

# **China's renewable energy in Progress**

S&T Office  
Chinese Embassy in Italy

June 15, 2011



# Outline

- **China's Renewable energy development and utilization**
- **China-Italy S&T Cooperation**
- **New Opportunities for China-Italy SMEs**



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## **Important and necessary**

- **21st century, an era of renewable energy**
- **China's Object: a road of harmonious and sustainable development**
- **China's measure: through S&T, the development of renewable energy and the enhancement of energy efficiency**



## **A Series of Laws**

- **the Environmental Protection Law (1989)**
- **the Electric Power Law (1995)**
- **the Coal Law (1996)**
- **the Renewable Energy Law (2006)**
- **the Law on the Promotion of Circular Economy (2008)**
- **the Energy Conservation Law (2008)**



# Solar Energy (1)

- **Solar photovoltaic power generation**

- Largest solar cell output in the world
- Golden Sun Demonstration Project, 640 MW systems, grid connection
- By 2020, 20,000 MW capacity





# Solar Energy (2)

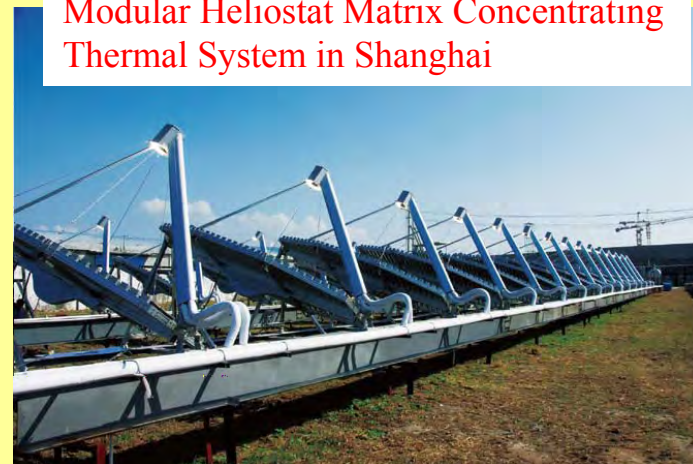
- **Solar thermal technology**

- The total output of solar water heaters: 140 million m<sup>2</sup>
- Centering on solar vacuum tube technology, many tech. breakthrough
- Capable of producing core equipments for solar thermal power generation

MW-level Tower-Type Plant in Beijing



Modular Heliostat Matrix Concentrating Thermal System in Shanghai





# Wind Power

- **Independent 1.5MW units industrialized; 3MW units in grid operations.**
- **At the next step, >5MW offshore unit focused**
- **End 2009, 25,000MW capacity, 100% growth for five years**
- **By 2020, 120,000-150,000MW capacity expected**

1.5MW Direct Drive and Permanent Magnet Units Provided Clean Power to the Beijing Olympic Games







# Biomass energy(1)

- **Currently, the biomass resources available each year equivalent to 330 million tons of standard coal ; In future 700-1,000 million tons of standard coal.**
- **2020 goals: Total generating capacity 30,000MW**



# Biomass energy (2)

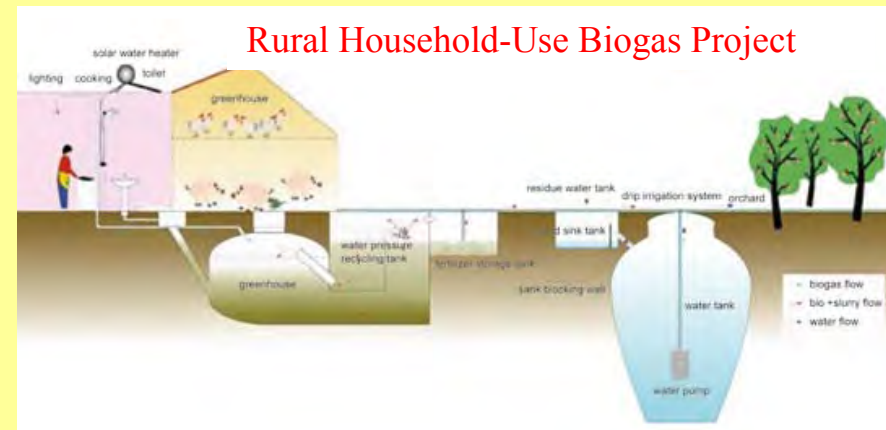
## ● Biomass gas

- Currently, 200 billion m<sup>3</sup> of equivalent biogas potentials, some 120 billion m<sup>3</sup> of equivalent natural gas.
- End 2008, 2,761 large-scale biogas projects developed

