

Challenges in Building-up a Sustainable Energy in China: between Economy and the Environment

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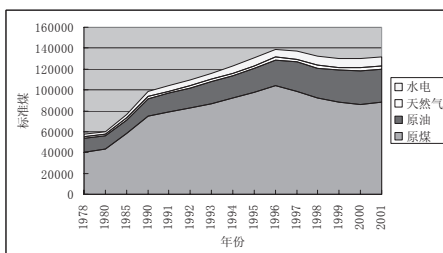


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1. Overview: history and current status of energy in China
2. Driving forces of China's energy
3. Major challenges
4. Relevant response measures: Sino-Japan environmental cooperation
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Overview: use of Energy in China

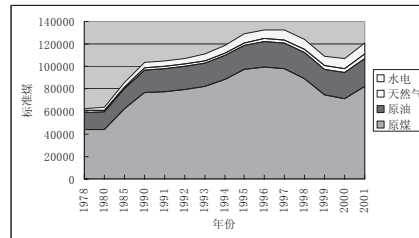
(unit: 10,000 toc)



资料来源: 《中国统计年鉴》(2002), 中国统计出版社

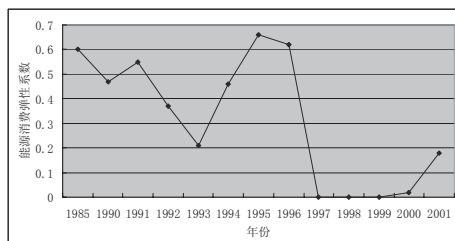
Overview: production of Energy in China

(unit: 10,000 toc)



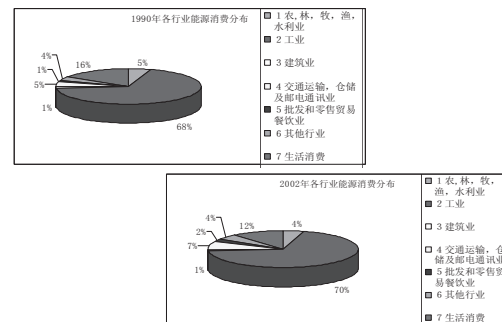
资料来源: 《中国统计年鉴》(2002), 中国统计出版社

Overview: Elasticity of Energy to Economic Growth in China



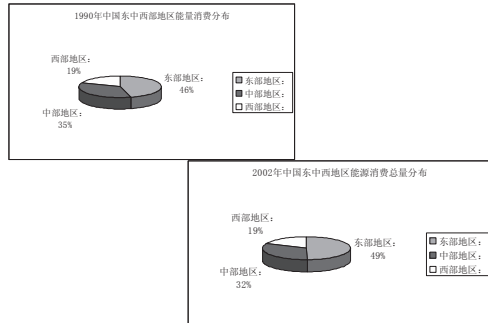
注: 97-99年数据缺失
资料来源: 《中国统计年鉴》(2002), 中国统计出版社

