

Delhi High Level Conference on Climate Change
Technology Development and Transfer

**Low Carbon Technology Needs
for China**

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China is the largest developing country

Population	13.3 billion	One-fifth of the world's
Per capita GDP	2,770 US\$	Ranked in the world's 100 countries
Primary energy consumption	2.66 billion tce	In 2007

Development path

- **China clearly put forward the major strategic task of constructing a ecological civilization**
- **Stressed a basic national policy of saving resources and environmental protection**
- **Adhere to sustainable development**
- **Continuously contribute to climate change**

Program, policies, actions of China to address climate change

- **China's National Climate Change Programme
in June 2007**
- **China's Policies and Actions for Addressing Climate Change
in October 2008**

Targets of emission reduction

- **20% reduction of energy intensity per unit GDP during 2005-2010**
- **i.e. 620 million tce of energy saving, equivalent to 1.5 billion t-CO₂ emission reduction**
- **In future, vigorously to develop renewable energy and nuclear power, to enable the proportion of non-fossil energy sources to the primary energy consumption by 2020 going up to 15% from 10% at present time**

Work together to address climate change challenges

— China's view by President Hu Jintao

(Sept. 22, 2009 UN)

- **Core** to adhere to “Common but differentiated responsibilities”
- **Aim** to achieve mutual benefits and win-win
- **Foundation** to promote common development
- **Key** to ensure fund and **technology**

Low carbon technologies (LCT)

- **Development, transfer, diffusion, and deployment of LCT in developing countries are of great importance to protect global climate**
- **These global public goods are shared and enjoyed by all the countries**
- **It is needed to find out an innovative mechanism to realize global allocation of LCT effectively**

Technology in China

- **The gap of gross energy efficiency between China (35%) and the OECD average (45%) is up to 10%**
- **This shows a potential for China to control its GHG emissions by improving energy efficiency with more efficient technologies available from developed countries**
- **Emission intensity heavily depends on progresses in LCT**
- **Giving the large share of energy use and GHG emissions, only several percentage points of improvement in energy efficiency may lead to significant GHG reduction**

LCT composition

Hardware	devices, equipment, process, etc.
Software	IPR, designs, know-how
Enabling environment	mechanism, policies, institutions, infrastructure
Human resources	well trained staff
Financial resources	equity, loan, aid, etc.

Technology needs for China -1

Described in

“Initial National Communication on Climate Change”

China, Dec. 2004

A. Industry

- 1. Technology equipment for industrialization of coke dry quench for big & medium coke-oven plant**
- 2. Technology for purification & recovery of coal gas from steel converter**
- 3. Technology for using surplus heat from smokes of open, semi-closed calcium carbide oven**
- 4. Technology for comprehensive use of petroleum associated resources**
- 5. Purified gas & mixed-fuel driven auto technology**

- 6. High efficiency coal production technology**
- 7. Technology for exploring and using coal-bed methane**
- 8. Oil hydrogenation technology**
- 9. High-efficiency, low-pollution coal-firing power generating technology**
- 10. Large-volume extra-critical thermo-power generating set technology**
- 11. Large & medium hydropower generating set technology**
- 12. Retrievable energy resources technology**
- 13. Technology for recovery and use of natural gas from oilfield rim areas**
- 14. Technology for control of volatile hydrocarbon gas from oil-gas field**

- 15. Oxygen-rich coal-spray blast furnace & long-life span technology**
- 16. High efficiency successive casting system**
- 17. Ore-Dressing-Bayer new technology and key technique for production of oxidized aluminum**
- 18. High-efficiency energy-saving whole-set new technology for ore-dressing**
- 19. Hydrogen recovery technology from smelting plant**
- 20. Comprehensive technology for transformation and expansion of medium and small nitrogenous fertilizer production equipment**
- 21. Technology for successive production of Fluoride chloride hydrocarbon substitute**
- 22. Big horsepower wheel-tractor technology**
- 23. Oil & gas pipeline transportation and manufacturing technology**
- 24. High performance battery & material technology**

B. Construction

- 1. New-type wall-body material technology**
- 2. Serial products technology of energy-saving building**

C. Transportation

- 1. Urban rail-traffic technology**
- 2. High-grade highway fieldwork, full set equipment for road maintenance and new material technology**
- 3. Intelligence transportation system technology**

D. Agriculture

- 1. Agro-technology for high efficient water-saving spray & drip irrigation**
- 2. Technology for deep & refined processing of agro-products**
- 3. Agricultural calamity observation & pre-warning technology**
- 4. Agro-biological technology**
- 5. Agricultural seedling technology**
- 6. Technologies for new-type fertilizer & for prevention & killing of agricultural pests**
- 7. Technological support for prevention & treatment of salinity & alkalinity and water-soil erosion**
- 8. Technology for raising agricultural water-use efficiency**
- 9. Modern agro-technology on basis of automation and intelligence**

