



# Experiences and Future of Solar Energy in China

**Han Jianguo**

**Beijing SUNDA Solar Technology Co.**



**Development of the Solar Industry**

**Comments on the Solar Industry**

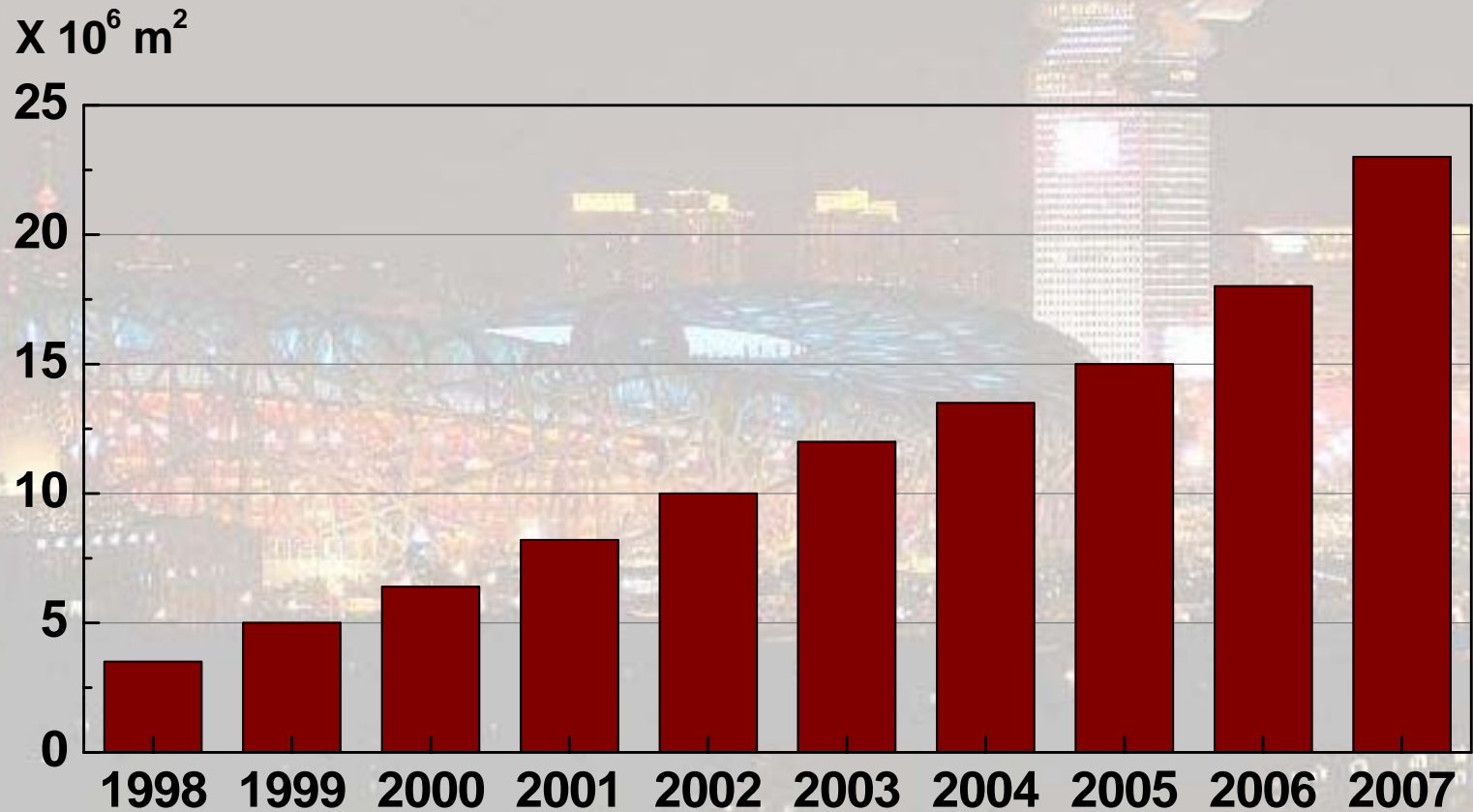
**Future of the Solar Industry**

**Contribution of the Chinese Solar Industry to the Climate Change**



**Development of the Solar Industry in China ——— Solar Thermal Production**

## Annual Production of Solar Water Heaters

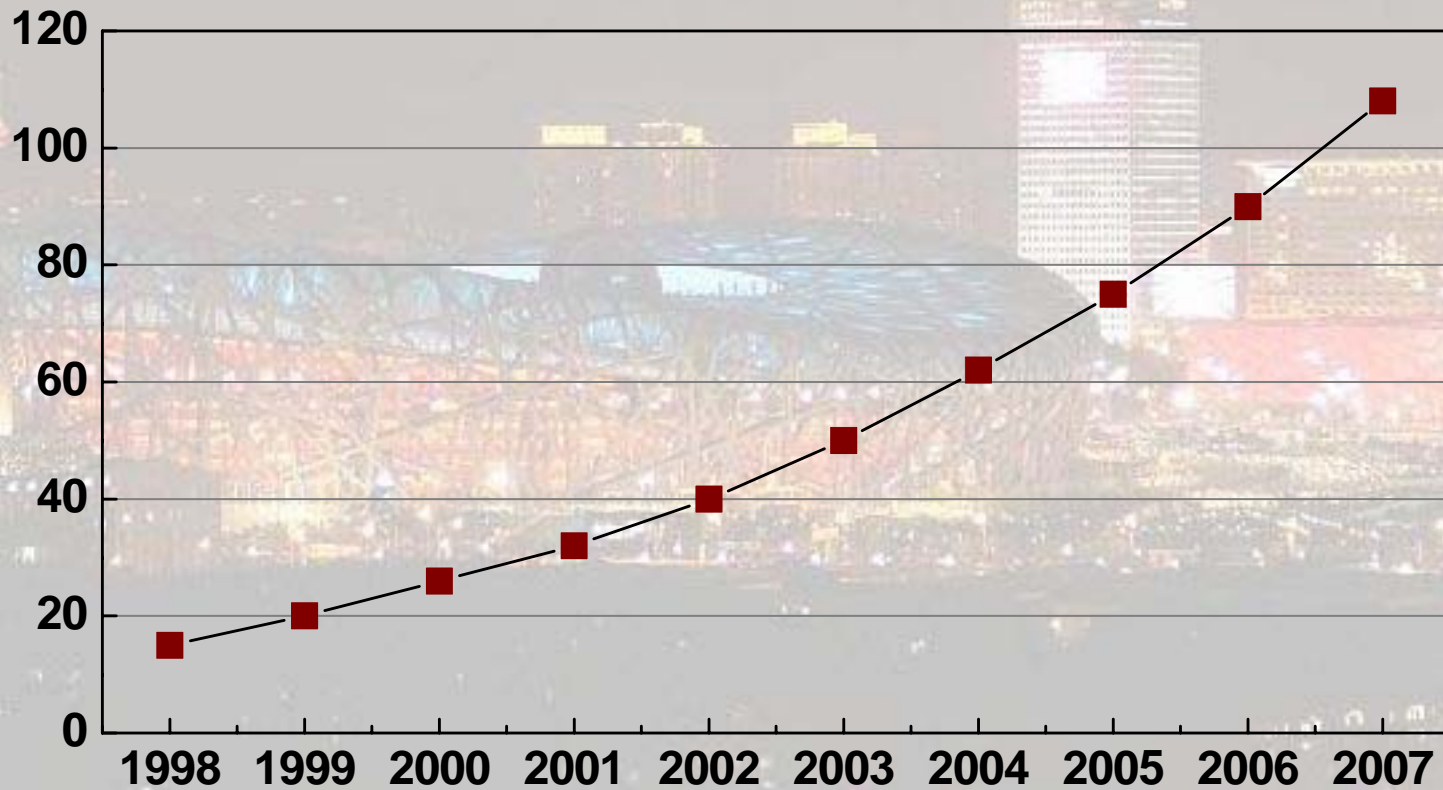




**Development of the Solar Industry in China ——— Solar Thermal Installation**

**Accumulative Installed Solar Water Heater Capacity in Operation**

$\times 10^6 \text{ m}^2$