Overview: Share of Energy Use by sectors



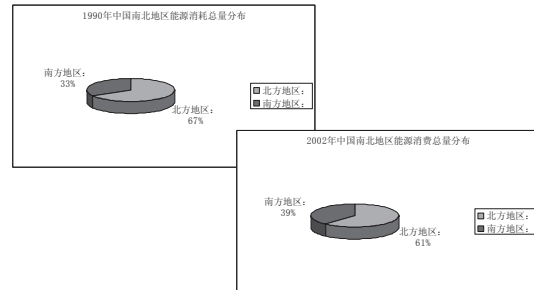
Overview: Share of Energy Use by Region

1

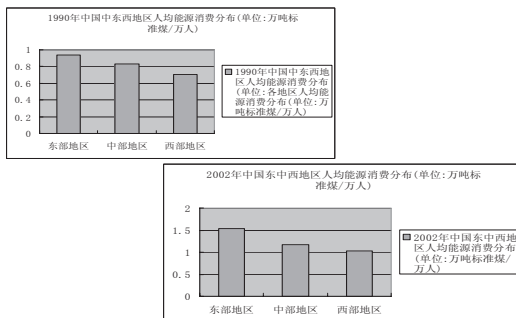


Overview: Share of Energy Use by Region

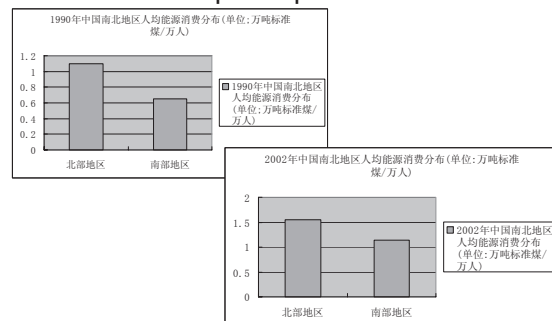
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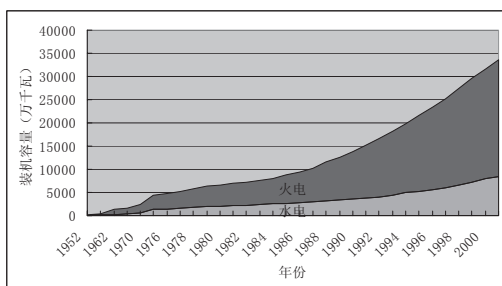
Overview: Share of Energy: per capita



Overview: Share of Energy Use: per capita

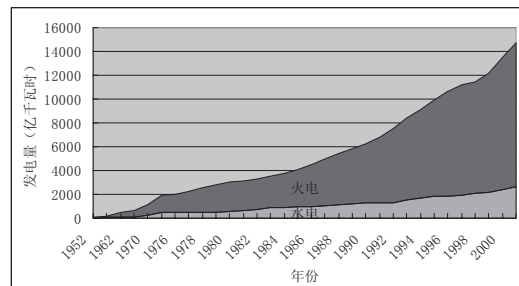


Electricity: Capacity

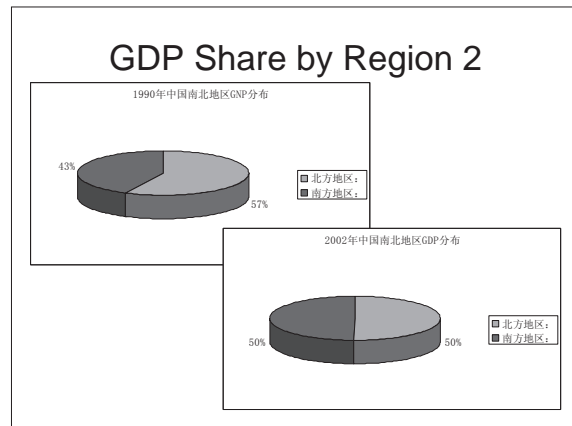
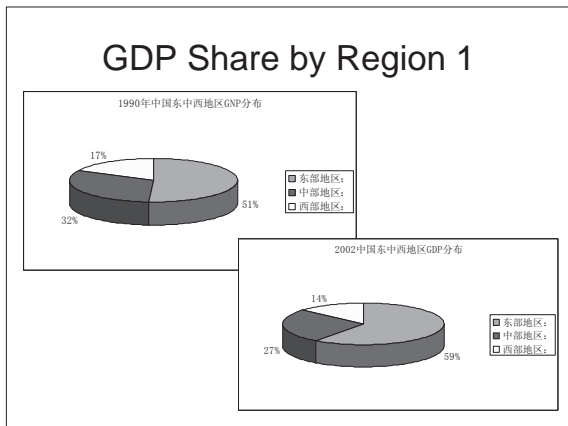


