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# Current situation of solar water heater in China (Thermosyphon)

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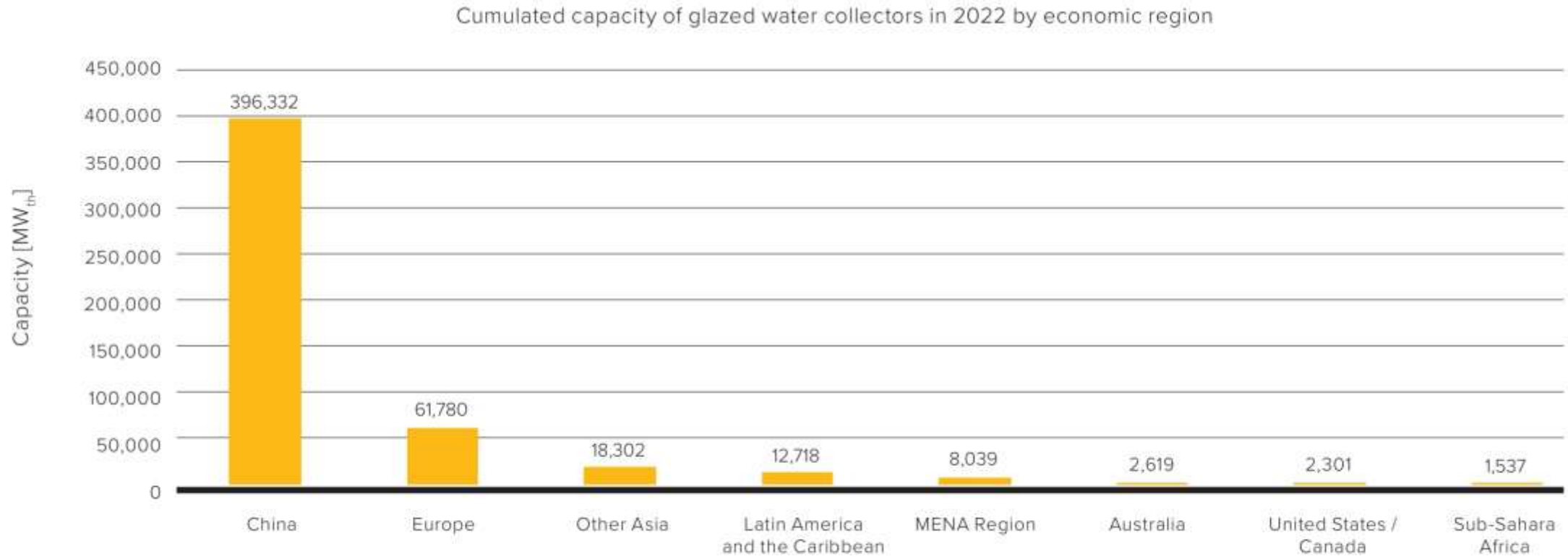
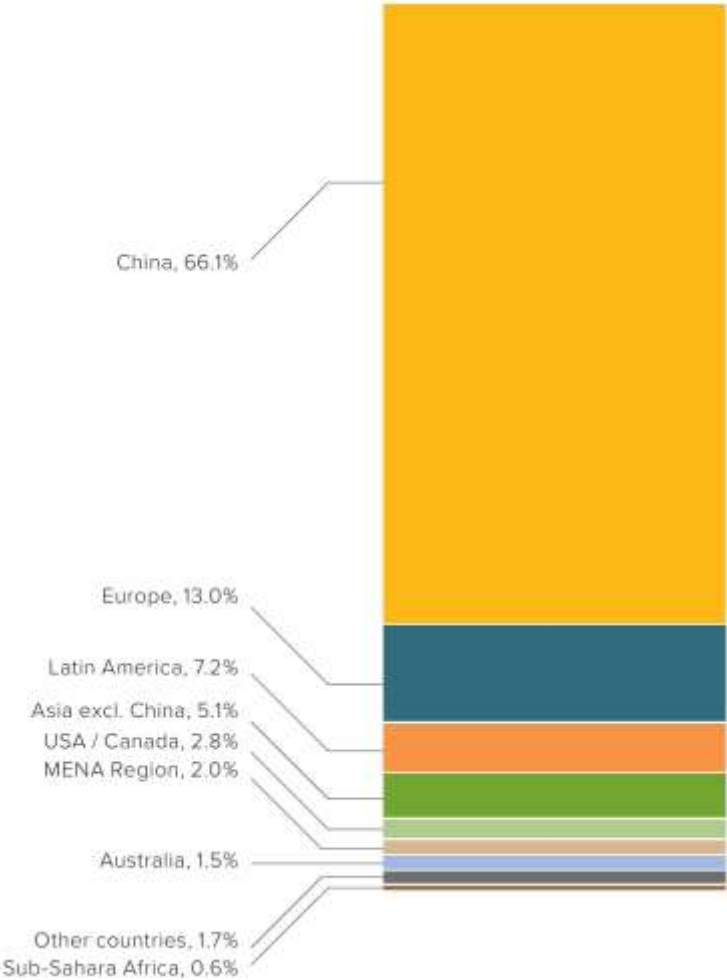


