

3rd Future Environmental Trends Conference
Energy, environment, and development: analysing opportunities for reducing poverty

Powering the MDGs through Energy: One Solution from China

Dr. ZHAO Xingshu

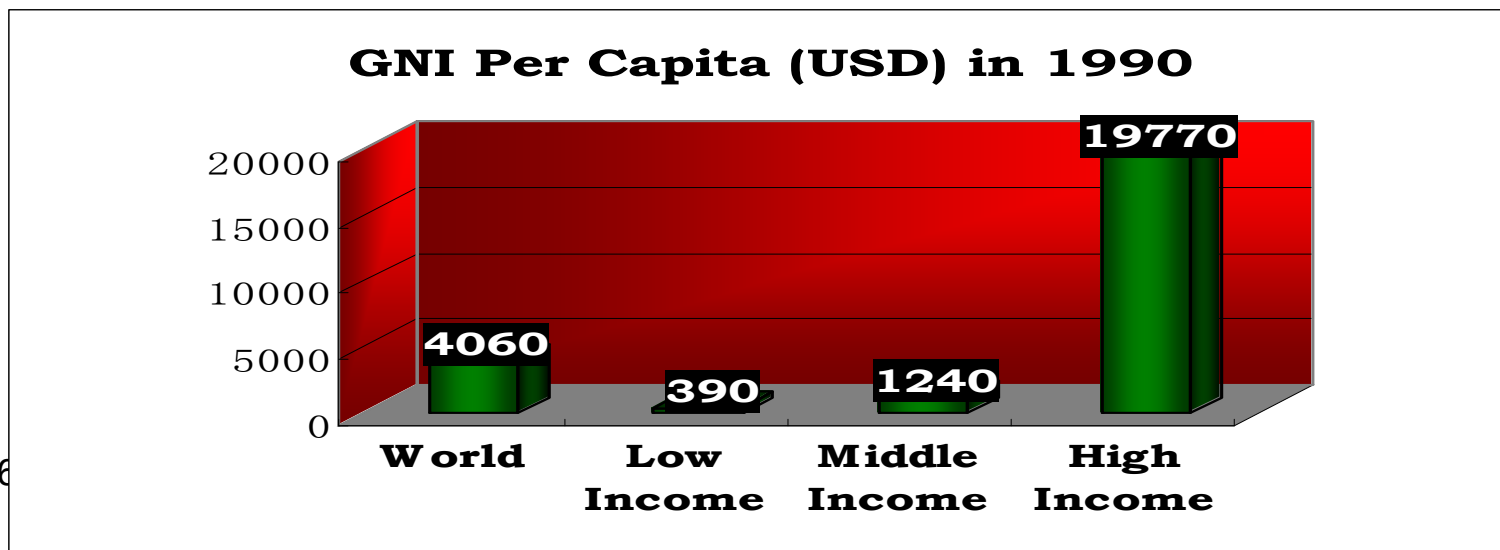
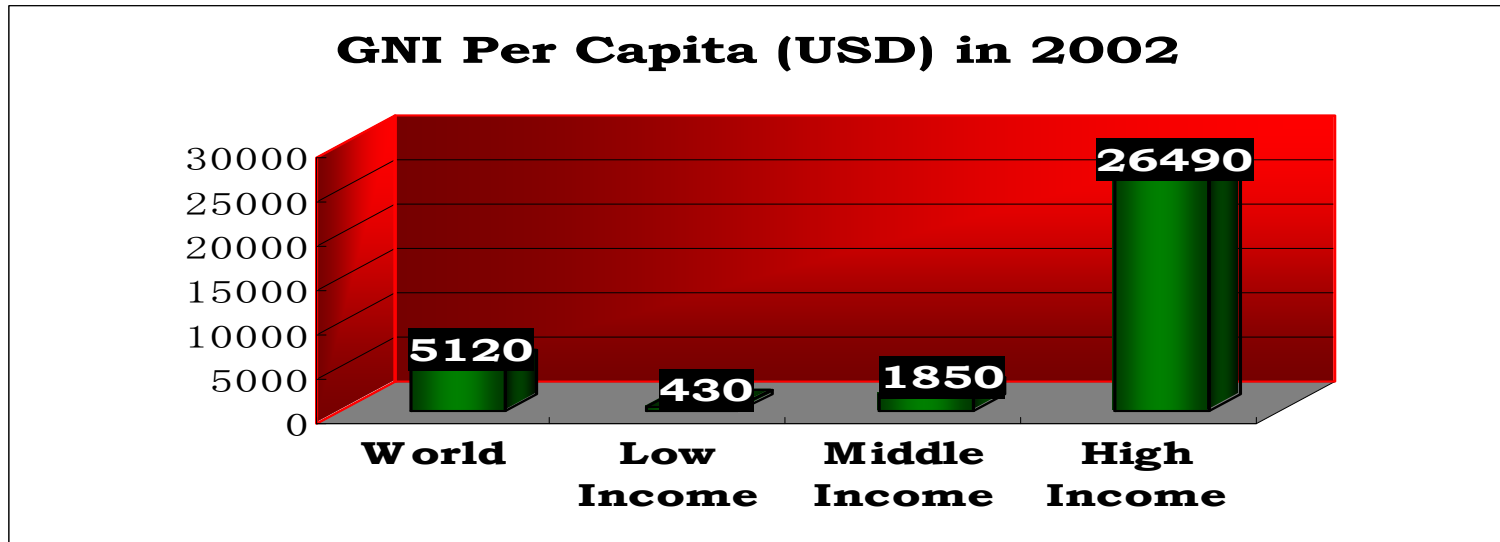
**Research Center for Sustainable Development
Chinese Academy of Social Sciences**