资料来源: 国家电力信息网, 电力统计

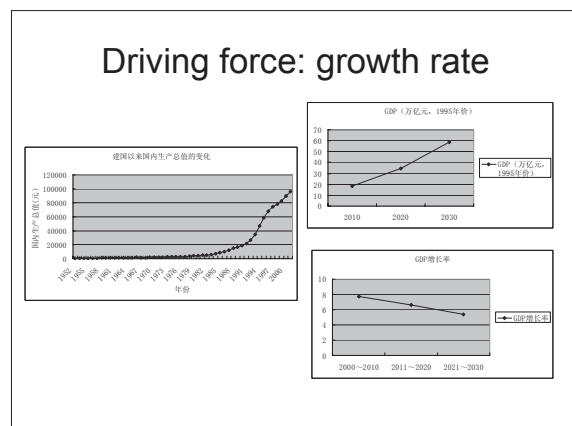
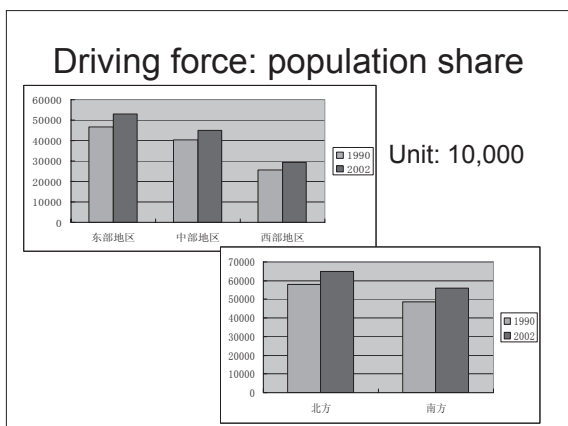
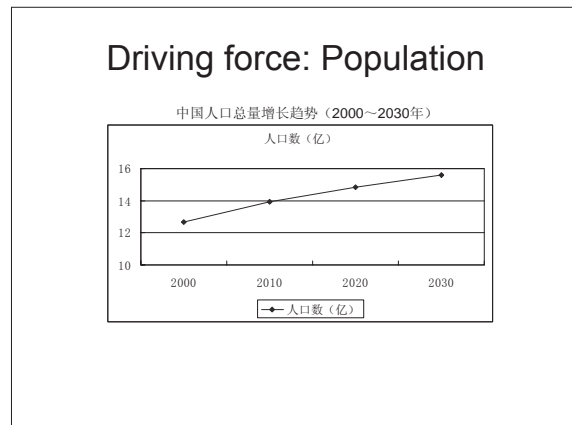
Electricity: Volume of Generation



资料来源: 国家电力信息网, 电力统计



- ### Driving Forces of Energy Change in China
- Population
 - Growth rate of economy
 - Industrialization (energy demand side)
 - Urbanization (energy demand side)
 - Change of energy share (supply side - technology)
 - Improvement of energy efficiency (D & S side – technology)

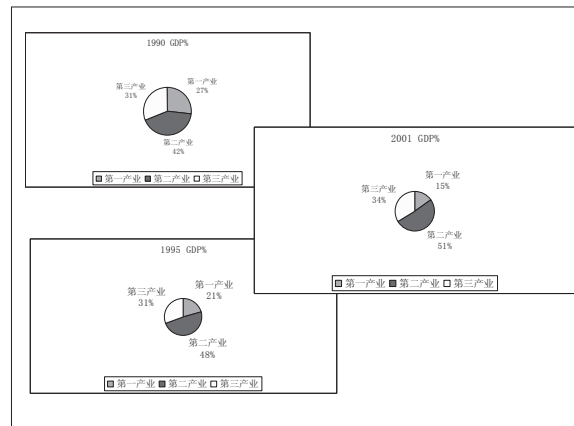


Driving force: change of sector share

Manufacture/industrial sectors will continue to account for a dominant share of the overall GDP.

Is China becoming a worldwide manufacturing center with high energy intensity?