Figure 29: Total capacity of glazed flat plate and evacuated tube collectors in operation by economic region in 2022

**China is the world's largest market for solar thermal utilization**

**Source: SOLAR HEAT WORLDWIDE 2024**

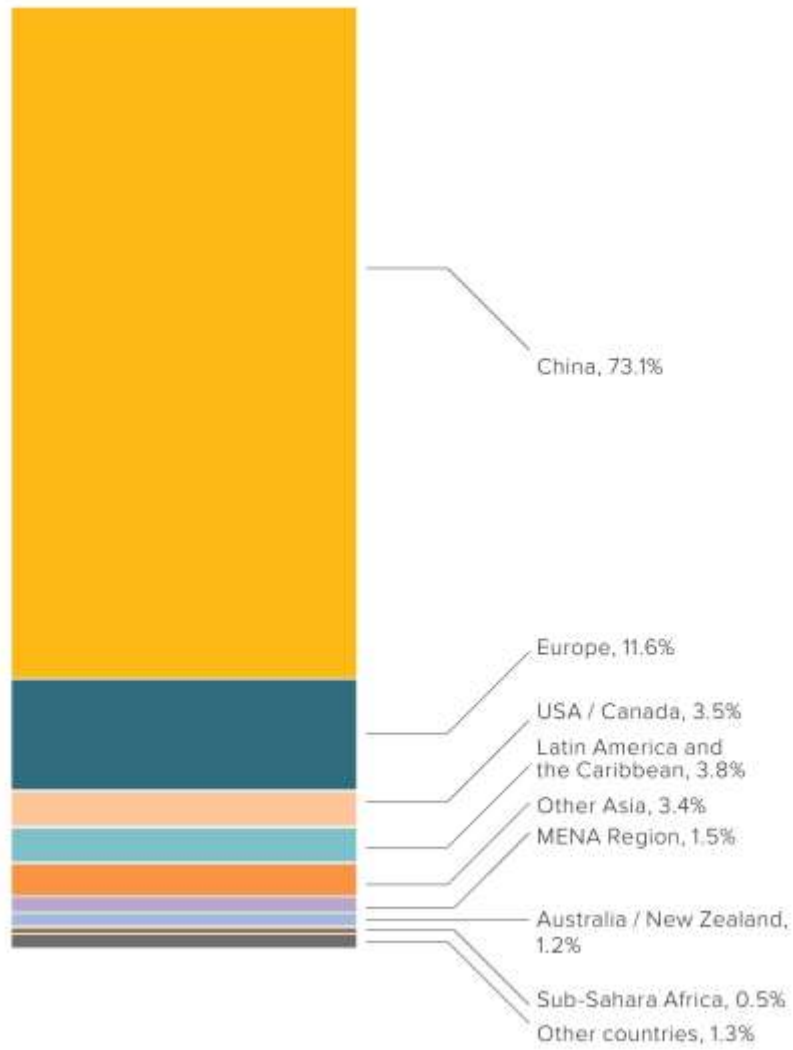
# 1. General overview



**Figure 33: Share of newly installed capacity (glazed and unglazed water and air collectors) by economic regions in 2022**

