We need a development model of low emission

Zhou Dadi
Energy Research Institute
NDRC, China
February 2005

Where is the world toward

- GHG emission needs decrease globally and significantly in the future
- Most of the countries still increase their emission with continuous economic growth
- Many leading economies are still not going to change this trends
- Current technology evolution has not led to lower global emission

Where the technology innovation happens

- Developed country is leading the technology innovation
- Especially for the energy technology
- Technology level in the developing country in general lags behind
- Innovation capacity correlates to development level

Globalization and its impact

- Globalization spread steadily
- The developing countries are following the models of developed countries by market force
- Modern consumption pattern is pushed into developing country
- Labor/Energy/Natural resources/land/Environmental intensive manufacturing is moving to developing countries

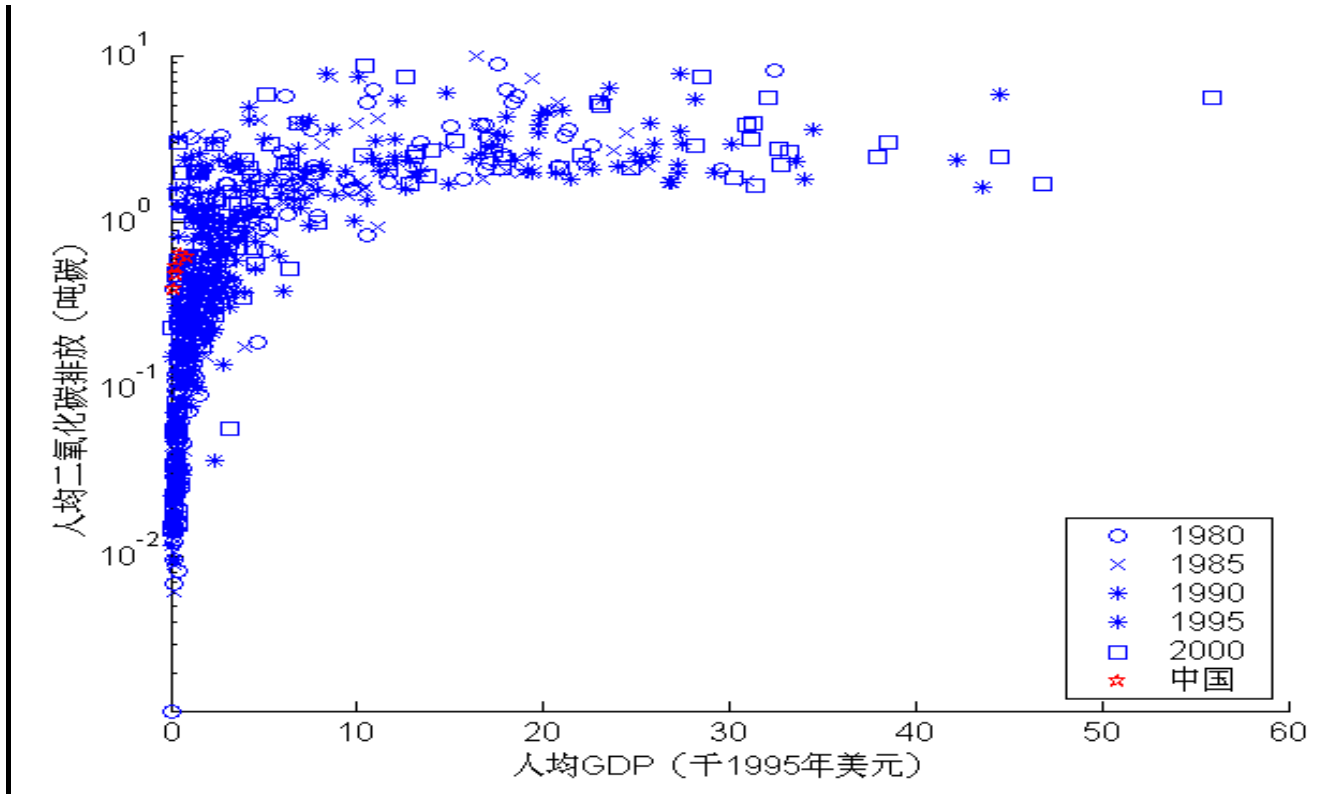
Relation between CO2 emission and economic development level