Yanqing 2 MW Biomass Gas Project in BJ



Rural Household-Use Biogas Project





# Biomass energy (3)

## ● Bio-liquid fuels

200,000 t/a Cassava Fuel Ethanol Project



Site of 70,000 t/a Bio-diesel Project in Longyan City, Fujian Province





# Biomass energy (4)

- **Concentrated utilization of urban and industrial biomass wastes**

200,000 t/a Cassava Fuel Ethanol Project



Site of 70,000 t/a Bio-diesel Project in Longyan City, Fujian Province





# Clean Coal (1)

- **Underground coal gasification technology**
  - industrial tests completed
  - a solid foundation for its industrialization and demonstration

The Ulanqab Gasification Station in Inner Mongolia





## Clean Coal (2)

- **CO<sub>2</sub> capture and sequestration technology for coal-fired power plants**
  - Major progress
  - Since 2006, 3 sets of demonstration installations
  - End 2009, Huaneng Group built a system which can capture 120,000 tons of CO<sub>2</sub> a year.

120,000 t/a CO<sub>2</sub> Capture Project in Shanghai





## Clean Coal (3)

- **Integrated gasification combined cycle (IGCC) power generation technology**

Coal Gasification System at  
Tianjin IGCC Power Plant

- In 2009, 250MW IGCC Demonstration Project has been approved





# Clean Coal (4)

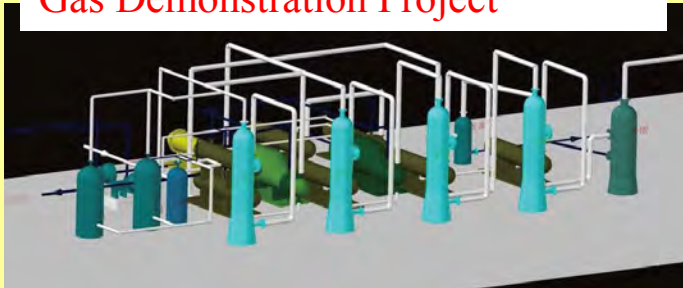
## ● Coal transformation technology

- Coal to olefin
- Coal to natural-gas
- Coal to oil

600,000 t/a Coal-To-Olefin (MTO)  
Industrial Installation



Key Coal Gasification and  
Methanation Technology  
Development and Coal-To-Natural  
Gas Demonstration Project



Direct Coal Liquefaction T e c h -  
R & D a n d Demonstration



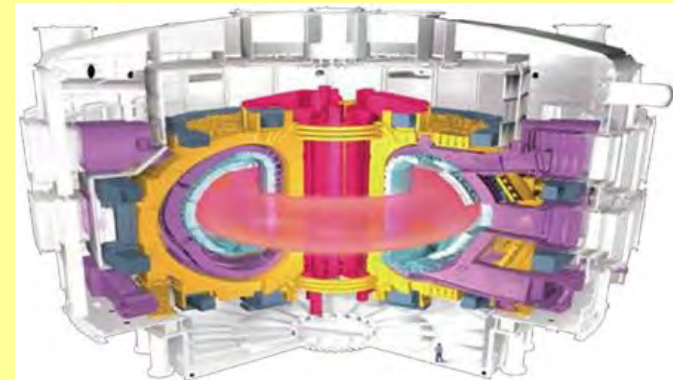




# Nuclear Energy

- the world's first AP1000 plant
- high temperature gas-cooled reactors, helium turbine technology, LMFBR technologies and so on
- By 2020, the ability independently for large-scale fusion power generation.