## Development of the Solar Industry in China ——— Solar Thermal Market

### Development of Solar Water Heater Market

Year	Total Production ( $10^6 \text{ m}^2$ )	Engineering Market ( $10^6 \text{ m}^2$ )	Percentage (%)
2003	12	2.4	20
2004	13.5	2.7	20
2005	15	3.75	25
2006	18	5.4	30
2007	23	8.05	35



## Development of the Solar Industry in China ——— Solar Thermal Market

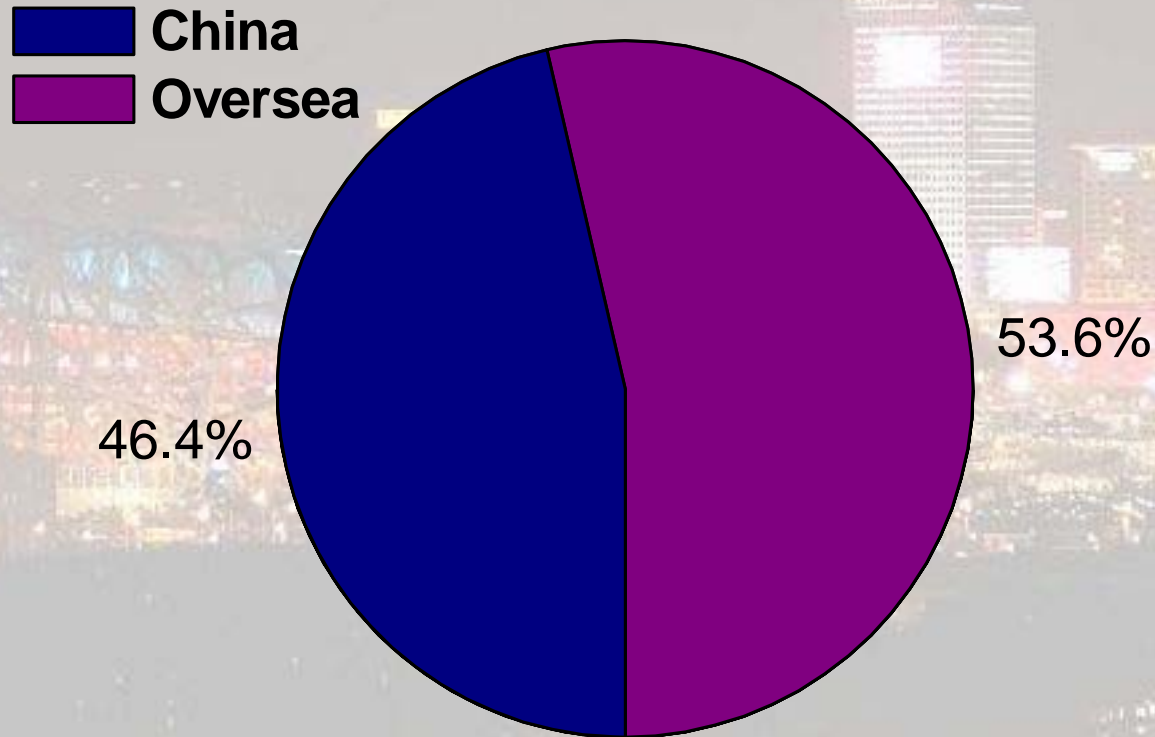
### Market Shares of Three Types of Water Heater

Year	Electric (%)	Gas & Oil (%)	Solar (%)
2001	30	54.8	15.2
2003	44.23	37.57	22.2
2005	45.2	26.57	28.23
2007	42.5	19.2	38.5



