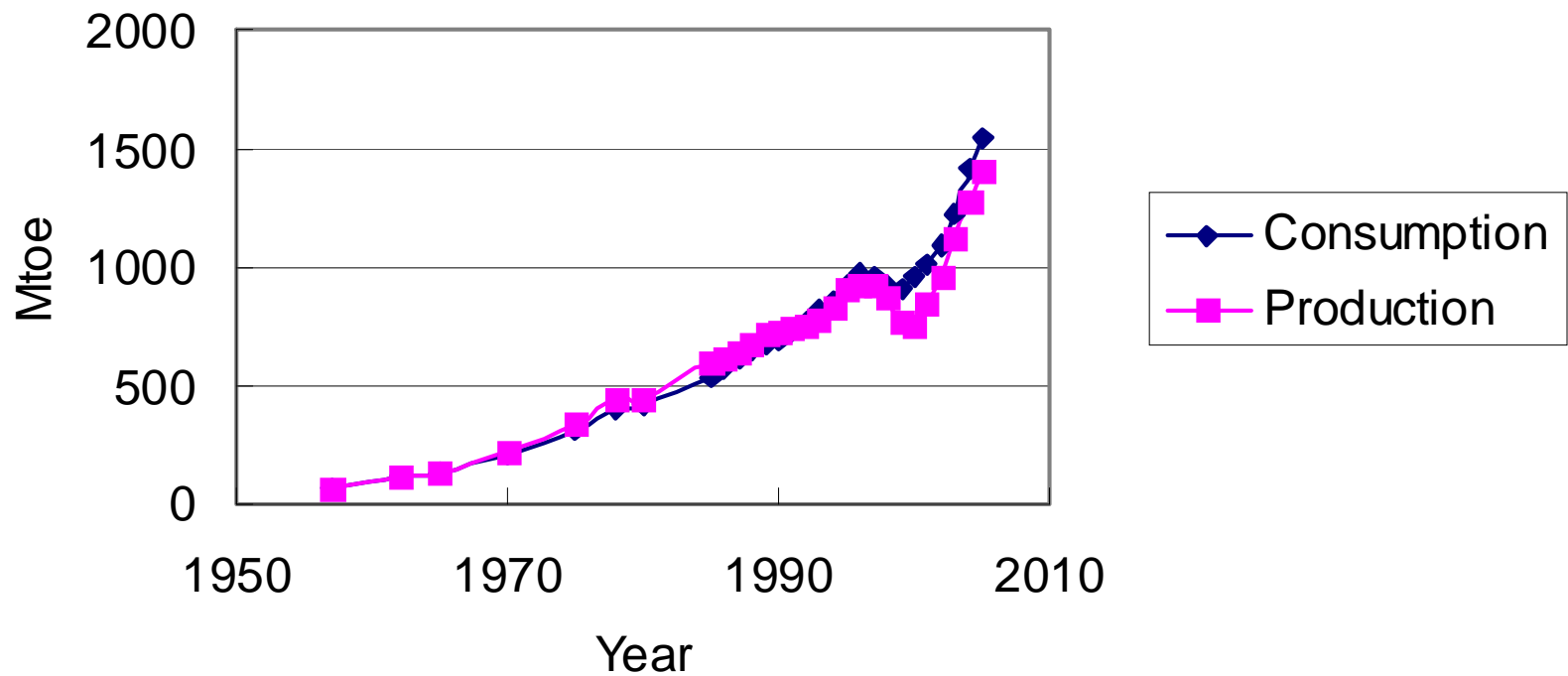


Energy Campaigns in China and its implication on Climate Change

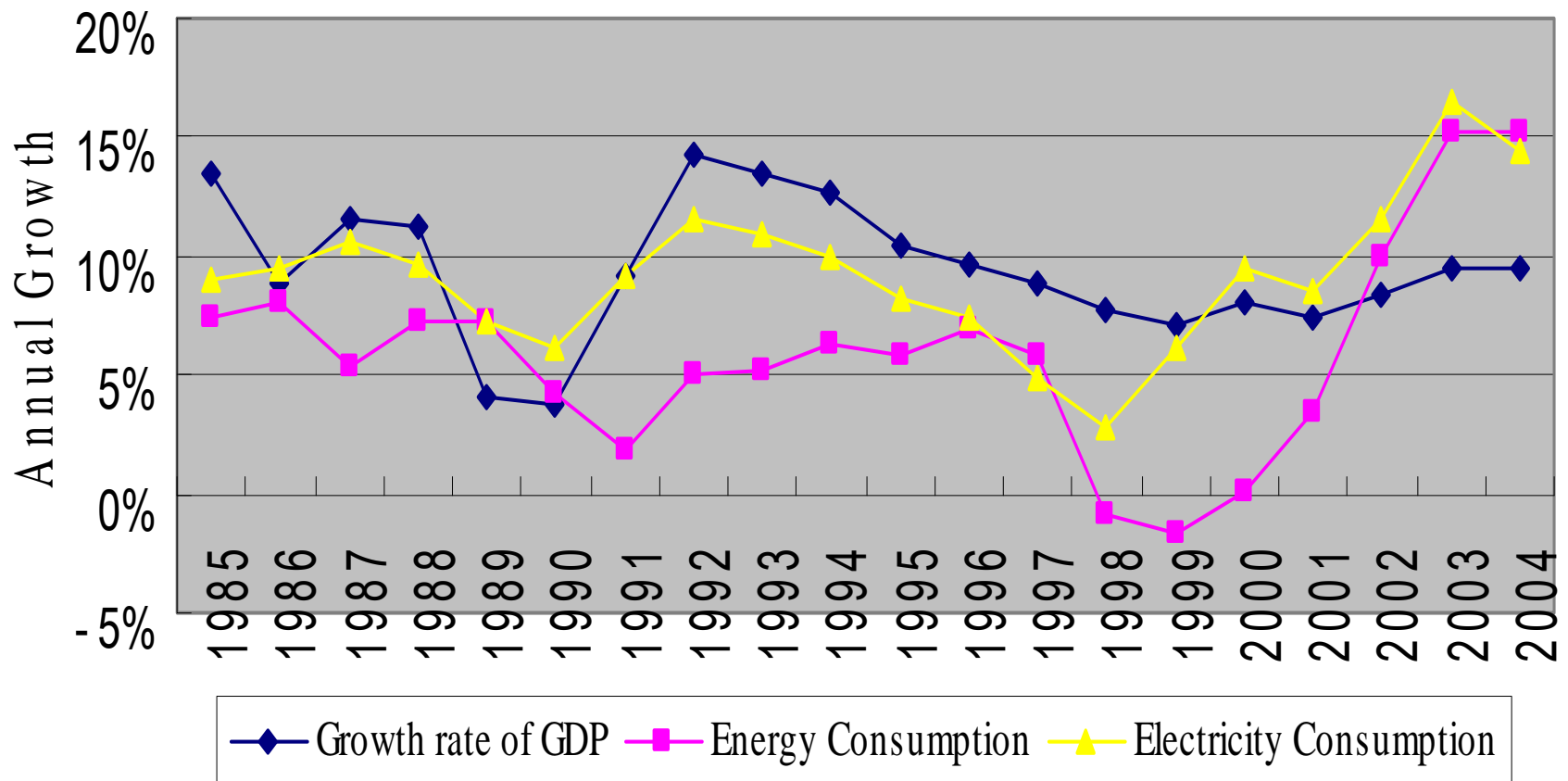
Qiang Liu