ITER Device Model





# Integrated Utilization in the BJ Olympic Game and SH Expo.

## ● Scientific Olympic Green Olympic



- PV generation systems, capacity over 600KW, saving 170 tons coal, reducing 570 tons CO<sub>2</sub> emissions
- solar semiconductor lights
- solar energy hot water system



- the Water Cube
- LED lights of 300-400KW power
- 60-67% electricity saving



- 595 new energy vehicles
- 3.714m Km mileage
- 4.4173m person-times passengers



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# Fruitful China-Italy S&T Cooperation

- **The China-Italy Government S&T Cooperation Agreement**
  - signed in October, 1978
  - 40+ Projects
  - 13 China-Italy S&T Mixed Commission
  - Major Fields: space, **environment, energy**, agriculture, biology, medicine....



# China-Italy Collaboration for Environment Protection (1)

- **85 projects since 2000**
- **Total 264 million Euro investments:**
  - ~200million Euro by Italy, 170million Euro by government, 25million Euro by enterprises
  - ~40million Euro by China
  - ~29million Euro by the third party



# China-Italy Collaboration for Environment Protection (2)

## ● Participated Parties

- Italy: Lead by Ministry of the Environment, Land and Sea
  - Institutions: CNR etc
  - Universities: Bologna, Turin, Venice, Pavia etc
  - the Mattei Foundation etc
  - enterprises tec
- China: Lead by Ministry of Environmental Protection
  - MOST, CASS, NDRC etc
  - Local governments: Beijing, Shanghai, Xi'an etc
  - Universities: Tsinghua, Tongji etc



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# China-Italy Collaboration for Environment Protection (3)

- 'Solar village' in Inner Mongolia



- Energy Saving Building in Tsinghua University







# China-Italy Collaboration for Environment Protection (4)

- **Exh. Of Env. Protection in China**

- **Oct. 2010**



- **Training program for senior civil servants and enterprise experts**





# Potential Cooperation

- **Symposium and Exhibition of China-Italy Energy-Environment Cooperation (2012)**
- **Solar Energy**
- **Wind Energy**
  - **LiDe ltd, Jiangxi**



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# Further Strengthen the China-Italy S&T Cooperation

- **Framework Agreement for China-Italy Innovation Cooperation( Nov. 2010)**

- P.M Wen visited Italy

- Signature ceremony





# Three Centers

- **China-Italy Technology Transfer Center**
  - April, 2011, Beijing
- **China-Italy Design and Innovation Center**
  - April 2011, Shanghai
- **China-Italy E-government Center**
  - Scheduled





