
The Chinese Factor: Current Economic Status, Demand for Energy and Opportunities



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Executive summary

- China is the most populous country in the world. Its GDP is the third largest after the USA and the EU.
- The Chinese phenomenon plays an important role in the whole South East Asia; “overseas“ Chinese own the majority of capital in the South Asian countries and the interdependence among south-east Asia increases with China joining ASEAN in late 2004.
- Networking and family bonds play very important role in the Chinese society, trade and business.
- China has become very important trade destination, since 1990, China has achieved remarkable and unsurpassed growth in export and import averaging more than 15% yearly growth for the whole period. In December 2001, China joined the WTO.
- China experiences very high rates of GDP growth, GDP grew by approximately 9% in the period 1986 –2004. In the first year, the growth was predominantly driven by industry sector growth, in the last year also services experience significant expansion.
- During the period 1994 – 2005 the exchange rate of jüan, the Chinese currency, did not change and was believed to be undervalued. This caused huge trade deficits of trade partners, especially of the USA. On June 21, 2005, after a persisting pressure of China’s trade partners, China partly released the exchange rate.
- Country experiences large regional and social disparities, the majority of GDP production and 1/3 of population is concentrated in the coastal part of mainland China and in the valley of Jang-ce and Pearl river. These regions encounter the highest GPD per capita.

Executive summary (2)

In 2003, China surpassed Japan to become the second-largest consumer of primary energy, after the United States. China is also the third-largest energy producer in the world, after the United States and Russia.

China's natural gas consumption is fully satisfied by the domestic production. In the future, however, China expects an increase in gas consumption, which would eventually result in need to import gas, especially via pipeline from Russia and Kazakhstan or in a form of LNG from Persian Gulf and Australia.

Historically, natural gas has not been a major fuel in China, but given China's domestic reserves of natural gas, which stood at 1.51 tcm at the beginning of 2004, and the environmental benefits of using natural gas, China has embarked on a major expansion of its gas infrastructure. The country's largest reserves of natural gas are located in western and north-central China, necessitating a significant further investment in pipeline infrastructure to carry it to eastern cities.

Natural gas currently accounts for only around 3% of total energy consumption in China, but consumption is expected to nearly triple by 2010. The gas consumption in China is expected to increase with a factor 6 from 30 bcm/y to 180 bcm/y by 2020.

Coal makes up the bulk of China's energy consumption (64% in 2002), and China is the largest producer and consumer of coal in the world. As China's economy continues to grow, China's coal demand is projected to rise significantly. Although coal's share of China's overall energy consumption will decrease, coal consumption will continue to rise in absolute terms.

China's electricity consumption is expected to grow by over 4% a year through 2030, which will require more than \$2 trillion in electricity infrastructure investment to meet the demand. China expects to add approximately 15,000 megawatts of generating capacity a year, with 20% of that coming from foreign suppliers.

 **China overview**

Chinese economy is not just mainland China (regional integration in south-east Asia dominated by Chinese)

Chinese outward looking economy

Chinese energy sector

China in Figures



Area: 9.6 mil sq km (slightly smaller than USA, fourth largest country)

Population: 1,306 million (20,6 % world's population, the most populous country)

Population growth rate: 0.58% (2005 est.)

GDP (PPP): USD 7,262 trillion (estimate 2004, the third largest economy after USA and EU)

GDP per capita (PPP): USD 5,600 (estimate 2004)

The second largest energy consumer (after the USA)

President: HU Jintao

Prime minister: WEN Jiabao

The Chinese roots – Confucianism, innovation and rapid opening up

China's history and culture is 4 thousand years old which is further dynamically developing. Already from 16th century BC (Sia dynasty) there are first on silk production and also calendars documenting the invention of script. China became famous because of fundamental innovations: paper, letter print, pig iron, tea, barrow, magnetic compass, gunpowder, drive belt, paper money, development of mathematics etc.

Also now are Chinese considered to be extraordinarily innovative. Siemens develops and produces its high-tech mobile phones technologies for world-wide market in China. Accordingly, also software is developed there.

China went through the periods of protection of its culture, closeness (incl. Chinese Wall), and also through periods of opening itself to the world – Marco Polo journeys for Kublai Khan (dynasty Jüan 1280-1368), international naval discovering and conquering campaigns almost to Arabian peninsula with a fleet of 60-140 ships, 20 thousand men (under admiral Cheng Ho, emperor Yung-lo of Ming dynasty 1402-1424) – up to 30 countries were discovered in this way. Simultaneously, foundations of further economic relations were established.

Long period of China's closeness followed, resulting in departure of many Chinese to emigration („overseas Chinese“), some of the emperors even intended to withdraw the emigrants back to China using force. China missed out the industrial revolution.

For centuries China stood as a leading civilization, but in the 19th and early 20th centuries, the country was beset by civil unrest, major famines, military defeats, and foreign occupation. After World War II, the Communists under MAO Zedong established an autocratic socialist system that, while ensuring China's sovereignty, imposed strict controls over everyday life and cost the lives of tens of millions of people. After 1978, his successor DENG Xiaoping and other leaders focused on market-oriented economic development and by 2000 output had quadrupled. For much of the population, living standards have improved dramatically and the room for personal choice has expanded, yet political controls remain tight.

In the last decades China apparently opens up to the rest of the world, finished up by the WTO admission in 2001. Effort to run highly export oriented economy is accompanied by the effort acquire and localise the most sophisticated technologies.

Influential Fact – Chinese Networking

Chinese networking and family bonds

- Doing business with Chinese require taking into account quite a lot of business/cultural differences.

- See two short summaries from Inside Chinese Business-A guide for managers worldwide, Ming-Jer Chen, for an idea about key differences.



- There's much more than this, however, too. Primarily, **relationship building**.

Networking	How its done	
	West	China
Motivation	Economic	Economic and social
Formality	Formal and defined roels	Informal flexible roles
Individual and Organization	Separate	Impact one another
Networked organizations	Independence	Mutual dependence
Governing authority	Contracts	Personal trust

Business Practice	How its done	
	West	China
Company purpose	Shareholder value maximization	Serve family interests
Financial openness	Public reports	Kept secret
Financing sources	Public sale of securities	Family and family friends
Transfer of ownership	Mergers, hostile takeovers	Co's not sold due to family obligations
Advertising	Brand promotion	No advertising, just networks
Management	Professional management	Senior managers are family insiders
Time horizon	Short-term emphasis on profits and shareholder value	Long-term family prestige

China overview



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Trading with Chinese does not mean trading with China only

- **Chinese capital and population penetration to SE Asian economies is enormous.** Thanks to this, it has become common to regards certain SE Asian countries as “Chinese Traders”.
- The WTO organization includes in its official statistics “Six East Asian Traders” comprising: **Hong Kong, China, Korea, Rep. Of Malaysia, Singapore, Chinese Taipei and Thailand.**
- Following figures explain why **trading with Chinese does not mean trading with China only** :

Population and economic participation of overseas Chinese in SE Asian countries and Taiwan				
Country	Total population	Chinese population	Chinese as % of total	% of market capital controlled by Chinese
Brunei	299 939	42 800	14,3%	*
Cambodia	11 163 861	250 000	2,2%	70,0%
Indonesia	209 774 138	5 244 353	2,5%	73,0%
Laos	5 116 959	66 520	1,3%	**
Malaysia	20 491 303	6 147 391	30,0%	69,0%
Myanmar	46 821 943	8 193 840	17,5%	**
Phillippines	76 103 564	1 522 071	2,0%	50-60%
Singapore	3 440 693	2 669 978	77,6%	81,0%
Thailand	59 450 818	8 323 115	14,0%	81,0%
Vietnam	75 123 880	1 051 734	1,4%	45,0%
Taiwan	21 699 776	21 048 783	97,0%	95,0%
Total	529 486 874	54 560 585	10,3%	-

Source: US Census Bureau, World Population Estimates, Australian Dept' of Foreign Affairs, Far Eastern Economic Review, Feb 26, 1998

* Chinese do not hold citizenship and form partnerships with locals often. ** Figures unavailable.

- **Traditional networking.** Another reason lies in traditional code of business conduct based on “guanxi”. i.e. on relationships instead of western base on contracts. More on this in a while.

