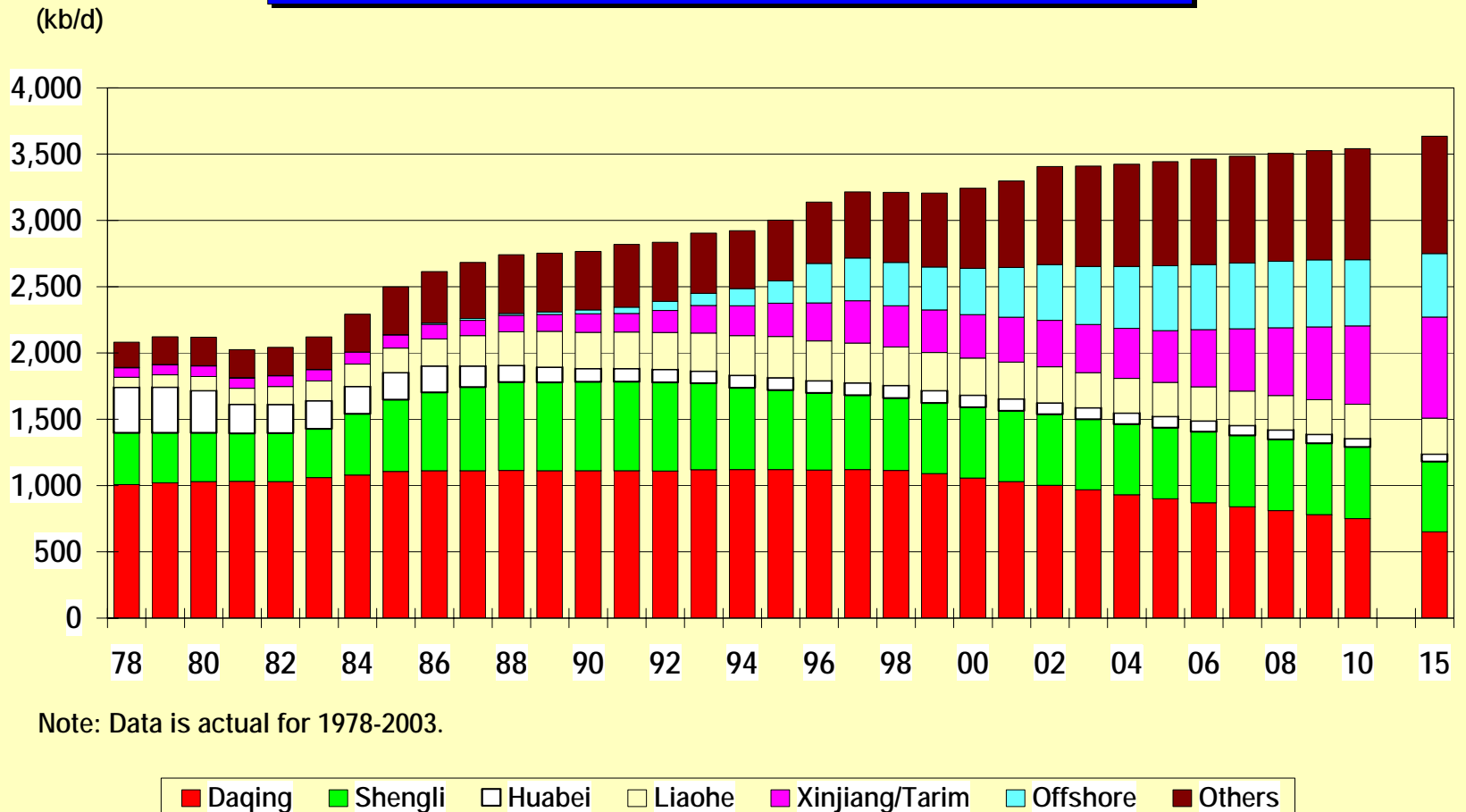
- ❖ Oil: domestic supply, import strategy, overseas investment, strategic petroleum reserves, overall supply security, oil diplomacy
- ❖ Natural gas: pricing issues, fuel competition, gas for power, infrastructure, imports in the form of LNG (liquefied natural gas) and by pipelines, environmental issues.
- ❖ Hydroelectricity: policy support, west-east power supply, and ecological issues
- ❖ Nuclear power: increasing importance, economics, and safety issues

❖ Major energy policy elements under the 10th Five-Year Plan:

- ❖ to optimize energy mix while ensuring the overall energy security;
 - ❖ to improve energy efficiency and energy conservation;
 - ❖ to protect the ecological environment;
 - ❖ to develop west China
- ❖ Future energy policies for individual fuels.
- ❖ Integrated energy policies for the future.