**China new installations in 2022 is account for 66.1% of global new installations**

**Source: SOLAR HEAT WORLDWIDE 2024**



**Figure 20: Share of the total installed capacity in operation (glazed and unglazed water and air collectors) by economic region in 2022**

**China total installed capacity in operation until 2022 is account for 73.1% of global total installed capacity**

**Source: SOLAR HEAT WORLDWIDE 2024**

Annual installed capacity of glazed water collectors 2000 - 2022

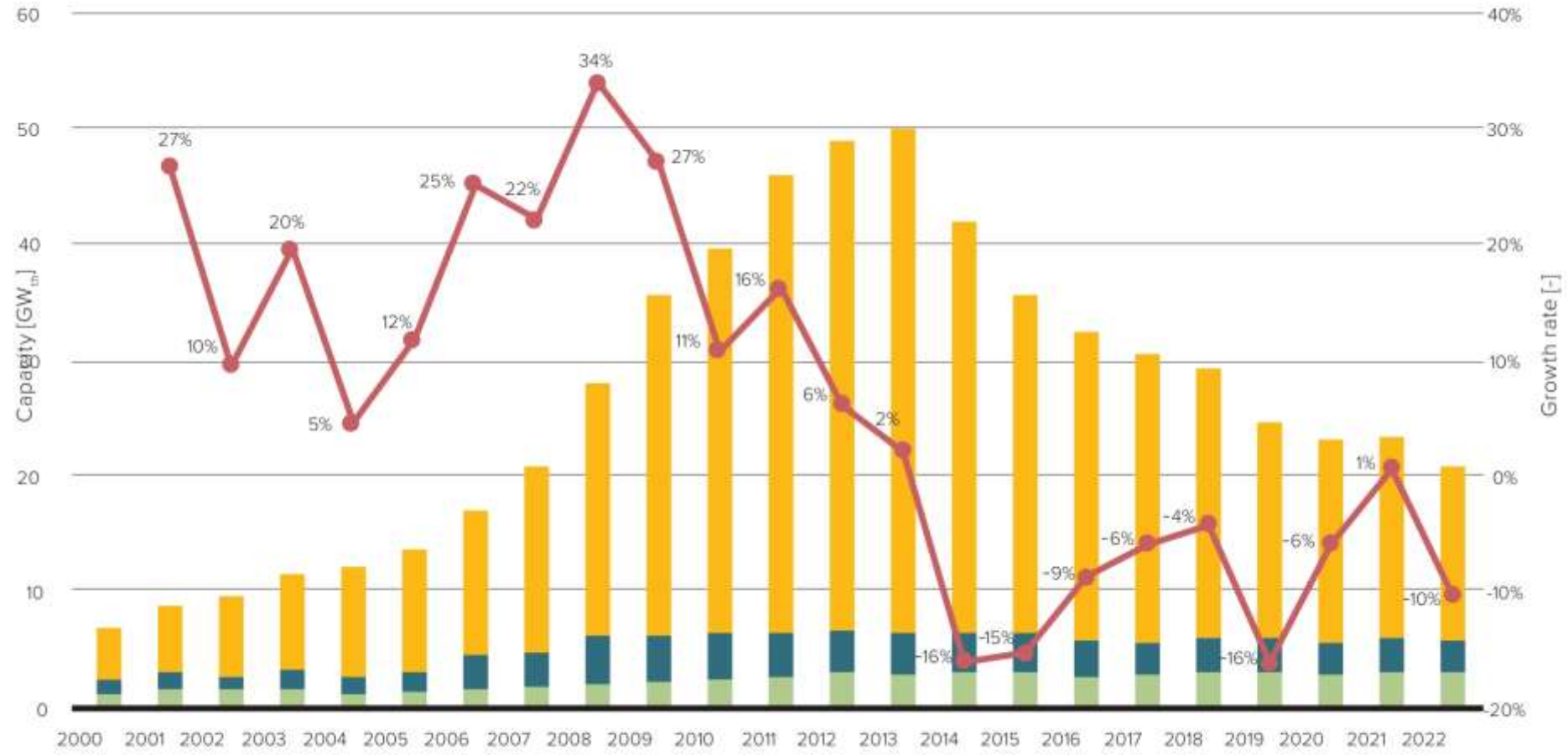


Figure 42: Global market development of glazed water collectors from 2000-2022

- China
- RoW\*
- Europe
- market growth [%]