China has become an extremely important trade destination dominated by Asian neighbors

- China has become a **super-important export destination** for many countries, but mostly for ASEAN
- Experts forecast even greater importance of the Chinese market
- Due to construction boom, for instance, China consumes staggering 55% of World cement production and 36% of World steel production.
- Mutual trade and economic co-operation between China and ASEAN according to the statistical data has further developed recently. The value of trade between China and ASEAN has been growing at 20% rate annually since 1990. **In 2003 reached the trade turnover USD 78.2 billion, 90 times more than in 1987.** ASEAN is the fifth largest China's trade partner among developing economies.

Table 2.3. Exports of Selected Economies to China
(In percent of their total exports)

	1980	1985	1990	1995	2000	2002	2003
Japan	3.9	7.1	2.1	5.0	6.3	9.6	13.6
Korea	0.0	0.0	0.0	7.0	10.7	14.7	20.5
Hong Kong SAR	6.3	26.0	24.8	33.3	34.5	39.3	42.7
Singapore	1.6	1.5	1.5	2.3	3.9	5.5	7.0
Indonesia	0.0	0.5	3.2	3.8	4.5	5.1	7.4
Malaysia	1.7	1.0	2.1	2.6	3.1	5.6	10.8
Philippines	0.8	1.8	0.8	1.2	1.7	3.9	12.0
Thailand	1.9	3.8	1.2	2.9	4.1	5.2	7.1
India	0.3	0.3	0.1	0.9	1.8	4.2	6.4
European Union ¹	0.8	1.8	1.2	2.2	2.7	3.4	4.2
United States	1.7	1.8	1.2	2.0	2.1	3.2	3.9
Germany	0.6	1.2	0.6	1.5	1.6	2.2	2.6

Source: IMF, Direction of Trade Statistics.

¹Adjusted for intra-EU trade.

Treaty between ASEAN and China – a way to create the world's largest free trade area

China – ASEAN Treaty.

- **ASEAN** (Malaysia, Philippines, Thailand, Brunei, Vietnam, Myanmar, Cambodia, Indonesia, Laos, Singapore) signed on November 29, 2004 a breaking-through treaty with **China** on gradual **trade liberalisation**.
- **Aim: free trade area by 2010** (EU as a model).
- Should include almost a **half of the world's population** and a **third of world's trade (USD 2 trillion)**!
- Duty and non-duty barriers to trade should be gradually removed and an arbitrage commission should be established in order to handle trade disputes.

First step is the free trade area within ASEAN

- At ASEAN summit also treaties between ASEAN countries were signed. Treaties counts on the creation of single market within the **500 million ASEAN**.
- Aim: decrease of tariffs by 2010 **of more developed countries** (Brunei, Indonesia, Malaysia, Philippines, Singapore, Thailand), by **2015 of less developed**.
- **11 key sectors** (including car manufacture, textile, electronics) – full liberalisation by **2007**, less developed by **2012**.

Important circumstances

- Treaty China – ASEAN weakens, in the sense of trade power, the traditional Asian power, Japan. Japan and ASEAM only carry out negotiations on free trade (together with South Korea)
- Treaty China – ASEAN also diminishes (according to the size) the position of trade areas of EU a NAFTA.



2003	Real GDP growth (%)	GDP per capita (USD)	GPD PPP per capita
Brunei	3,20	12 971	15 051
Cambodia	5,00	310	1 658
Indonesia	4,10	973	3 405
Laos	5,90	362	1 799
Malaysia	5,31	4 198	9 579
Myanmar	5,10	179	1 364
Philippines	4,70	973	4 387
Singapore	1,09	20 987	22 962
Thailand	6,75	2 291	7 253
Vietnam	7,24	481	2 477
ASEAN	5,01	1 266	4 042

Source: ASEAN, HN, 1/12/2004

China overview

Chinese economy is not just mainland China (regional integration in south-east Asia dominated by Chinese)

➔ Chinese outward looking economy – driving demand for energy

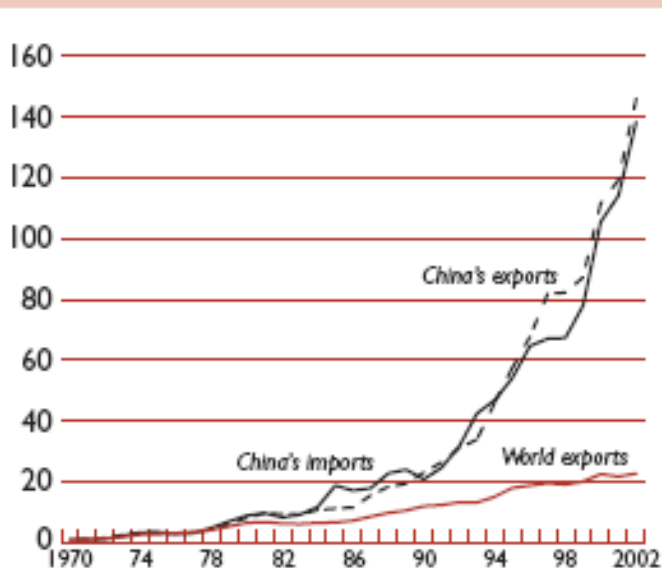
Chinese energy sector

China has been on its way to become World economic superpower: 1980 and on

▪1] China's integration with the global economy is reflected in its rapidly growing role in international trade. **China's exports and imports have grown faster than world trade for more than 20 years.**

▪ 2] **China succeeds in terms of competitiveness, too.** Its share on imports to the most developed markets has been rising steadily.

Figure 2.1. Growth in Trade¹
(Index, 1970 = 1)



Source: IMF, Direction of Trade Statistics.
¹Based on the value of merchandise exports (f.o.b.) and imports (c.i.f.) in U.S. dollar terms.

Table 2.1. Market Share in Major Export Markets
(Imports from China divided by total imports, in percent)

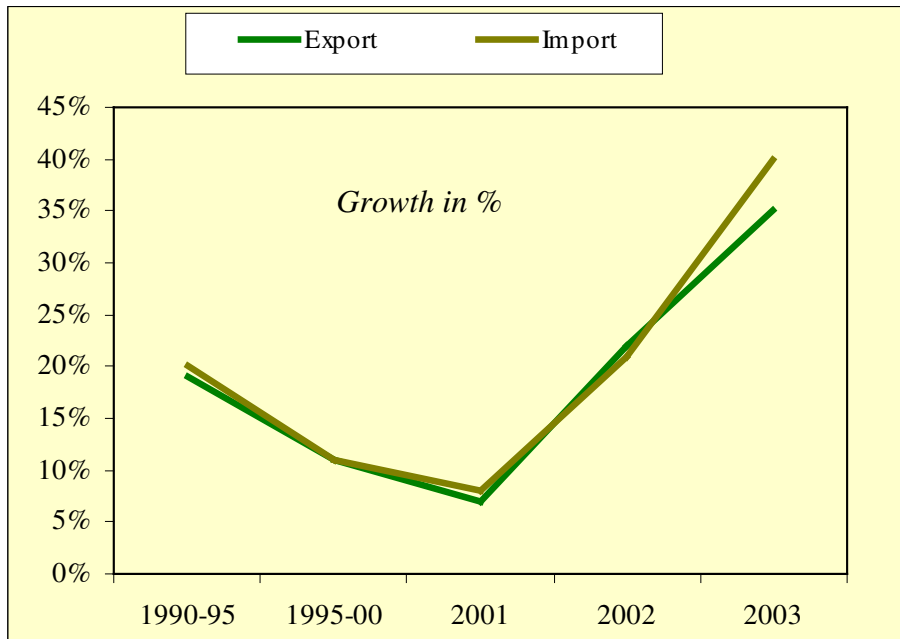
	1970	1980	1990	1995	2000	2002	2003
Japan	1.4	3.1	5.1	10.7	14.5	18.3	18.5
United States	0.0	0.5	3.2	6.3	8.6	11.1	12.5
European Union ¹	0.6	0.7	2.0	3.8	6.2	7.5	8.9

Source: IMF, Direction of Trade Statistics.
¹Excluding intra-EU trade.