Energy System Analysis Center,
Energy Research Institute, China

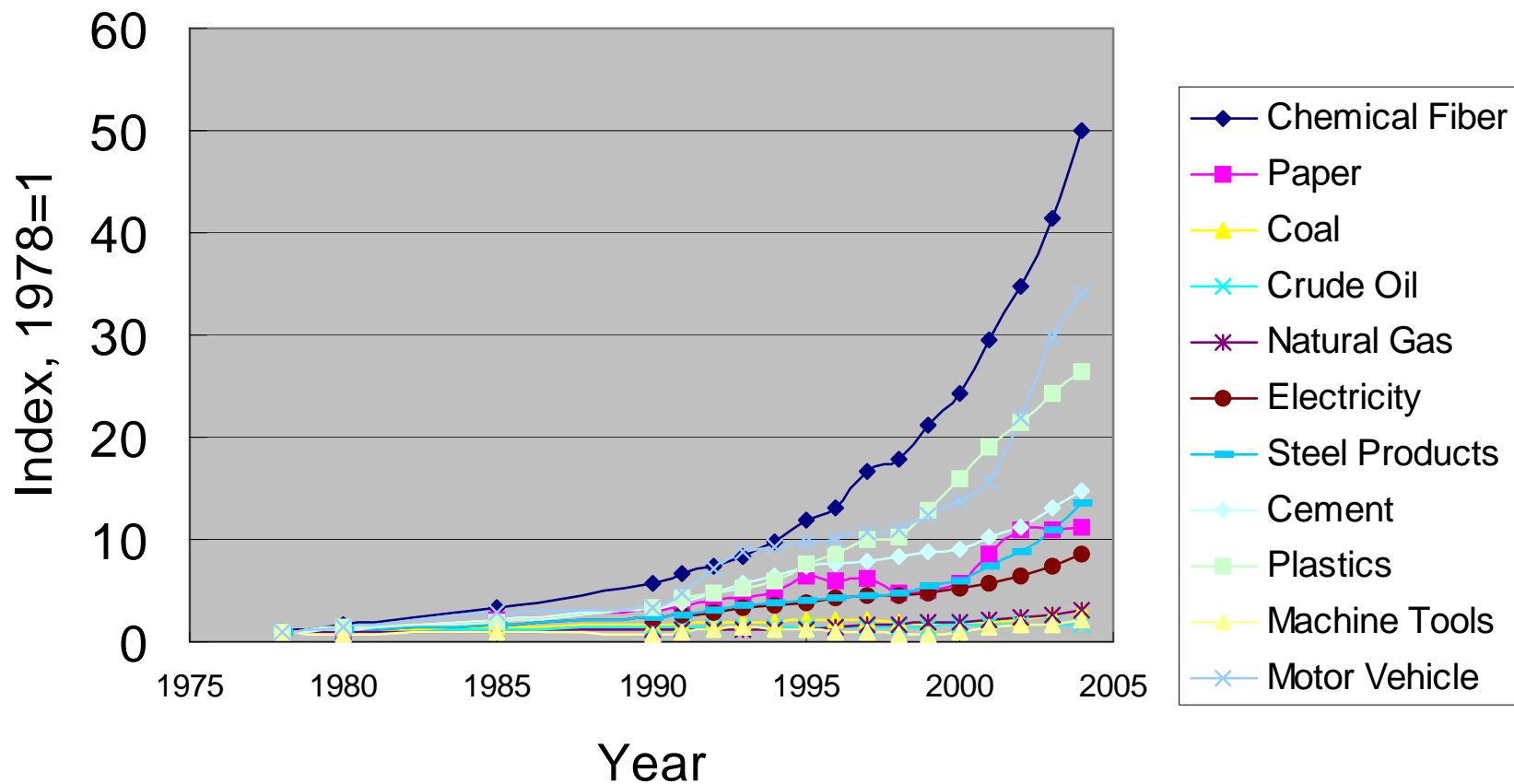
Energy Production and Consumption in China, 1957-2005