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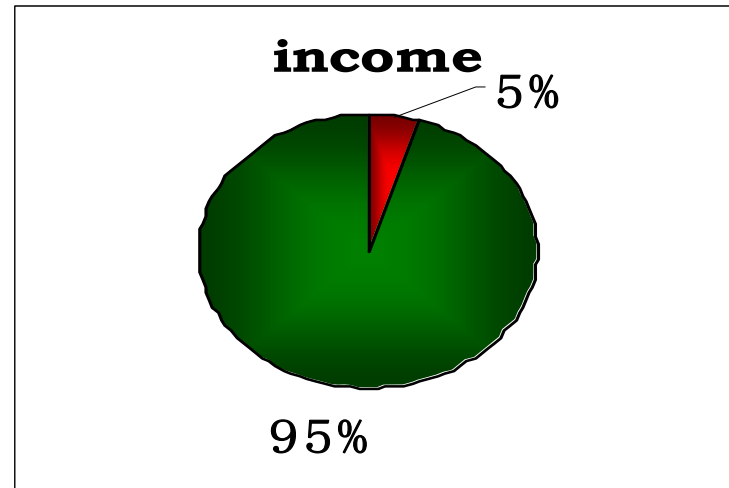
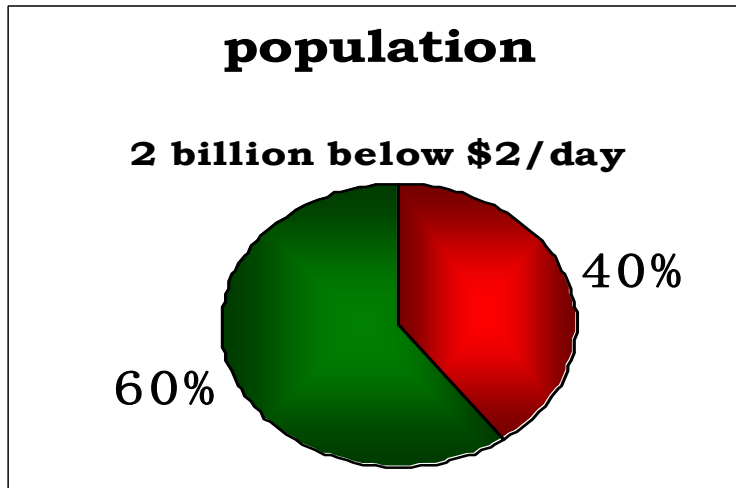
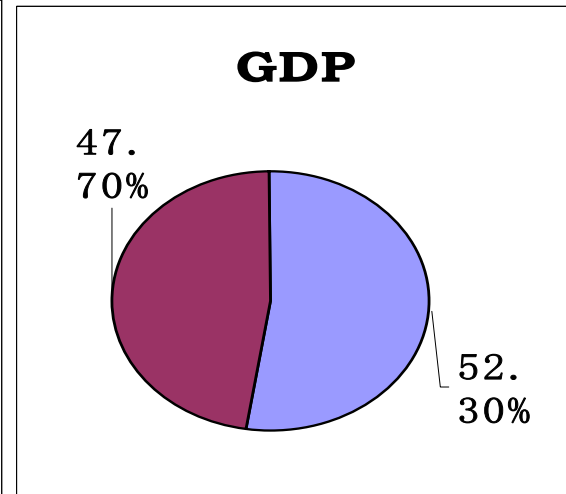
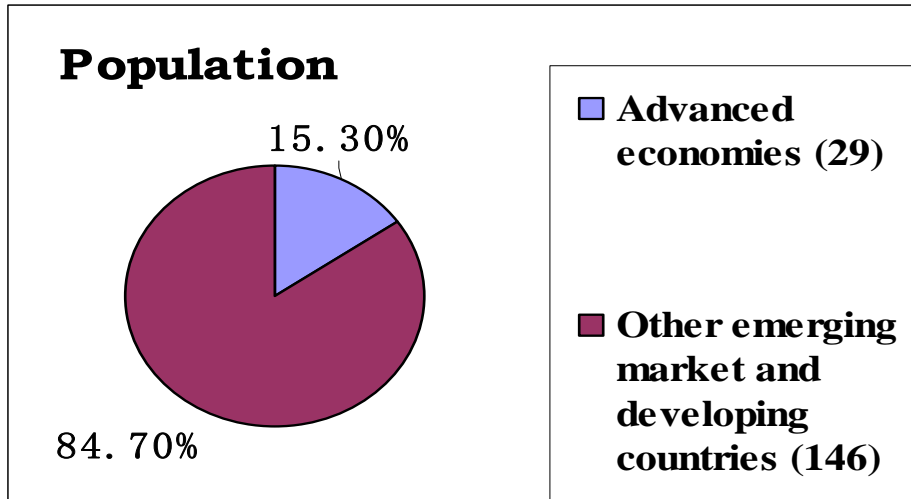
Bangalore Dec. 14-16, 2006