- Higher per capita GDP means higher per capita energy consumption, and higher GHG emission too
- CO2 emission intensity is a function of development level with per capita GDP as major indicator, with lower GDP carbon intensity when per capita GDP becomes higher
- Along with the per capita GDP increase, GDP CO2 intensity declines, while the per capita CO2 still increase,

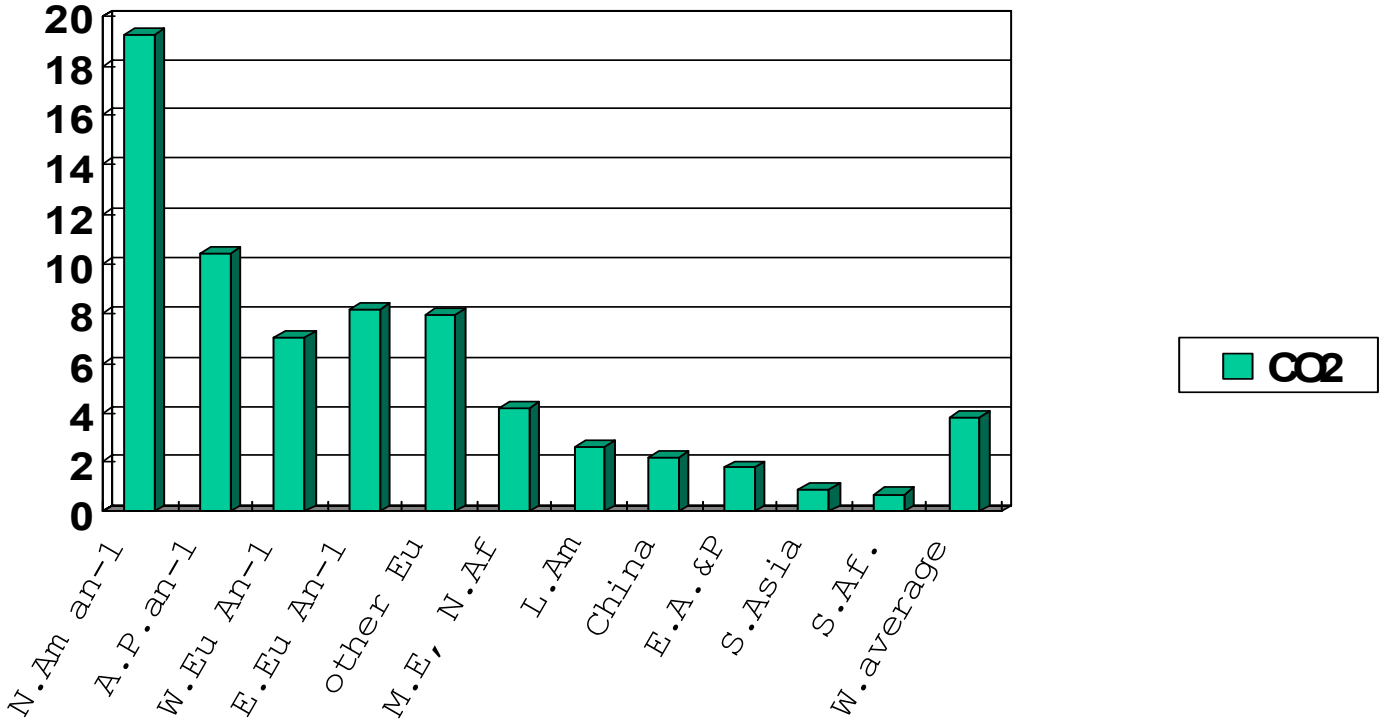
GDP, Energy and CO2 emission (1999)

Country by income	GDP per capita	Energy per unit GDP(tce/mllm $)	CO2 emission per unit GDP(kg/$)
Least developed	Very low	1477	0.6
Low income	<760	1911	2.4
Mid-low income	761-3030	1467	2.61
Mid income	761-9360	1032	1.82
Mid-high income	3031-9360	553	0.94
High income	>9360	288	0.46
OECD	27095	284	0.45
World average	5142	465	0.73