## Development of the Solar Industry in China ——— **Solar Thermal Status**

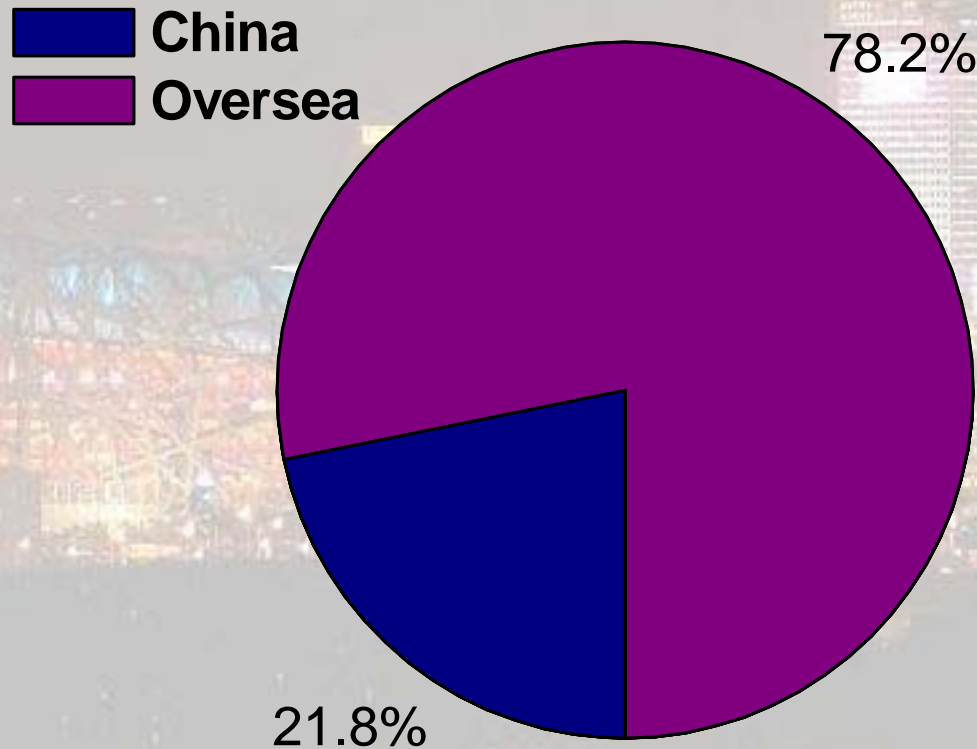
### Accumulative Installed Solar Collector Capacity in Operation, 2006