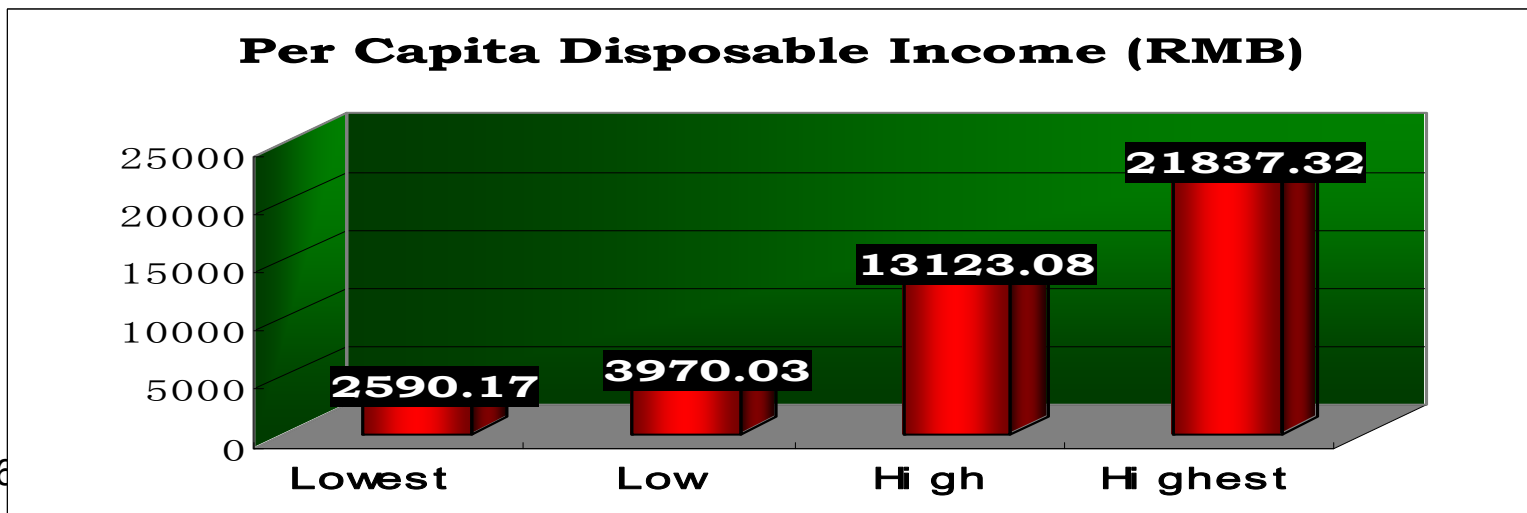
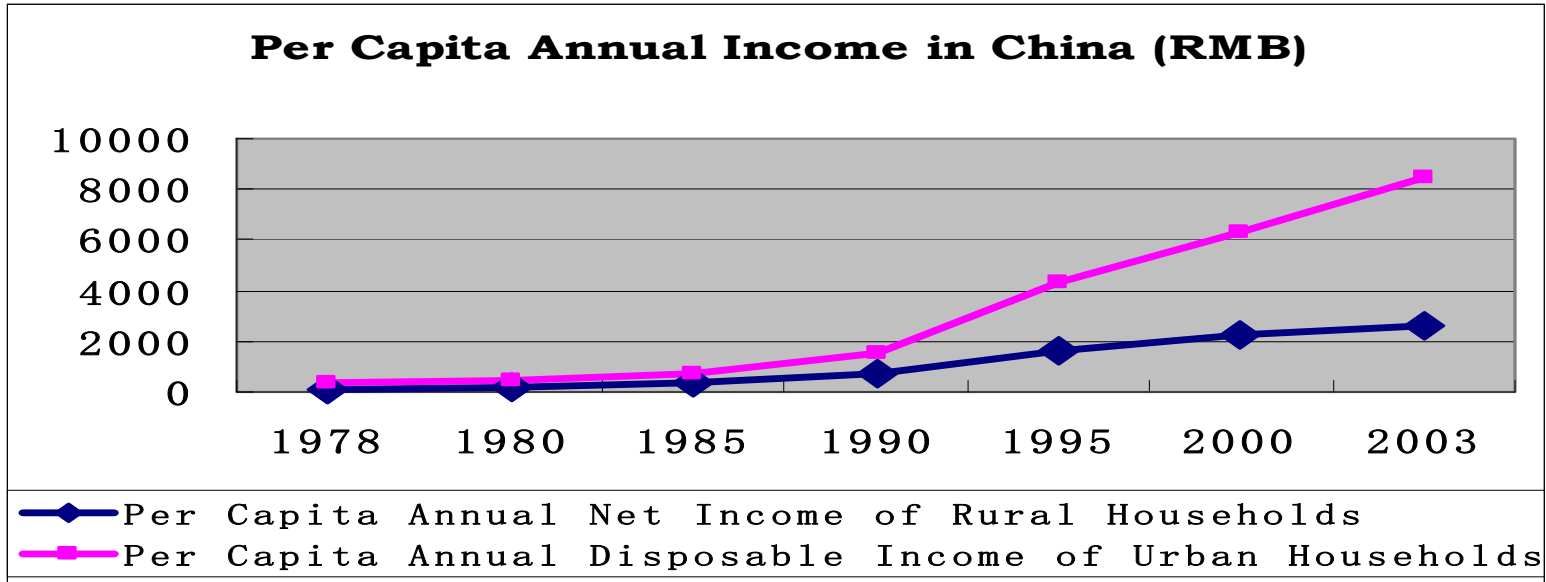
1 The Enlarging Gap between poor and rich from Globalization



The poor: much poorer The rich: much richer.