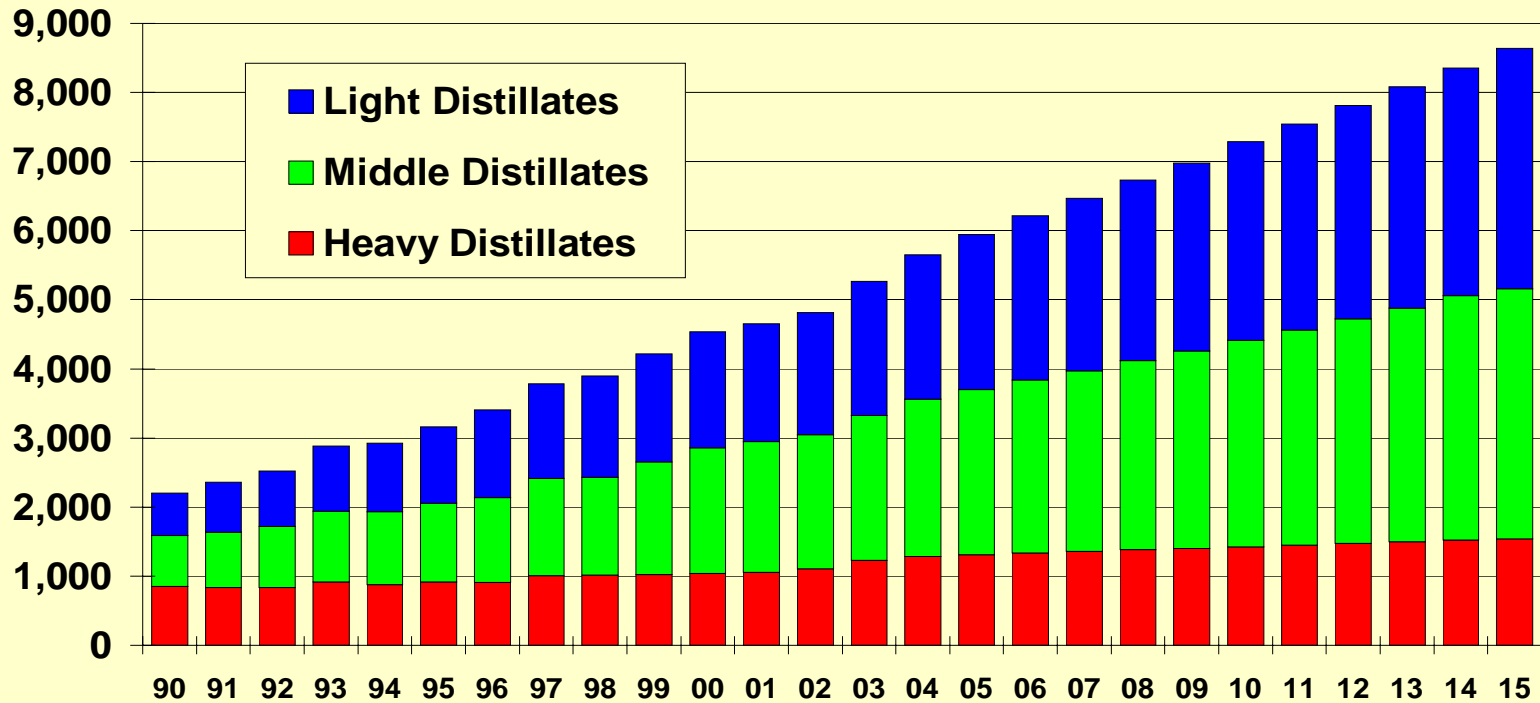
The Petroleum Sector

China's Crude Oil Production by Field, 1978-2015



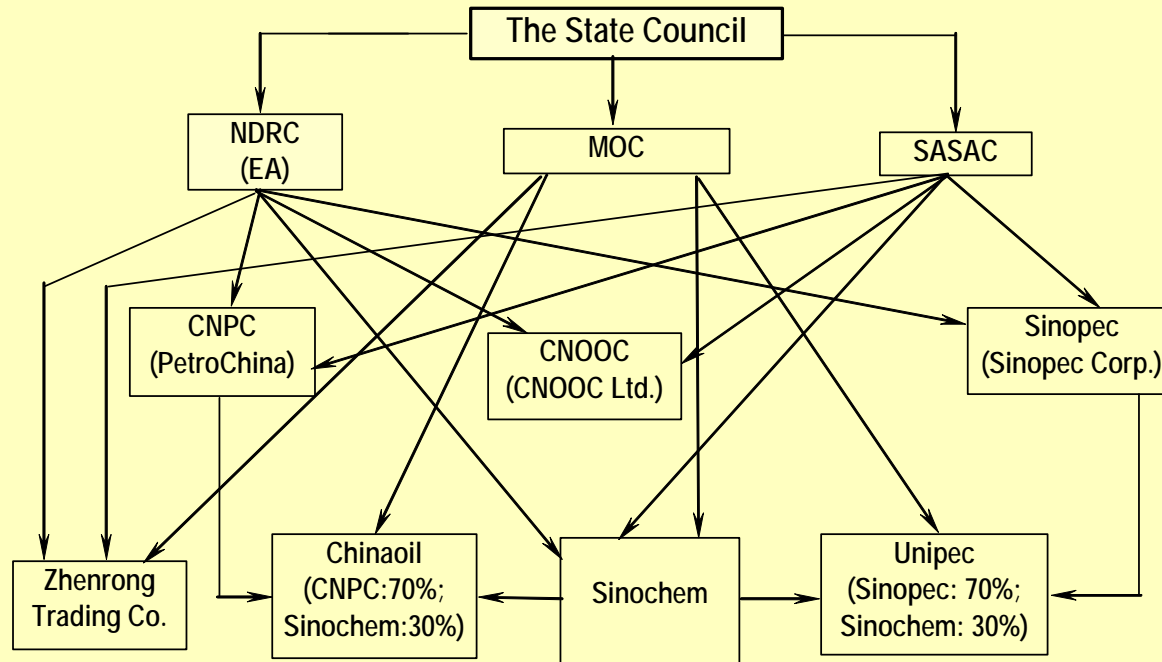
China's Petroleum Product Demand 1990-2015

(kb/d)



Note: 1990-2002 are actual, 2003 is preliminary, 2004-2015 are projections.