# China-Italy Technology Transfer Center (1)

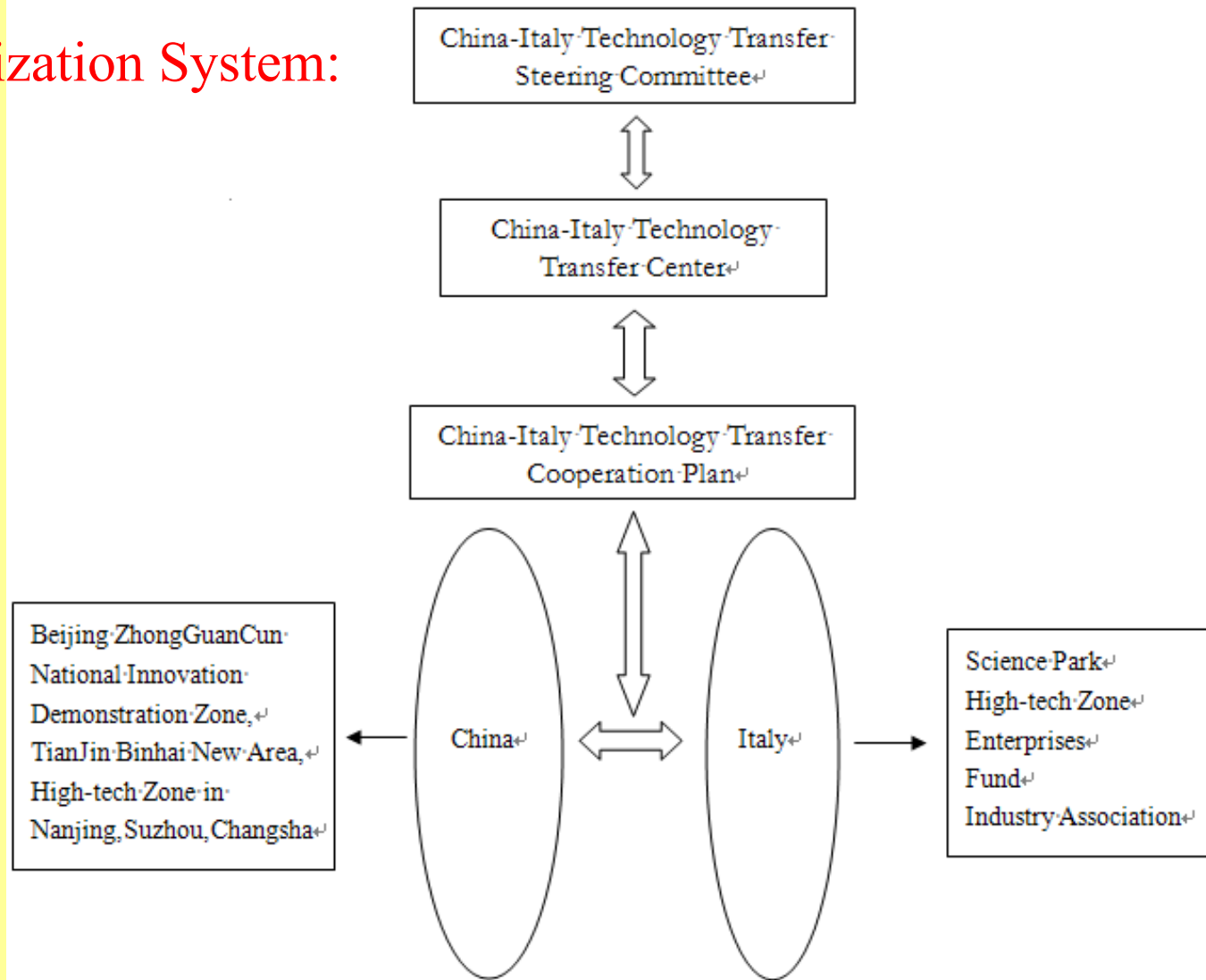
**Milestones: April 25th, 2011: officially announce the launch of the center**





# China-Italy Technology Transfer Center (2)

Organization System:





# China-Italy Technology Transfer Center (3)

## Four Main Functions

- **information sharing**
- **perfect matchmaking**
- **corresponding service**
- **soft landing**