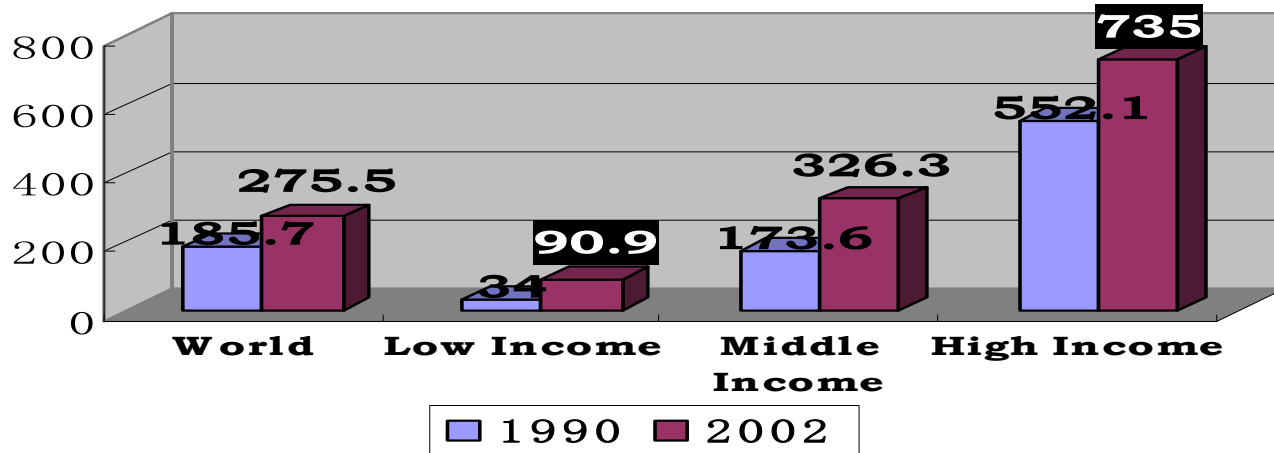


Facts in China

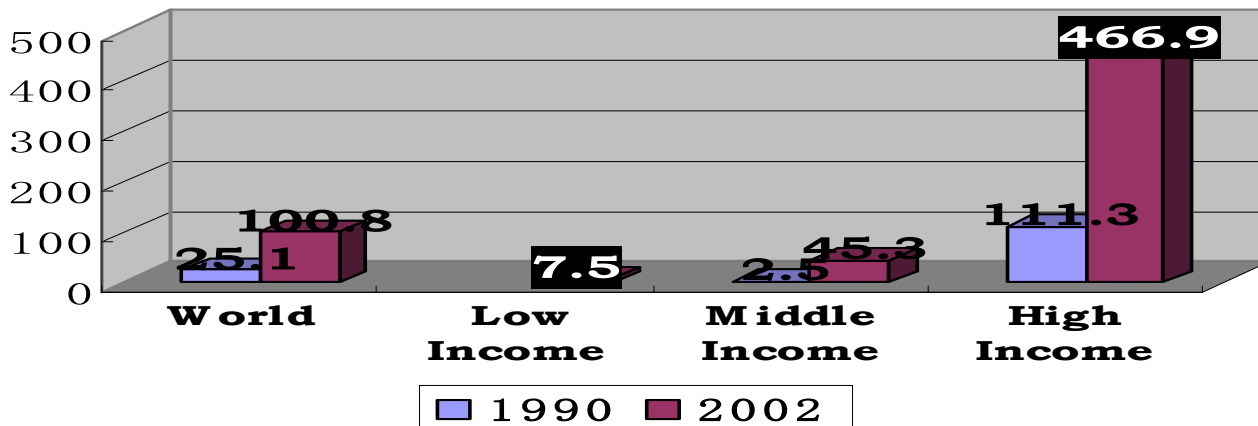


The poor usually cannot share the fruits.

Television Sets per 1000 People



Personal Computer per 1000 People



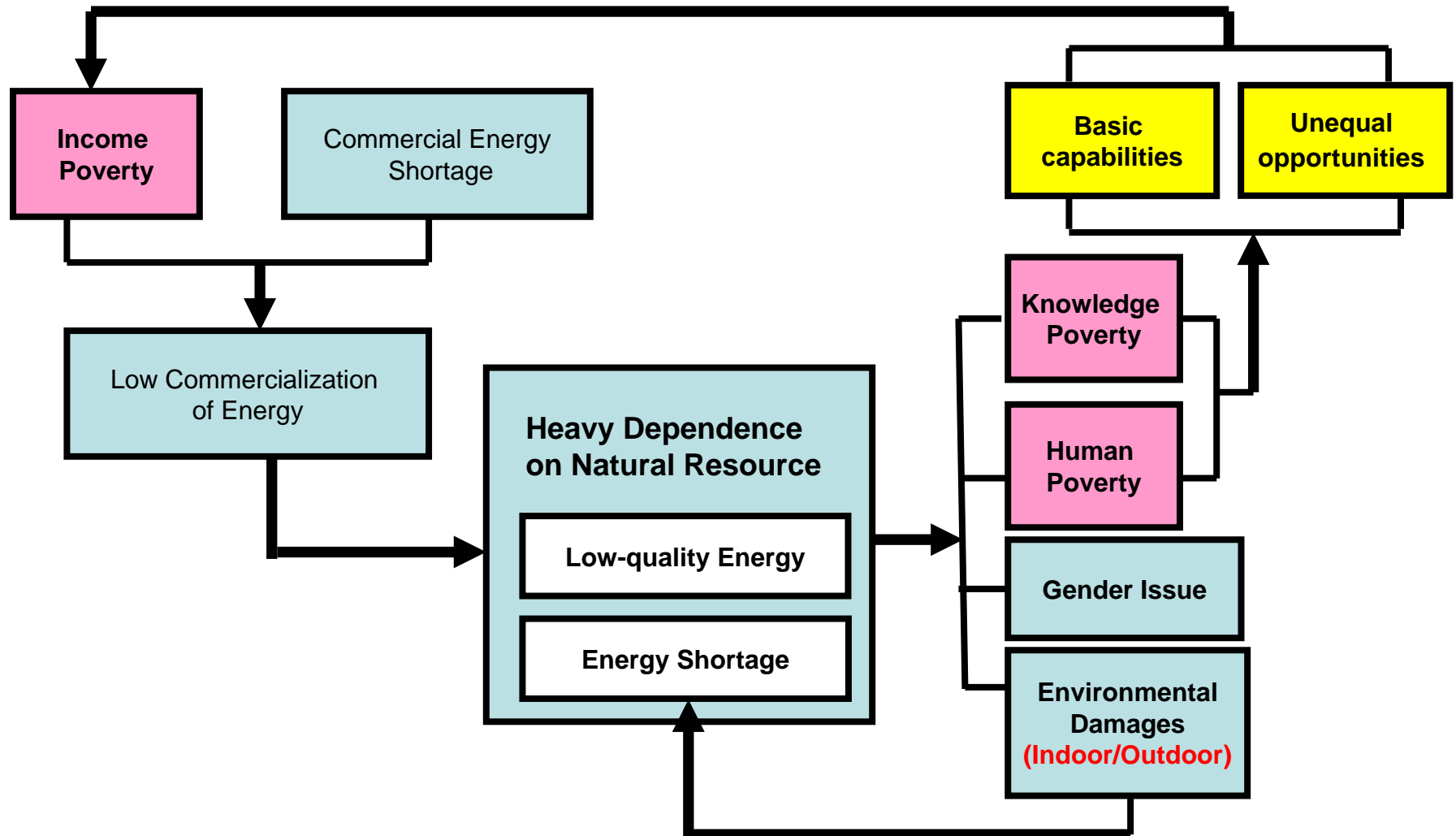
2 Energy is essential.

