

Policies and Measures on Energy Efficiency Improvement and Renewable Energy Development

19-20 March 2007, Paris

Li Liyan

Office of National Climate Change Coordination Committee
National Development and Reform Commission (NDRC)

Sun Guoshun

Ministry of Foreign Affairs, China

Introduction

- Climate change is one of the key concerns of the international community. Climate change, both as an environmental issue and development issue, falls in the category of development in the final analysis;
- Energy efficiency improvement and renewable energy development are the most important measures to tackle the challenges of climate change;

Introduction

- Actively addressing climate change and enhancing sustainable development are not only the requirements of implementing the UNFCCC, but also the requirements of carrying out the scientific concept of development in China;
- Advancing the sustainable development in full scale and effectively controlling GHG emissions are the key measures of China to carry out its basic national policies on resource-conserving and environmental protection and to ensure national security.

China's National circumstances relevant to climate change (1)

- Population: 1.3 billion
- Economic development level
GDP per capita is about US\$1714 in 2005
- Poverty population: there are still 23.65 million people living under poverty in 2005 according to the Chinese defined poverty standard and there will be more added if UN/WB standard be used.
- Imbalanced regional development between the east and that of the west: per capita GDP is US\$2877 vs US\$1136

China's National circumstances relevant to climate change (2)

- Development gaps between urban and rural. urbanization rate is 43% around in China and the rural areas have a relatively lower level of development with lower energy consumption
- Energy mix
 - Energy sources: coal is taking the overwhelming majority with share of 76.4% in primary energy production in 2005; share of oil and natural gas is lower ;
 - Consumption: share of coal is 68.9% in 2005; oil import is increasing; energy consumption in 2005 is about 2.2 billion tce.

China's National circumstances relevant to climate change (3)

- Natural conditions: uneven temperature and precipitation
national territory covers multi climate zones, with great demand for air-conditioning and heating, with more energy demand for the same level of life standard;
- Ecological environment: 18.1% forest coverage, 27.4% desertification land, 18,000 km coastal lines, and 6500 islands over 500 square meters which decides that China is relatively fragile and vulnerable to the adverse impacts of climate change.

Energy efficiency and renewable energy development policies

Efforts in the past:

- Per GDP energy consumption is 2.68 tce in 1990 and 1.43 tce in 2005, 4.1% annual reduction; from 1990 to 2005, 800 mtce saved via economy restructuring and efficiency improvement which is equivalent of 1.8 billion tons of carbon dioxide emission reduction (emission factor 2.277 in 1994).
- Coal consumption is 76.2% in 1990 and 68.9% in 2005; renewable energy utilization reached 166 mtce (including big hydro) in 2005 which is 7.5% of the whole energy consumption.

Energy efficiency and renewable energy development policies

Related elements in China's 11th National Development Programme (2005-2010)

- Energy intensity reduction (per GDP energy consumption to 2010 vs the level of 2005): 20%;
- 30 large scale wind farms with the capacity of 100Mw; Grid-connected wind and biomass will reach 5 gw and 5.5 gw respectively;
- 10 key programmes for energy conservation; etc.

Energy efficiency and renewable energy development policies

Overall policy development up to date:

- Laws and regulations: Energy Saving Law – amending and updating; Renewable Energy Law – promotion and implementation.
- Decisions by the State Council on both energy conservation and renewable energy development.
- Medium and long term development plans;
- Institutional and organizational reform and enhancement: policy, market (taxing, pricing, etc.) financing, technical and technological instruments work together.

Energy efficiency and renewable energy development policies

Energy supply and transformation side:

- Medium and long term energy development plan which will include both generic and specific sectoral plans. The sectors will cover coal, power generation, oil and gas, nuclear, and renewables.
- New and renewables: nuclear, biomass/gas, hydro, solid waste power generation, wind, solar, geothermal, and tidal power generation.
- High efficiency grid system design and construction.