**Development of the Solar Industry in China ——— Solar Thermal Market**

**Solar Water Heater Production, 2006**

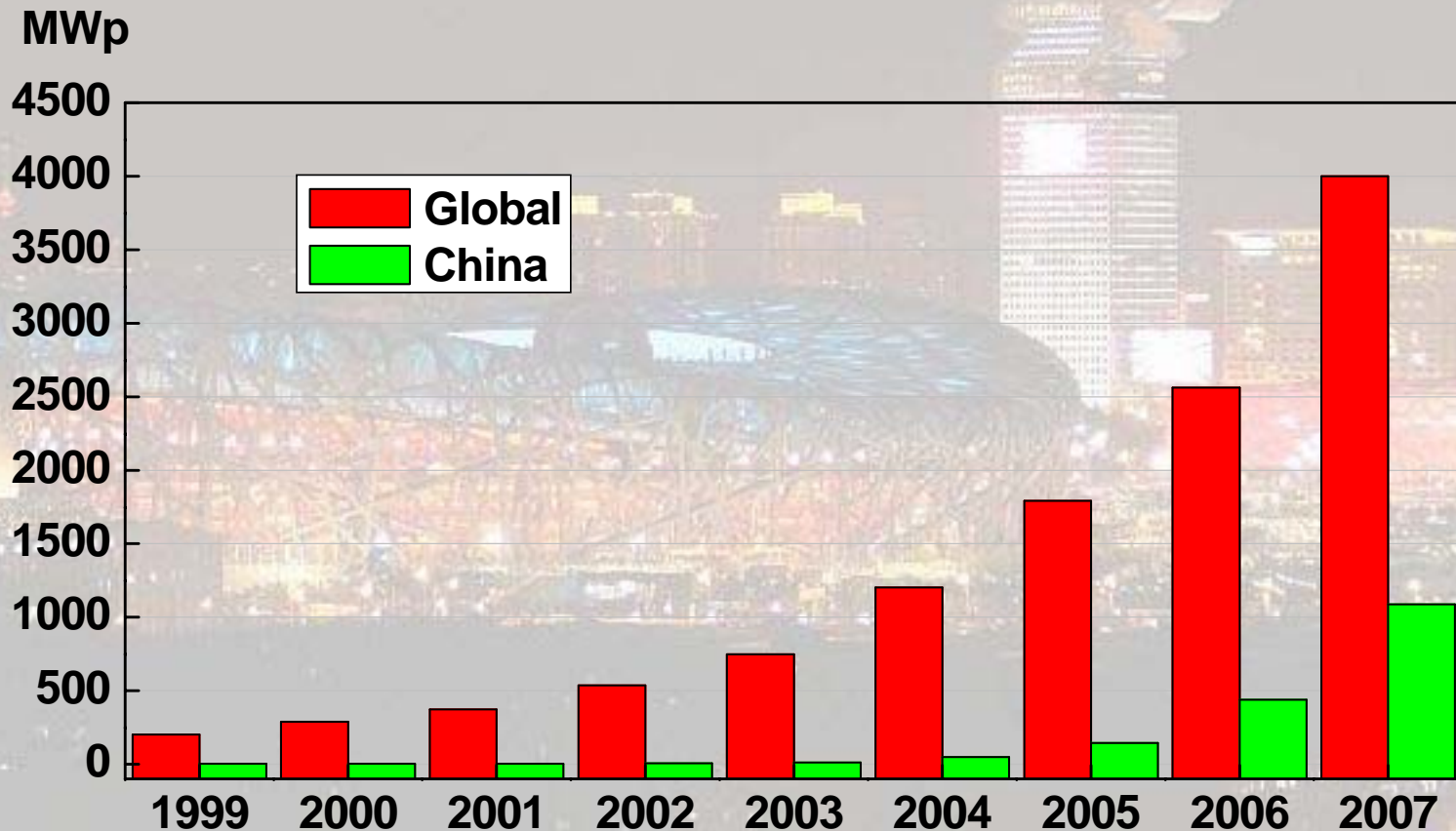






**Development of the Solar Industry in China — Photovoltaic Production**

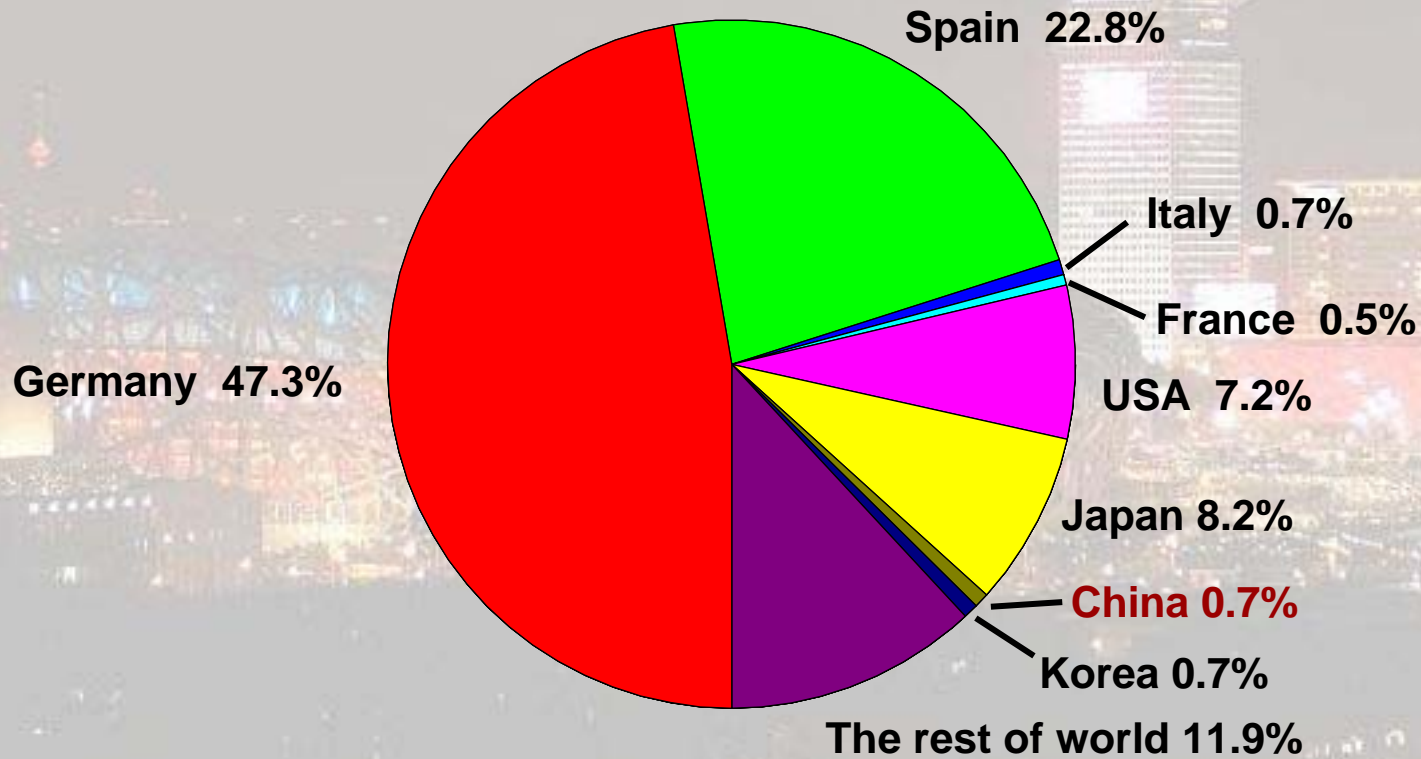
## Annual Production Capacity for Solar Cells, 1999-2007





**Development of the Solar Industry in China — Photovoltaic Market**

**Global Market for Solar Cells, 2007**





## Comments on the Solar Thermal Industry in China

- **The development of the solar thermal industry in China is dependent on the economic solution without the subsidy from the government during the past years.**
- **The solar thermal market mainly is domestic, which is more than 98% in 2007.**
- **Single domestic solar water heaters are still predominate in the market.**
- **Market shares of the flat plate and evacuated tube collectors are 5% and 95% respectively in 2007.**



## Comments on the Photovoltaic Industry in China

- **The development of the photovoltaic industry in China is with the help of the quick development of the European market. No subsidy and less support from the government.**
- **The photovoltaic market mainly is oversea. The demand for the solar cells in China is only 0.7% of the global even though its production is 27.2% of the global production in 2007.**



## Future of the Solar Thermal Industry in China

- **The accumulative area of the solar collectors in operation will be 150Mm<sup>2</sup> by 2010 and 300Mm<sup>2</sup> by 2020.**
- **In addition to the water heating, more applications, i.e. space heating, air conditioning, industrial heating, desalination and power generation will be utilizing solar energy.**
- **More research and demonstration projects are supported from the Chinese Government.**



## Future of the Photovoltaic Industry in China

- **The accumulative PV electricity generation will be 250MWp by 2010 and 1600MWp by 2020.**
- **“Feed in tariff” is under consideration and more supports from the Chinese Government will have.**