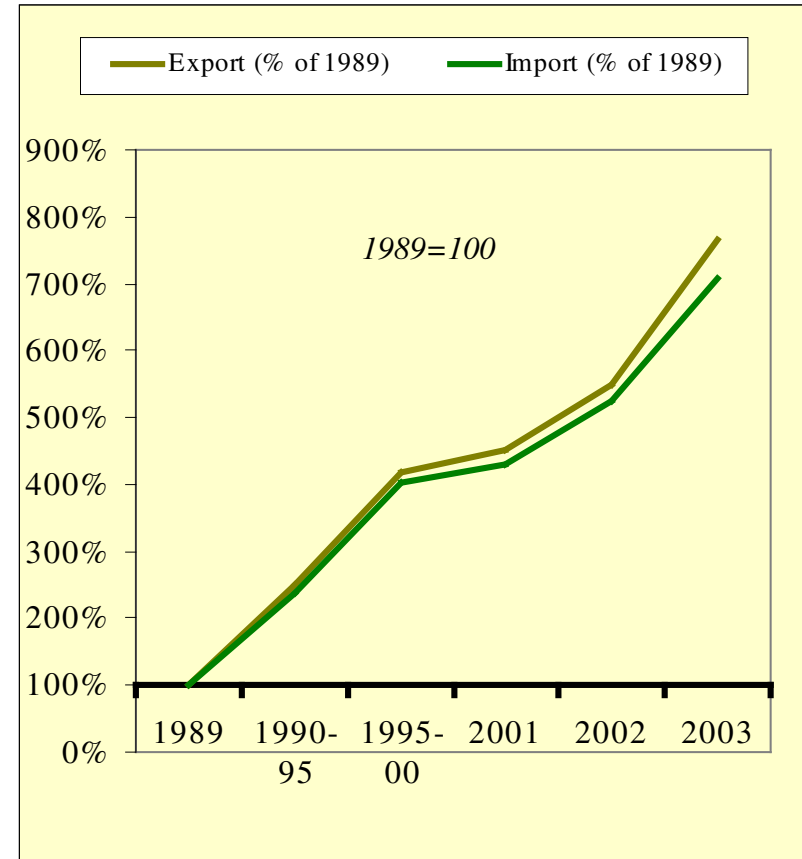
- Chinese exports have become an important issue in talks over deficits in many developed countries (eg. USA).
- WTO Multi-fibre agreement completely opening WTO textile markets promise the Chinese textile industry further edge over all developed countries producers.
- **3]** China has been a WTO member country since 11 December 2001

China has been on its way to become World economic superpower:1990 and on, still growing

- Since 1990, China has achieved **remarkable and unsurpassed growth in export and import averaging more than 15% yearly** growth for the whole period, left graph.
- Such high levels of growth translate into more than **700% increase** in both **import and export** over 1990-2004, right graph.



Source: WTO, 2004



Source: WTO, 2004

Economic background I.

China is important regional Asian power with a combination of planned economy and increasing role of market economy – Communist Party of China lead by reforming leaders plays the role of organizing factor..

Since 1986 has China carried out number of economic reforms. The aim is especially the overall development of domestic economy and enlargement and intensification of international economic cooperation „Open-door-policy“. After the Tiananmen incident in 1989 economic sanctions followed.

Reforms since 1994 (aim: social system market economy)

- Financial, tax, banking, exchange rate, foreign trade, investment activity reforms, reforms of price and enterprise system, VAT system introduced
- Directed floating introduced of single RMB exchange rate, closer to its market value.
- GDP grew by annual rate of 9.5% on average in the period 1986 - 1990.

▪1991-1995 (eighth 5-year plan) – strong expansion

- Average GDP growth was 12%, GDP has doubled compared to 1990. (GDP 1995 = 5,770 billion RMB
- The problem in 1995 was inflation of 14.8 %, in 1996 inflation fell to 6.1 % and in 1997 eventually to 0.8 %.

▪1995 - 2000 – moderate expansion

- Growth 1995 – 1999 respectively 10.5 %, 9.6 %, 8.8 %, 7.8 % a 7.1 %.

	2000	2001	2002	2003	2004
GDP growth	8,90%	7,30%	8,00%	9,10%	9,50%
GDP (billion RMB)	8 940	9 593	10 240	11 923	13 652
GDP per capita (USD)	757	n/a	963	1 087	1 250

Economic background II.

- **2003** → China – 2nd largest trade partner of the EU (after the US) → Turnover = EUR 135 billion annual growth 17%
EU - China's 2nd largest trade partner (after Japan) → EU's deficit = EUR 55 billion
- **Indebtedness OK:** Debt service: 7,89 %, deep under then 20% alert level. → World Bank: „ China is a reliable debtor.“
China's loan rating - some 30th position in the world.
- **China and WTO – accession on December 11, 2001**
- As a part of integration China has to adjust number of its economic measures:
 - PRC has already in 1992 committed itself to decrease and remove tariffs and other trade barriers in order to renew its membership in GATT.
 - In October 2000 China was granted the permanent most favoured nation clause by the US government, without the need of annual renewal.
 - China undertakes step to harmonise its customs duties with WTO member countries. According to the last announcement of China's officials should the average import duty be lowered to 10%.
- **China is a member of number of important international organisation:** UN, UN Security Council, UNCTAD, APEC, UNESCO, UNHCR, UNIDO, WHO, FAO, MAAE, INMARSAT, INTELSAT and Interpol.
- **Probable convergence with EU.** In the international context further convergence with EU is likely, more regular contacts not only in the political field, but also in economic field and research cooperation. China also very carefully studies impacts of EU enlargement on its economy.
- **The most important trade partners:** Japan, US, Hong Kong, South Korea, Taipei, then Germany, Malaysia, Singapore, Russia and Netherlands, that made up with USD 581.5 billion 68% of China's foreign trade in 2003.

Source: MIT

Recent development of Chinese economy

China expects growth of economy by 8% in each of the five following years and in 2010 should the GDP reach USD 2.6 trillion (now USD 1.5 trillion).

Economic development in 2004

- Economic growth exceeded the plan and reached 9.5 %. Industry growth slowed from 17 % to 11.5 % and services growth becomes the driving force of Chinese economy.
- Consumer price index grew by 2.4 % and producer price index by 7.1 %.
- Investment in fixed assets grew by 21.3 %.
- China rose interests rates by 0.27% to 5.8 %.

2005 expectations

- According to Xinhua News Agency survey the majority of addressed Chinese economists expected economic growth over 8% in 2005
- E.g. Scotiabank Group analysis expects growth of 8.8 % in 2005.

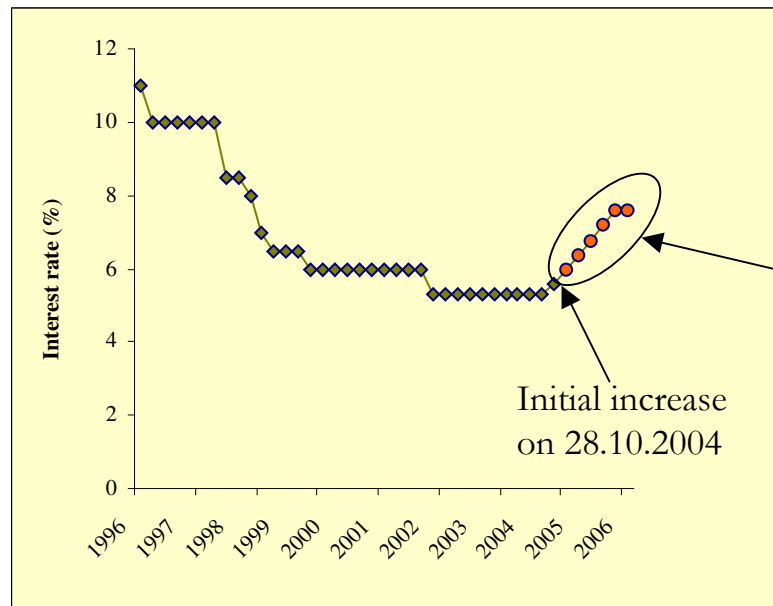
We may expect the Chinese economy to slow somewhat

■ In order to partially mitigate the adverse development of the Czech engagement in the trade with China, a very swift reaction is needed: the Chinese administration has started to slow the growth down because of inflation and other signs of overheated economy => room for increasing the export is shrinking.

■ Steps of Chinese Gov't to slow the economy:

- For the first time in 9 years the ChCB has increased the deposit rate in order to slow the economy
- Ceiling for lending rates exists no more.
- This step is regarded by experts as “the right break for the Chinese economy”, CSFB analysts
- Required capital reserves of banks have been raised
- Credit to automobile industry has been administratively limited

Development of Chinese Central Bank's (ChCB) deposit rates



■ There is high probability that the interest rates will go up again, Citigroup Globak Markets Asia.