E. Water resources

- 1. Technology for economizing & cycled-use of industrial water resources**
- 2. Water-saving technology & tool transformation of daily-life water**
- 3. Technologies for industry & daily-life water sewage treatment, & for recycling & use of the water**
- 4. High-efficiency technology against floods**
- 5. Water & soil preservation technology**
- 6. Technology for observation & pre-warning against floods & droughts**

F. Forestry

- 1. Technological support for eco-protection of forestry and grassland**
- 2. Technology for prevention & treatment of forest & grassland pests**
- 3. Public welfare eco-forest, speedy & lush growth forest, & forest for high-efficient coke & charcoal, & afforestation technology**

G. Others

- 1. Technology for observation, pre-warning & forecast of sea level rise, seashore and marine eco-environment**
- 2. High standard dyke & embankment construction technology**
- 3. Technology for recovery & reconstruct of marshland, mangrove & coral-reefs**
- 4. Technological support for prevention & treatment of desertification**
- 5. Technology for observation & pre-warning of natural calamities**
- 6. Protection of diversity of biological beings, construction & function preservation for protection of nature reserve, protection of marshland, prevention & recovery of soil deterioration & other relevant technologies**
- 7. Urban-domestic waste disposal technology**

Technology needs for China -2

Described in
“China’s National Climate Change Programme”

June 2007

- A. For observation and monitoring of climate change**
 - 1. Atmospheric observation, marine observation, terrestrial eco-observation technology**
 - 2. Satellite technology on meteorological, marine and terrestrial resources**
 - 3. Climate system simulation and calculation technology**

B. For mitigation of climate change

- 1. High-efficiency, low-pollution coal-burning power generation technology**
- 2. Large hydropower generation unit technology**
- 3. New nuclear power technology**
- 4. Renewable energy technology**
- 5. Building energy conservation technology**
- 6. Clean fuel vehicle technology, hybrid vehicle technology**

- 7. Urban rail-based traffic technology**
- 8. Fuel cell and hydrogen technology**
- 9. Oxygen-rich coal-spray blast furnace & long-life span technology**
- 10. Comprehensive technology for transformation and expansion of medium and small nitrogenous fertilizer production facilities**
- 11. New paving material technology**
- 12. New-type wall-body material technology**

C. For adaptation to climate change

- 1. High-efficiency water-saving agro-technologies, such as spray & drip irrigation**
- 2. Water-saving and reusing technology of industrial water**
- 3. Treatment technology of industrial and household wastewater**
- 4. Household water-saving technology**
- 5. High-efficiency flood-controlling technology**
- 6. Agro-biological technology**

- 7. Agricultural breeding technology**
- 8. Production technology for new-type fertilizers**
- 9. Disease and pest control technology for cropland, forest, and grassland, cultivation**
- 10. Technology of fast-growing high-yield forest and high-efficiency firewood forest**
- 11. Technology for recovery and reconstruction of wetland, mangrove and coral reef ecosystems**
- 12. Technology for observation and pre-warning of flood, drought, sea level rise, agricultural disasters**

Priority technologies -1

Indicated in

**Measures for Operation and Management of Clean Development
Mechanism Projects in China**

Oct. 2005

- **Energy efficiency improvement**
- **Development and utilization of new and renewable energy**
- **Methane recovery and utilization**

Priority technologies -2

- **Period: 2010 - 2020**
- **Assumptions:**
 - GDP growth: 7% per year**
 - Energy intensity per GDP: 20% reduction**
 - Renew. energy share: 15%**
- **CO2 reduction by energy saving:**
 - 3 billion t-CO₂**
- **CO2 reduction by renewable energy:**
 - 1 billion t-CO₂**
- **Priority sector and technology:**
 - To improve energy efficiency**

Key energy saving technologies

Industry

- High-efficiency coal-burning power generation technologies
- High-efficient coal-fired industrial boilers
- District cogeneration
- Low calorific value gas combustion turbine technology in iron & steel sector
- Oxygen-rich coal-spray blast furnace & long-life span technology
- Advanced cement kiln technology package
- Highly efficient heat exchangers and burners in petroleum sector
- Medium and large size frequency modulated equipment

Transportation

- The technologies for efficient gasoline and diesel engines
- Urban rail-based traffic

Energy saving buildings

- Technologies and materials of heat-insulation of external walls
- White light conduct LED

Main barriers to LCT transfer to address climate change

- **Export ban for providing technology**
- **Monopoly tendency for high benefit expectation**
- **IPR for hindering market development**
- **Inadequacy of incentives from public policies**
- **Lack of knowledge, information, norms, regulations and standards in the process of localization**
- **Shortage of skilled personnel**
- **Lack of financial resources**
- **Lack of integrated institution in host country**

Measures to overcome TT barriers

- **Establish a special Intergovernmental body for LCT transfer under COP of UNFCCC**
- **Establish special finance mechanism to support TT by combining various funds and using effective instruments**
- **Identify priority areas of TT**
- **Develop a flexible mechanism of IPR protection for climate change technology and knowledge transfer**
- **Developing countries need to enhance their own R&D and innovation capacity through initiating a series of programs aiming at priority technological areas**

Thank you