

Electricity and Regulatory Overview of China

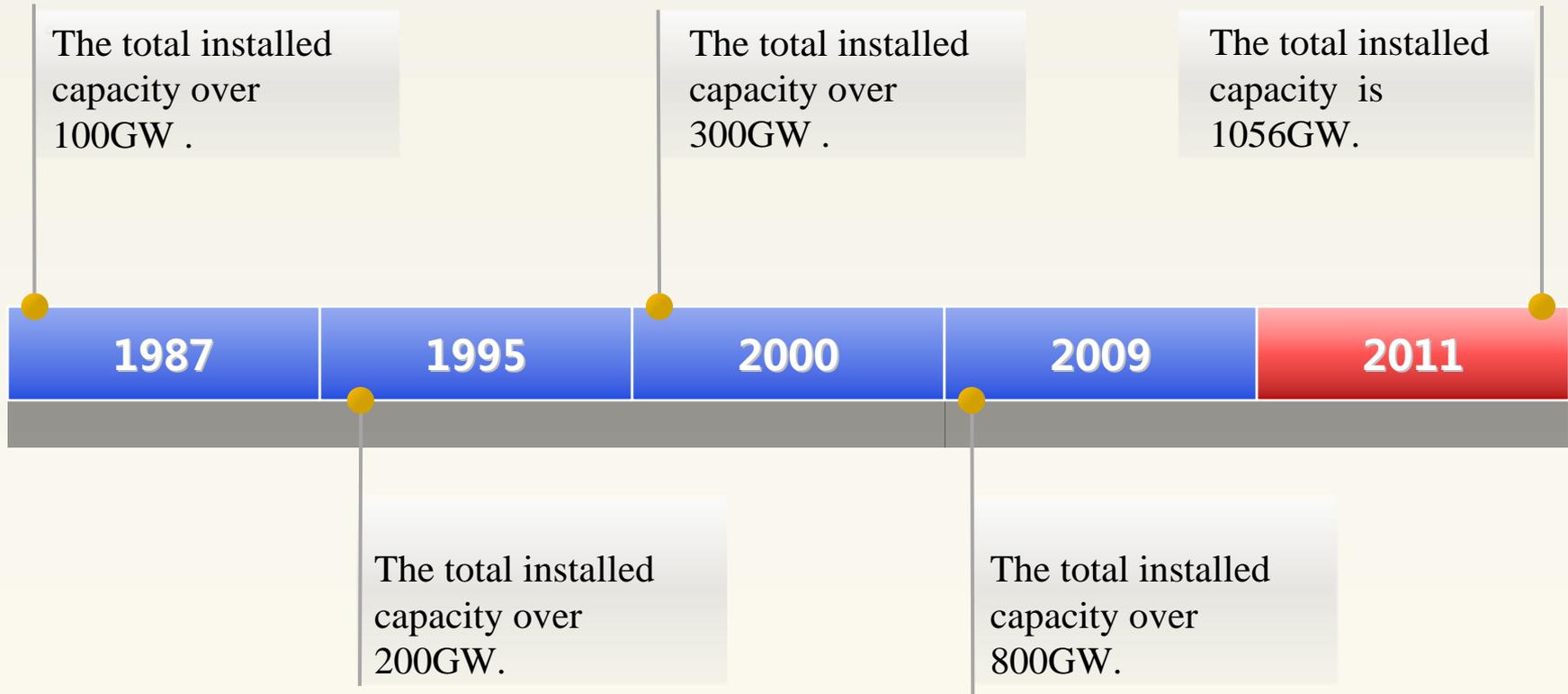
1st Aug. 2012, Washington D.C.
State Electricity Regulatory Commission of P.R.China