■ **CSFB expects 2 p.p. increase over 18 months**

■ **+ the last increase in interest rates in 1995 led to a drop in the growth by 1/2.**

Source: MPO

Exchange rate of RMB is a source of conflict

Exchange rates (ER)

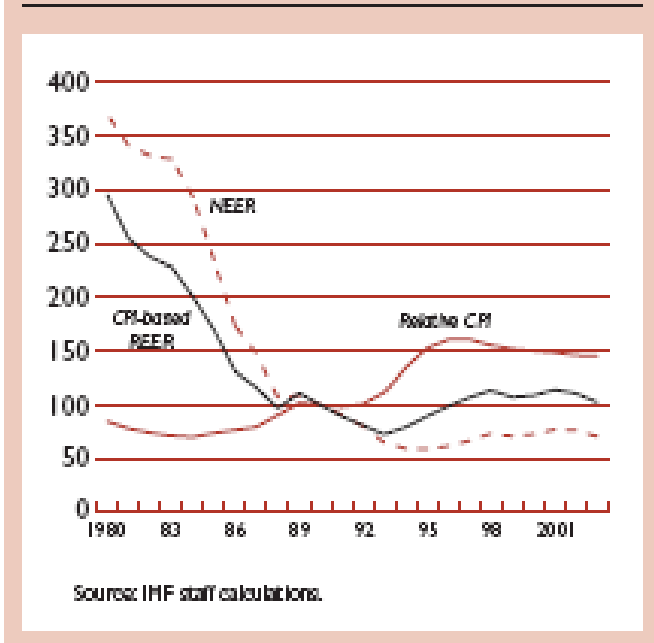
- 1980s: Fixed ER. Often devalued regarding the waves of openness.
- 1988 – 1993: Dual ER: First, official and second, market - determined by supply and demand in exchange centres.
- 1990: Fall of market ER. Official overvalued.
- 1994: Unification of exchange rates by devaluation of official ER. In market ER 80% of transaction of current account are made..
- 1994: Officially directed **floating**, de facto fixed ER against USD (8.28/USD).
- 1980 – 2000: Evolution of real effective ER (CPI base) – depreciation because of nominal devaluation, later appreciation until Asian crisis (1997) because of nominal fixation and growth of Chinese CPI against other countries (see also picture).

China does not hurry into revaluation

- Chinese currency Renminbi (RMB, jüan) has been since 1995 fixed to USD (8.28 RMB/USD).
- US experts point out Chinese currency is undervalued by more than 40% against the US dollar, IMF regard the relation as stable
- Together with other factors can the undervaluation be a significant reason for huge American-Chinese trade deficit(USD 150 billion expected in 2004).

- **On June 21, 2005, Chinese state media informed, China no longer defines its exchange rate against the US dollar only and the former exchange rate of 8.2765 jüan per one US dollar is not valid. The new exchange rate is 8.11 jüan for one US dollar and Beijing now wants to define the exchange rate against a currency basket .The original fluctuation band of 0.3 jüan will remain unchanged. China balances on the edge between its own economic interests to keep the exchange rate at the current level and the pressure of trade partners with the USA in the lead to devaluate the exchange rate.**

Figure 4.1. CPI-Based Real Effective Exchange Rate and Its Components (1990 = 100)



Chinese monetary policy has global impact

China's foreign currency reserves – impact on US dollar

- Chinese foreign currency reserves = USD 514.5 billion USD (September 2004)

- 2nd largest in the world (1st - Japan – USD 837.88 billion)

Economic Indicator					
	1999	2000	2001	2002	2003
GDP (\$ bn)	998,5	1079,5	1191,5	1237,1	1409,9
Total reserves (\$ bn)	158,3	327,2	218,7	295,5	412,2
- of which foreign exchange reserves (\$ bn)	154,7	165,6	212,2	286,4	403,3

- By 80% they are made up by the American dollars. High rate of „dollarisation“ is also given by the fact Chinese central bank using low-yield American T-bills finances American debt – trade deficit and stimulates consumption and thus imports from China.

Decrease of value of USD decreases the value of Chinese foreign currency reserves.



- Sale of dollars.** China therefore decreases its share of dollars in its foreign currency reserves to avoid further losses regarding the fall of American currency. Chinese central bank officially denies it, however, declarations of its officials differ.



- Further strong pressure on dollar devaluation.** USD exchange rate accounts further losses on the world markets and the currency falls to lower and lower minimum values against euro. On November 26, 2004, reacting to the information on decrease in dollar assets in China's reserves, for the first time broke the exchange rate the 1.33 USD/EUR level and ended up at 1.3324 USD. News on decrease of dollar reserves of South Korea (4th world's largest dollar reserves) also influence the strength of dollar (February 23, 2005)

Structure of Chinese economy by structure and territories

- Structure of Chinese GDP definitely does not rely on agriculture only

Chinese GDP structure (2003, in %)	
Industry	52,90%
Agriculture	14,80%
Services	32,30%

Structure of Chinese industry (2Q 2004)	
Primary	10,51%
Secondary	57,55%
Tertiary	31,94%

- In 2003 the average GDP per capita was USD 1087. Using PPP, the GDP per capital was USD 4,580 (UNDP).

- Map shows GDP per capita in the regions of China (in RMB, 2002).

- Darker shade means higher GDP per capita.

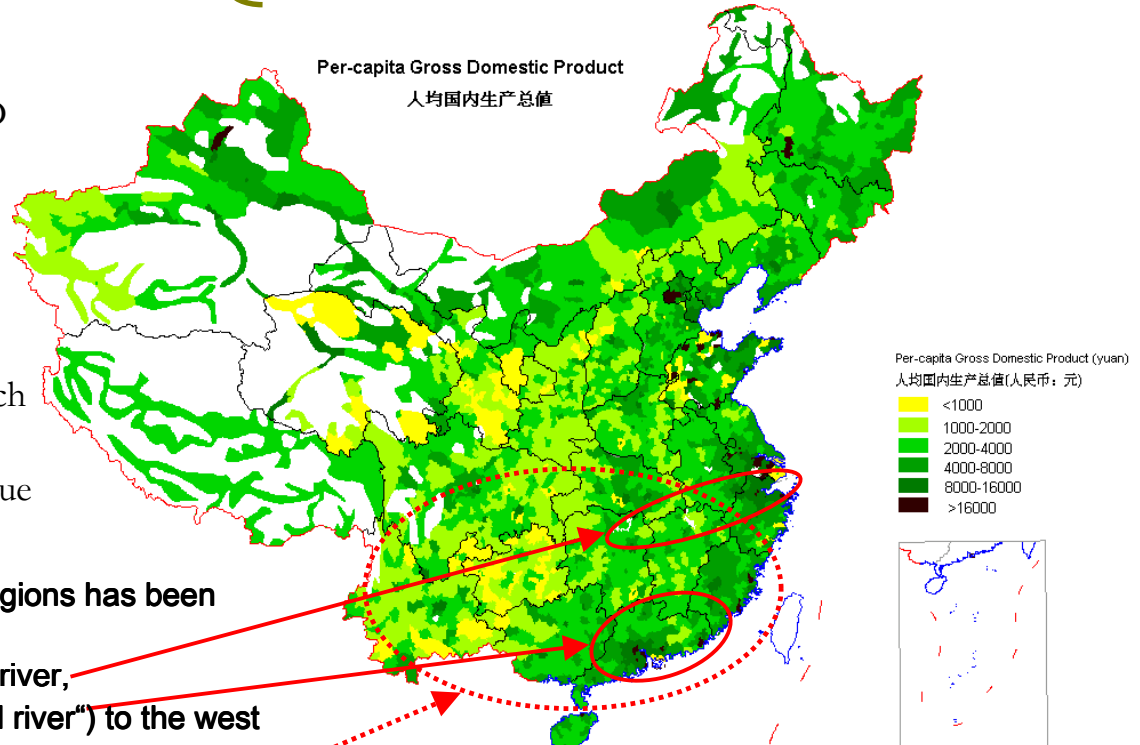
- Number of experts warn of excessive concentration of growth in coastal area, which leads to income inequality

- Inequality grow, nevertheless, the absolute value of income does not fall.

- Recently the industrial areas and prosperous regions has been enlarged

- from Shanghai along the whole length Jang-ce river,
- Through the whole Guangdong province („Pearl river“) to the west up to India.