## Flat Plate Collectors from SUNDA





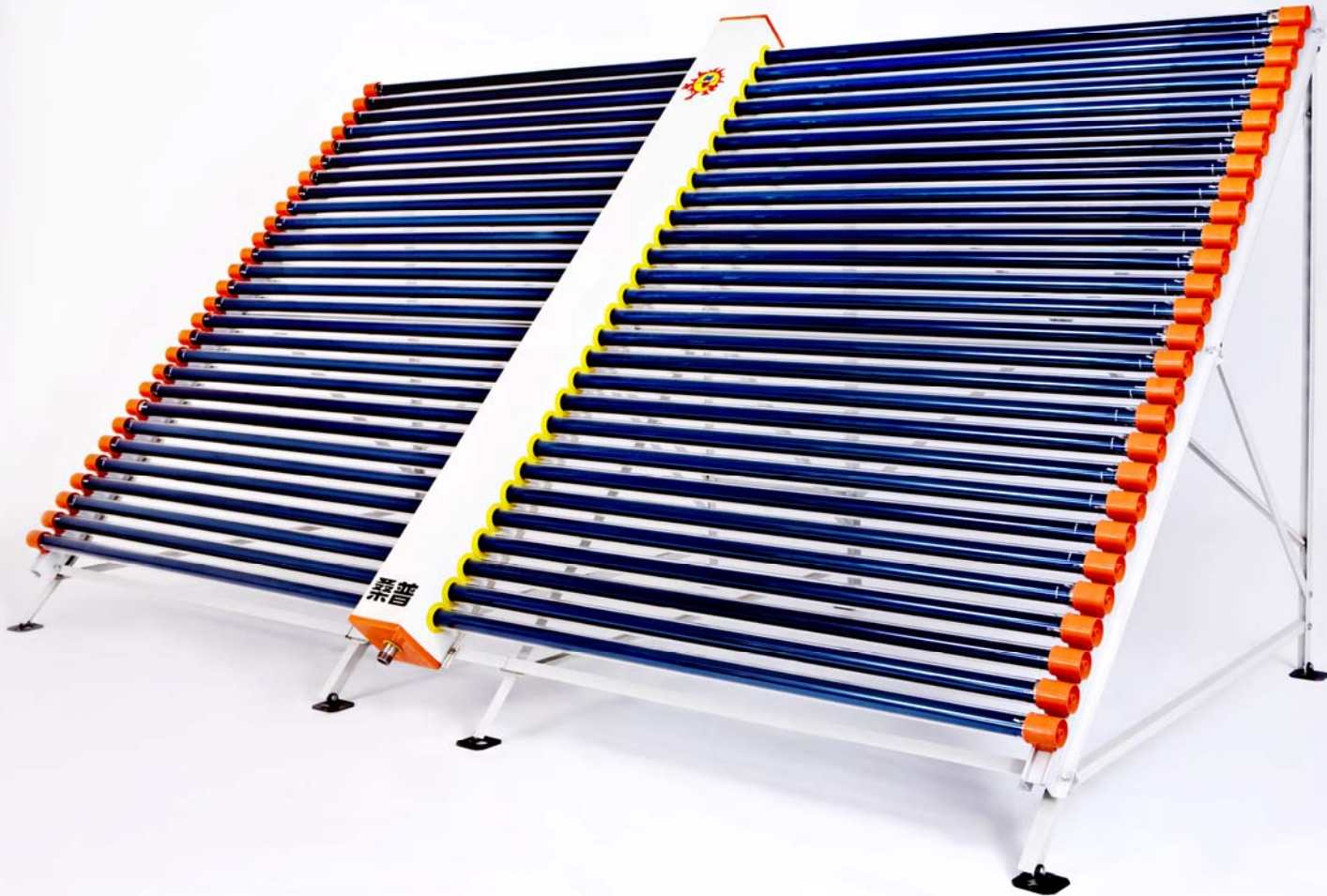
## Evacuated Tubes from SUNDA







## All-glass Evacuated Tube Collectors from SUNDA





## Solar Water Heater with Heat Pipe Evacuated Tube Collectors from SUNDA



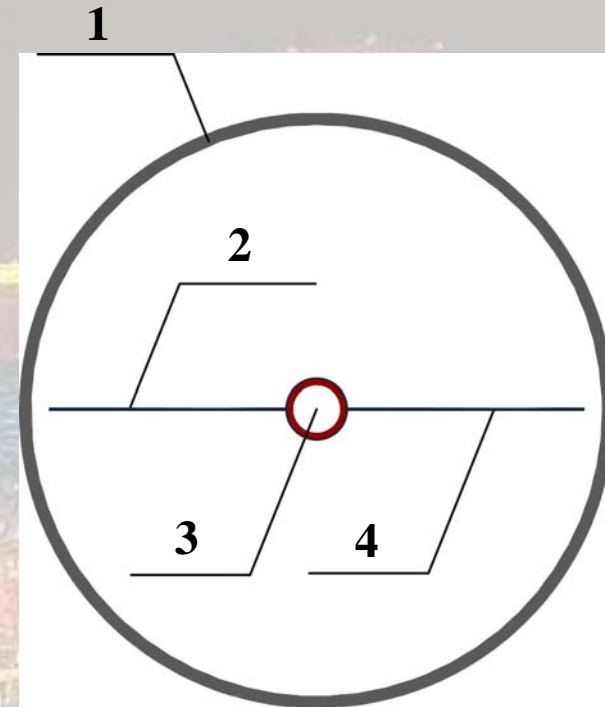
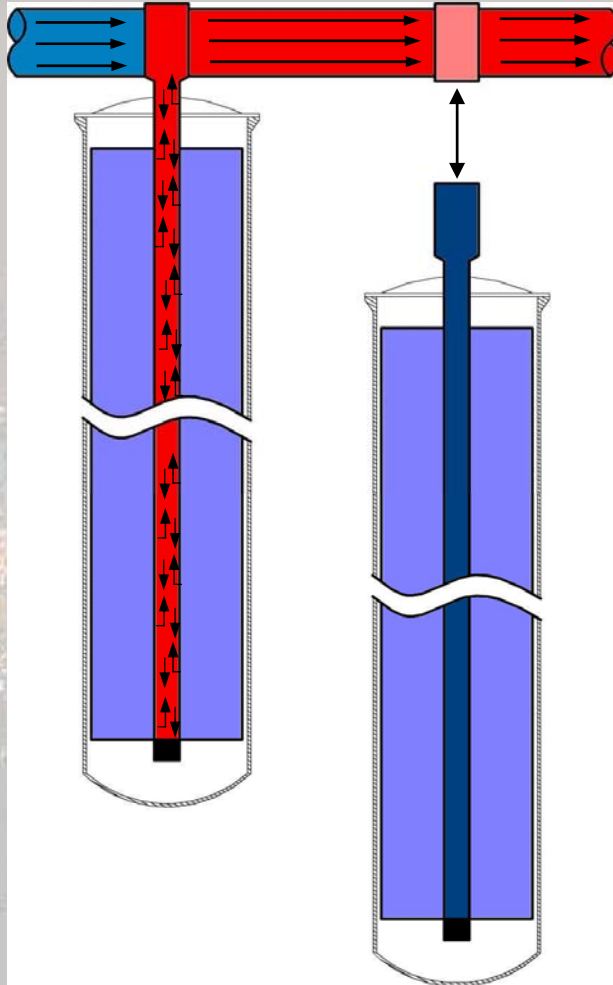