SERC

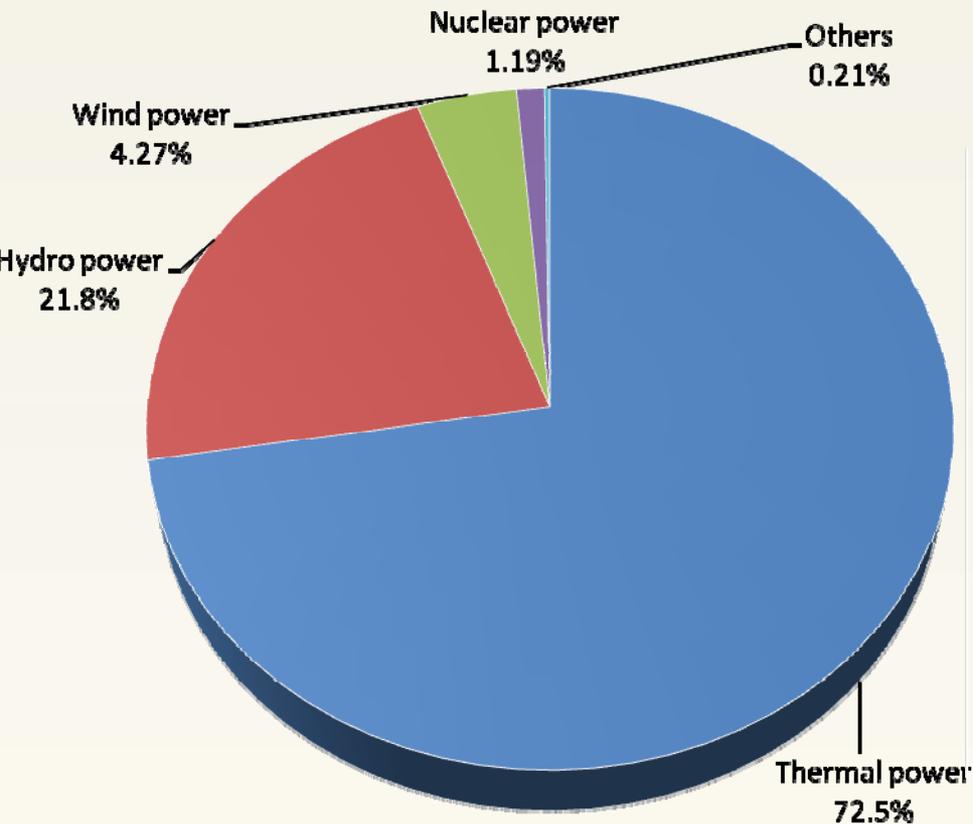
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Overview of Generation Development

(Data is about Mainland China ,same as below.)



Mix of Installed Capacity (by the end of 2011)