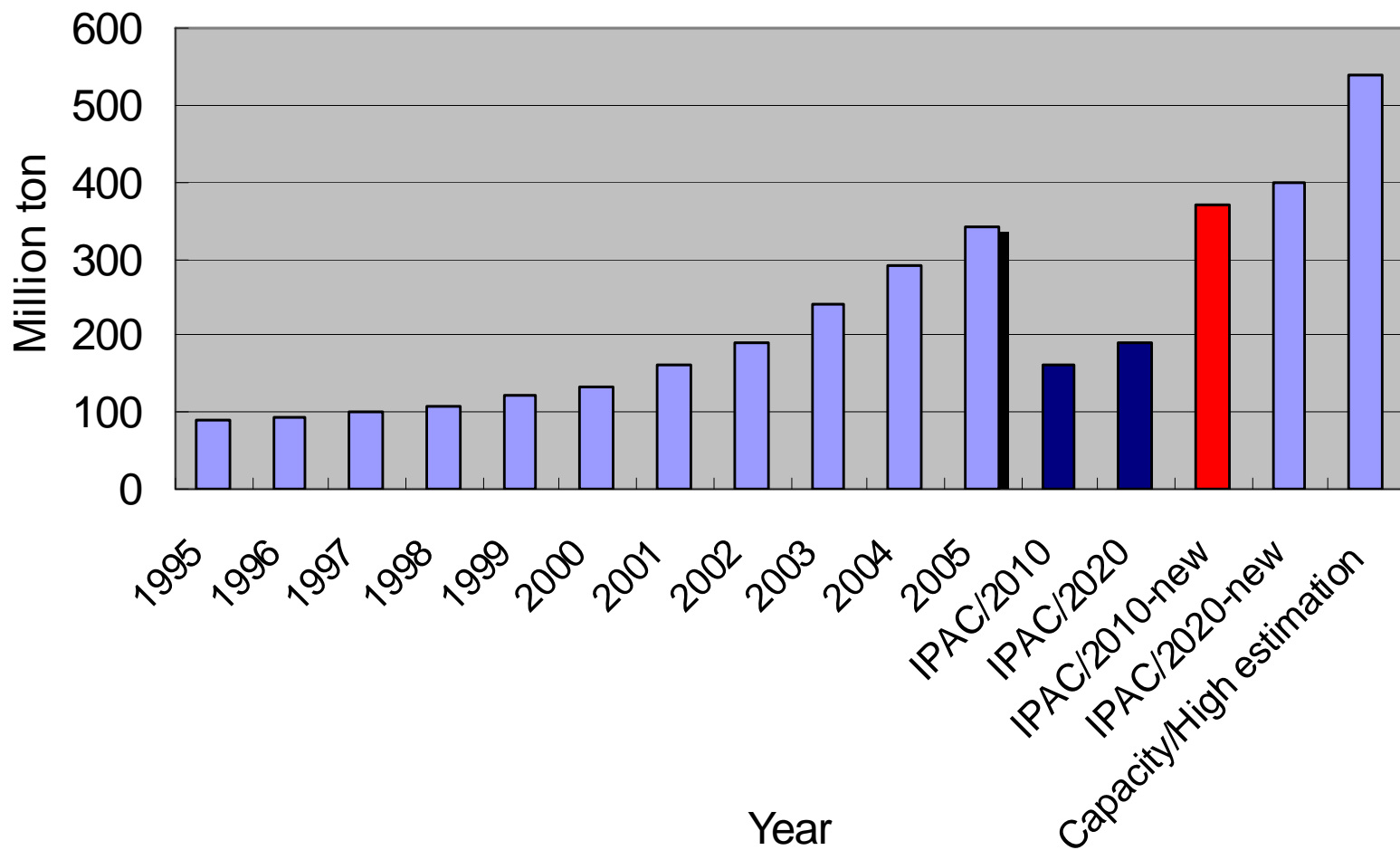
Growth rate of GDP, Energy and Electricity Use



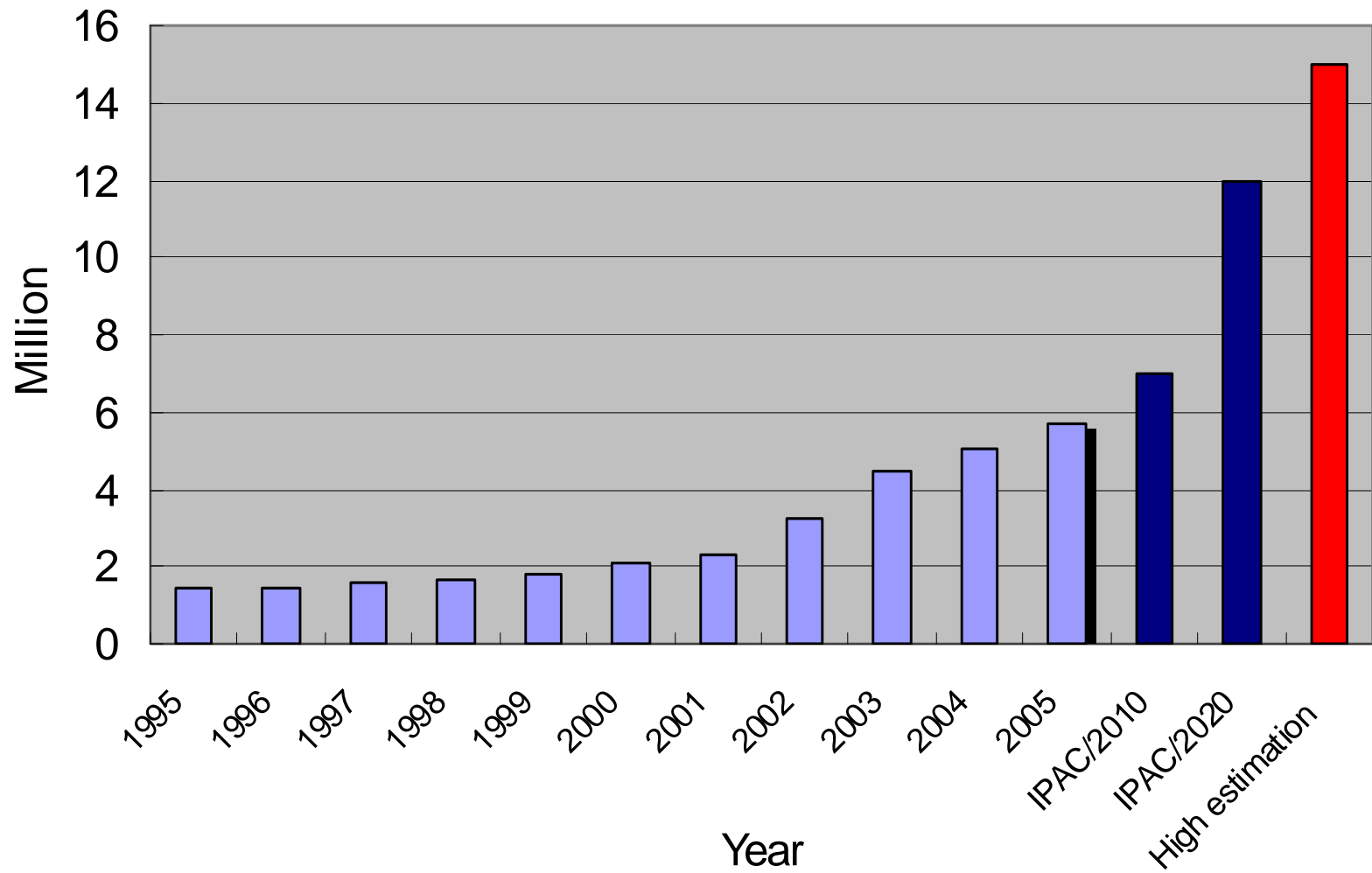
Index of industry products in China, 1975-2004