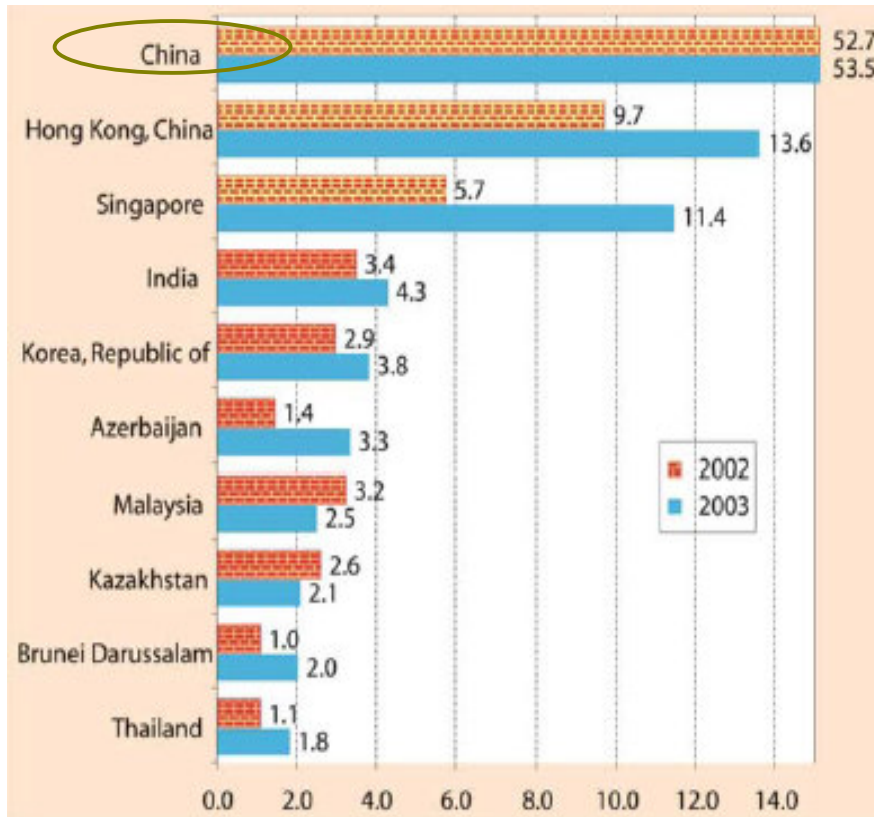
- Guangdong government plans to establish „9+2“ free-trade area, or „Pan Pearl River Delta“, 9 provinces + Hong Kong + Macao, approx. 1/3 of Chinese population, 40% GDP.



Source: U. of Michigan, National Bureau of Statistics of China, Economist, Nov. 20 – 26/04.

Importance of FDI for China, China's openness to FDI II.

▪ Asia and the Pacific - top 10 recipients of FDI inflows, 2002, 2003 a (Billions of dollars)



Source: UNCTAD, World Investment Report 2004

▪ Rate of return to FDI (%)

Economy	1999	2000	2001
World Average	7,1	6,8	5,5
Developed countries average	7,4	7,1	5,7
China	5	6,2	5,8
Hong Kong	13,6	12,5	11,5
Indonesia	5,5	5,7	5,4
Korea	3,3	3,1	3,3
Malaysia	11,5	14,1	11,2
Philippines	3,6	9,5	8,8

Source: UNCTAD, World Investment Report 2004

China overview

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Chinese outward looking economy - driving demand for energy

 **Chinese energy sector**

Energy overview (1)

Oil

Proven Reserves (1/1/04E): 18.3 billion barrels

Production (2003E): 3.54 million barrels per day (bbl/d)

Consumption (2003E): 5.56 million bbl/d

Net Imports (2003E): 2.02 million bbl/d

Crude Oil Refining Capacity (1/1/04E): 4.5 million bbl/d

Natural gas

Reserves (1/1/04E): 1.51 tcm

Production (2003E): 35 bcm

Consumption (2003E): 35 bcm

Coal

Recoverable reserves (2002E): 126.2 billion short tons

Production (2002E): 1.52 billion short tons

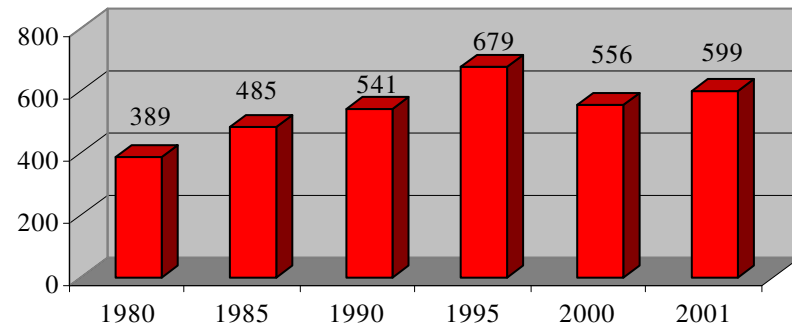
Coal Consumption (2002E): 1.42 billion short tons

Electricity

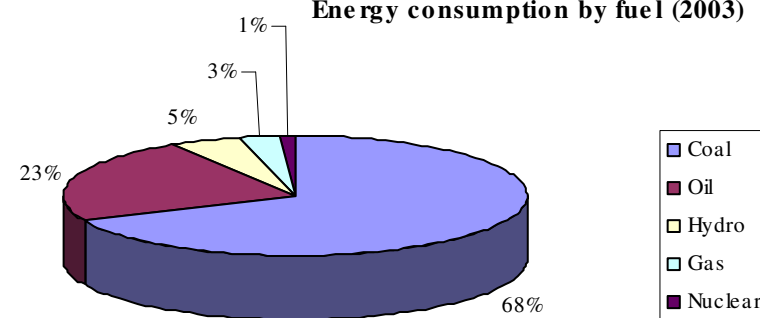
Electric Generation Capacity (1/1/02E): 338 GW (253 GW thermal; 83 GW hydro; 2 GW nuclear)

Electricity Generation (2002E): 1,575 billion kilowatthours (1,240 conventional thermal; 308 hydro; 23 nuclear)

**Energy consumption per capita
(tons of oil equivalent)**



Energy consumption by fuel (2003)



Source: BP

Energy overview (2)

In 2003, China surpassed Japan to become the second-largest consumer of primary energy, after the United States. China is also the third-largest energy producer in the world, after the United States and Russia. China's electricity consumption is expected to grow by over 4% a year through 2030, which will require more than \$2 trillion in electricity infrastructure investment to meet the demand. China expects to add approximately 15,000 megawatts of generating capacity a year, with 20% of that coming from foreign suppliers.

Coal makes up the bulk of China's energy consumption (64% in 2002), and China is the largest producer and consumer of coal in the world. As China's economy continues to grow, China's coal demand is projected to rise significantly. Although coal's share of China's overall energy consumption will decrease, coal consumption will continue to rise in absolute terms. Due in large part to environmental concerns, Beijing would like to shift China's current energy mix toward greater reliance on oil, natural gas, renewable energy, and nuclear power. China has abundant hydroelectric resources; the Three Gorges Dam, for example, will have a total capacity of 18 gigawatts when fully on-line (projected for 2009). In addition, the share of electricity generated by nuclear power is projected to grow from 1% in 2000 to 5% in 2030. But while interest in renewable sources of energy is growing, except for hydropower, their contribution to the overall energy mix is unlikely to rise above 1%-2% in the near future.

Since 1993, China has been a net importer of oil. Net imports are expected to rise to 3.5 million barrels per day by 2010. China is interested in diversifying the sources of its oil imports and has invested in oil fields around the world. Beijing also plans to increase China's natural gas production, which currently accounts for only 3% of China's total energy consumption. Analysts expect China's consumption of natural gas to more than double by 2010.

Natural gas

Historically, natural gas has not been a major fuel in China, but given China's domestic reserves of natural gas, which stood at 1.51 tcm at the beginning of 2004, and the environmental benefits of using natural gas, China has embarked on a major expansion of its gas infrastructure.