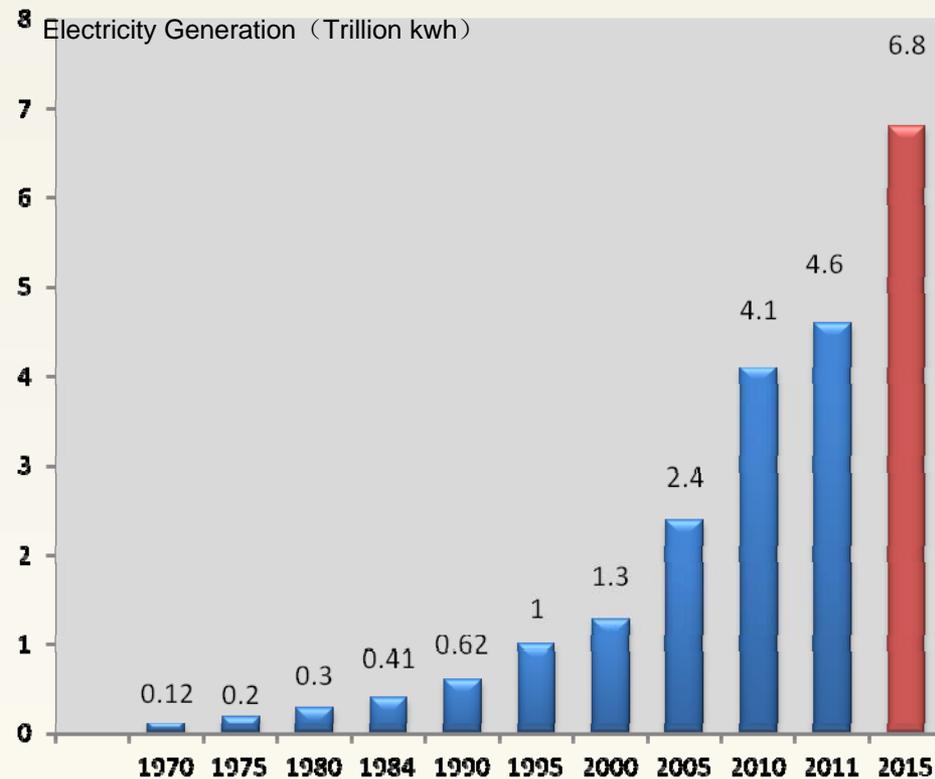


Keep improving the structure of power generation

The Chinese government attaches great importance to the improving the power generation structure, with the fast development of hydro, nuclear, wind power etc.

The percentage of conventional power generation installed capacity is slightly decreased.

Annual Amount of Electricity Generation



Fast Growth of Electricity Generation

At the year of 2011, annual amount is 4700Twh, with 11.7% increased. It is estimated 6800Twh in the year of 2015.

Electricity consumption per capita reach the average world-level

In 2005, annual electricity consumption per capita is 1894Kwh, and in 2011 3485Kwh.

Power Grid Construction

By the end of 2011, transmission line above 220kV is 480,000 kms, relative capacity is 2200GVA, which is the largest in the world.

The highest voltage-level of transmission line has reached to 1000kV.

1000kV Pilot AC Substation in Hubei Province



Conventional Generation

(Thermal Power)

- By the end of 2011, the thermal power installed capacity is 765GW,70% of which consist of units above 300MW. 38 units of 1000MW.
- 89% of thermal plants has been equipped with de-sulphuration,20% equipped with de-nitrogen.
- In 2011, the power supply coal consumption rate is 330 g.ce per kWh.



The power supply coal consumption



Nuclear Power

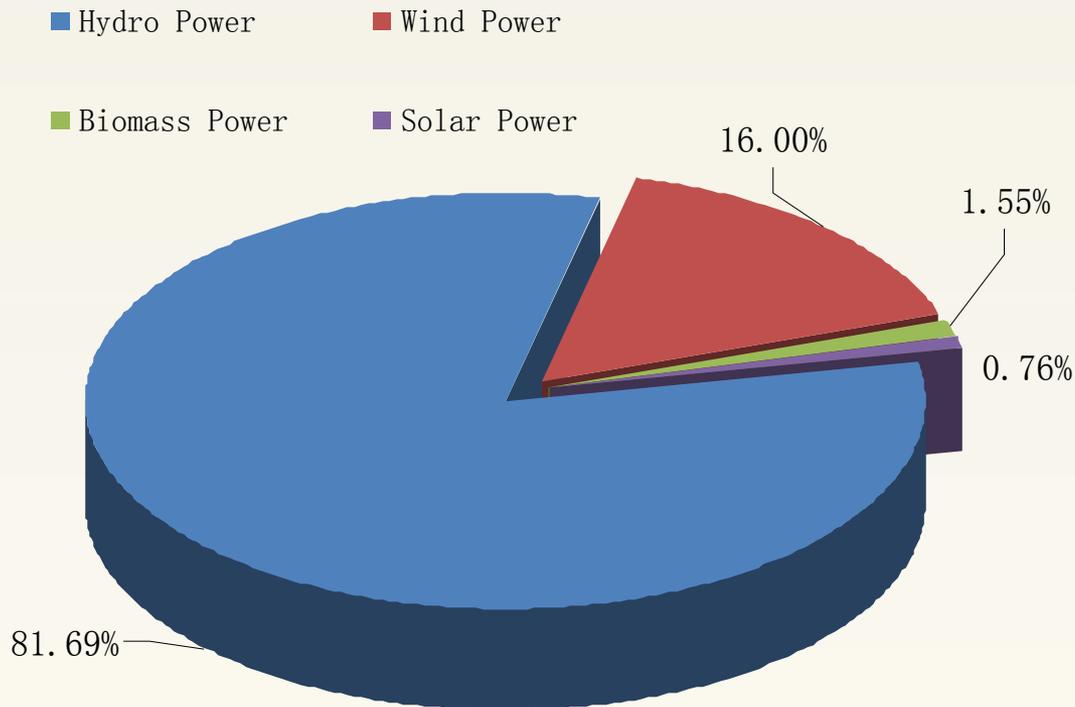
- By the end of 2011, the installed capacity is 11.9GW, and 29.24GW being under construction, which is 40% of the total in the world.
- The third-generation nuclear units are being constructed.