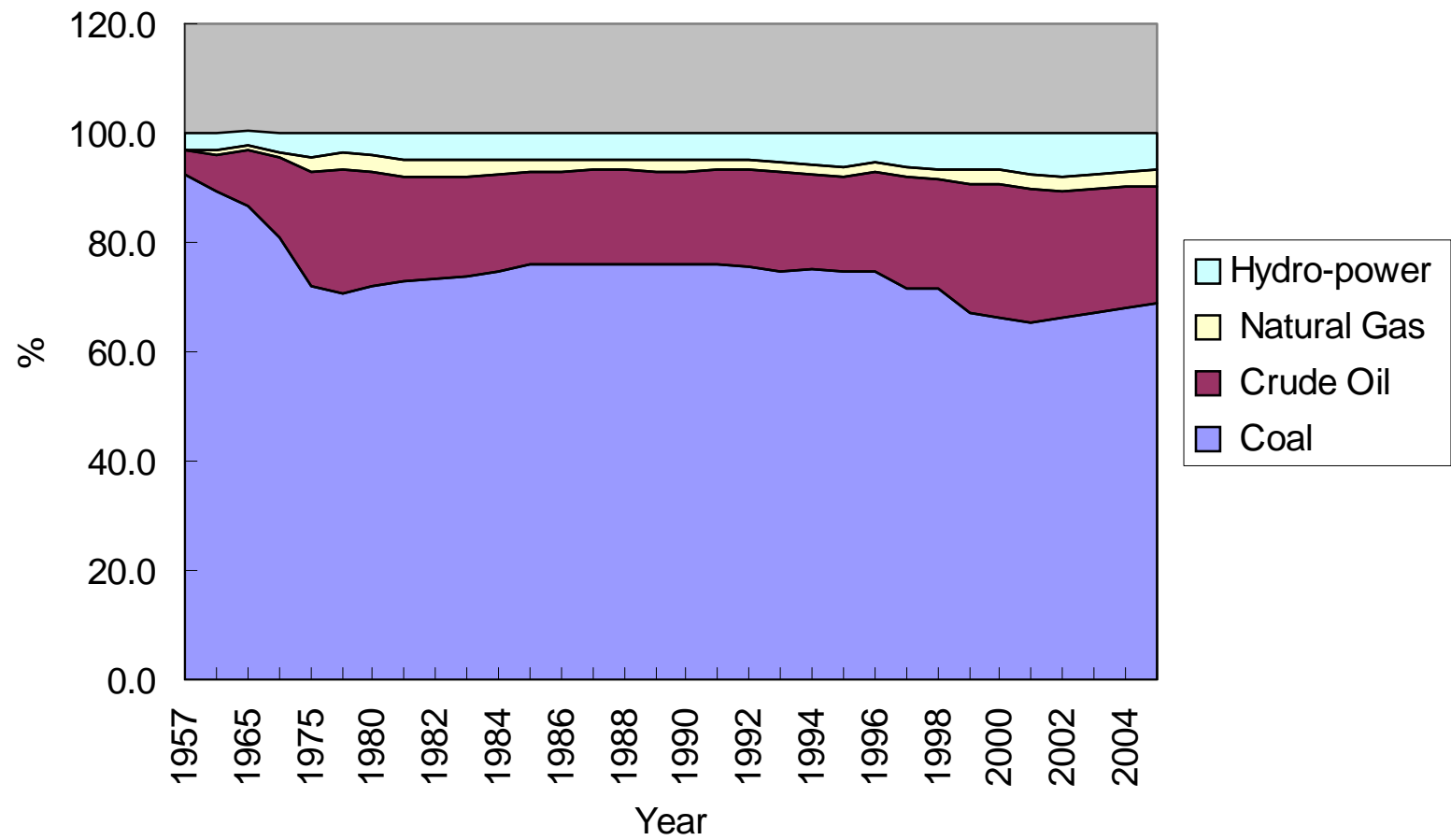
Steel Product output in China



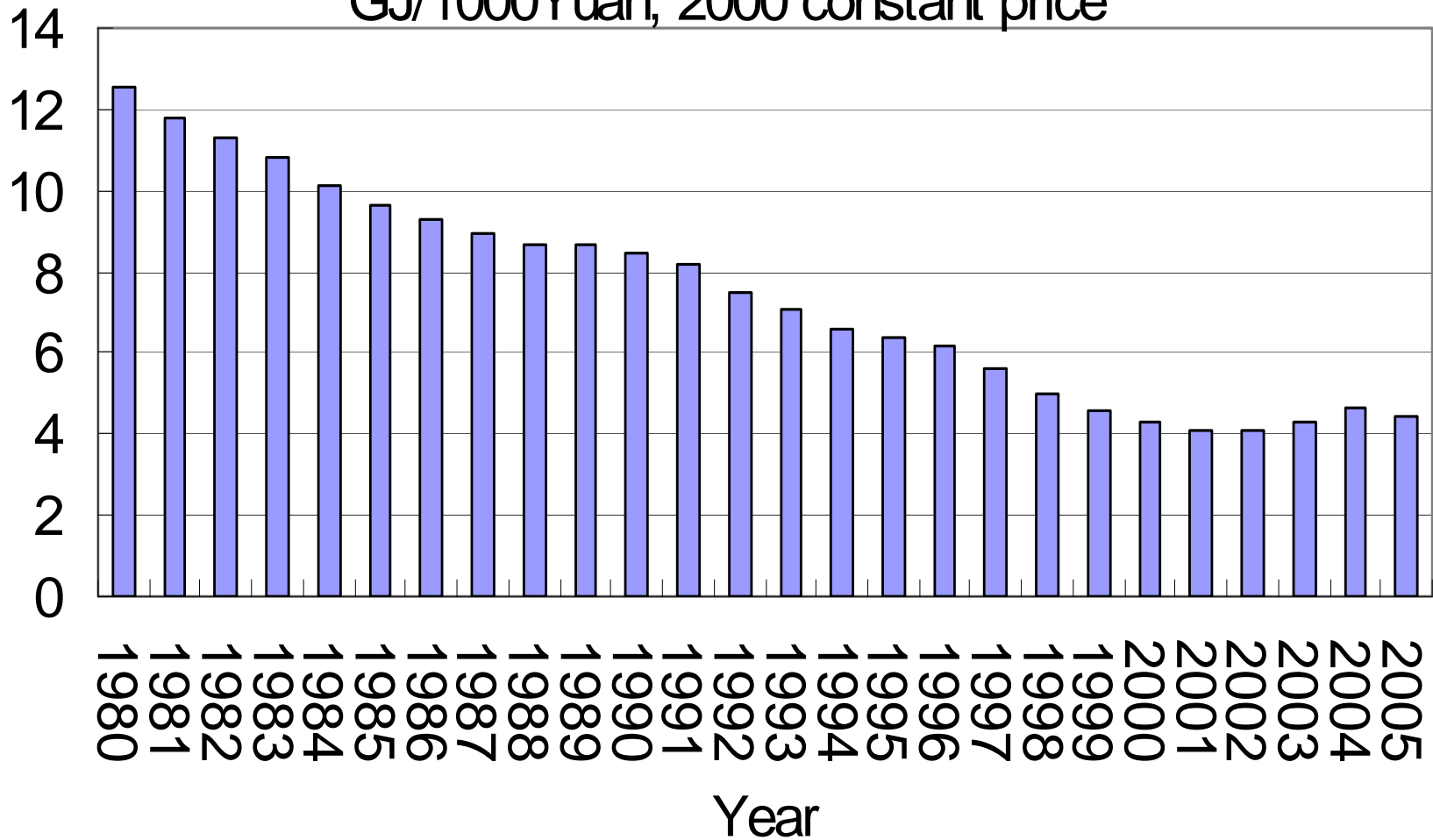
Motor vehicle output in China



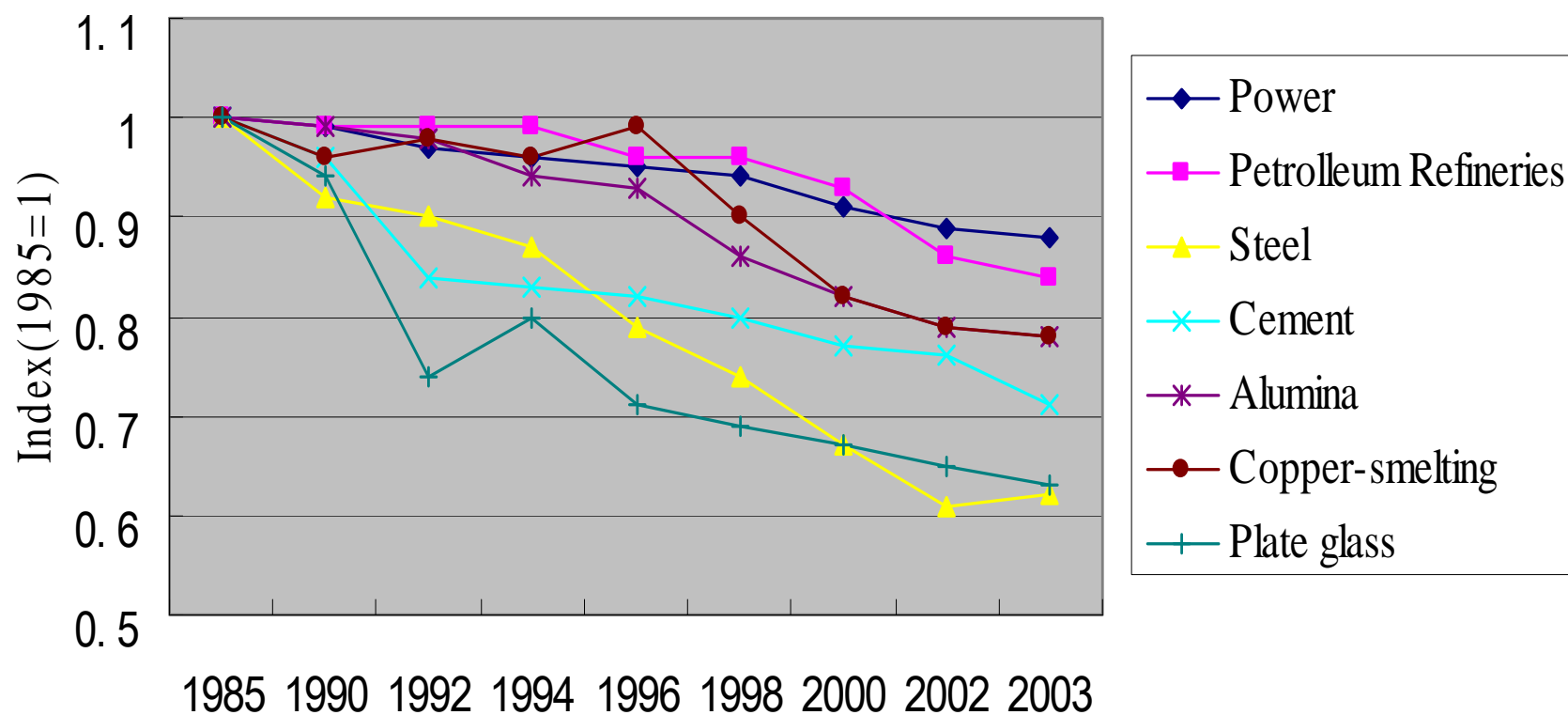
Energy Consumption Mix in , 1957-2005



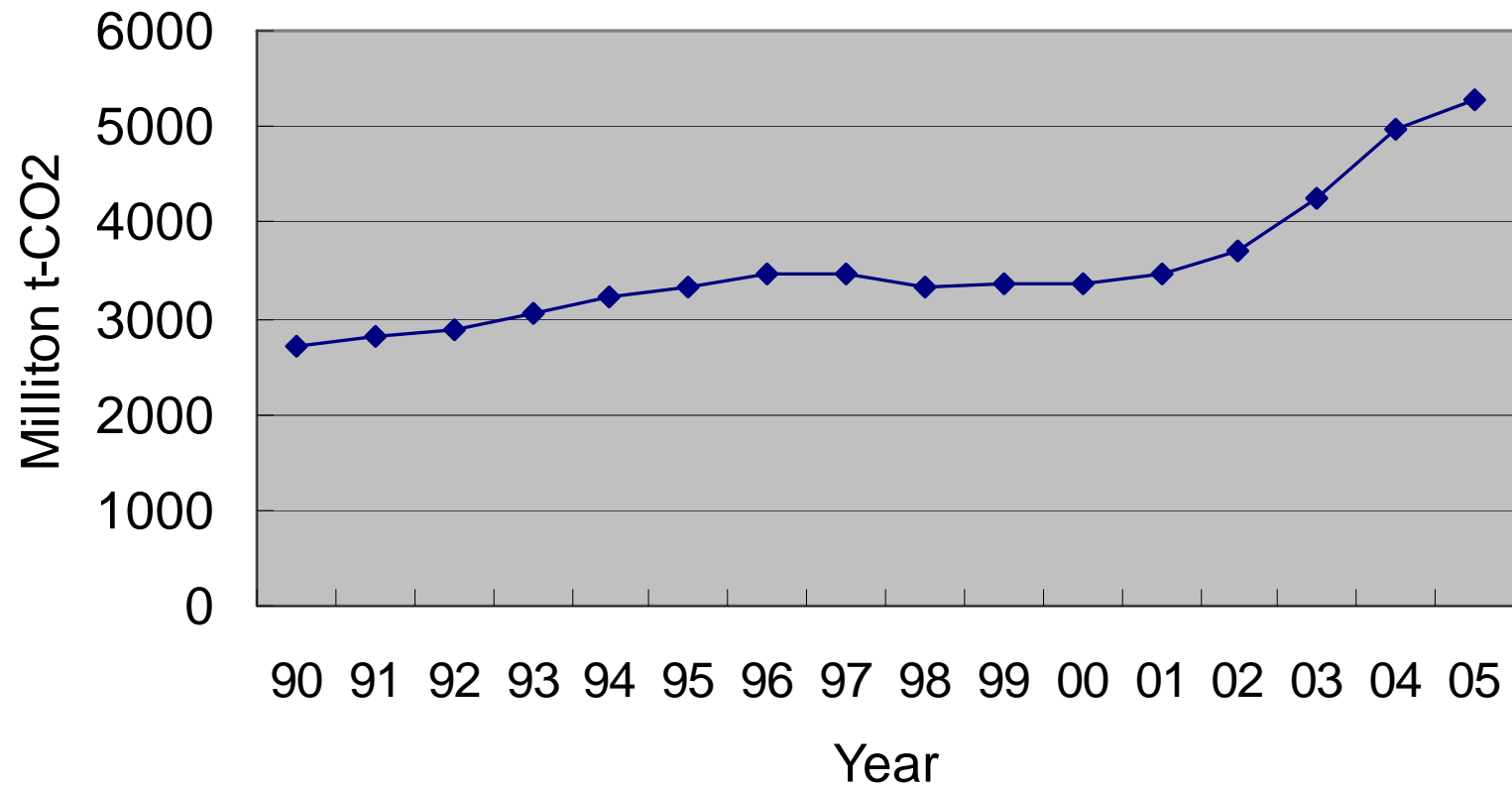
Energy Consumption per unit of GDP GJ/1000Yuan, 2000 constant price



Major Products Energy Consumption Index change from 1985 to 2003



CO2 Emission in China, 1990-2005



Key issues: After 2003

Energy issue is becoming crucial concerning of government:

- Sustainable development is an important voice
- Circular economy is widely accepted
- Energy efficiency and renewable energy are attached more importance
- Energy price increase is getting much more attention
- Widely spread energy shortage:
- Accident in coal mine is widely known by public.
- One of major concerns of government is to improve the living and working standard of rural employees

Energy Policies: After 2003

National laws and plan

- Long- and Medium-term Energy Conservation Plan, with much more concrete content
- Renewable energy law: renewable energy target by 2020
- 11th-five-year Energy Plan: National energy intensity target

Standard and regulation

- Vehicle fuel efficiency standard
- Strictly implementation of building energy standards
- Implementation of energy label of electric appliances
- Releasing the control on coal price for all users
- Higher consumption tax for larger engine vehicles

Ongoing procedures: After 2003

- Drafting Energy Law
- Revise Energy Conservation Law
- Drafting Oil and Natural Gas Law
- Renewable energy development plan up to 2020
- Implement fuel tax
- Second vehicle fuel efficiency standard
- Energy reporting by government officials
- Energy monitoring for 1000 large energy users
- More than 500 energy conservation projects in 11th five year plan

Climate Change Policies in China

So far there is no specific climate change policies in China. Ongoing work includes:

- Climate Change Strategy of China
- National Programs on Climate Change:
the White Book, will be officially released recently