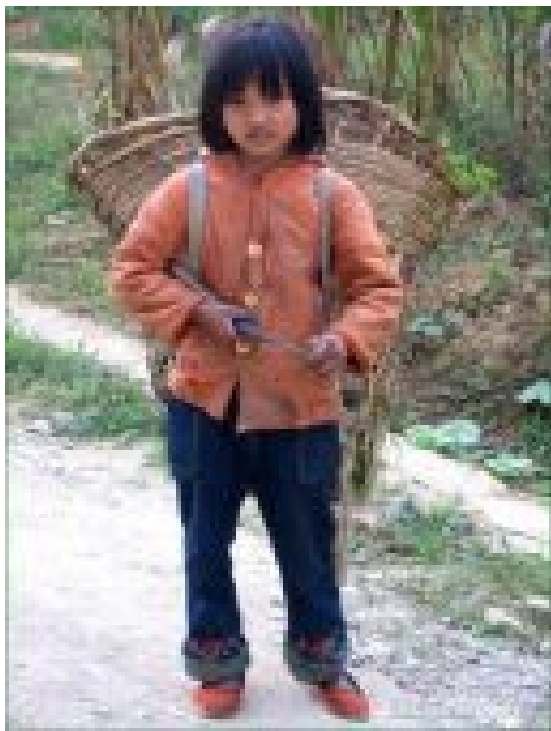


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“access to energy for all”