Energy efficiency and renewable energy development policies

Priority technology cooperation areas from energy supply and transmission/distribution side:

- Clean coal – coal mining, coal gasification, coal power, coal chemical, and CCS (carbon capture and storage)
- Oil and gas:
- Nuclear:
- Large scale wind turbine, solar, bio-energy
- Power transmission and distribution system: grid connection; distance transmission; grid monitoring, adjustment, and safety; supply side management.

Energy efficiency and renewable energy development policies

Policy progress in demand side (energy efficiency and energy saving):

- Regulations and standards: industrial energy consumption equipments, residence appliances, lighting, motors, buildings, air-conditioning and heating, and transportation vehicles
- Labeling, monitoring and auditing system is being framed
- Innovative instruments: energy saving financing, voluntary agreement
- List of encouraged industries and technologies
- Government subsidies

Energy efficiency and renewable energy development policies

Key energy saving sectors and the corresponding technologies:

- Steel: e.g. CDQ
- Metallurgy: e.g. Aluminum
- Oil and chemical industries:
- Building materials: cement, glasses, etc. .
- Transportation: road vehicles, railway system, bunker fuels
- Agriculture mechanics including fishing and husbandry
- Buildings: design and green buildings
- Commercial and residential appliances

Energy efficiency and renewable energy development policies

10 priority energy saving programmes (1/3):

- Industrial boilers: total volume is about 500,000, of which 90% are coal boilers with design efficiency 72-80% and operation efficiency 65%. 5% upgrade is the target.
- District central heating and cogeneration of power and heat: coverage 27% in 2002 and plan to go up to 40% in the urban areas.
- Industrial heat and gas discharge recovery in steel production, cement industry, and coal mine industry. 10 billion cubic meters of coal gas will be recovered by 2010

Energy efficiency and renewable energy development policies

10 priority energy saving programmes (2/3):

- Oil saving and alternatives: gas and electricity transportation from west to east; vehicle fuel switch, e.g. bio-diesel.
- Electric motors: about 60% of the total electricity consumption with operation efficiency 10-30% lower than that in the developed countries. 2% average upgrade is the target.
- System optimization: good design, retrofit and sound management to improve the efficiency in key industries like metallurgy and chemical industry

Energy efficiency and renewable energy development policies

10 priority energy saving programmes (3/3):

- Efficient buildings: 50% energy saving rate is the standard for new buildings
- Green lighting: 13% electricity consumption is for lighting
- Energy saving in the public sector: heating, air-conditioning and lighting in public buildings
- Setting up energy saving monitoring and energy saving service system

why is innovative international technology cooperation needed?

- Global public goods: climate stabilization, a global benefit shared by all countries.
- Developing countries are stepping into a development stage in which GHG emission may increase sharply given higher energy demand and lower financial and technological capacity. High emission may be locked in for several decades: power plants in China
- We need to speed up the process to transfer more climate sound technologies to developing countries in order to avoid such lock-in effects.

Initial Ideas on International Technology Cooperation

Criteria for the innovative international
technology cooperation

- New rather than existing Mechanisms
- Availability
- Foreseeability
- Accessibility
- Affordability

Initial Ideas on International Technology Cooperation

- Innovative financing options for development, deployment and transfer of technologies (D&D&T);
- Smart handling the relationship between the climate protection and the intellectual property right;
- Institutional and organizational arrangement at international, regional and national levels;
- Legal and regulatory reform; and
- Tangible incentives: taxation, government subsidy.

Initial Ideas on International Technology Cooperation

- Joint R&D
- Systematic training programmes (knowledge, information, skill and know-how sharing) to enhance human and technical capacity:
 - sectoral approach
 - Enhancing technology information centers
 - Pilot and demonstration
- IPR solution: example of DCQ technology transfer from Japan to China

How to understand “innovative financing”?

- Public finance should play important roles to support companies in developed countries to transfer technologies;
- PPP should be paid more attention;
- A set of systematic actions should be taken, including removing restriction of technology transfer;
- TT-CDM ??

End

Thank you!