

## Building Energy Efficiency in China

The total quantity of energy consumption in building is rather high, with low energy efficiency and serious pollution. It has become a main obstacle which seriously influences our sustainable development.

1. The **new building** area in urban area is about 0.7 billion m<sup>2</sup> each year, and it is about 1.6 billion m<sup>2</sup> if we include the buildings in rural area. It results in the dramatic increasing in energy consumption. For example, in 2001 the total increased capacity of air conditioners in building is beyond the total electricity capacity of Three Gorges Dam.

2. The total **existing building** is a large part, which is about 37 billion m<sup>2</sup> in 2002. According to statistic data, the energy consumed in building sector is about 0.358 billion tons standard coal, which is about 27.45% of the energy consumption of the total end use. According to the experience from developed countries, with the development of urbanization and improvement of living quality, the proportion will still increase up to about 35%.

3. **Energy efficiency is rather low**; the energy consumption per square meter is 1.5-3 times compared with developed countries. Thus, result in the heavy environmental pollution, for example, CO<sub>2</sub>, greenhouse gas discharged by building, accounts for 25% of the total. For instance, the average energy consumption for heating per square meter in Beijing is 30.1 W/m<sup>2</sup> before the energy efficiency standard is implemented, and is 20.6 W/m<sup>2</sup> after it is implemented. However it is only 11 W/m<sup>2</sup> in Sweden, Denmark, and Finland with the same climate. Because of the high energy consumption, thousand tons of coal is wasted in heating area, the direct loss is about 7 billion RMB, and about 52 million tons of CO<sub>2</sub> are emitted.

4. From 1986 to 2003, series of **energy conservation standards** are developed. Followings are energy conservation standards, which have been issued:

- 《Energy conservation design standard for new heating residential buildings》 (JGJ26-86)
- 《Energy conservation design standard for new heating residential buildings》 (JGJ26-95)
- 《Energy conservation test standard for heating residential buildings》 (JGJ132-2001)
- 《Technical Specification for energy conservation Renovation of existing heating residential building》 (JGJ129-2000)
- 《Design Standard for energy efficiency of residential Buildings in Hot summer and cold winter zone》 (JGJ134-2001)
- 《Design Standard for energy efficiency of residential Buildings in Hot summer and warm winter zone》 (JGJ75-2003)
- 《Thermal performance and air conditioning energy conservation design standard for hotel》 (GB50189-93)
- 《Thermal design code for civil building》 (GB50176-93)

- 《lighting design standard for residential buildings》 (GBJ133-90)

Follows are energy conservation standards, which are under developing:

- 《Energy conservation design standard for non-residential buildings》
- 《Lighting energy conservation standard for civil building》

#### **5. International Cooperation**

- Sino-Canada Building energy efficiency Program
- US-EF Incentive Policy for Building Energy Efficiency
- UNDP/GEF End user energy efficiency program
- WB/GEF China: Heating reform and building energy efficiency