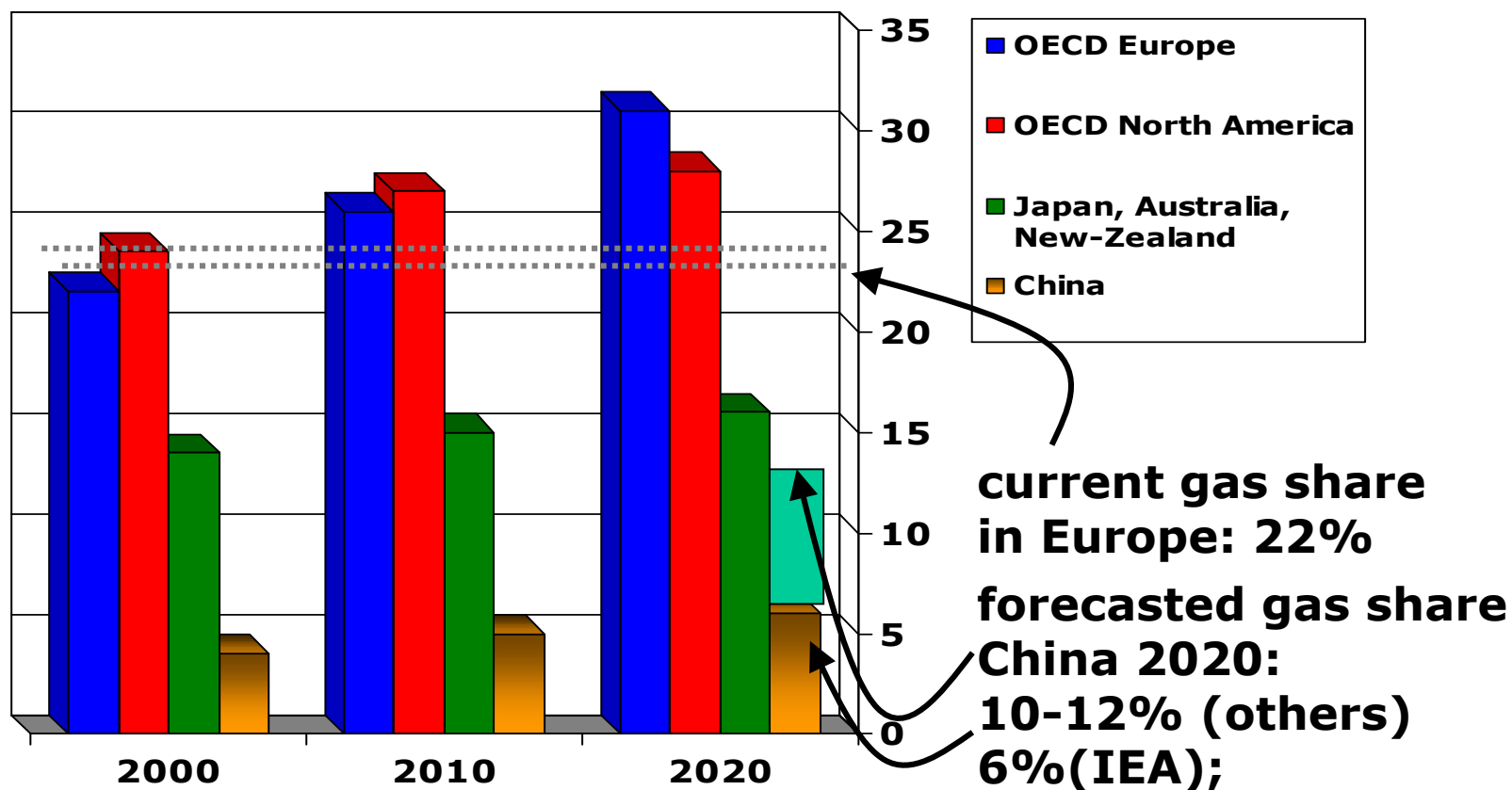
Until the 1990s, natural gas was used largely as a feedstock for fertilizer plants, with little use for electricity generation.

Natural gas currently accounts for only around 3% of total energy consumption in China, but consumption is expected to nearly triple by 2010. This will involve increases in domestic production, and imports, by pipeline and in the form of liquefied natural gas (LNG).

The country's largest reserves of natural gas are located in western and north-central China, necessitating a significant further investment in pipeline infrastructure to carry it to eastern cities. CNPC has a pipeline under construction, the "West-to-East Pipeline," from natural gas deposits in the western Xinjiang province to Shanghai, picking up additional gas in the Ordos Basin along the way. Construction began in July 2002, and a section of the pipeline east of the Ordos Basin began operation in early 2004. The segment connecting to Xinjiang was completed at the end of 2004. While it was expected initially that several major foreign oil and gas companies would take stakes in the project, it has progressed without foreign equity participation.

China announced the discovery of a major gas field at Sulige in the Ordos Basin in the Inner Mongolia Autonomous Region, adjacent to the Changqing oilfield, in 2001. While the field is still under evaluation, unofficial reserve estimates cited in the trade press put reserves in the range of 45-60 bcm. Some natural gas from the Ordos Basin is likely to be put into the West-to-East Pipeline, which was to run through the area in any case, to help make it economically viable.

Natural gas (2)



Source: IEA

The gas consumption in China is expected to increase with a factor 6 from 30 bcm/y to 180 bcm/y by 2020.

Natural gas (3)

Natural gas production by major Chinese producers (hundreds million m3)

Producer	1997	1998	1999	2000	2001	2002
CNPC*	171.80	149.83	162.60	183.10	205.81	224.75
Sinopec*		23.24	22.26	39.16	46.12	49.45
CNOOC*	40.50	38.64	43.92	39.60	38.57	37.16
Others	14.73	21.08	23.20	10.14	12.79	14.97
Total**	227.03	232.79	251.98	272.00	303.29	326.33
Growth%		2.54	8.2	7.9	11.5	7.6

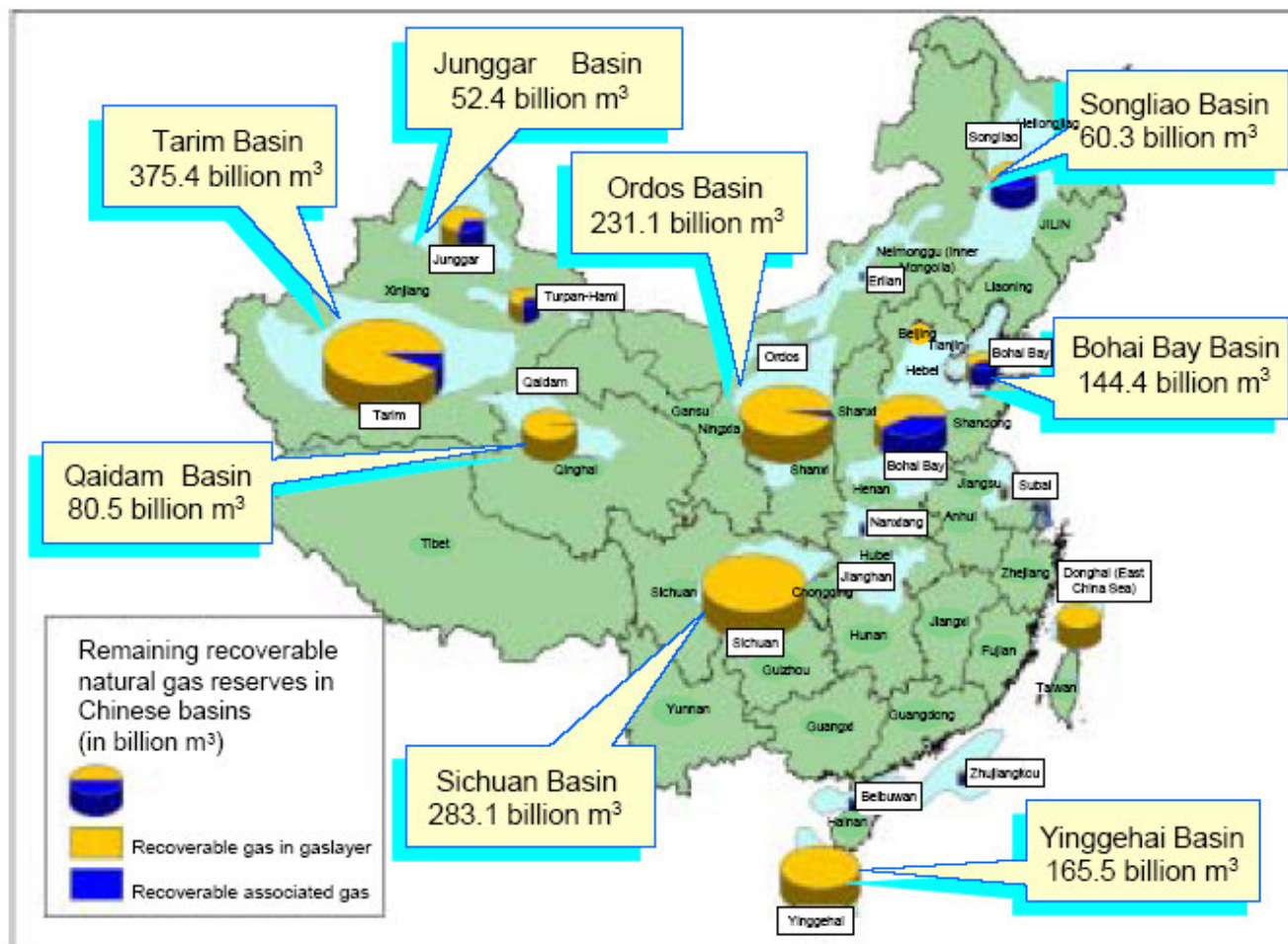
Source:IEEJ

Natural gas demand by sector (forecast)

