

# Information Expansion about energy codes in China

## 1. Overall perception of green energy-efficient buildings

Recommended to read this standard to know the main concerns of green energy-efficient buildings in China.

- “Assessment standard for green building” (GB/T 50378—2019) [English version]

Links to the document:

[https://www.mohurd.gov.cn/gongkai/fdzdgknr/zfhcxjsbwj/202107/20210730\\_761399.html](https://www.mohurd.gov.cn/gongkai/fdzdgknr/zfhcxjsbwj/202107/20210730_761399.html)

See website attachment.

## 2. Domestic and Shanghai building design standards in Chinese version

Specific design standards for buildings are given in detail in the following documents.

- “Green design standard for public buildings” (DGJ08-2143-2021)

Links to the document: [https://zjw.sh.gov.cn/xxbz/index\\_3.html](https://zjw.sh.gov.cn/xxbz/index_3.html) See website attachment.

- “Design standard for energy efficiency of public buildings” (GB 50189-2015)

Links to the document: <http://www.jianbiaoku.com/webarbs/book/73810/1628137.shtml> See website online document.

- “General code for energy efficiency and renewable energy application in buildings” (GB 55015-2021)

Links to the document:

[https://www.mohurd.gov.cn/gongkai/fdzdgknr/zfhcxjsbwj/202110/20211013\\_762460.html](https://www.mohurd.gov.cn/gongkai/fdzdgknr/zfhcxjsbwj/202110/20211013_762460.html)

See website attachment.

## 3. Overview of the current situation of energy-efficient buildings in China

Information on building energy consumption levels is obtained from design limits and energy consumption reports. The following data is only used as a reference for general building energy consumption levels in China. Actual energy consumption level in this competition should follow the actual situation.

### 3.1 According to the design limits

- Standard for energy consumption of building (GB/T 51161-2016)

Links to the document: <https://www.soujianzhu.cn/NormAndRules/NormContent.aspx?id=753>

See website online document.

This standard applies to the management of energy consumption in the operation of civil buildings. Two indicators are given in this standard which are constraint value of energy consumption indicator and leading value of energy consumption indicator. When the actual energy consumption is higher than constraint value of energy consumption indicator, it means that the energy consumption of the building is high and needs energy-saving renovation. When

the actual energy consumption is between the constraint value and the leading value, it means that the energy consumption of the building is at a normal level. When the actual energy consumption is lower than the leading value, it means that the building is an energy-saving building.

For the office building in Shanghai area, constraint value of total energy consumption indicator is 85 kW·h / (m<sup>2</sup>·a) and leading value of total energy consumption indicator is 70 kW·h / (m<sup>2</sup>·a), as shown in the table below.

Table 5.2.1 Constraint value and Leading value of energy consumption indicators for office buildings[kW·h / (m<sup>2</sup>·a)]

| Building Type |                                | Severe cold and cold zone |                  | Hot-summer and cold-winter zone |               | Hot-summer and warm-winter zone |               | Warm zone        |               |
|---------------|--------------------------------|---------------------------|------------------|---------------------------------|---------------|---------------------------------|---------------|------------------|---------------|
|               |                                | constraint value          | constraint value | constraint value                | leading value | constraint value                | leading value | constraint value | leading value |
| A             | Institutional office buildings | 55                        | 45               | 70                              | 55            | 65                              | 50            | 50               | 40            |
|               | Commercial office buildings    | 65                        | 55               | 85                              | 70            | 80                              | 65            | 65               | 50            |
| B             | Institutional office buildings | 70                        | 50               | 90                              | 65            | 80                              | 60            | 60               | 45            |
|               | Commercial office buildings    | 80                        | 60               | 110                             | 80            | 100                             | 75            | 70               | 55            |

- **Technical standard for nearly zero energy buildings (GB/T 51350-2019)**

Links to the document:

<https://www.soujianzhu.cn/NormAndRules/NormContent.aspx?id=1035> See website online document.

According to the standard, public nearly zero energy buildings in Shanghai should have a renewable energy utilization rate of more than 10%. In addition, the appendix B of the standard shows that the equivalent power consumption value ranges from 22~57 kW·h / (m<sup>2</sup>·a).

Table B.0.2 Equivalent power consumption value of public nearly zero energy buildings (kW·h / (m<sup>2</sup>·a))

| City      | Small office | Large office | Small hotel | Large hotel | Shopping Mall | Hospital | School Building-Academic Building | School Building-Library |
|-----------|--------------|--------------|-------------|-------------|---------------|----------|-----------------------------------|-------------------------|
| Harbin    | 24           | 29           | 26          | 32          | 43            | 46       | 24                                | 25                      |
| Shenyang  | 22           | 27           | 26          | 31          | 44            | 44       | 24                                | 24                      |
| Beijing   | 23           | 28           | 27          | 33          | 49            | 47       | 28                                | 25                      |
| Zhumadian | 22           | 29           | 29          | 35          | 54            | 49       | 31                                | 27                      |
| Shanghai  | 22           | 30           | 30          | 37          | 57            | 52       | 34                                | 28                      |
| Wuhan     | 21           | 29           | 30          | 35          | 57            | 50       | 31                                | 27                      |
| Chengdu   | 21           | 29           | 29          | 34          | 57            | 52       | 33                                | 28                      |

|           |    |    |    |    |    |    |    |    |
|-----------|----|----|----|----|----|----|----|----|
| Shaoguan  | 23 | 32 | 33 | 40 | 66 | 57 | 38 | 31 |
| Guangzhou | 25 | 35 | 37 | 46 | 76 | 66 | 43 | 36 |
| Kunming   | 16 | 22 | 23 | 26 | 43 | 40 | 21 | 21 |

Note: A) The data in the table are the calculation results of typical buildings using IBE's near-zero energy building design and evaluation tool. Due to the large differences in actual building functions and building forms, the data in the table are not used as evaluation values for nearly zero-energy public buildings, but only as a reference in the design process.

B) The data in the table are calculated on the basis of typical building models, in which small office buildings and small hotel buildings are panel buildings with a floor area of less than 10,000m<sup>2</sup>. Other types of buildings are typical buildings with a floor area of more than 20,000m<sup>2</sup>.

C) The data in the table are the equivalent power consumption value of heating, air conditioning, ventilation, lighting, domestic hot water, elevators and renewable energy systems, which converts the energy consumption values of various energy types into the energy consumption of electric power kWh.

### 3.2 According to actual energy consumption reports

- **China Building Energy Efficiency Annual Development Research Report 2022 (Public Buildings Topic)**

ISBN: 9787112271948

According to the China Building Energy Consumption Development Report, China's public buildings consumed 24.7kgce/m<sup>2</sup> in 2020 and small volume office buildings consumed 60kW·h/m<sup>2</sup>.