Organizational Chart of the Petroleum Industry in China (State), 2004



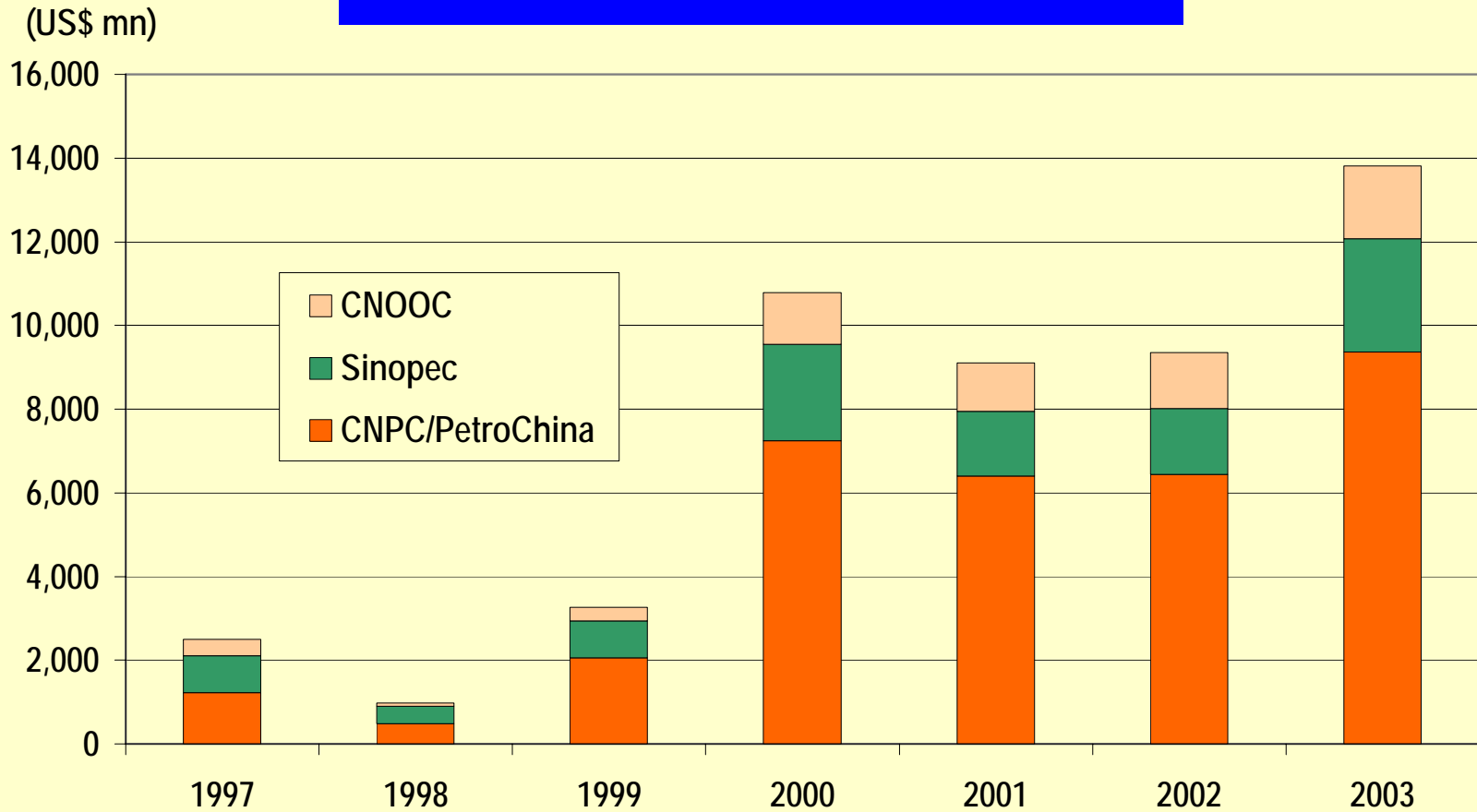
NDRC: National Development and Reform Commission. MOC: Ministry of Commerce, newly established in March 2003.
 EA: Energy Administration of NDRC, newly established in April 2003 under NDRC.
 CNPC: China National Petroleum Corporation. PetroChina: PetroChina Company Limited.
 Sinopec: China Petrochemical Corporation. Sinopec Corp.: China Petroleum and Chemical Corporation