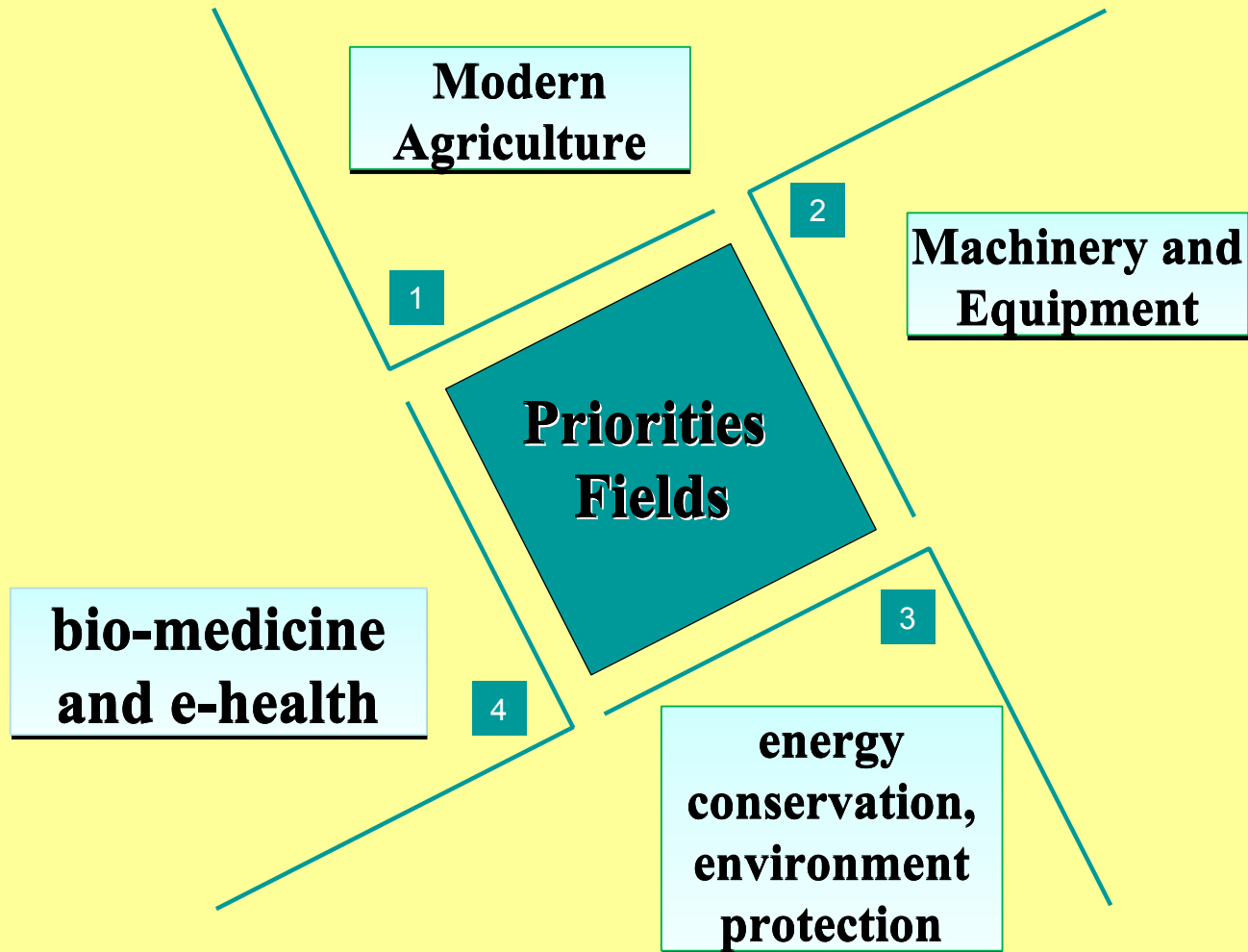
## Four Scope of Business

- **'information sharing' platform**
- **innovation resources 'perfect matchmaking' platform**
- **Tech. transfer 'corresponding service' platform**
- **China-Italy SMEs innovation incubation**





# China-Italy Technology Transfer Center (4)





# China-Italy Technology Transfer Center (5)

- **currently, depending on 'International Technology Transfer Network'**  
<http://en.bjittn.org/>
- **In the future, independent 'China-Italy Technology Transfer Network'**



# China-Italy Innovation Cooperation Conference (1)

- 1st conference, Nov. 2010, Rome





# China-Italy Innovation Cooperation Conference (2)

- **Oct. 20, 2011, in Nanjing**
- **Italian delegates: approx.100-150**
  - Officials from Ministry of Administration and Innovation
  - Researchers from universities and comprehensive R&D institutes, senior executives and experts from enterprises responsible for R&D innovation
  - Representatives from partners with Chinese enterprises
  - Representatives from science parks, technology transfer intermediaries



# China-Italy Innovation Cooperation Conference (3)

## ● Tentative Agenda

- Oct.19 (Wed.) : Registration  
Welcome Banquet
- Oct 20 (Thu.) : Innovation Cooperation Forum  
Morning: Opening Ceremony  
Keynote Speech  
Afternoon: Italy of Innovators  
Parallel Sessions
- Oct.21 (Fri.) : On-site visit in Jiangsu
- Oct.22 (Sat.) : Departure



# China-Italy Innovation Cooperation Conference (4)

## ● **Main activities**

### ● 4-6 Keynote speeches

- Strategy and planning on the S&T Development of China, etc
- Strength and priorities of Italian S&T development, etc
- Introduction of successful cooperation case

### ● Interactive Sessions

- Design and Originality, New Energy, Bio-tech and Medicine, Environmental Protection, Advanced Manufacturing

### ● On-site Visits

- highly-intensive hi-tech zones and R&D infrastructure in Jiangsu.





**Grazie!**

**谢 谢!**