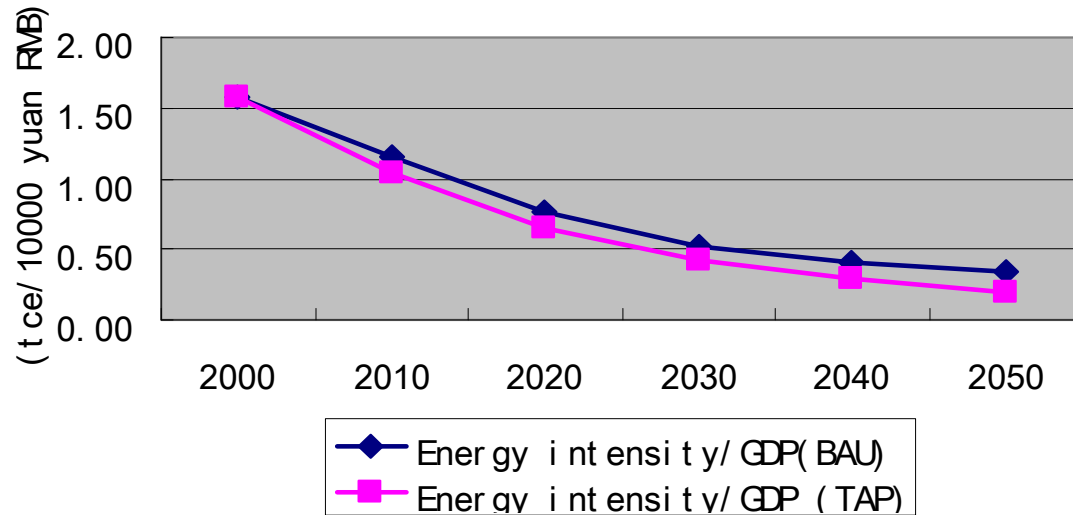
Options for Policy Scenario

Policy options	Explanation
Technology promotion policy	End use technology efficiency increase by using new technologies
Energy efficiency standard for buildings	New buildings reach 75% increase standard in 2030
Renewable energy development policy	Promote use of renewable energy(subsidy for wind power, biomass power generation; government supporting village biogas supply system)
Energy tax	Introduce vehicle tax by 2005, and energy tax by 2015
Public transport policies	In cities public transport in 2030 will take 10 to 15% higher share than 2000.
Transport Efficiency Improvement	High fuel efficiency vehicles widely used, including hybrid vehicle, compact cars, advanced diesel car
Power Generation Efficiency	Efficiency of coal fired power plants increase to 40% by 2030
Nature Gas Incentive	Enhance natural gas supply, localization of technology to reduce cost
Nuclear power development	National promotion program by setting up target, enhanced government investment, technology development
Energy Intensive Production Policies	Increase export tax, using resource tax
Environment policies	SO ₂ , NO _X Emission control, 40% lower in 2020
Recycling Policies	Increase recycling of building material, increase use of recycle chemical materials

Identify efficiency promised technologies: fully used by 2020

Sector	Technologies
Steel Industry	Large size equipment (Coke Oven, Blast furnace, Basic oxygen furnace ,etc.), Equipment of coke dry quenching, Continuous casting machine, TRT Continuous rolling machine, Equipment of coke oven gas, OH gas and BOF gas recovery , DC-electric arc furnace
Chemical Industry	Large size equipment for Chemical Production, Waste Heat Recover System, Ion membrane technology, Existing Technology Improving
Paper Making	Co-generation System, facilities of residue heat utilization, Black liquor recovery system, Continuous distillation system
Textile	Co-generation System, Shuttleless loom, High Speed Printing and Dyeing
Non-ferrous metal	Reverberator furnace, Waste Heat Recover System, QSL for lead and zinc production
Building Materials	dry process rotary kiln with pre-calciner, Electric power generator with residue heat, Colburn process, Hoffman kiln, Tunnel kiln
Machinery	High speed cutting, Electric-hydraulic hammer, Heat Preservation Furnace
Residential	Cooking by gas, Centralized Space Heating System, Energy Saving Electric Appliance, High Efficient Lighting
Service	Centralized Space Heating System, Centralized Cooling Heating System, Co-generation System, Energy Saving Electric Appliance, High Efficient Lighting
Transport	Diesel truck, Low Energy Use Car, Electric Car, Natural Gas Car, Electric Railway Locomotives
Common Use Technology	High Efficiency Boiler, FCB Technology, High Efficiency Electric Motor Speed Adjustable Motor, Centrifugal Electric Fun, Energy Saving Lighting

GDP energy intensity in China, 2000-2050



Energy demand will be reduced by 27% (1708Mtce) in 2050 by technology and policy scenario compared with baseline scenario .

Energy conservation ratio in 2000~2050

■ BAU

2000-2020 : 3.66% ;

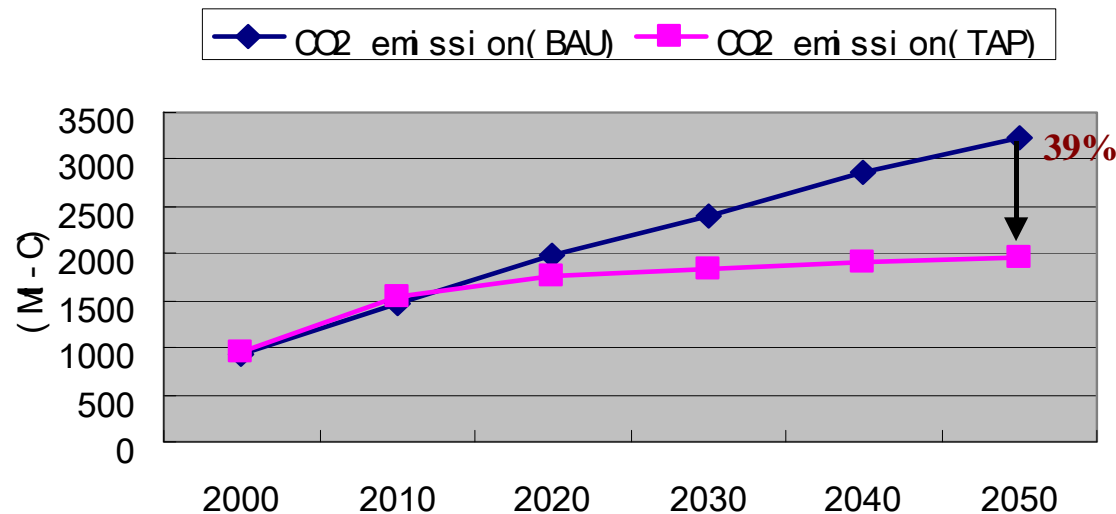
2020-2050 : 2.76%

■ Policy case

2000-2020 : 4.54% ;