- After the Fukushima nuclear accident of Japan, the Chinese government started to comprehensive security inspection and evaluation for all the nuclear units constructed and under construction.

Renewable Energy

Structure of Renewable Energy Power

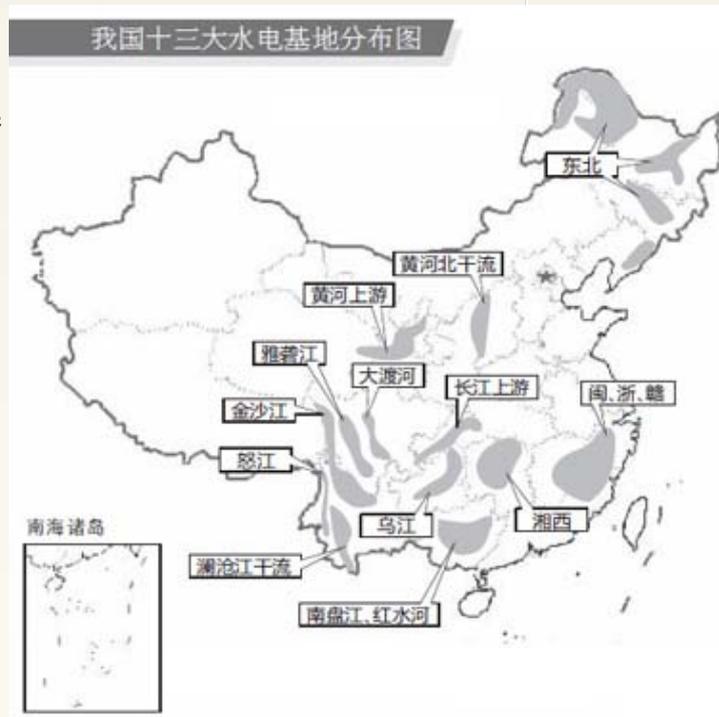


By the end of 2011, 282GW of total installed capacity.

Hydro Power

➤ By the end of 2011, the installed capacity is 230GW, 21.83% of the total; annual amount of generation is 690Twh, 14.03% of total.

➤ Imbalance of the hydro resource distribution, mainly in the south-west of China(70%), where 8 of 13 big hydro base are planned.



2006-2011 Generating Capacity

Year	Total generating capacity	Hydro power	Hydro power proportion
2006	62200	12857	20.67 %
2007	71329	14526	20.36%
2008	79253	17152	21.64%
2009	87407	19679	22.51 %
2010	96219	21340	22.18 %
2011	105576	23051	21.83 %

Wind Power

- By the end of 2011, 45GW of wind power has been commissioned.
- The installed capacity of 8 large wind power bases , mostly in the north-west of China, is 35.8GW so far, 71% of total wind capacity.
- Four benchmark prices for the wind power, i.e.0.51yuan/kWh, 0.54yuan/kWh, 0.58yuan/kWh, 0.61yuan/kWh, according the quality of wind resource.



The challenges:

- The large wind power bases are far from load centers, which are mostly along the east coast line.
- Difficulties for the grid to absorb all the wind power generation. The reasons are varied, such as the planning is not coordinated; lack of peak and off-peak load adjusting units; etc.
- Many safety issues. Such as standards of the connection to the grid, the technical requirements of the wind power equipments, wind power dispatching rules, and so on, need to be improved.