## Solar Water Heater with All-glass Evacuated Tube Collectors from SUNDA





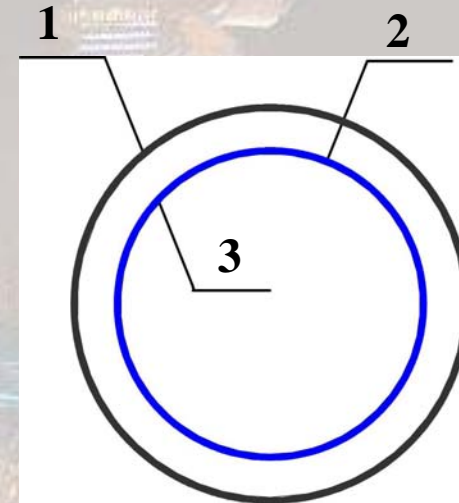
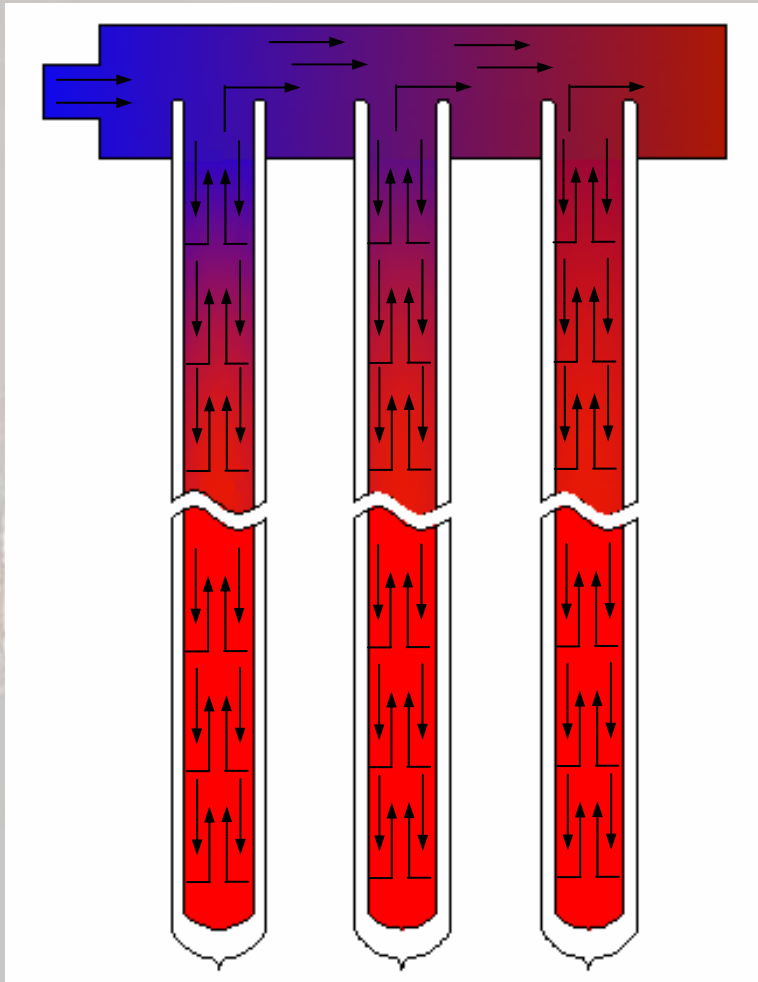
## Working Principle of the Heat Pipe Evacuated Tube Collector



