

The Current situation of China's Electric Power Industry

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Overview

Since 1994, China's electric power industry has seen a considerable transformation. An Electric Power Law was put in force April 1996. This was a major event in China's electric power history. The new law promotes the development of the electric power industry, protects legal rights of investors, managers and consumers, and regulates generation, distribution and consumption.

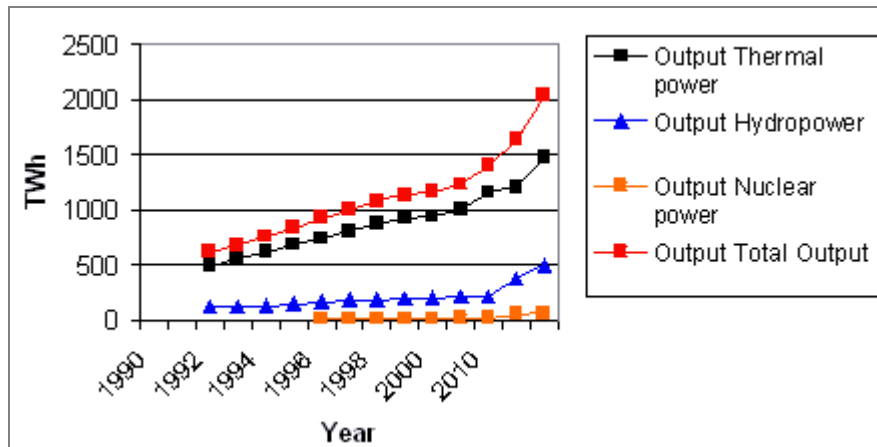
Before electricity supply was managed by electric power bureaus of the provinces and cities by administrative agents. Now utilities have been changed into companies outside of administration. It is expected that the municipal electric power companies will be divided into electric power generating and electric power supply companies. A policy of competition between the different generators will be implemented in the next years .

China's electric power industry continuously maintains a high growth rate. By the end of 2000, the total installed power was 315 GW, that means an increase of 16,5 GW or 5.5% compared to 1999. Hydropower amounted to 77 GW, accounting for 15 %; thermal power amounted to 235 GW, accounting for 83 %.and nuclear power amounted to 2GW, accounting for 1 % of installed capacity. Electricity generation reached 1400 TWh, 13.5 % more than in the previous year. In 1999, the construction investment of the electric power industry reached 14 billion US dollars, of which 49.3 % were dedicated to thermal power, 12.5 % to hydropower 6.4 % to nuclear 26.1 %, to transmission lines and transformers and 5.7 %.to other investments.

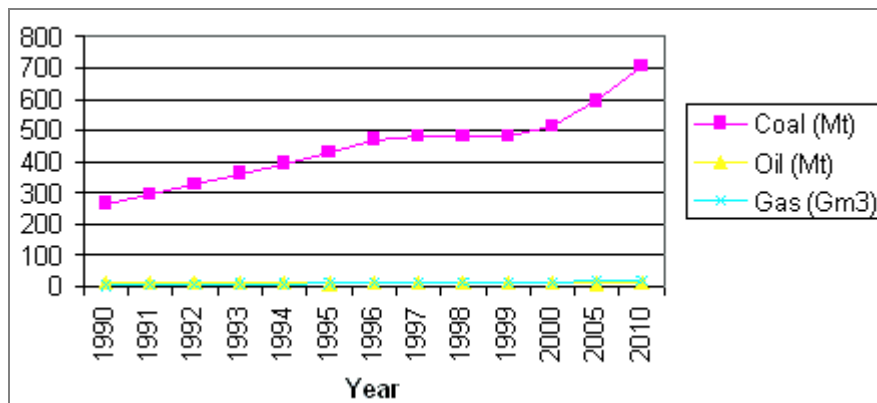
By the end of 2010, it is expected that the total installed capacity will reach 500 GW. Annual generation of electricity will exceed 2040 TWh. Figure 1 shows the expected contributions of different sources to this production.

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China's Electric Power Production



China's Fuel Consumption for Thermal Power Generation



Electricity Demand and supply

In 2000, the total installed capacity of electric equipment for final use was over 2 times larger than the total generating capacity. The national electricity consumption was 1400 TWh of which, 166TWh was consumed by households, accounting for 12 %, increased by 13 % compared to the previous year; 1078 TWh was consumed by industry, accounting for 77 %, increased by 22 %; 68 TWh was consumed by agriculture, accounting for 5 %, increased by 30 %; 87TWh was consumed by service industry, accounting for 6 %, decreased by 33 %.