Conceptual Framework: Energy's Role

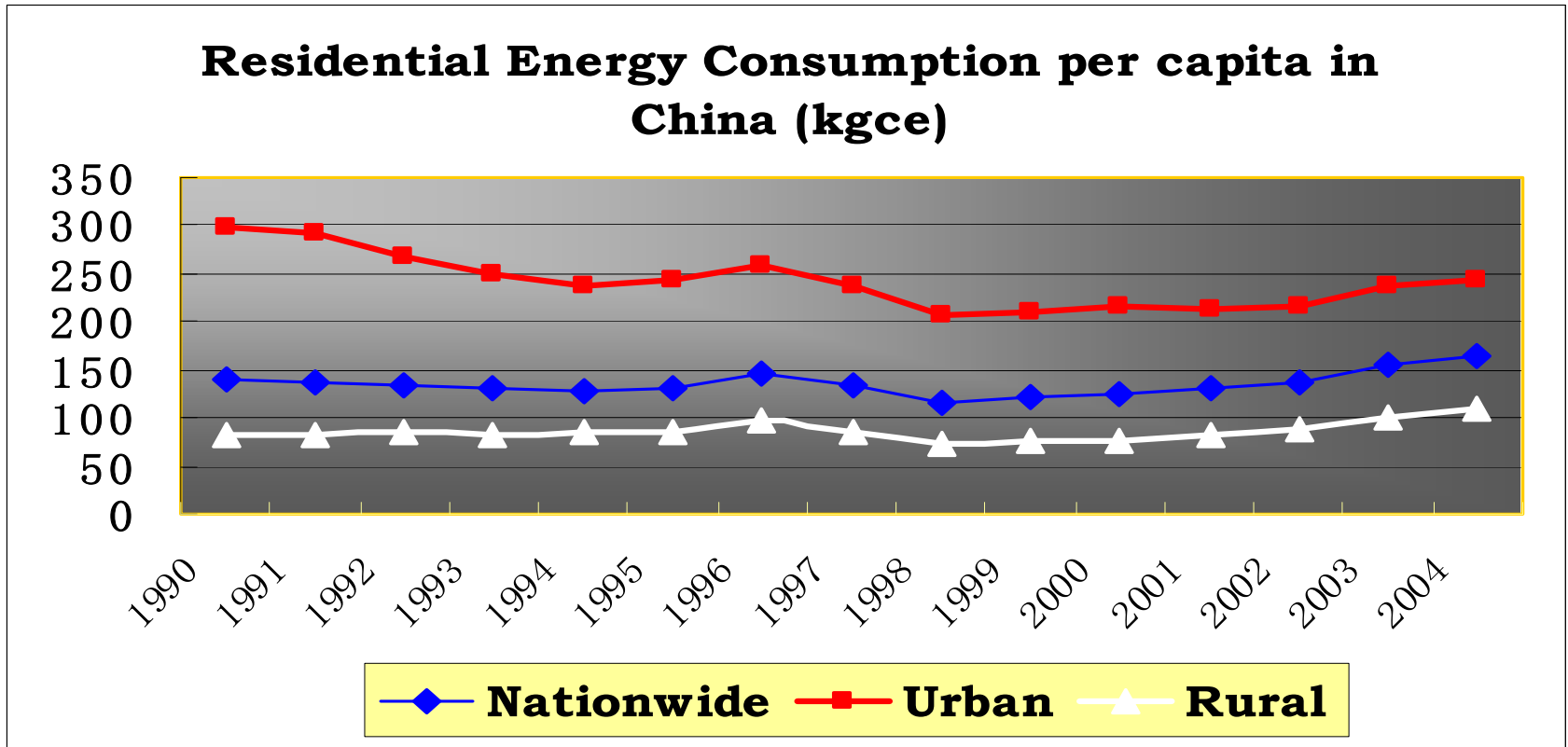




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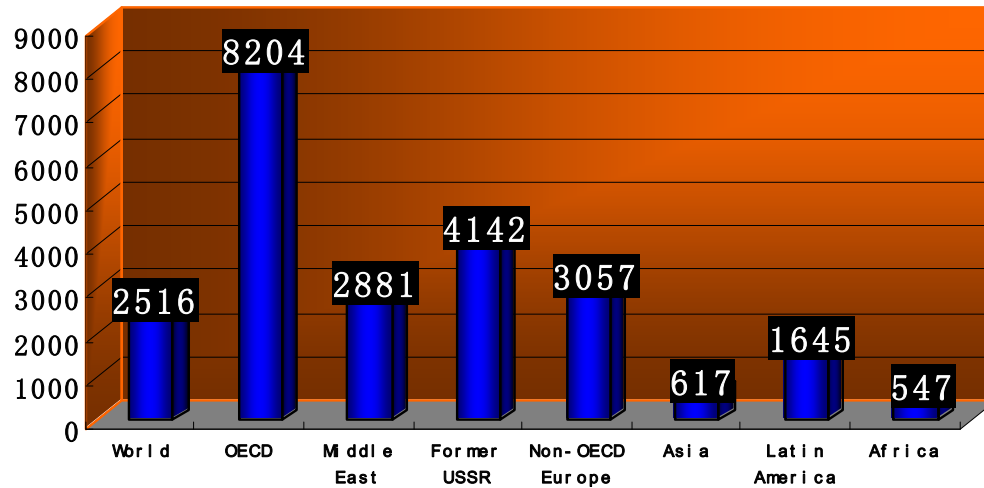


High price VS Low income

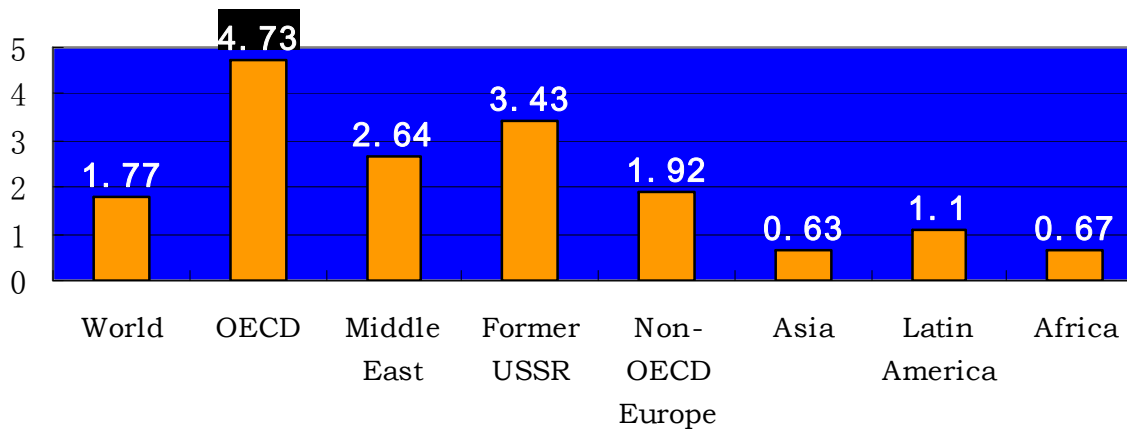


- Price of Electricity for Households: \$0.07~0.17/kWh
- Electricity Consumption per capita: 2500kWh/year
- Total Annual Expenditure: \$250

Electricity Consumption (kWh/capita)



Primary Energy (toe/capita)



3 One Solution from China



3.1 Why biogas? ¹¹

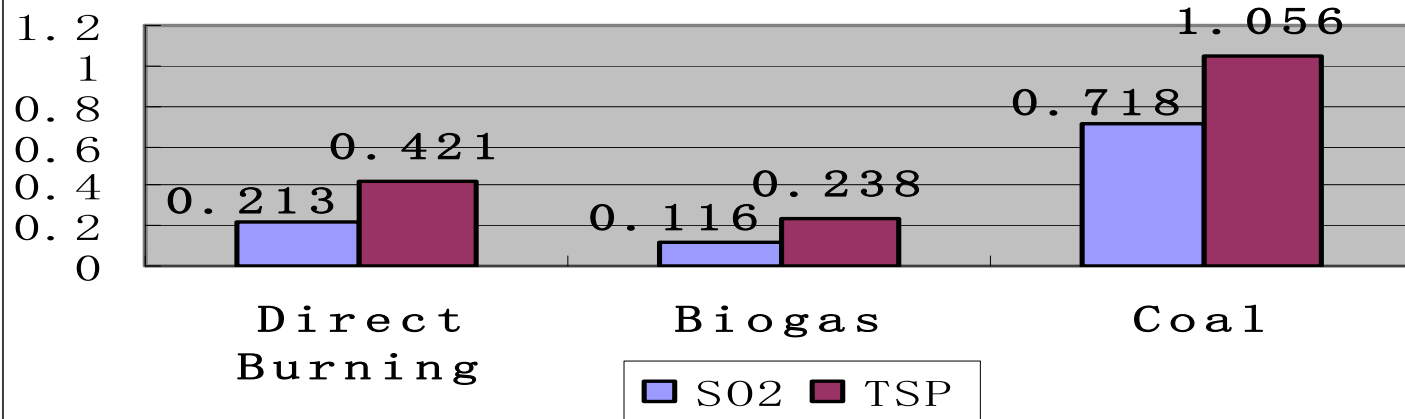
	Electricity	Biogas
Resource Reserve	Coal or RE?	Large (RE)
Cost	High	Low
Environment	Coal or RE?	Clean
What kind of people?	Concentrated	Concentrated/Dispersed