Demand by sector (100 million m ³ /y)			
	1997 results	2010	2020
Power	21.9	350	812
Residential use	21.2	220	500
Chemical/Fertilizer	84.3	190	325
Industry & Others	68.2	200	400
Total	195.6	960	2037

Source:IEEJ

China's natural gas reserves



Source: Institute of Energy Economics, Japan (based on 1994 official figures)

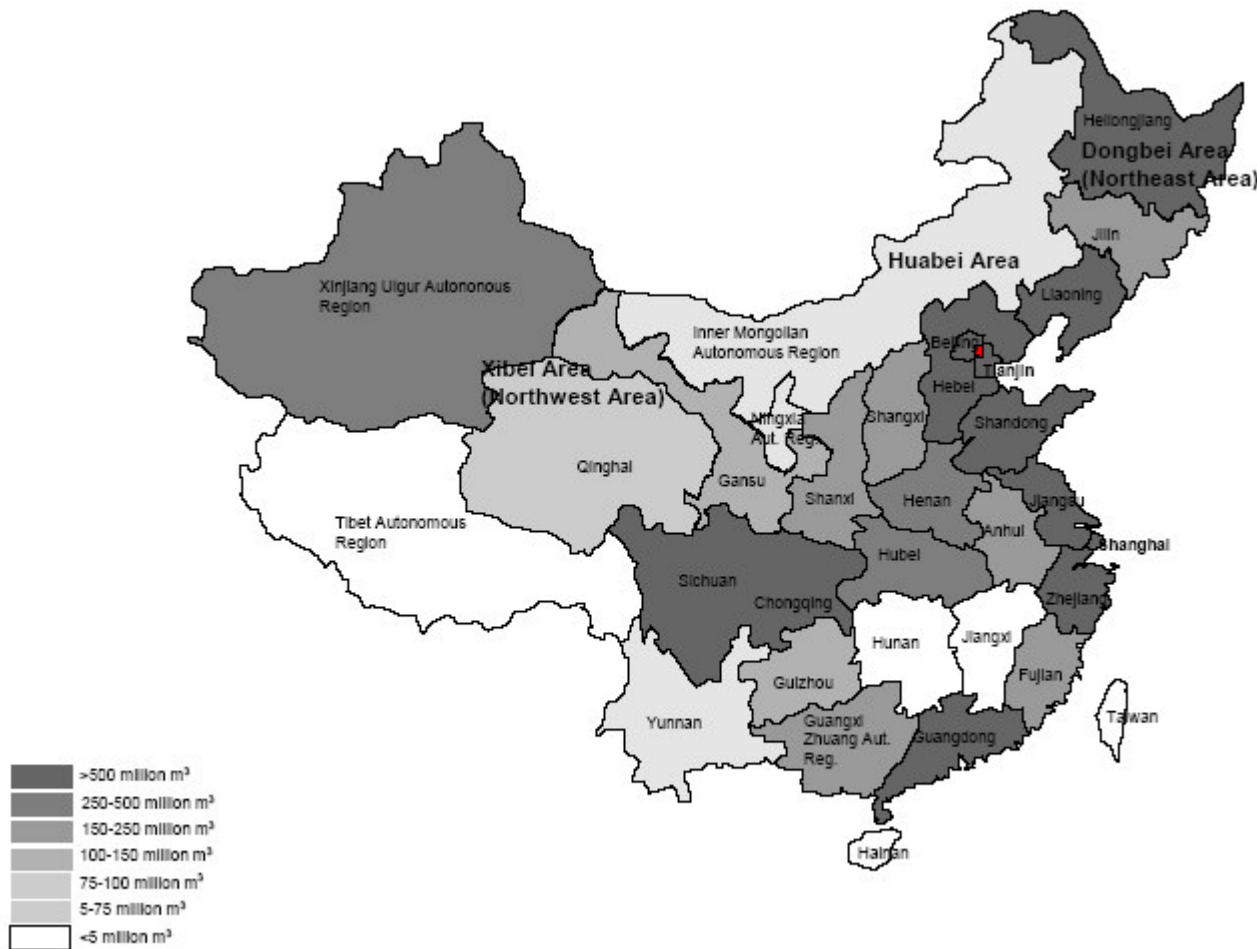
Main fields:

- Tarim Basin
- Sichuan Basin (traditional, accounts for 30% production)
- Ordos Basin

Latest developments:

- **December 2002:** 30 bcm discovery in Songliao basin
- **January 2003:** 160 bcm discovery in Sichuan basin
- **August 2004:** discoveries in Junggar Basin
- **March 2005:** Sinopec announced 115 bcm discovery (88 bcm extractable) in Sichuan Basin

Projected 2010 natural gas demand by province



Source: Institute of Energy Economics, Japan

DISPARITY

The largest consumption in the East (Pearl river, Jang – ce river, Gouangdou ec.zone)

VS.