Solar Power

- By the end of 2011, 2140MW of photovoltaic power were connected to the grid.
- The annual production of photovoltaic cell is 4000MW, nearly 40% of the total production in the world.
- Set the benchmark price for 1~1.15 yuan/kWh.



- Financial support with up to 50%-70% of the cost of installation.

Renewable Energy Policy

Legislation

2005, *The Renewable Energy Act*
2007, *The Energy Conservation Act*
2010, *The Regulations on the full Procurement of the Renewable Energy by the Grid*

Planning

2007, *The Renewable Energy Mid and Long-term Development Plan*;
The 11st Five-year Plan for the Renewable Energy;
The 12th Five-year Plan for the Renewable Energy

Preferential Tax

Preferential tax policy for the PV generation company in the Income tax and add-value tax.

Financial incentives

The national renewable energy fund, etc.

Energy Saving and Emission Reduction (2005-2010)

Year	2005	2010
Power supply coal consumption rate (g.ce/KWh)	370	333
Grid Loss (%)	7.21	6.53
Generation water consumption rate (Kg/KWh)	3.10	2.45
SO2 emission (10 Kilo-Tans)	1350	956
Installed capacity with desulfurization (GW)	53	578
Solid waste utilization rate (%)	55.8	Fly ash 68.0%; desulfurization gypsum 69.0%

➤ Non-fossil generation increased from 454TWh in 2005 to 824TWh in 2011, i.e. increased by 81.6%.

➤ **Shut down 76.8GW of small thermal unit during 2005 to 2010.** Over 70% of thermal units are above 300MW so far.

➤ The coal-fired units are obligatory to install the desulfurization equipment. By 2011, nearly 90% of coal-fired units have done, which reduced the emission of SO₂ by 29.8% compared with the year 2005.

Energy Saving and Emission Reduction Targets (2011-2015)

- ◆ CO₂ emission per GDP decrease by 17%.
- ◆ The share of energy consumption of Non-fossil energy increases from 8.3% to 11.4%.
- ◆ Energy consumption per GDP decreases by 16%.
- ◆ Emission of the main pollutants decrease by 8-10%.

Targets in electricity sector

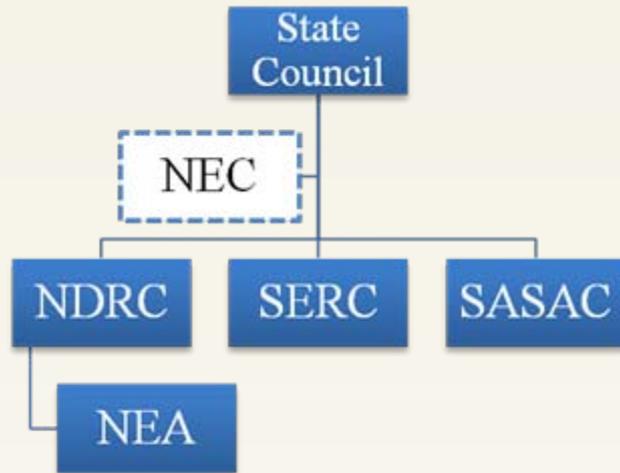
More non-fossil energy;
less coal consumption
rate; less grid loss etc.

To save 264 million tons of coal by 2015, to reduce 655 million tons of CO₂, 5.65 million tons of SO₂, and 2.48 million tons of NOX (Nitrogen Oxide) .

To save 273 million tons of coal by 2020 compared with 2015, to reduce 676 million tons of CO₂, 5.84 million tons of SO₂, and 2.56 million tons of NOX (Nitrogen Oxide) .