(steel, aluminum, cement, chemical products, car, machinery, etc)



Driving force: urbanization

- Population shift from rural to urban areas with higher average energy use;
- Construction of infrastructure: railway, highway, airport, port, pipeline for gas and tap water and wastewater, electricity transmission system, telecommunication, commercial facilities, and so on;
- More housing
- More heating & air-conditioning and lighting
- More transportation

Driving force: technology change 1

Share change of different energy sources

- Coal: keeping dominant, gradual share decrease;
- More hydropower;
- Nuclear power and renewable: more, but not nationally significant; local implication
- Biomass: good in rural areas
- Other new energy: Hydrogen, fuel cell, etc

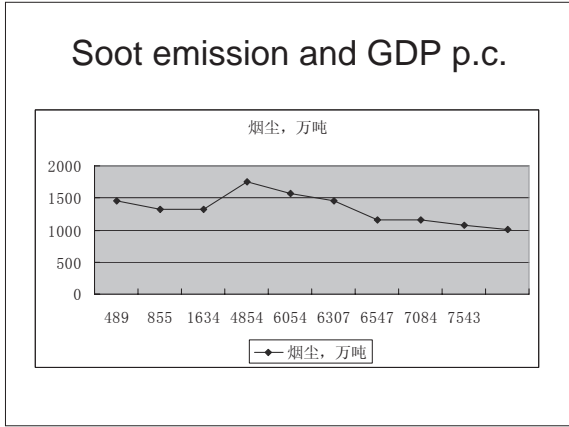
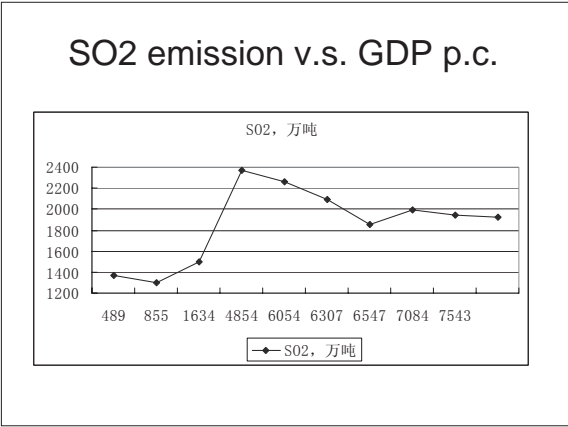
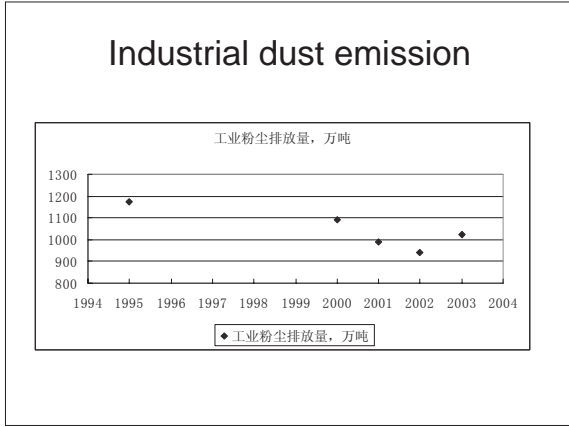
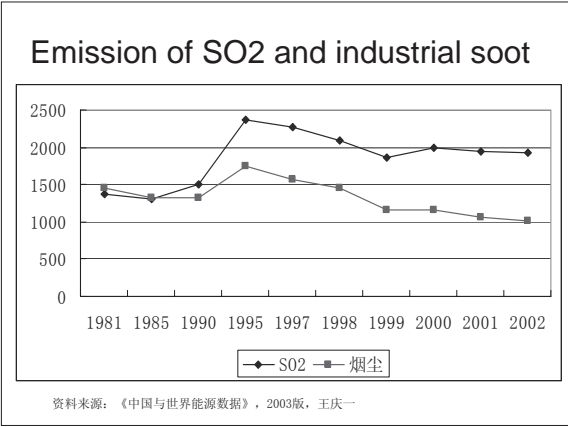
Driving force: technology change 2