Source: SOLAR HEAT WORLDWIDE 2023

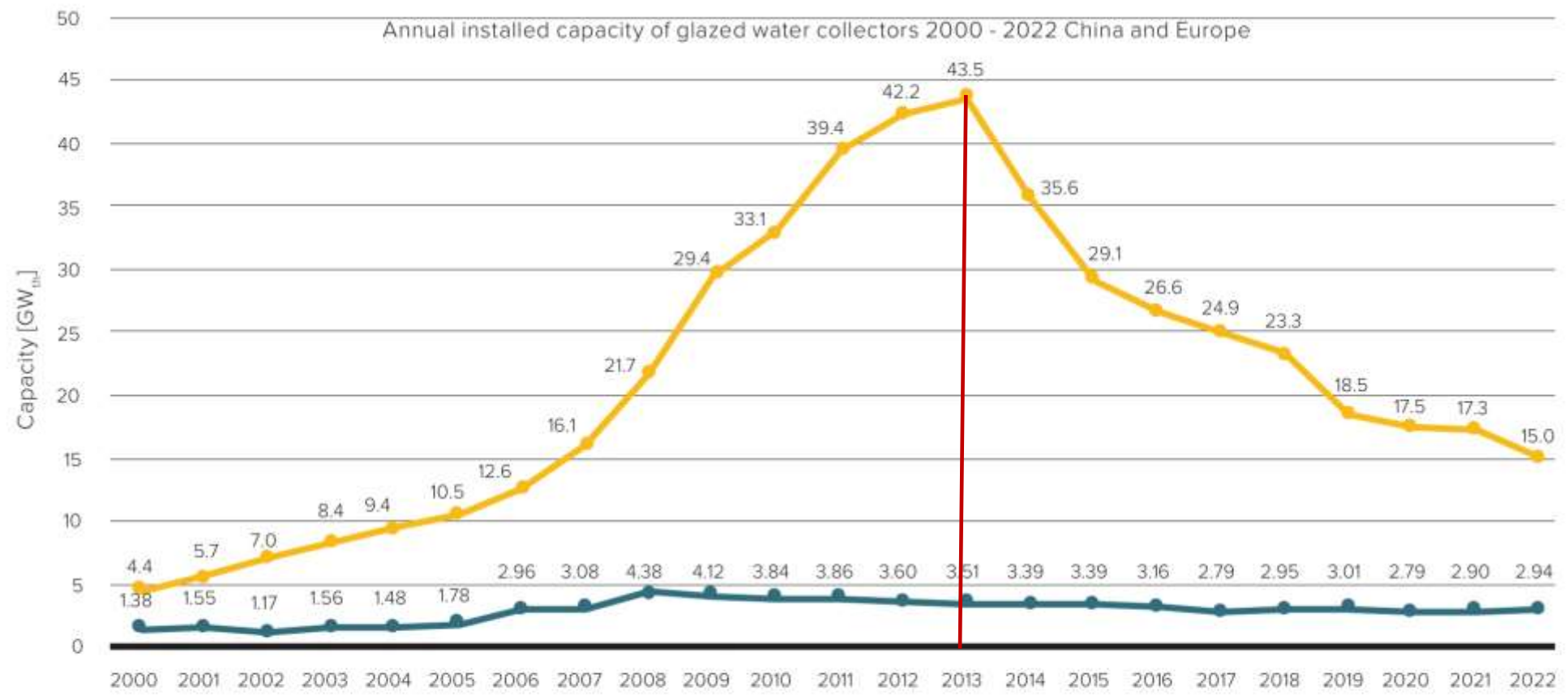


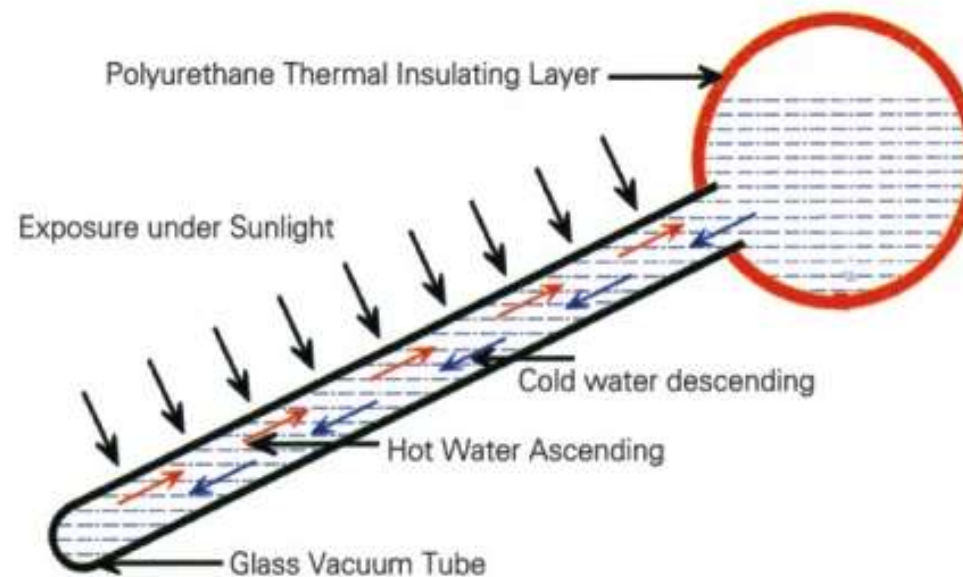
Figure 43: Market development of glazed water collectors in China and Europe 2000-2022

China Europe

**2013 is a watershed year for China's solar thermal utilization market**

**Source: SOLAR HEAT WORLDWIDE 2023**

## Typical thermosyphon solar water heaters in China



## Working principle of thermosyphon solar water heater

## **Reasons for the rapid development of the market before 2013**

- 1. Before 2000, China's urbanization rate was very low, only 35% in 2000**
- 2. Most people bathe in public baths room, but people want to bathe in their own homes**
- 3. Energy supplies are inadequate, there is no natural gas supply in the countryside, and the electricity grid is fragile. Even in large and medium-sized cities, gas and electricity supplies are insufficient**
- 4. At that stage, solar water heaters were almost the only products to solve the problem of bathing in the home, Especially in the countryside**
- 5. In rural areas, solar water heaters are the most important products after TV sets**
- 6. In the city, the first thing after people buy a apartment is to occupy a spot on the roof that can be installed with solar water heaters, and sometimes the location of solar water heaters needs to be purchased**
- 7. The government also has some incentives to encourage the use of solar water heaters**



## Reasons for the market decline after 2013

1. In 2023, China's urbanization rate is 66.16%, most of the inhabitants live in cities.
2. Energy supplies are plentiful, and even in remote rural areas, electricity supplies have improved dramatically
3. High-rise buildings replaced the original ground-floor scattered buildings, and there is not only enough area on the roof to install solar water heaters, and too long hot water pipes affect the user experience
4. Compared with other products such as gas and electric water heaters, the problems of solar water heaters have also gradually emerged, such as: pressure and temperature instability, efficiency varies greatly in different seasons, the use effect of different systems and different installation areas and installation methods varies greatly, and the initial investment is high
5. Energy prices for Chinese households are very stable
6. Government incentives have also shifted to photovoltaic, wind energy and other industries that can bring more industrial output