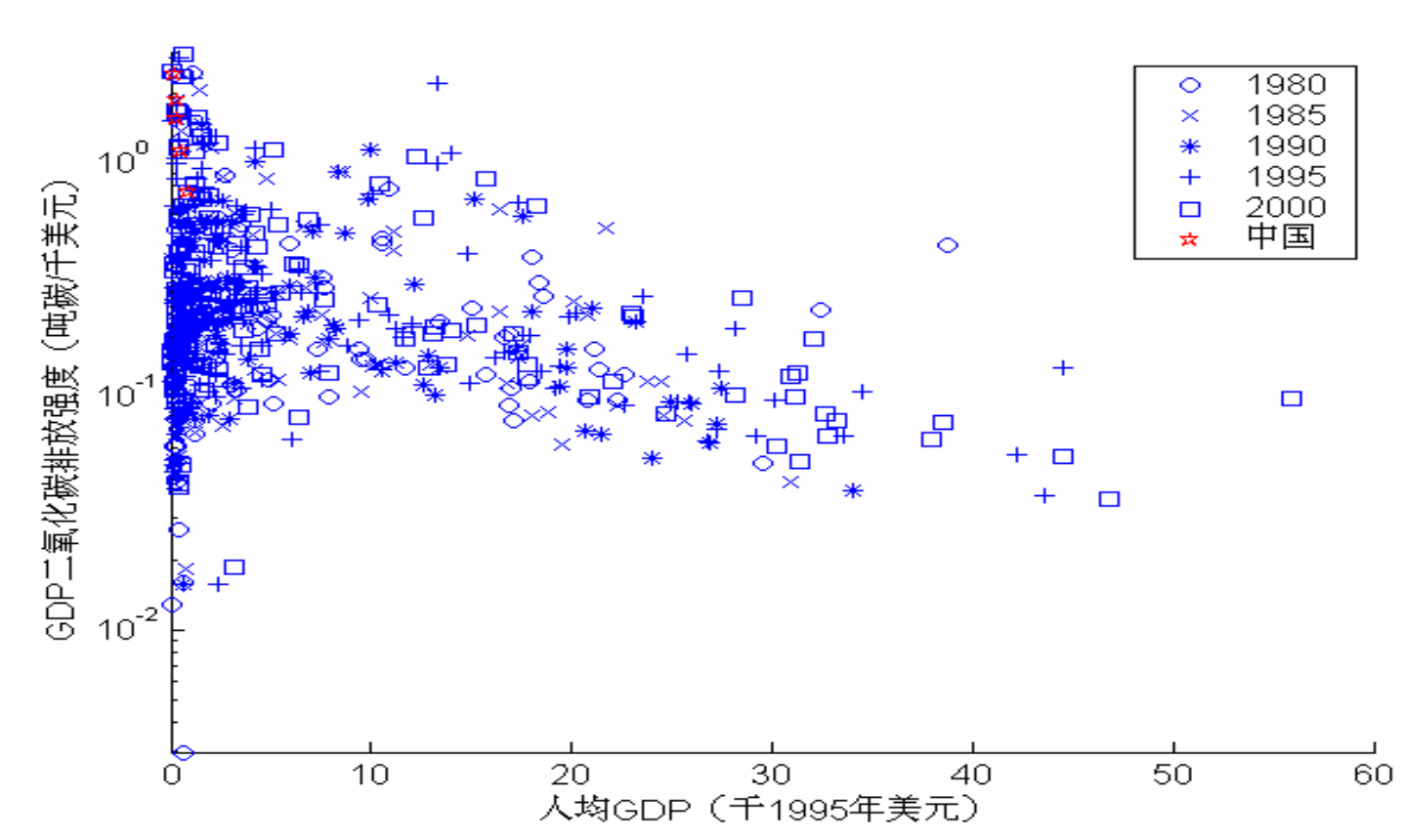
Per capita CO_2 emission vs. per capita GDP