Most reserves in the middle West

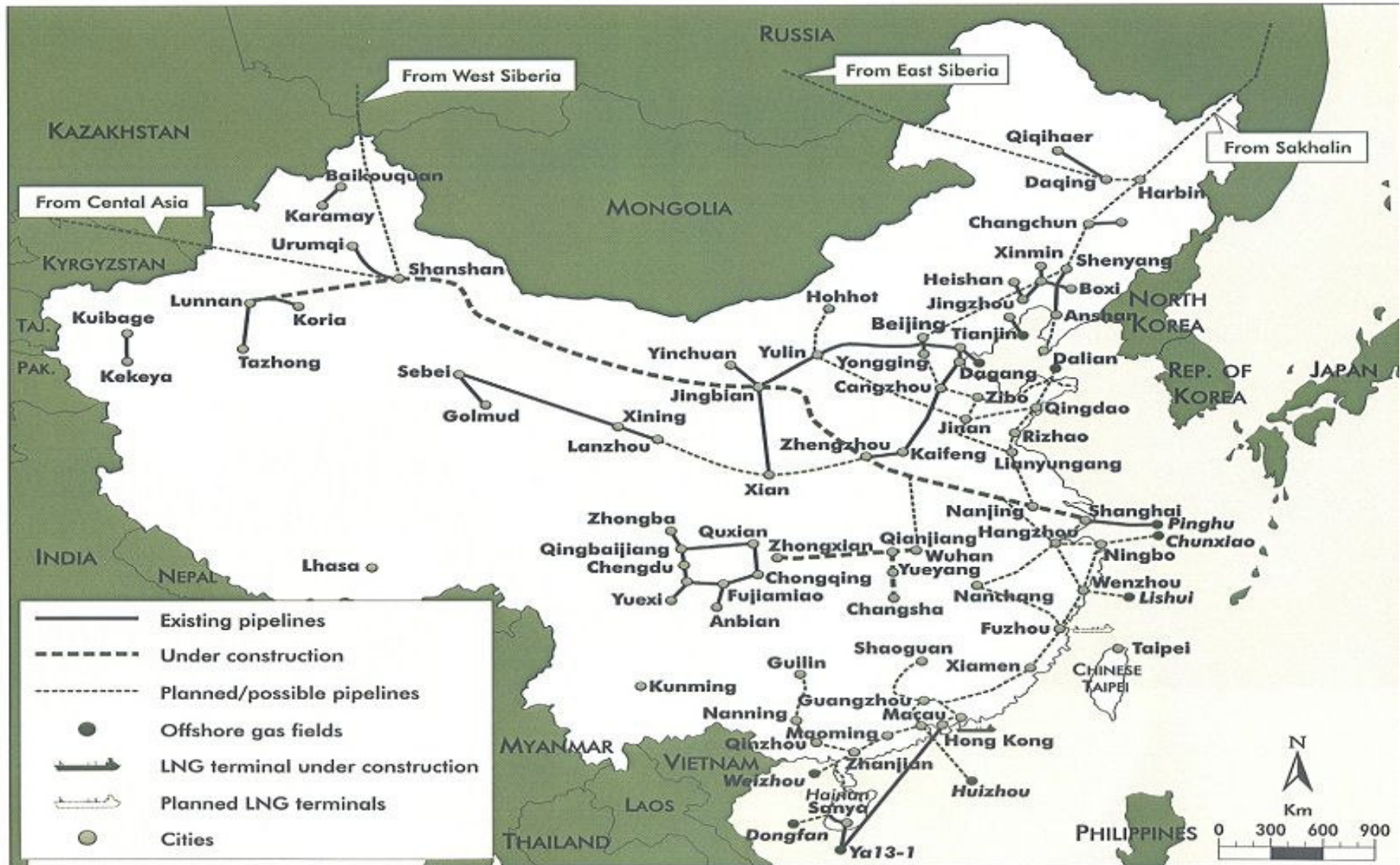


Large need for transport from East to West

Need to cover increased 2010 demand using

- Increase in domestic production (necessity to build pipelines from West to East (Main project: transport from West (Xinjian Tarim gas field) to Shanghai, USD 12 billion)
- Pipeline imports from Central Asia via Kazakhstan
- Pipeline imports from Siberia
- LNG imports from Australia

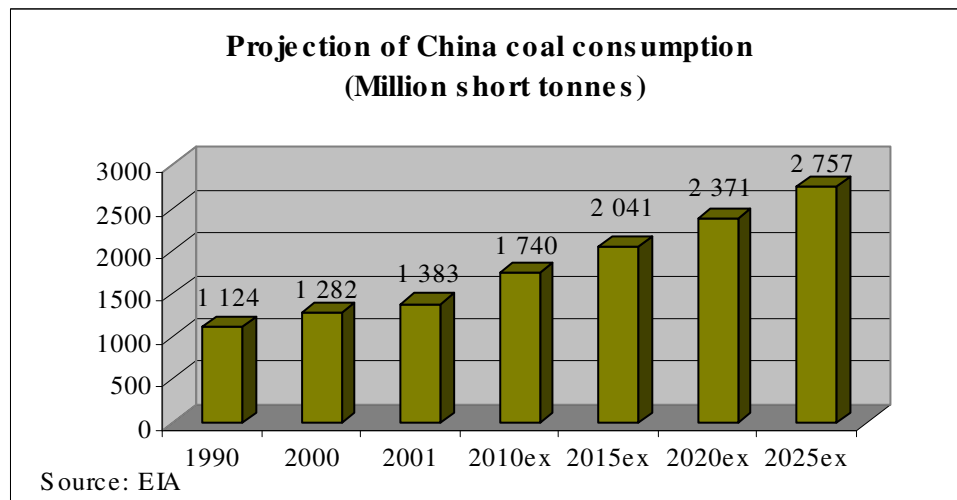
Future Gas Supply Infrastructure in China



Source: IEA

Coal

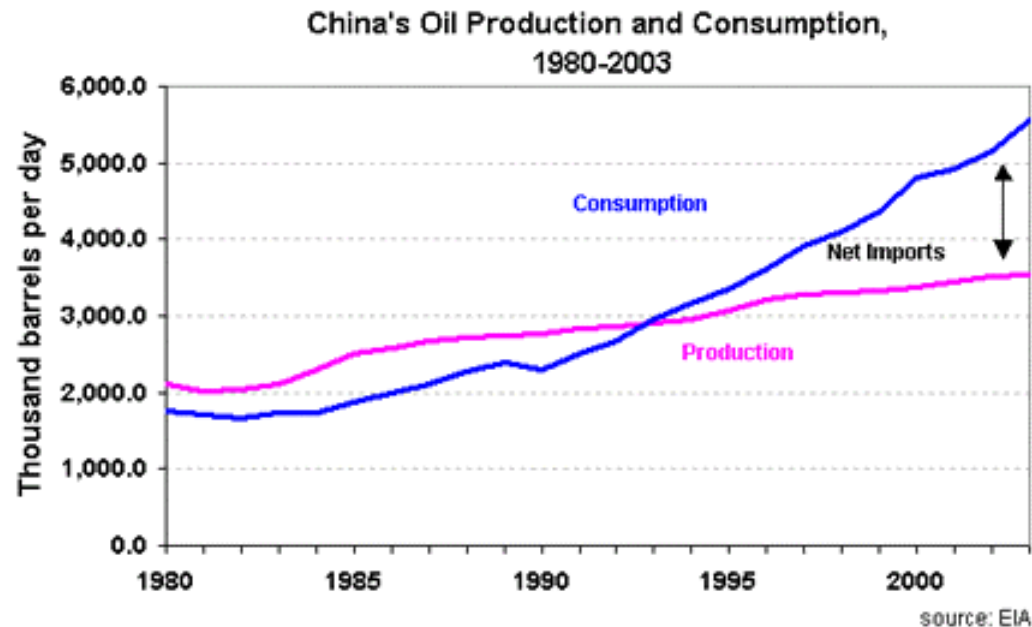
Coal makes up the bulk, 65%, of China's primary energy consumption, and China is both the largest consumer and producer of coal in the world. China's coal consumption in 2002 was 1.42 billion short tons, or 27% of the world total. The Chinese government has made major upward revisions to coal production and consumption figures covering the last several years. The new figures show coal consumption rising sharply in 2001-2002, reversing the decline seen from 1997 to 2000. The decline during that period also is much less than the previously reported data.



China's coal industry has had a serious oversupply problem in recent years, particularly in the late 1990s, and the government has begun implementing major reforms aimed at reducing the oversupply, returning large state-owned mines to profitability as a prelude to possible future privatization, and reducing mine accidents. A large number of small, unlicensed mines also have added to the oversupply. In 1998, the government launched a large-scale effort to close down the small mines. Many small coal mines were ordered closed.

China also is increasingly seeking export markets for its coal as a way of dealing with its surplus production, and as of 2002 it was the world's second-largest coal exporter. Japan and South Korea are the primary markets, and China is beginning to emerge as a serious competitor to Australia for Japanese coal imports. Increased domestic demand for thermal coal in 2004, however, has led to a sharp dropoff in coal exports, reversing the price decline in the Asian coal market which had taken place in response to the expansion of Chinese exports.

Oil



China was the world's second largest consumer of petroleum products in 2003, surpassing Japan for the first time, with total demand of 5.56 million barrels per day (bbl/d). China's oil demand is projected by EIA to reach 12.8 million bbl/d by 2025, with net imports of 9.4 million bbl/d. As the source of around 40% of world oil demand growth over the past four years, Chinese oil demand already is a very significant factor in world oil markets.

Most Chinese oil production capacity, close to 90%, is located onshore. One field alone, Daqing in northeastern China, accounts for about 1.0 million bbl/d of China's production, out of a total production of around 3.4 million bbl/d. Daqing is a mature field, however, and production fell by 3.5% in 2003. At China's second-largest producing field, Liaohe in northeastern China, CNPC has contracted with several foreign firms for work to enhance oil recovery and extend the life of the field.

Government priorities focus on stabilizing production in the eastern regions of the country at current levels, increasing production in new fields in the West, and developing the infrastructure required to deliver western oil and gas to consumers in the East. Offshore development also is a high priority.

Chinese authorities announced a "major" new find in April 2004 in the area of the existing Shengli field in the northeast, but it is still under assessment.

Electricity

As with coal, China's electric power industry experienced a serious oversupply problem in the late 1990s, due largely to demand reductions from closures of inefficient state-owned industrial units, which were major consumers of electricity. The Chinese government responded to the short-term oversupply in part by implementing a drive to close down small thermal power plants and by imposing a moratorium (with a few exceptions) on approval of new power plant construction, which ran through January 1, 2002. Until recently, the backlog of projects approved in the mid-1990s had kept pace with demand increases. In 2003, however, the Chinese government has approved 30 major new electric power projects, with a total of around 22 gigawatts (GW) of capacity. With the surge in economic growth in 2003 came a surge in electric power demand, which has outpaced previous demand forecasts, leading to a shortage of generating capacity and even load-shedding in some areas. A shortage of rainfall in some areas in 2003 and early 2004 has worsened this problem.