	Quantity of Heat	Price	Comparative Price (RMB/MJ)
Coal Gas	12000 kJ/m ³	0.95 RMB/m ³	0.079
LPG	42400 kJ/kg	3.5 RMB/kg	0.0849
Straw Gas	4200 kJ/m ³	0.16~0.20 RMB/m ³	0.038~0.0476
Biogas	23100 kJ/m ³	0.40 RMB/m ³	0.017

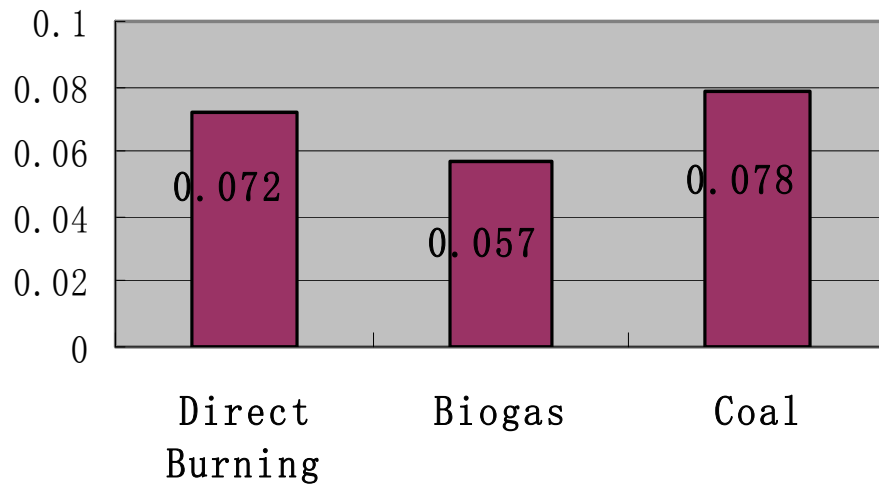
Cost-Benefit Analysis for Household Biogas (8 ~ 10m³)

COST		Initial input: 1500~1900 RMB	
B E N E F I T	1	Direct Economic Benefit	800~1600 RMB/Y (save expenditure on ①fuel, electricity; ②fertilizer, pesticides;)
	2	Forest Protection	Firewood: 2500kg/Y; Forest: 0.2hm ² /Y. ①CO ₂ absorption: 200kg/Y ; ②O ₂ release: 160kg/Y ; ③soil erosion reduction.
	3	Alternative energy	Can reduce firewood or coal consumption and reduce CO₂ emissions by 300kg/Y-household.
	4	Improvement of soil quality	
	5	Elimination of rural Non-point Source Pollution and Improvement of rural living conditions	
	6	Indoor air pollution reduction and accordingly health improvement	
	7	Gender issues: liberation of women from the heavy housework	

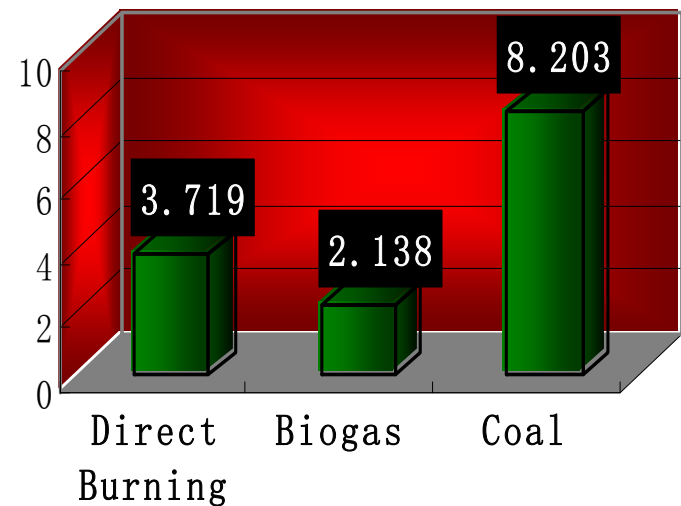
Indoor air pollution (mg/m³)



CO₂ Emission (mg/m³)



CO Emissions (mg/m³)



3.2 Biogas History

■ The First Stage:

- From late 1970s to early 1980s
- Demand for **energy**
- Focus on resolving the serious energy shortage in rural areas;