 SASAC: State-Owned Assets Supervision and Administration Commission, newly established in March 2003.
 Unipec: United International Petroleum & Chemicals Co., Ltd. Zhenrong Trading Co: Zhuhai Zhenrong Trading Company.
 Sinochem: Sinochem Corp. Chinaoil: China National United Oil Corporation.

Geographical Division of CNPC/PetroChina and Sinopec*



*Based on the affiliation of provincial oil companies, but assets are overlapping in certain provinces.

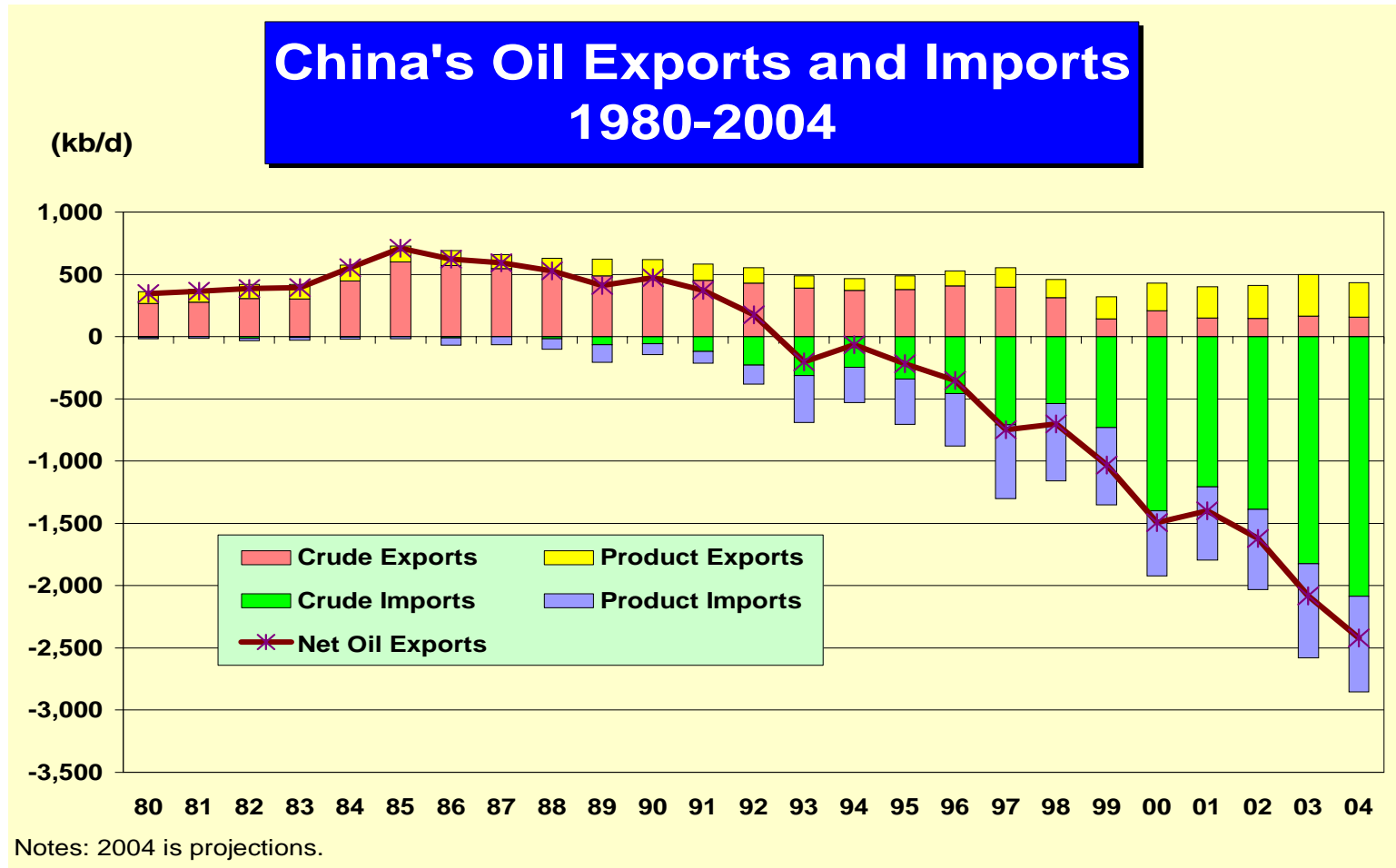
Profits of Chinese State Oil Companies 1997-2003