2020-2050 : 4.0%

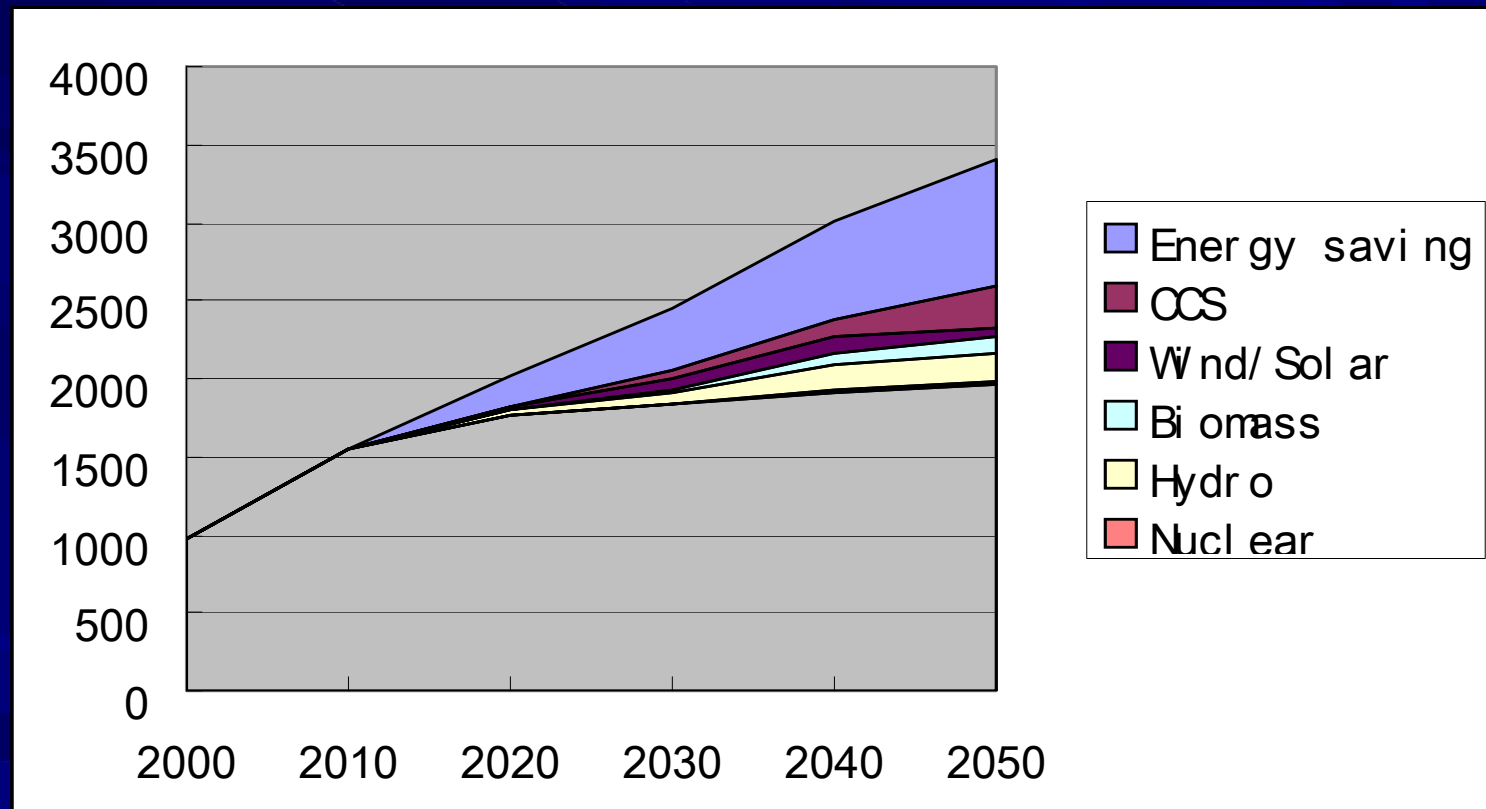
CO2 Emission in China,2050



CO2 emission will be reduced 39% (1263Mt-C) in 2050 by technology and policy scenario compared with baseline scenario.

Contributions to CO₂ emission reduction from policies, sectors, energy types, technologies

■ CO₂ emission reduction contribution (Mt-C) by policies



■ Energy saving: 64%; CCS:20%; Wind, Biomass, Hydro and Nuclear:16%

For China: domestic policies

- Economy activities are more important and given more attention than climate change mitigation policies
- Need integrated policy package, rather than energy and climate change policies.
- Energy conservation and environmental protection actions will help to reduce GHG emission in large degree.
- China is taking largest energy conservation and renewable energy campaign in the world.
- The advancement of energy using technologies, especially clean coal technologies, is crucial for large-scale mitigation

Future aspects

- Leading and demonstration role of developed countries
- Importance of action
- Multi-approach regime
- Funds
- Technology R&D

Future aspects: Leading and demonstration role of developed countries

Common but differential responsibility

- Due to the economy level and awareness, developing countries can only take a complementary role in dealing with climate change issues.
- The developed countries should take the leading role and their actions and achievements can become good incentives and examples for developing countries to follow up.
- The role of developing countries is unchanged but their involvement and the effect of their actions can be largely different.

Future aspects: Importance of action

Emission target is important, but actions with realistic mitigation outcome are much more important.

- GHG reduction is not apparent currently
- Negotiation on commits need long time
- Emission reduction is actually an economy behavior
- Chinese energy and environment actions are much consistent with climate change policies, and the corresponding mitigation is large. Such actions should be included in climate change regime and be encouraged

Future aspects: Multi-approach regime

Commitment is not the only way to mitigate:

The developing countries have the demand for development but also face many problems. They have initiatives to take actions against climate change. The point is how to promote this progress.

Future aspects: Multi-approach regime (Cont.)

- Volunteer agreement:
expanding scope; rewards and incentives
- Regular reporting regime:
efforts and achievements; incentives
- Partnership:
bi-lateral or multi-lateral; low-carbon activities
- Sector-based agreement:
easier to implement; “win-win” and “non-regret” options;
incentive and awareness rising

Future aspects: Funds

Funds: key to strengthen the effort against climate change

- Through normal trade channels or other flexible mechanisms;
- Use of price signal (e.g. carbon or energy price);
- Use funds more clean and efficiently;

Future aspects: Funds and technology R&D

Technology R&D: need to be enhanced.

- With an effect in global scale
- Basic factor to deal with climate change
- Developed countries' leading role and efforts
- Who can play the role? WB, UN, AP6, Private?
- Working earlier to get correct infrastructure constructed
- Cooperation options: international technology R&D collaboration framework, research centers, research program, etc.

Summary

- Climate change is consistent with Chinese national strategy of resource-saving society and sustainable development.
- China have willingness to join the campaign against climate change
- The characteristic and development need of developing countries must be considered.
- Joint efforts are needed to take practical actions as fast as possible.

Thank you for your attention!

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