Country Profile of Renewable Energy: China

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Agenda

- Country profile
- Strategic position of RE in China
- Status of RETs utilization in various sectors
- Incentive policy for RE development
- Impact of the RE Law
- R&D
- Plan and trends
Country profile

- Population 1.31 billion
- Area 960 million ha
- Total GDP 20,000 billion Yuan or = 2000 billion Euros
- TPS 2460 million tce
- GDP per capita 1500 Euro
- Energy use per capita, 1892 kgce, 2006
Strategic position of RE

- GDP growth over 10% from 2004-2006
- Energy consumption growth near 10% since 2000.
- 2.46 billion tce in 2006
- Facing pressure of energy security and global climate change
Strategic position of RE

- Triangle support to combat energy security
  - Efficient utilization of convention energy resource
  - International cooperation to improve the energy utilization technology
  - Encourage the development of new and renewable energy

- Two pathways towards sustainable development of energy
  - Renewable energy
  - Energy efficiency
Strategic Position of RE

- Share of RE in 2006
  - 0.93% within total energy consumption
  - Covers electricity, heating, gas, and bio-fuel

- RE portfolio in 2006 (hydro excl.)
  - Electricity 19.8%
  - Heating 73.9%
  - Bio-fuel 6.2%
Historical Share of RE in TPES
## RETS Market Against Sectors (2006)

### ELECTRICITY SECTOR

**Electricity generation: total renewables**

<table>
<thead>
<tr>
<th>Unit: TWh per year</th>
<th>429.63</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydro (TWh)</td>
<td>416.70</td>
</tr>
<tr>
<td>of which: Pumped Storage</td>
<td>na</td>
</tr>
<tr>
<td>Wind (GWh)</td>
<td>3868.00</td>
</tr>
<tr>
<td>Solar PV (GWh)</td>
<td>105.00</td>
</tr>
<tr>
<td>Solar Thermal (GWh)</td>
<td>0.00</td>
</tr>
<tr>
<td>Geothermal (GWh)</td>
<td>79.20</td>
</tr>
<tr>
<td>Biomass excl. CHP (GWh)</td>
<td>3891.25</td>
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<tr>
<td>Biomass CHP (GWh)</td>
<td>4968.0</td>
</tr>
<tr>
<td>Tide, Wave, Ocean (GWh)</td>
<td>18.0</td>
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</tbody>
</table>
RETS Market Against Sectors (2006)
Heating Sector

- Solar thermal (GWt): 66.50
- Geothermal (GWt): N/a
- Biomass heat: N/a
RETS Market Against Sectors (2006)

TRANSPORT SECTOR

Ethanol (million tons)  1.56

Biodiesel (million tons)  0.19
Key RE Policies

1. Renewable Energy Law of the People’s Republic of China (Adopted by the 14th meeting of the Standing Committee of the 10th NPC on Feb. 28, 2005)
Key RE Policies

11. Vehicle use Ethanol Gasoline GB 18351-2004
14. NDRC about Requirements of Management of Wind Farm projects, NDRC Energy No.〔2005〕1204
15. Interim Measures of Management of Land use of Wind Farm Construction Project and Environmental Protection, NDRC Energy No.〔2005〕1511
17. National Grid Company about Regulations of Connecting Wind Farm into the Power, Grid (tentative), National Grid Development No. [2006]779
Impacts of renewable energy law

- Current status of the law
- Impacts of the law
  - Market expansion
  - Investment involvement
  - Manufacture’s booming
  - International influence
Current status of law

- 12 regulations should be developed
- 10 of them have been issued
- Most important one
  - the price and cost sharing
  - National fund for RETs
- The rest one is taxation and favorite bank loan
Wind price in China

Before 2005: RMB 0.72/kWh
After 2005: RMB 0.47/kWh

CREIA
Good news for wind price

- Local is higher than the central government
  - 5 to 10 cents high
- Local approval more than control approval
  - One 25% is approval from central government
- Price bureau is conducting investigation for price system improvement
- The Vice Chair for price indicated that NDRC will gradually make right price system
Renewable market expansion

- **Wind**
  - 1337 MW to be added in one year
  - 2.6 GW accumulated
  - Ranked 6th in the world

- **Solar PV**
  - 1000 MW for capacity
  - 360 MW for real production
  - 7 companies listed in stock market

- **Solar thermal**
  - 100 million square meters have been installed, with annual production 10 million square meters
Investment involvement

- All the state owned large investor start into RETs
- Private sector involved slowly
  - Mainly in the solar and small hydro sectors
- International investment
  - mainly through the venture capital
  - FDI is limited
Manufacture booming

- 30+5 wind turbine manufactures are ready for production
  - Include GE, Vestas, Suzlon, Gamsa and other
  - Most of people believe that by 2010, the annual production of WTG will be over 5 GW

- More than 300 solar PV and more than 3000 solar collector manufactures
International influence

- China is not only for coal
- Renewable energy became playing some role
- International cooperation increased
  - USA discussed for supporting to set up RE lab
  - EU
    - set up a clean energy center
    - Open R&D for China
  - Australia
    - We have a lot in fast
    - What is the new?
Next step for the law improvement

- A national wide comments have been taken
- A annual review will be hold during 20\textsuperscript{th} of April
  - Every ministry will report to NPC for current status and next step
- Most concern by the investor is wind price
  - Continue to argue with the price bureau.
  - No any signal to change yet.
The new taxation law was just issued
- Energy efficiency, waste utilization has been put into the favorite taxation system
- Renewable is not yet, however, the taxation department indicated, renewable will sure be in the listed of low taxation system

Bank loan
- Most of the banks put renewable energy as investment priorities
- National development bank takes majority of the investment
Industrial support

- NDRC and MOF issued a paper
  - Supply subsided for localization of wind, solar
  - Support set up national test center for wind
  - Set up a national test wind farm for new turbine demonstration
  - Lunched a solar power demonstration in west desert areas and roof top in Beijing, Shanghai and other developed cities
Resources assessment & strategy

NDRC lunched program for national RETs resource assessment
- Wind map
- Biomass for power
- Biomass for liquid fuel

NDRC and National energy lead group
- Start a study for energy strategy for 2030 and beyond
R&D National Budget and Share

<table>
<thead>
<tr>
<th>Year</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
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</thead>
<tbody>
<tr>
<td>Budget (Million Yuan)</td>
<td>53</td>
<td>53</td>
<td>53</td>
<td>211</td>
<td>211</td>
<td>325</td>
</tr>
</tbody>
</table>
Plan & Trends

The chart illustrates the energy trends from 2006 to 2050. It shows the consumption of Electricity, Heating, and Liquid Fuel over the years. The chart is color-coded to differentiate between the three types of energy. The data points for each year are as follows:

- **2006**
  - Electricity: 1,688.2
  - Heating: 142.6
  - Liquid Fuel: 127.1

- **2020**
  - Electricity: 2,589.1
  - Heating: 289.4
  - Liquid Fuel: 74.7

- **2030**
  - Electricity: 9,240.0
  - Heating: 4,904.2
  - Liquid Fuel: 1,057.1

- **2050**
  - Electricity: 18,000.0
  - Heating: 9,407.7
  - Liquid Fuel: 3,470.7

The chart provides a visual representation of how energy consumption trends are expected to evolve over the next few decades.
Thanks

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