# The main products of the Chinese and European markets are different

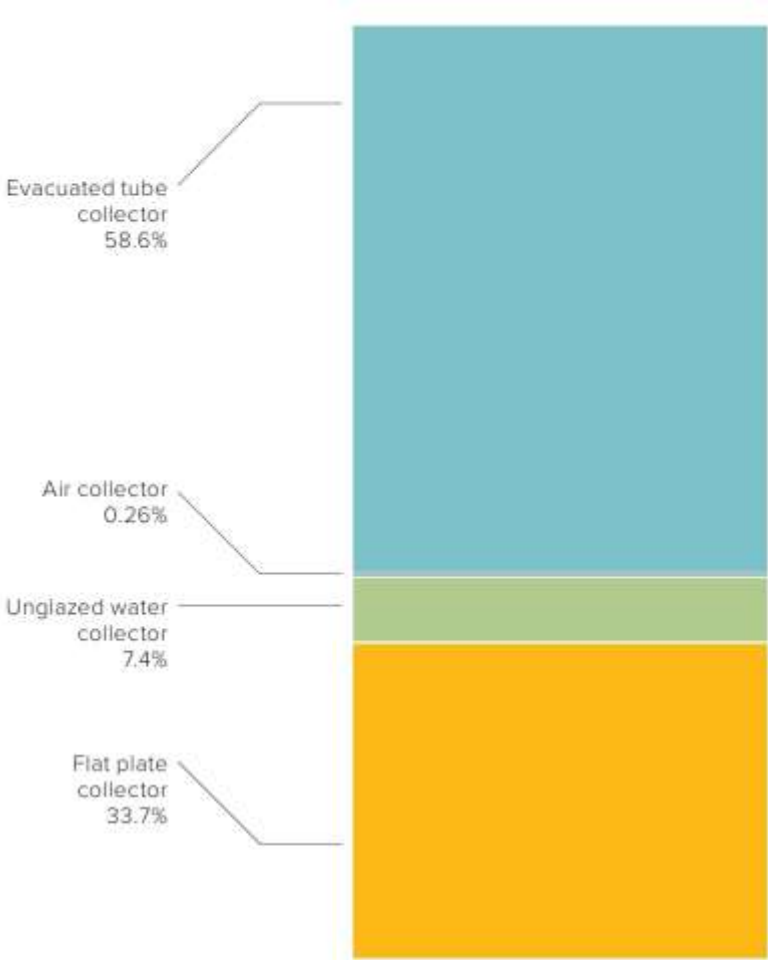


Figure 34: Distribution of the newly installed capacity by collector type in 2022 – WORLD