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In 2000, the main features of electric demand and supply were as follows:

- Power demand growth rates unbalanced in different regions, this led to great differences in power generation growth in different networks.
- Load factor being decreased for some networks.
- Electricity quality being improved.
- Investment for upgrading rural networks increasing by a large margin and the same electric price policy of rural areas and cities being implemented.
- Conflicts between power supply and demands being serious at peak period.
- Electricity consumption per capita still being low. In 2000, the national installed capacity per person was only 0.24kW, increasing by 0.003 kW over the previous year, consumption per capita was 1069 kWh, 90 kWh more than 1999.

Development direction of China's electric power industry

1. China prioritizes to develop hydropower, especially in the southwest of China. Since 1990's, newly added hydropower installed capacity has grown greatly. At present, there are many large sized hydropower stations under construction. At the end of 1999, 36GW of hydropower were under construction, of which, the Three Gorges was 18GW. Other large sized hydropower projects amounted to 8 GW, medium and small hydropower projects amounted to 10 GW.
2. Thermal power plants will account for three-fourth of the newly added capacity in the future. Coal will still be the major fuel source for these plants. A certain amount of imported fuel oil and liquefied natural gas will feed the thermal power stations in the coastal areas with booming economic development.
The future development is to construct a number of large thermal power plants near the coal mine areas.
A number of large thermal power plants will also be constructed in the concentrated area along the coast, near the sea and/or at railway junctions.
The low and medium pressure thermal power units as well as the units beyond their normal service life will be rehabilitated or substituted with large units, in order to reduce fuel consumption and to improve the environment. Research, development and demonstration of clean coal technology shall be carried out, including integrated gasification combined cycle generation, fluidized bed combustion, low NO_x combustors and flue gas treatment techniques.

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Co-generation will be encouraged at places where concentrated thermal loads are located. A small number of gas turbines and gas-steam combined cycle units will be installed in the coastal areas.

3. China possesses nuclear fuel resources and nuclear technical forces. In east China, south China and the coastal area of northeast China, where serious energy shortage occurs, while economy is well developed, nuclear power is considered an appropriate solution to improve the local energy supply.

There are two nuclear power stations (2.1GW) in operation and 4 nuclear power stations (6.6 GW) under construction.

Rural electrification

Chinese government pays great attentions to the development of rural electrification. At the beginning of 1990s, the government proclaimed the principle of 'the power industry should serve for agriculture, for the farm and for rural economy'. By the end of 1994, the former Ministry of Electric Power Industry (MOEP) made further arrangements, in order to alleviate unreasonable traffic burden of farmers, MOEP began to rectify the rural traffic, made it to reach a reasonable level, and to improve reliability of peasants' domestic power supply.

By the end of 1996, the percentage of household with access of electricity amounted to 94.7 %, and 11 counties and 72 million residents throughout the country remained no electricity.

In June 1998, Chinese government authorized the project of the construction and upgrading for rural networks of 2,400 counties, with the total investment of 23 billion US dollars. It is expected that the project will be completed at the end of 2001. After the project completely finished, 11 counties originally with no electricity will have access to electricity, the percentage of household with access of electricity will amount to 98 %.

For the households with no electricity in remote regions, the government encourages farmers to exploit and use new and renewable energy, such as micro hydropower, solar energy, wind energy, geothermal energy and biomass energy, simultaneously, will give a subsidy to a certain degree and loan on favorable terms for the households in remote regions.

At present, there are 14 electric networks in China with the capacity over 1 GW. The largest is the East China power system, with a system capacity of 31.67 GW; Central China, North China and Northeast China electric networks each exceed 25 GW, reaches 27.60 GW, 27.15 GW, 26.53 GW respectively;

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Guangdong, Shangdong, Northwest and Sichuan electric networks each exceed 10 GW, reaches 19.0 GW, 11.25 GW, 11.48 GW and 10.9 GW respectively.

The total installed capacity of 14 above mentioned power system was 184.12 GW, and their annual generation was 890.2 TWh, accounted 92% and 95% of the national total respectively.

Now China's networks are not connected completely with each other. The State Electric Power Company has made a plan to connect the networks in 2001; it will invest 72.5 billion US dollars during 2000-2005, of which 43.5 billion US dollars is networks construction and upgrading. At the end of 2005, China's networks will be integrated except Tibet, Hainan and Xinjiang networks.

In 1994, the average power price of electric power companies was 26.63 US dollars/MWh. The highest was 55.80 US dollars/MWh, in Hainan provincial power and 47.15 US dollars/MWh in Guangdong power province. The lowest was only 14.01 US dollars/MWh in Qinghai province.

The price bureau of municipal or provincial government fixes the power price, the basic principles of fixing the power price depend on three factors---costs of power generation and transmission and distribution; local living standard; and market demand. In a city, the power price is different for different final users; for example, in 2000, Chonqing's average power price was 77.15 US dollars/MWh, agriculture 52 US dollars/MWh, second industry 60.46 US dollars/MWh, service sector 133.01 US dollars/MWh, farmer household 67.71 US dollars/MWh, city household and office 72.55 US dollars/MWh.

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