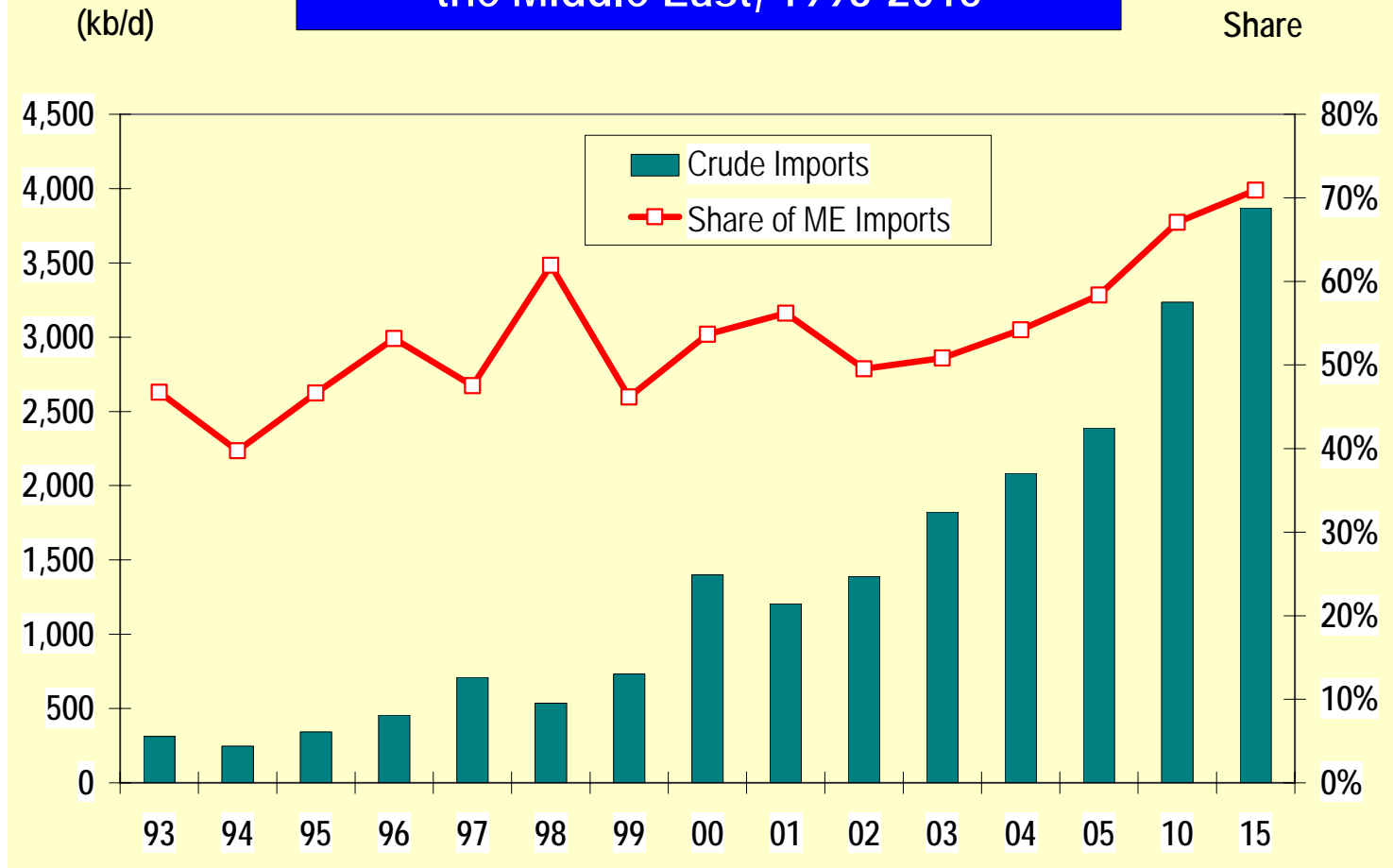
Note: Data for 2003 are estimates.