Efficiency improvement: prioritized fields

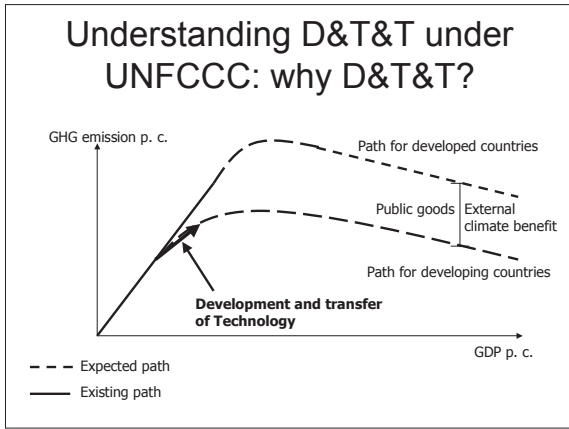
- Energy production sectors: coal mining, oil & gas fields, petroleum chemistry, power sector;
- End-users: energy-intensive sectors (metallurgy, chemical industry, construction materials, transportation, housing, machinery, etc.)

Major challenges

- Rapid increase of demand over supply: wide energy stress
- Energy security: heavier and heavier reliance on oil and gas import (1/3 of use from import in 2003, 2/3 in 2010)
- Transportation system: a constraint
- Low efficiency accompanied with out-of-date technologies
- High pollution: urban air quality, increase in GHG emission
- Global concerns: international energy security and global warming



- ### Global Warming
- UNFCCC and Kyoto Protocol
 - Overlapping global concerns with local concerns
 - Way-out: cooperation in low-carbon technology transfer



Relevant response measures: Sino-Japan Cooperation

Existing Sino-Japan Cooperation

- Research and education
- Personnel exchange
- FDI and trade related to environmental technologies and services
- Policy dialogues: regular communication between environmental ministers
- Approaches: COE, Sino-Japan Friendship Centre for Environmental Protection
- Trend? Given ODA declines and finally disappears

International Perspective on Sino-Japan Environmental Cooperation 1

- Common environmental concerns
 - Global: security of water, food, and energy; global warming; biodiversity; ozone layer; desertification; trans-boundary hazards, POPs;
 - Regional: sand storms in northeastern Asia; acid deposition, and so on.
- Common economic concerns
 - Trade: WTO and environment norms as non-tariff barriers;
 - FDI and pollution transfer
 - New environmental market: technology transfer and new investment areas

International Perspective on Sino-Japan Environmental Cooperation 2

- Conclusions: needs for cooperation
- No single party can address the challenges of public bads;
 - Share the public goods derived from efforts to combat environmental degradation;
 - More effective and efficient;
 - Need for imagination on creating new approaches and mechanism meeting new challenges: interaction between developed and developing countries.
 - Capacity development: a vehicle for international cooperation

Feasibility of regional environmental management in East and South East Asia 1

- Basis
 - Short geographical distance
 - Close economic and trade link
 - Common environmental and resources concerns: oil, carbon, acid deposition, desertification/sand-storm
 - Similar cultural value judgment: concern welfare of future generation and collective interests

Feasibility of regional environmental management in East and South East Asia 2

Closer links and higher level of cooperation among China, Japan, and Korea in economic and environmental terms with more common concerns

Regional environmental management: elements

- Regular communication/consultation mechanism at different level
- Multilateral and bilateral international conventions or protocols as legal basis
- Prioritize environmental issues and establish goals and plans in the region
- Development and transfer of environmentally sound technologies
- Constant financial and technological assistance in research, education, and institutional development
- Policy coordination

Significance of regional environmental management

- Contribution to efforts on global change
- Widen current economic cooperation
- Curb regional environmental issues more effectively (desertification, acid deposition)
- Knowledge and technology transfer
- Towards to common market (less and less differences in environmental standards)

Suggestion 1

- Development of network of COE;
- Establish a mechanism to disseminate information and knowledge via COE network;
- More attention to cooperation and communication in civil society: NGOs, univ., media, etc;
- Learning by doing with some real exercises in forms of projects and activities

Suggestion 2

Focuses related China-Japan cooperation:

- 2008 Olympic Game and urban development (infrastructure, managing eco-city);
- Urban traffic management and air quality improvement
- Eco-system management
- Socioeconomic assessment methodologies
- Stakeholder participation

**Thank you for your attention
and comments are welcomed!**

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