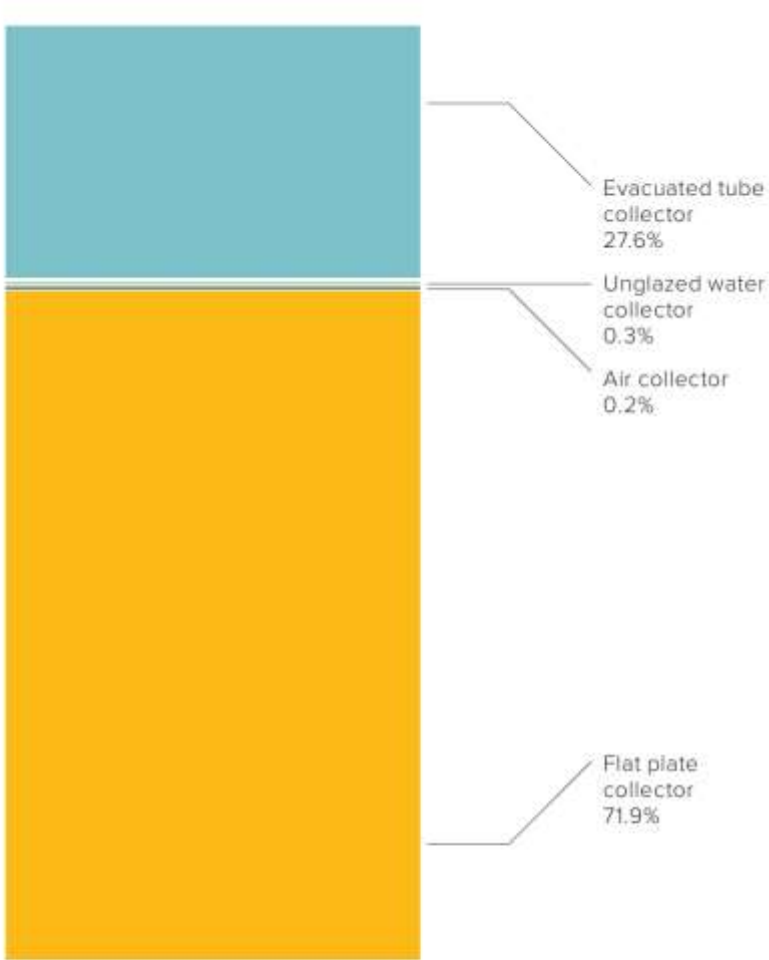


Figure 35: Distribution of the newly installed capacity by collector type in 2022 – EUROPE

Europe: EU 27, Albania, North Macedonia, Norway, Russia, Switzerland, Turkey, United Kingdom



**China has all the products and technologies related to solar thermal utilization**

## **Reasons for different products in the Chinese market**

- 1. The market development stage is different, the initial Chinese water heater market, customers are concerned about economy rather than comfort**
- 2. Vacuum tube thermosiphon solar water heater, reasonable price, simple installation, easy after-sales, wide application area, very suitable for the Chinese market**
- 3. However, the production process of vacuum tubes is complex, especially the kiln for the production of high borosilicate glass tubes must be continuously produced, which is only suitable for a large enough area of the single market**
- 4. Vacuum tube is suitable for non-pressurized thermosiphon solar water heater, if the vacuum tube is used for pressurized solar water heating system, the price will rise significantly, which affects the promotion of vacuum tube in the market of pressurized products**

# Whole industry chain manufacturing technology for evacuated tubes



## Whole industry chain manufacturing technology for evacuated tubes



| Country/Region/Economy | Water Collectors [m <sup>2</sup> ] |           |            | Air Collectors [m <sup>2</sup> ] |        | TOTAL [m <sup>2</sup> ] |
|------------------------|------------------------------------|-----------|------------|----------------------------------|--------|-------------------------|
|                        | unglazed                           | FPC       | ETC        | unglazed                         | glazed |                         |
| Albania                |                                    | 17,680    | 1,640      |                                  |        | 19,320                  |
| Argentina              | 6,769                              | 35,000    | 69,373     | 20                               | 158    | 111,320                 |
| Australia              | 350,000                            | 123,533   | 13,728     |                                  | 1,000  | 488,261                 |
| Austria                | 1,480                              | 56,830    | 660        |                                  | 190    | 59,160                  |
| Belgium                |                                    | 16,000    | 3,500      |                                  |        | 19,500                  |
| Bhutan                 |                                    | 824       |            |                                  |        | 824                     |
| Botswana*              |                                    | 1,190     | 210        |                                  |        | 1,400                   |
| Brazil                 | 920,463                            | 821,248   | 38,124     |                                  |        | 1,779,835               |
| Bulgaria               |                                    | 24,296    |            |                                  |        | 24,296                  |
| Canada                 | 2,100                              | 4         | 902        | 19,991                           | 4,325  | 27,322                  |
| Chile                  |                                    | 13,071    |            |                                  |        | 13,071                  |
| China                  |                                    | 5,757,000 | 15,680,491 | 20,819                           | 23,000 | 21,481,310              |
| Croatia                |                                    | 12,000    |            |                                  |        | 12,000                  |