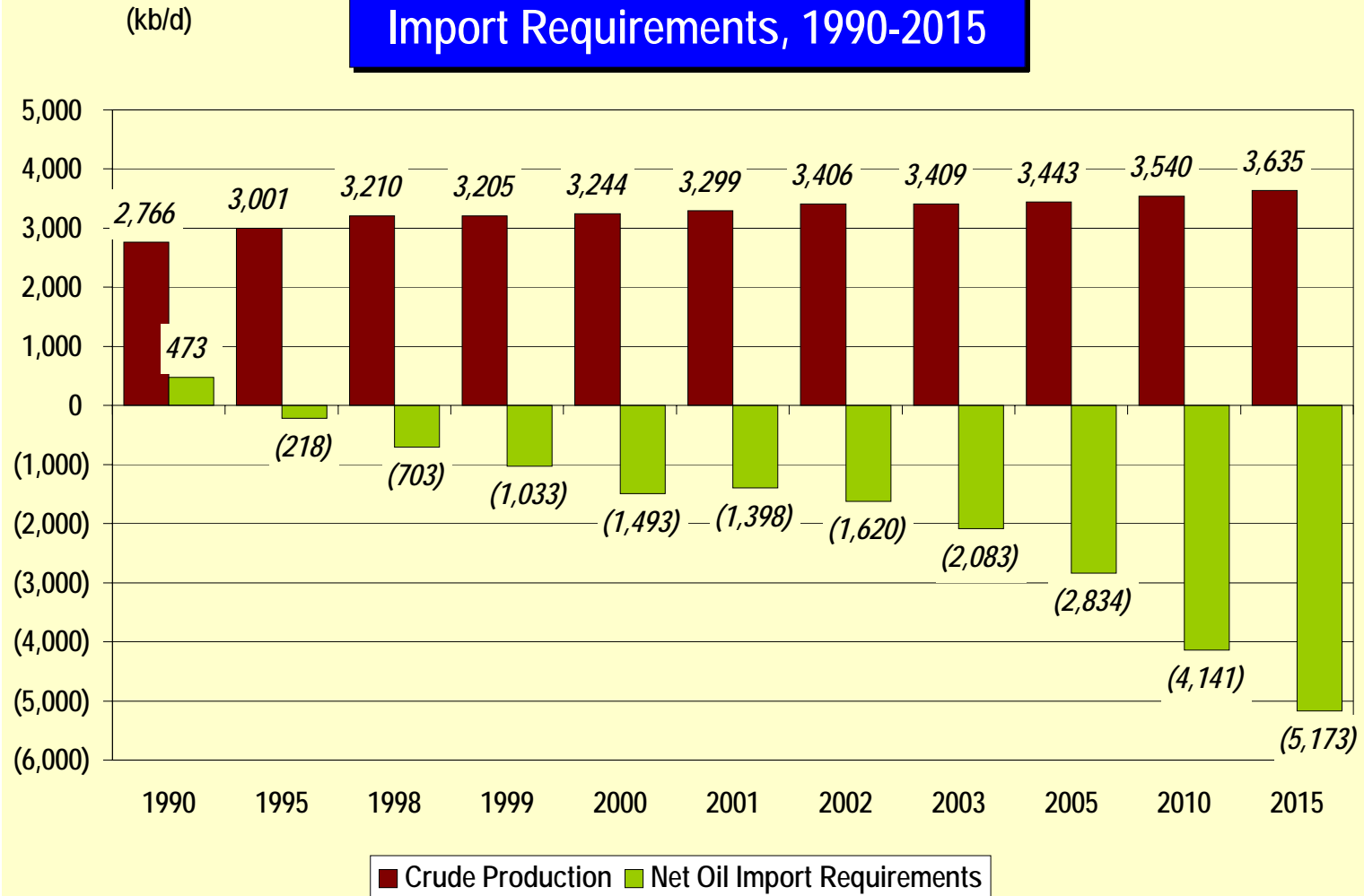
Rising Oil and Gas Imports: Present and Future