- 1. Cover glass tube
- 2. Selective coating
- 3. Heat pipe
- 4. Absorber



## Working Principle of the All-glass Evacuated Tube Collector



- 1. Cover glass tube
- 2. Selective coating
- 3. Inner glass tube



## Solar Water Heating System with Flat Plate Collectors





## Solar Water Heating System for the Olympic Village





## Solar Water Heating System with All-glass Evacuated Tubular Collectors







## Solar Space Heating in the Countryside near Beijing





## Solar Space Heating and Air Conditioning in SUNDA Office Building





## Parabolic Solar Absorption Air Conditioning





## Solar Desalination System in Test



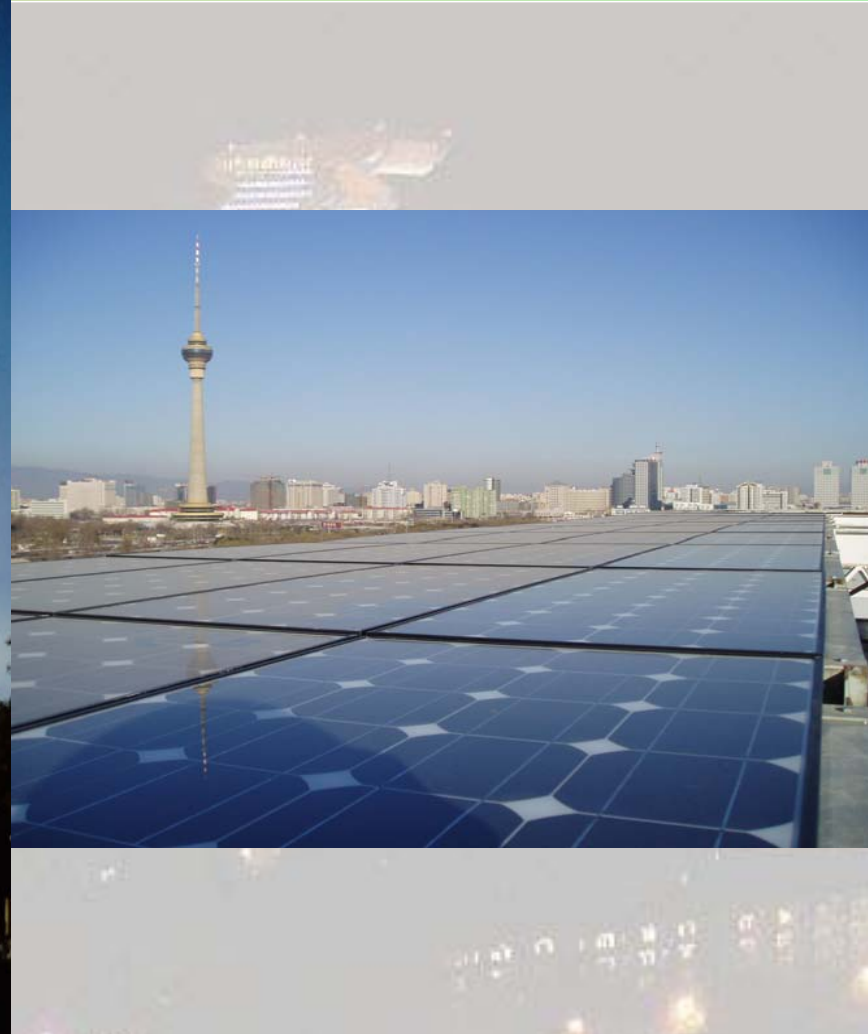


## Solar CombiSystem for the Kindergarten in the Olympic Village





## 15kW Solar PV Grid Connected System





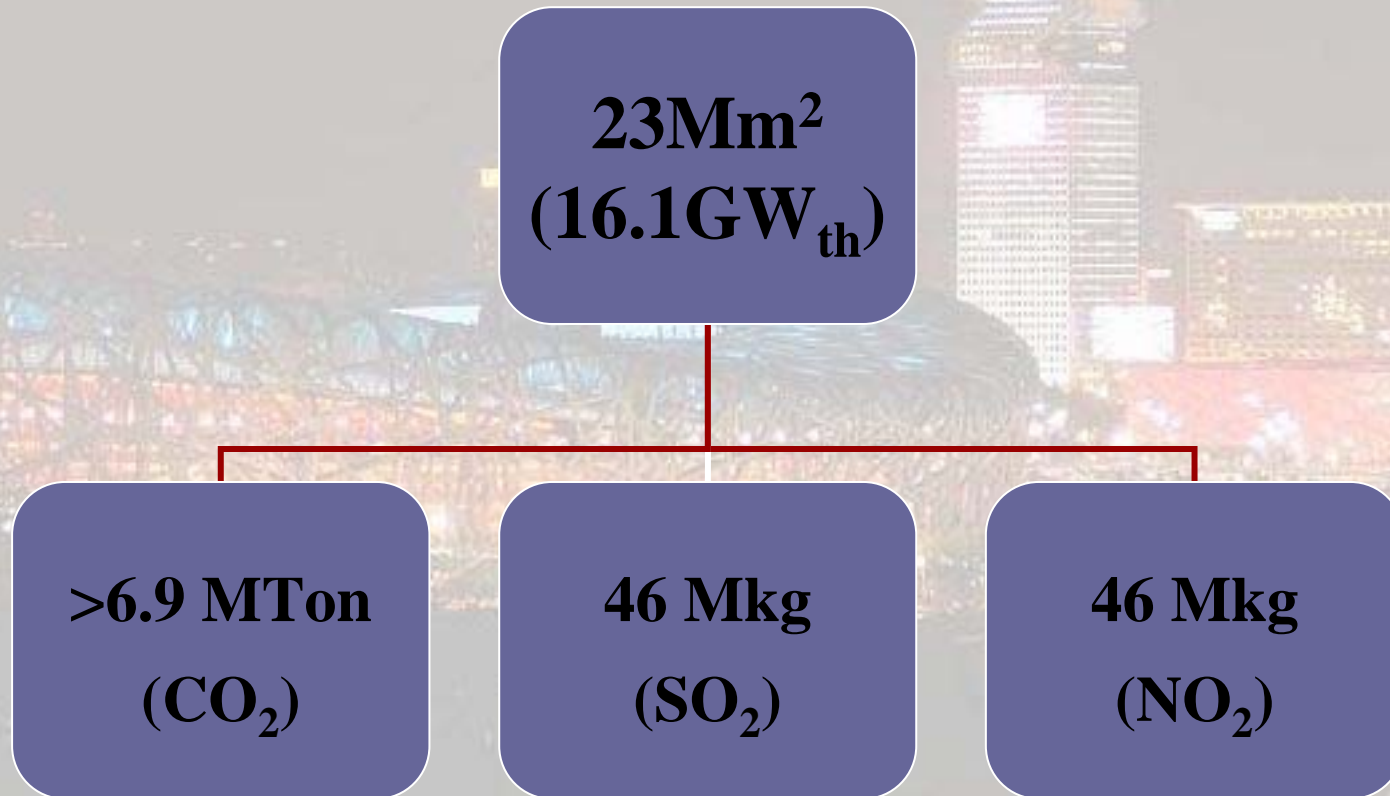
## 100kW Solar PV Power Generation System in SUNDA Office Building





