



North China Electric Power University

# DEVELOPMENT OF ENERGY POWER AND UNIVERSITY'S OPPORTUNITY



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## Outline

- n Trends of World Energy Power Development
- n Trends of China's Energy Power Development
- n University's Opportunity Due to Energy Power Development
- n Development of NCEPU'S Energy-Related Disciplines
- n Proposals Toward Sino-Japanese Universities' Collaboration in Energy Fields



## Trends of World Energy Power Development

### IEA World Energy Outlook 2007 Statistics

- World primary energy demand in the Reference Scenario is projected to grow by more than half between 2005 and 2030
- Fossil fuels remain the dominant source of primary energy
- Electricity use almost doubles, its share of final energy consumption rising from 17% to 22%.
- Renewable energy has been the important part of energy consumption.



## Trends of China's Energy Power Development

### nFacts and Figures of Energy Development in China

- Consecutive growth of GDP by more than 10% from 2003 to 2008.
- More than 700 million Kilowatts by the end of 2007, hopefully to 1500 million Kilowatts in 2015.
- Coal accounting for 76.4% of the total energy consumption.
- Low share of energy resources per capita compared to other countries.
- Thermal power remains the dominant energy source.



- Reshuffling of energy development strategy. Renewable Energy Law issued in 2005 & Mid and Long-Term Development Plan of Renewable Energy.
- Rapid development of renewable energy. The installed capacity of wind power has been 12 million Kilowatts in 2008, No. 4 in the world.
- Building of a strong smart grid.



## University's Opportunity Due to Energy Power Development

### n World Energy Development & Problems

- Climate Change
- CO<sub>2</sub> emission
- Energy Security
- Energy price soaring
- Energy policies, strategic planning, action plan



## nUniversity's Opportunity – IEA Technology Roadmaps

- Electric power generation: CO<sub>2</sub> Capture & Storage, nuclear power plants, onshore and offshore wind energy, biomass integrated gasification combined cycle and co combustion, photovoltaic systems, concentrating solar power, coal integrated gasification combined cycle systems
- Building & Appliances: Energy efficiency, heat pumps, solar space and water heating
- Transportation: energy efficiency, second-generation bio-fuels, electric and plug-in hybrid vehicles.



## Development of NCEPU'S Energy Related Disciplines

### nBasic Facts

#### uTraditional Energy and Electric Power Disciplines

- Founded in 1958, featured by all-walk disciplines about electric power generation, transmission and distribution.
- National key disciplines: Electric Power & Its Automation, Thermal Physics
- Domestically and internationally cutting-edge fields: electric power system protection, integrated automation of substation, large unit simulation, information monitoring of power plant, cleaner coal technology, energy saving etc.





## u New Development

- To address the two main energy challenges: secure and reliable, but low price energy supply; low-carbon, high-efficiency, environment-friendly energy supply
- School of Renewable Energy School in 2007, first wind energy & power engineering undergraduate program in the world;
- School of Nuclear Science and Technology in 2007, nuclear engineering and technology undergraduate program.



- National Engineering Lab of Biomass Generation Equipment

- Beijing Key Lab of Secure and Clean Energy Utilization

- Beijing Research Institute of Energy Strategy

## u International Collaboration in Energy Fields

- Joint undergraduate programs in electrical engineering with University of Manchester, University of Bath, Cardiff University, and University of Strathclyde in UK.



- Joint undergraduate program in nuclear engineering and technology with Grenoble Institute of Technology in France
- World Bank: China Renewable Energy Scale-up Development Program
- Sino-Danish Wind Energy Development Program.
- Broad Grid Protection and Faults Analysis Program with U.S Universities and National Labs



## Proposals Toward Sino-Japanese Universities' Collaboration in Energy Fields

- n Establish Sino-Japanese University Collaboration Mechanism in energy fields
- n Open labs mutually between partner universities
- n Share some courses
- n Hold workshops in energy fields
- n Conduct joint research under Sino-Japanese government collaborative framework

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Thank You !