The Governmental Structure in Electric Power Sector

The Administrative departments of electric power Sector

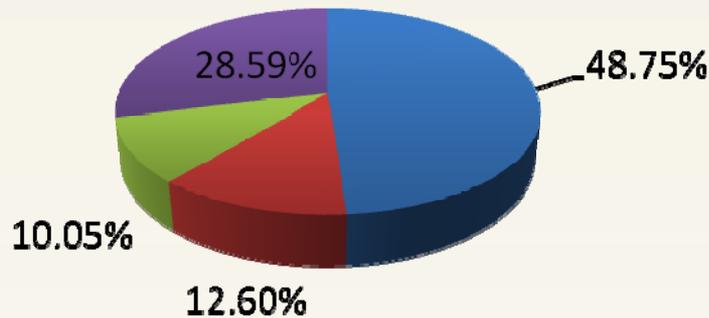


Power market



National Energy Commission (NEC)	Set up in 2010, to stipulate the energy strategy, to deliberate the big issues on energy security, to coordinate the important matters of energy development etc.
National Development and Reform Commission (NDRC)	Set up in 2003, to set the price of the energy
National Energy Administration (NEA)	Set up in 2008, to stipulate the energy developing policy, plan, and strategy etc, to approve the energy projects.
State Electricity Regulatory Commission (SERC)	Set up in 2003, empowered by the State Council, to perform administrative and regulatory duties.
State-owned Assets Supervision and Administration Commission (SASAC)	Set up in 2003, to supervise the state-assets

Market Structure—Power Generation Companies



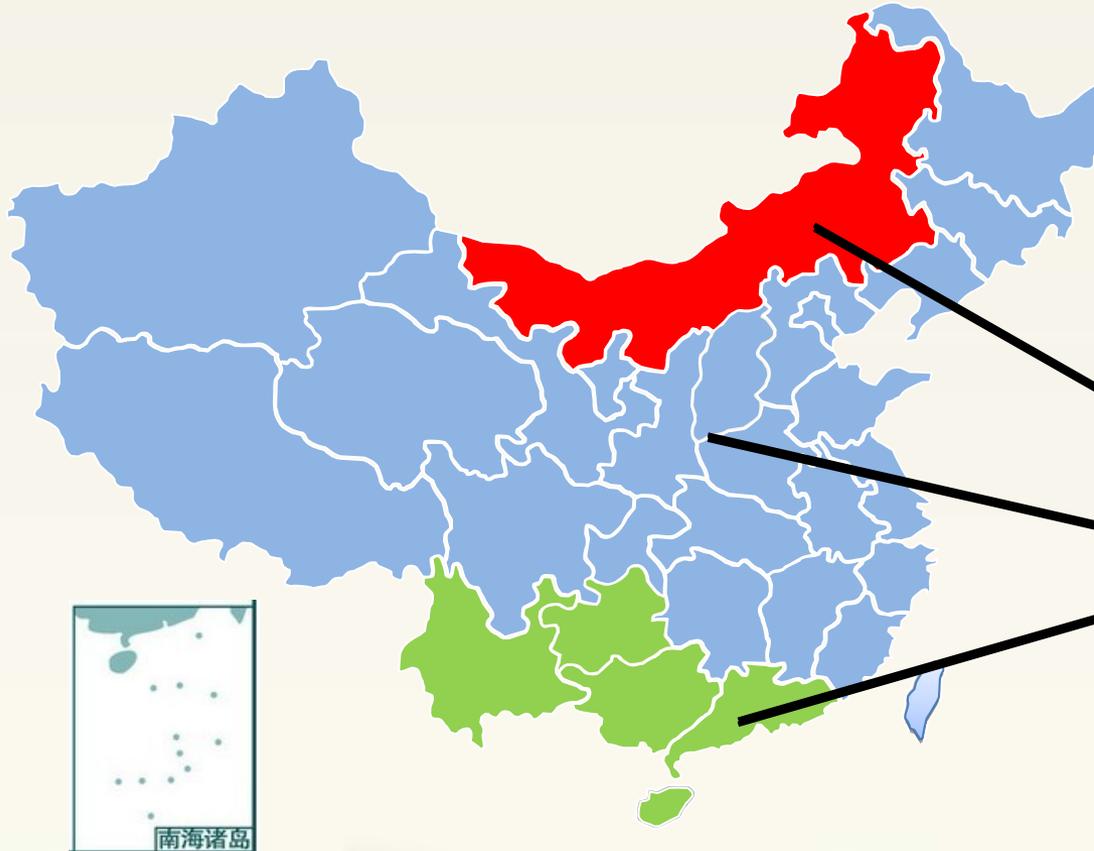
- The 5 major power groups
- Central Electricity Generating Company
- Local power company
- Others

