

## Jixian Marriott Hotel

### Introduction of “Green and Low-Carbon” Theme

#### 1. Hotel Overview

Jixian Marriott Hotel, invested and developed by Tianjin Saint Light Investment Group, is located inside a national 5A scenic spot-- the tourism and leisure area planned by Jixian County, with a breathtaking natural beauty. This project is in the south of Dongtong Jingguan Road, which makes the transportation convenient, and close to the Fujunshan Park with a northern sight of mountains and overlooking Cuiping Lake. The land area for this six-story hotel, with its five stories above and one under the ground, is 43943.54m<sup>2</sup>, while 56756.62 m<sup>2</sup> for the building area. The height of the hotel is 23.95m, and the greening rate is 43.7%. The main functional area includes guest rooms, conference rooms, banquet hall, restaurant, swimming pool, hot spring pools and gym.



#### 1.1. The Three-Star Certificate of Green Building Design Label by Ministry of Housing and Urban-Rural Development

In May 2012, the hotel won the Three-Star Green Building Design evaluation certification from Ministry of Housing and Urban-Rural Development, and has been awarded with a certificate.

#### 1.2. National Green Building Innovation Award

In 2013, the hotel won the National Green Building Innovation Award.

### 1.3. First “Low Carbon Theme Hotel” in China with “carbon footprint” recording system



## 2. Low Carbon Theme

### 2.1. Carbon emissions

According to the annual report of China Building Energy and the data released by National Tourism Bureau, the annual power consumption per unit area of state office buildings and large public buildings reaches 70 ~ 300kWh, which is 10

to 20 times of ordinary residential buildings. As to hotel building, the annual power consumption per unit area lies in the range of 63.8 to 222.4kWh, with an average value of 104.6 kW. The higher the star-level is, the more energy consumed. This hotel gives top priority to energy planning, and uses green building technologies including optimal design of building envelope, recycling of Lithium Bromide direct-fired machine’s fuel gas and waste heat, solar water heating system, adjustable shading, green lighting design etc. The carbon emission of this hotel is 348.9 tons, with the energy consumption reduced by 21%.



### 2.2. Carbon neutralization plan

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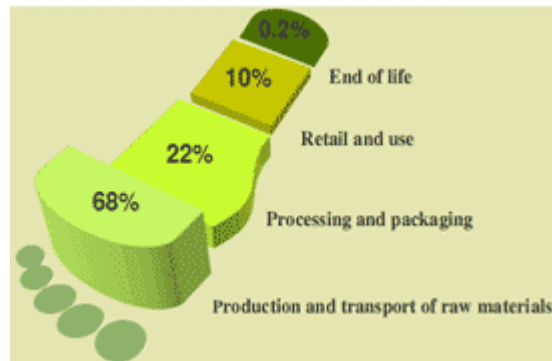


Carbon offset can be achieved by the balance between the CO<sub>2</sub> emissions and CO<sub>2</sub> absorption by trees and other ways for environmental protection objectives. For this reason, governments all around the world now take greening as a primary approach. In order to achieve the carbon neutral plan, this hotel

introduces tree planting with donation from the environmentalists, whom the trees are named after, and hires a third-party afforestation company to ensure the implementation of planting plan.

### 2.3. Carbon footprint activities

The Carbon Footprint records guests' CO<sub>2</sub> emissions for all events happened in the hotel. It starts at the moment of check in and ends at check out. Every activity of the guest can be traced by the key card, and the reduction in CO<sub>2</sub> emission by guest in this "low-carbon theme hotel" can be achieved by a calculation of CO<sub>2</sub> emission and printed out.



## 3. Three-Star Green Building Technology

### 3.1. Building envelope

Wall insulation: 50mm EPS+40mm Aerated concrete block, heat transfer coefficient 0.42W/m<sup>2</sup>K

External window: Three layer toughened glass plastic steel window (5+6A+5+6A+5), Heat transfer coefficient 2.00W/m<sup>2</sup>K

External shading: Blinds are set on the east, west and south-facing windows for the 3<sup>rd</sup> and 4<sup>th</sup> floor to reduce solar radiation

Energy simulation indicates that the actual annual energy consumption can be reduced to 72.05% of the reference hotel

### 3.2. Efficient air conditioning system

Central air conditioning system, with a source of direct-fired lithium bromide unit, is adopted for cooling in summer and heating in winter. To achieve higher indoor comfort index, floor heating is used in winter.

### 3.3. Energy-efficient lighting

The lamps in the guest room mainly use T5 fluorescent lamps which are energy-saving and highly light-efficient compared with T8 fluorescent lamps.

### 3.4. Energy-saving equipment

Low-loss projector, in-room refrigerators and television sets are all energy-efficient products.

### 3.5. The use of non-traditional water sources

There is a recycle water station in the hotel. The source water is collected from bath rooms and swimming pool. When the water is treated in the station, it will be re-used for indoor flushing, sprinkling roads and green irrigation. Reclaimed water consumption accounts for 25.29% of the total water consumption.

### 3.6. Use of renewable energy

Solar water heating systems are designed for the hotel Spa purpose, and the solar water generation rate is 4575.2m<sup>3</sup>/a, accounting for 20.78% of the total hot water demanded in the building.

### 3.7. Waste heat utilization

7119.1m<sup>3</sup> of domestic hot water is heated by waste heat each year, accounting for 32.33% of the total.

### 3.8. Lighting environment

The Spa's roof is equipped with a 3200 m<sup>2</sup> sunroof, enabling full use of natural light. On the fifth floor, 16 sets of light pipes are installed in the hallway to improve the lighting environment of the aisle.

### 3.9. Air quality monitoring

The fresh air unit is equipped with a negative-generator to provide comfortable, healthy and fresh air for guests. In the ballrooms, meeting rooms, and banquet halls, certain CO<sub>2</sub> concentration monitors are launched to achieve real-time alarm when the CO<sub>2</sub> concentration is exceeded, and change the opening of the blast gate in the duct to ensure indoor air quality.