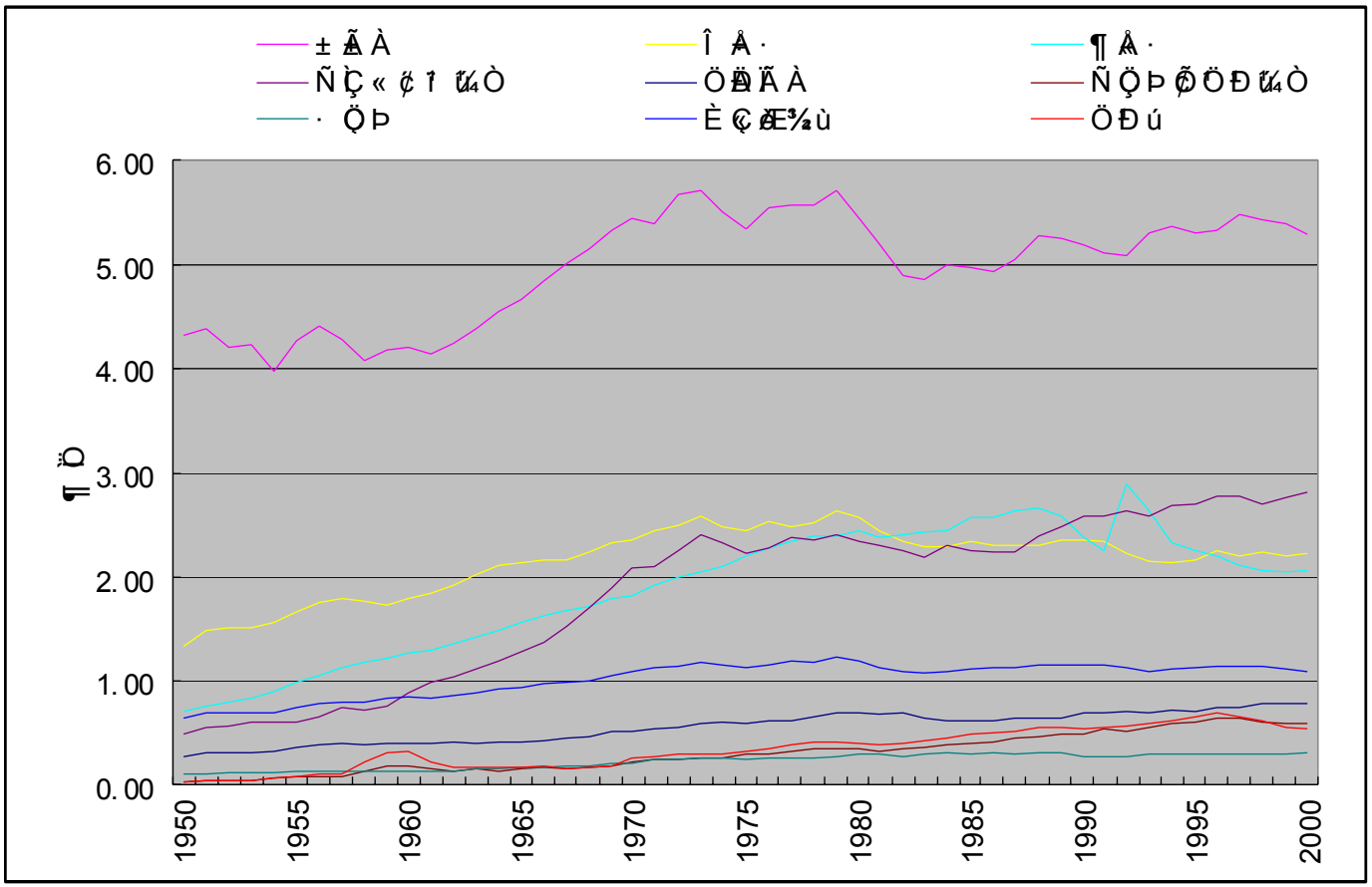
Per capita emissions



GDP CO2 intensity vs. per capita GDP



Historical Per Capita Emission



What is the target development model for developing country

- There is no model available for high level economic development with low GHG emission
- Energy efficiency improves too slowly under current market situation
- Leap frogging is unproved, needs demonstration
- Who will take the lead?

What can developing country to do on mitigation

- Country situation differs significantly, depending on the process of development
- Energy efficiency promoting is welcome all the time, needs breakthrough technologies
  - 3% improvement rate to offset the growth
- Are there non-carbon solutions?
  - Will not do carbon sequestration for long
  - Nuclear, maturated and economic
  - Renewables, still not competitive
- part of global market, follow the global change