The 5 major national power groups	Huaneng. Datang. Huadian. Guodian. Zhongdiantou. which capacity is 515GW, 48.75% of total.
Other 6 Central Electricity Generation Companies	Shenhua, Three-Gorge, Huarun, etc. which capacity is 133GW, 12.6% of total.
Local power companies	15 local power companies owned by the provincial governments, which capacity is about 106GW.
Others	28.59% of total

Market Structure—Power Grid Corps

39 transmission companies, among which 5 regional companies and 32 provincial companies.

3171 distribution companies, among which 431 municipal companies, and 2740 county companies.



Inner Mongolia Electric Power (Group) Co., Ltd	Owned by the inner Mongolia government
China State Grid Corp	National state-owned company, serves 26 provinces.
Southern Power Grid Corp	National state-owned company, serves 5 provinces

Market Structure — Others



Dispatching Centers
Trading Centers

Five-level dispatching systems, which include state-level, region-level, province-level, municipal level, county-level. All under power grid companies.



Customers

230 millions of customers in total, among which 2 millions of customers with 10kV or above voltage-level and 315kVA or above in capacity.

The Organizational Structure of SERC

Chairman
3 Vice
Chairmen

- **Operational Departments**

- General Office
- Policy and Regulations
- Market Supervision
- Transmission Supervision
- Power Supply Supervision
- Price and Finance Supervision
- Safety Supervision

- **Support Centers**

- Information Center
- Dam Safety Supervision Center
- Reliability Management Center
- License Management Center

- **Agency of Region**

- 6 Regional Branches
- 12 Provincial Branches

The Main Duties of SERC

- Formulate regulatory rules for the sector.

Legislation



- To recommend on power sector reform and to implement.

Reform



- To supervise and administer over the safety of electricity
- To investigate the major accidents

Safety



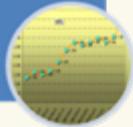
- To issue license
- To develop market rules and to make enforcement ,
- To regulate the market.

Market



- To set or assist to set the tariff
- To supervise and review the tariff and Forward price adjustment suggestion.

Pricing



- To supervise the implementation of the policies of general service.

Service



- To investigate violation of laws and regulations
- To handle the disputes.

Enforcement



- To supervise the implement of policies of energy saving & emission reduction

Energy Conservation



The Main Works of Electricity Regulation

Electricity Safety Supervision

- To draft 《The Regulations on Emergency Handling, Investigation, and Treatment with Major Power Accidents》 .
- To reinforce the supervision of the wind power safety ,such as investigation on the wind power plants and manufactories , to carry out the safety evaluation for the wind farm , etc.
- To carry out the investigations on the electric systems of the nuclear power stations.

The Main Works of Electricity Regulation

Market Regulation

- More requirements of the entry to the markets with regard to the power plants. Desulfurization equipment is necessary for the power plants to get the license.
- To organize the large customers to purchase the energy directly from the generation companies.
- To organize the inter-province & inter-region power trades.
- To organize the compensation for power plants which provide the ancillary services.

The Main Works of Electricity Regulation

Pricing & Finance Regulation

- To stipulate rules for the transmission & distribution costs regulation.
- To examine & approve the inter-region transmission corridors' tariff.
- To check & review the tariff of the on-grid, transmission and retail, to make recommendations to the governmental agencies.

The Main Works of Electricity Regulation

Power Supply Regulation

- To carry out the special regulation with regard to the power supply ability and quality for the residential customers , to ensure the grid companies offer qualified services to the customers.
- To supervise the power supply reliability , to monitor the power outage across China , and supervise & urge the grid companies to ensure the non-interruptive power supply.
- To manage the complaints of customers, and to handle all sorts of complaints.

THANK YOU!

SERC

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