## Contribution to the Climate Change — Chinese Solar Thermal Industry

**According to the total production of the solar water heater in 2007**

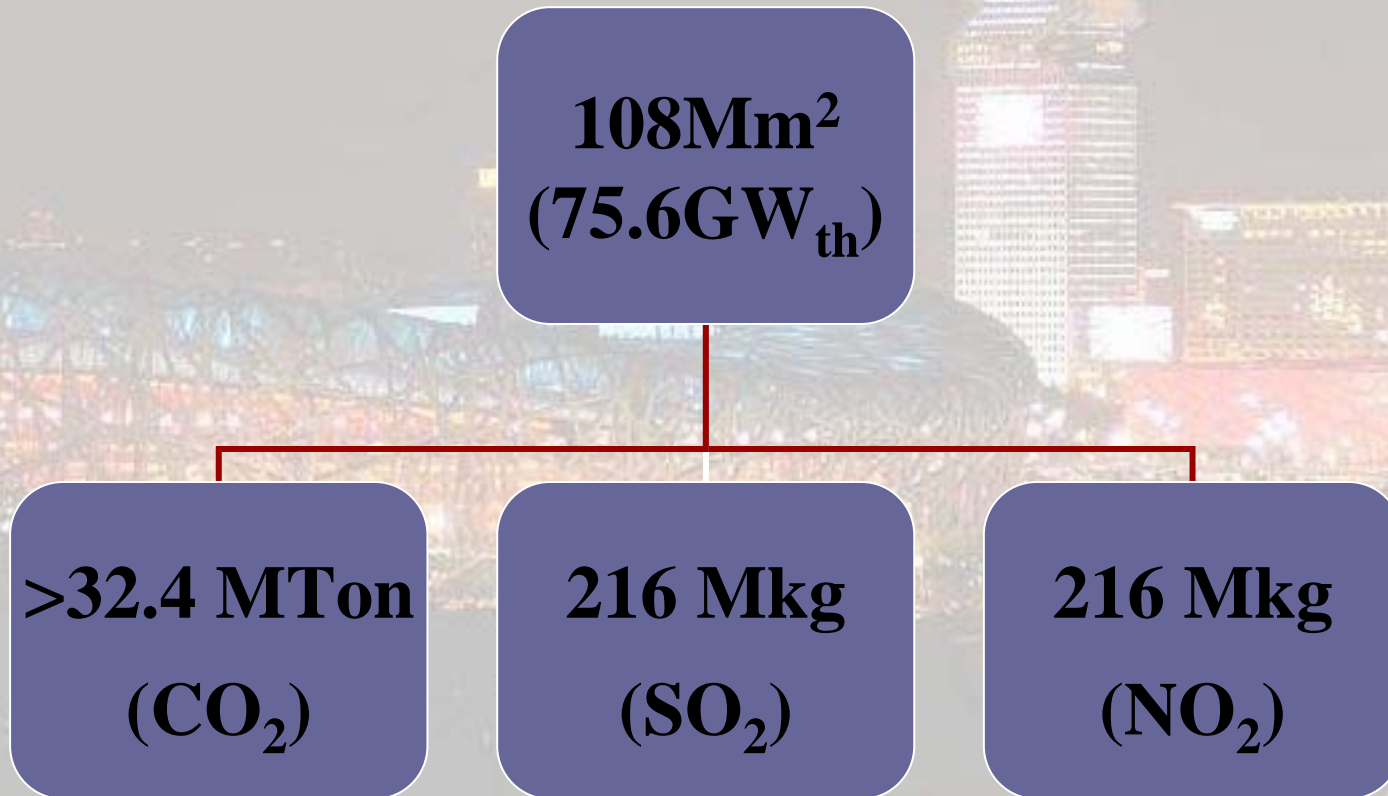






## Contribution to the Climate Change — Chinese Solar Thermal Industry

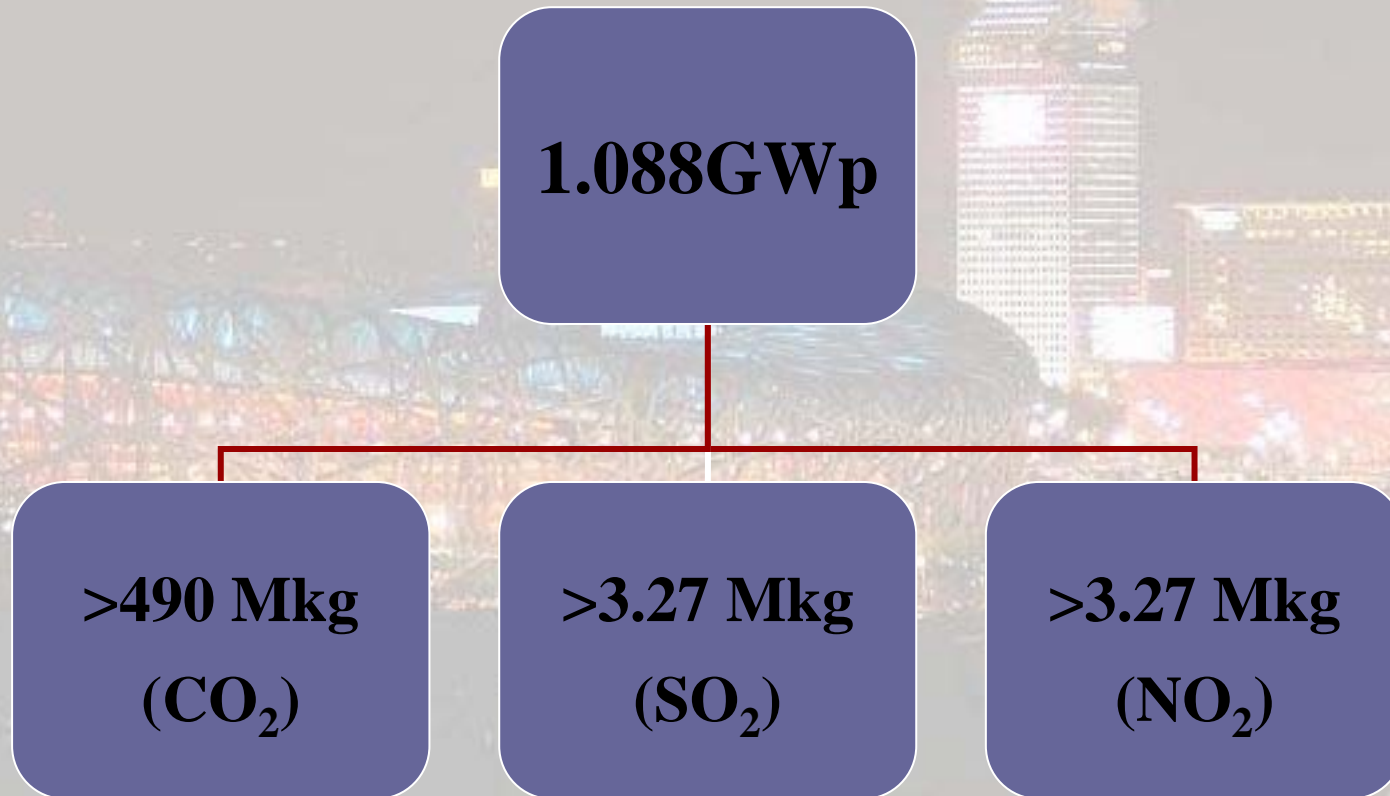
**According to the accumulative installed capacity of the solar water heater up to 2007**





## Contribution to the Climate Change — Chinese Photovoltaic Industry

**According to the total production of the solar cells in 2007**





# Conclusions

- **China has successful experiences in solar thermal industry and market.**
- **China also has a successful photovoltaic industry, but the market is not quite successful.**
- **More supports and efforts are from Chinese Government regarding the policies.**
- **More financial supports and demonstration projects are from the Chinese Government so as to extend the applications of the solar energy.**



# One World One Dream

18 September 2008, Copenhagen

**SUNDA Solar Technology**



# Thank You!