China's Crude Imports and the Share of the Middle East, 1993-2015

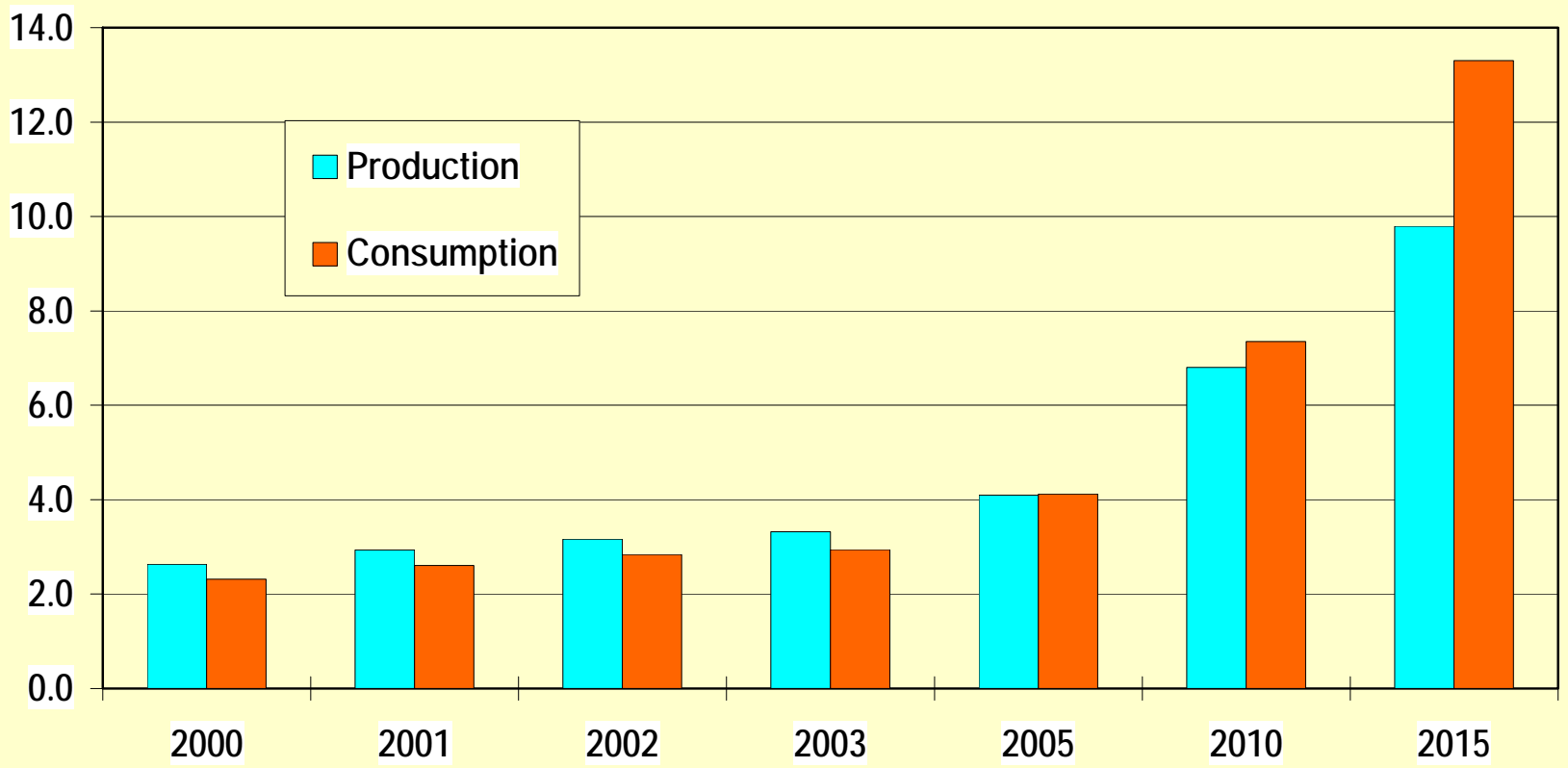


China Crude Production and Net Oil Import Requirements, 1990-2015



Outlook for Natural Gas Production and Consumption in China

(bscf/d)