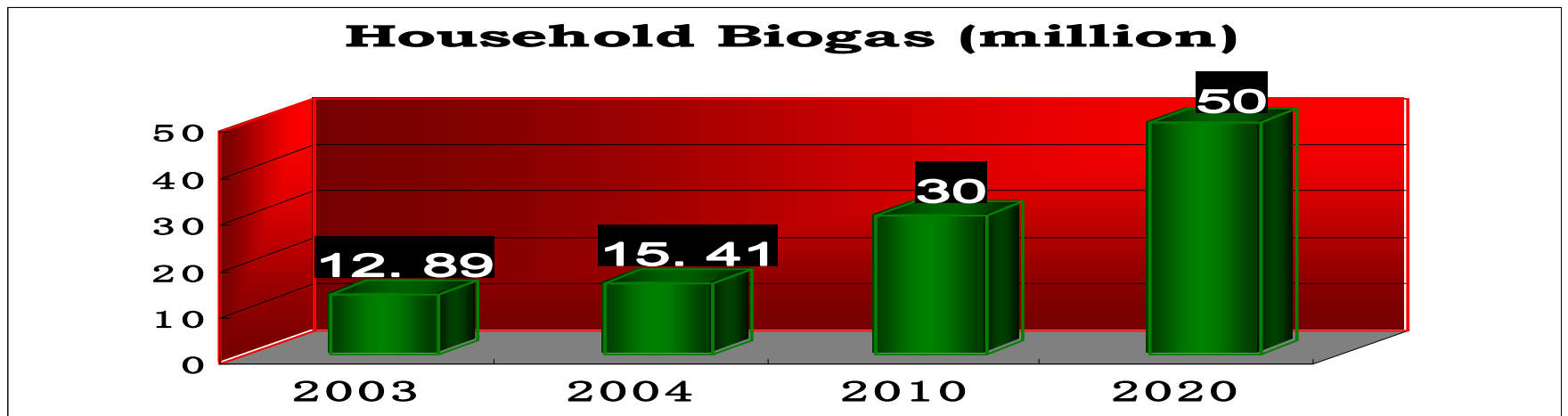
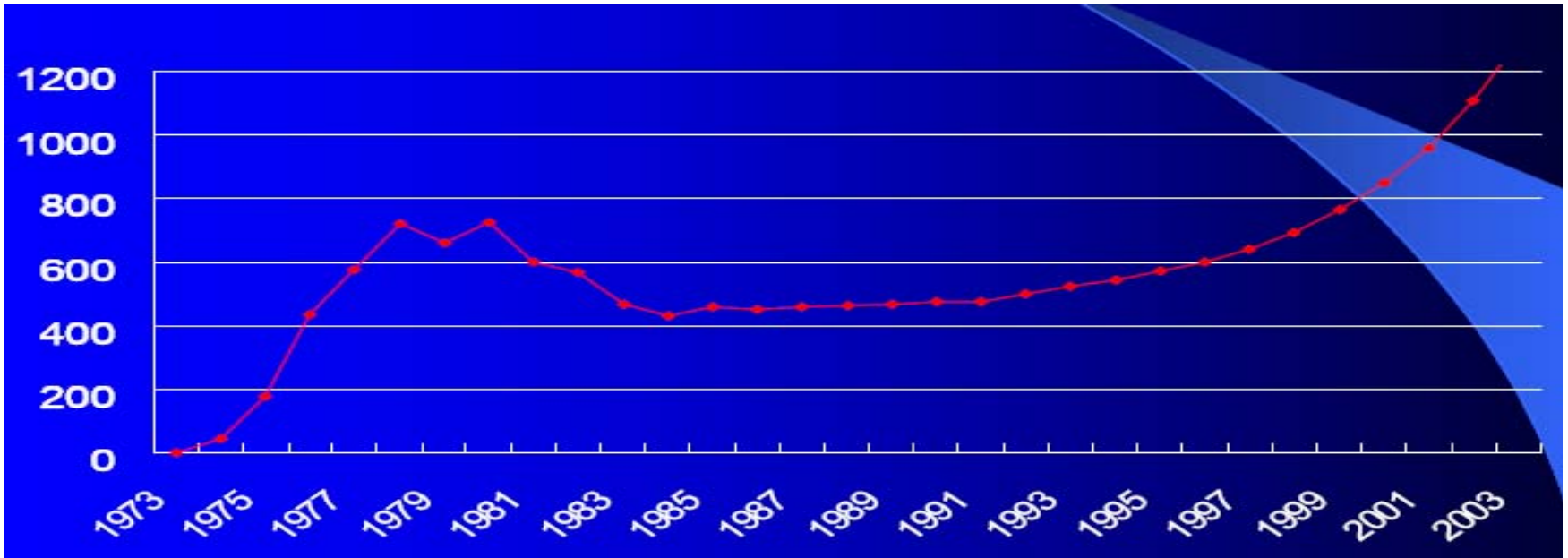
■ The Second Stage:

- From mid-1980s to early 1990s
- Demand for **high-quality energy**
- Focus on development and utilization of high-quality energy

■ The Third Stage:

- From mid-1990s, esp. since 2001
- The eco-home construction stage
- Shift from the single idea (only for energy) to the comprehensive method (Rural RE development together with living standard, agriculture production, environment protection and farmers' income increase)
- Target at large-scale extension :
①South->North; ②Rural->Small cities; ③Individual->Collective.

Rural Household Biogas Development



3.3 National Policies and Measures

■ Premier Wen Jiabao in Sep.2002

- “biogas development not only provides living energy but also contributes to ecological environment protection. It is a significant and meaningful public welfare cause.”

■ Significant meetings

- The fifth Plenary Session of the 16th CPC Central Committee
- The meeting of the State Council Leading Group for Energy (2005)

■ Documents

- Central Government Document No.1 in 2003, 2004, and 2005

■ Laws

- Agriculture Law
- Energy Conservation Law
- Renewable Energy Law

■ National Plan for Rural Biogas Development (2004~2010)

■ Financial Policies

Major Financial Policies

- **Preferential Loan with financial interest subsidy to RE development**
 - The State Economic and Trade Commission
 - From 1987 to 1998
 - Loan quota: 60 million RMB/Y; 120—130 million RMB/Y (from 1996)
 - More than 200 Large- and mid-scale biogas projects
- **Plan for Ecological Homeland to Enrich People**
 - Ministry of Agriculture
 - Subsidy for rural small-scale public utility construction
 - Late 1990s
 - Focus on household biogas and small-Scale biogas on livestock farms
- **the State Treasury Bond Project for Rural Biogas**
 - Ministry of Agriculture
 - Since 2003
 - Focus on household biogas
 - Selected Province, county, village

4 Conclusions:

- Access to energy for basic needs is key to development and MDGs.
- China has accumulated rich experience from its blooming biogas practices.
- China is willing to share these experiences with the rest of the world, which is actually China's responsibility as a stakeholder.



Many Thanks!

Dr. ZHAO Xingshu

xszhao@cass.org.cn

zhaoxingshu2003@yahoo.com.cn

**Research Center for Sustainable Development (RCSD)
Chinese Academy of Social Sciences (CASS)**