Note: 2005-2015 are projections.



Map: China's West-East Gas Pipelines, Ordos-Beijing Pipelines, and Proposed Russia-China-Korea Pipelines



Note: the Russia-China-Korea pipeline route is for illustrative purposes only.



Energy Security Strategies

- ❖ **China has not yet established a full-ranged energy security policy framework. However, the following has emerged as the main elements of the policy:**
 - **Adjust energy consumption and production structures and reduce dependence on oil through coal gasification, liquefaction, and development of nuclear power etc**
 - **Establish strategic upstream oil and gas reserves in certain parts of the country, as well as, enhance domestic oil and gas E&P activities**

- ❖ **Elements of China's energy securities in formation (cont'd):**
 - **Actively participate in the formation of a regional community and establish a regional energy security system**
 - **Establish an oil futures market**
 - **Diversify the sources of oil and gas imports, increasing the share of oil and gas imports from Russia and Central Asia**
 - **Strengthen overseas investment by state oil companies, particularly in the Middle East, Asia Pacific, Russia, and Central Asia**

- ❖ **Elements of China's energy securities in formation (cont'd):**
 - **Undertake different ways of trade to avoid transaction risks**
 - **Increase the investment in an oil and gas infrastructure and open more channels to imports**
 - **Establish government-controlled strategic petroleum reserves (SPRs)**
 - **Increase mandatory oil reserves for large oil companies**

Special: SPRs

- ❖ System does not exist at present
- ❖ Task is set under the Tenth Five-Year Plan (2001-2005). NDRC is in charge of the work. The NDRC Energy Administration (EA) is the home to the National Office of SPRs
- ❖ Target for Phase I (around 2005/06): Approximately 16 million m³ or 100 million bbl (approximately 35 days of net imports). Phase I is now underway.
- ❖ Target Phase II (2010): 30 million m³ or 189 million bbl (approximately 45 days of net imports)
- ❖ In principle, the funds will come from the state mainly but also the state oil companies, which will manage and maintain the facilities.

SPRs (cont'd)

- ❖ The four selected sites for the first phase:
 - Zhenhai (Zhejiang Province) with Sinopec: 5 million m³ (31 million bbl) by 2005/06
 - Aoshan (Zhejiang Province) with Sinochem: 5 million m³ (31 million bbl) by 2005/06
 - Huangdao (Shandong Province) with Sinopec: 3 million m³ (13 million bbl) by 2005/06
 - Dalian (Liaoning Province) with PetroChina: 3 million m³ (13 million bbl) by 2005/06
- ❖ Commercial operation and management of the storage may be allowed to a certain degree while the government retains the overall control
- ❖ The government may also pass law to require oil companies to also establish a minimum level of storage as a supplement to the national storage

Special: China's Overseas Investment Push

- ❖ **Six state-owned companies have overseas upstream departments**
 - **CNPC**
 - **PetroChina**
 - **Sinopec**
 - **CNOOC**
 - **Sinochem**
 - **One state-owned non-oil company player: CITIC**

Overseas Investment Push (cont'd)

❖ Example of China's Overseas Activities:

- **CNPC: Kazakhstan, Peru, Sudan, and Venezuela, and most recently Syria, Algeria, and Ecuador**
- **PetroChina: Indonesia**
- **CNOOC: Indonesia, Australia, etc.**
- **Sinopec: Iran, Azerbaijan, Saudi Arabia, etc.**
- **CITIC/Sunwing Energy JV: have interest in the Middle East and Africa**

Key Factors Driving China's Energy Security

- ❖ **Economic Factor: Ensuring China's Long-Term Economic Growth**
- ❖ **Geopolitical Factor: Reducing China's Energy Vulnerabilities**
- ❖ **Environmental Factor: Protecting the Environment and Avoiding Ecological Degradation and Disasters**