**Flat plate solar collectors account for 26.8% of new installation in China(2022)**

**Source: SOLAR HEAT WORLDWIDE 2024**

# SOLAR HEAT WORLDWIDE 2008

| Country   | Water Collectors* |            |                | Air Collectors* |        | TOTAL [m <sup>2</sup> ] |
|-----------|-------------------|------------|----------------|-----------------|--------|-------------------------|
|           | unglazed          | glazed     | evacuated tube | unglazed        | glazed |                         |
| Albania   |                   | 57,283     | 336            |                 |        | <b>57,619</b>           |
| Australia | 4,100,000         | 1,960,550  | 37,450         |                 |        | <b>6,098,000</b>        |
| Austria   | 624,110           | 3,293,175  | 47,069         |                 |        | <b>3,964,354</b>        |
| Barbados  |                   | 82,104     |                |                 |        | <b>82,104</b>           |
| Belgium   | 46,875            | 207,120    | 20,513         |                 |        | <b>274,508</b>          |
| Brazil    | 802,830           | 3,490,377  |                |                 |        | <b>4,293,206</b>        |
| Bulgaria  |                   | 30,336     |                |                 |        | <b>30,336</b>           |
| Canada    | 725,277           | 91,131     | 5,597          | 157,533         | 1,327  | <b>980,865</b>          |
| Chile     | 1,470             | 17,730     |                |                 |        | <b>19,200</b>           |
| China     |                   | 10,243,297 | 114,756,703    |                 |        | <b>125,000,000</b>      |
| Cyprus    |                   | 801,637    | 1,883          |                 |        | <b>803,520</b>          |

Total installed collector area in operation at the end of 2008 [m<sup>2</sup>]

**Flat plate solar collectors account for 8.2% in China**



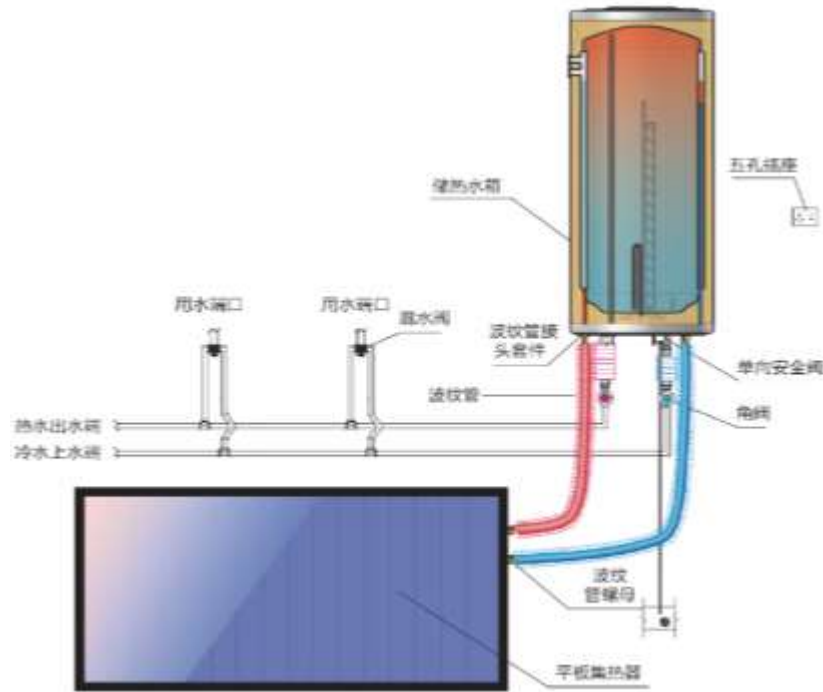
# SOLAR HEAT WORLDWIDE 2008

| Country   | Water Collectors* |           |                | Air Collectors* |        | TOTAL [m <sup>2</sup> ] |
|-----------|-------------------|-----------|----------------|-----------------|--------|-------------------------|
|           | unglazed          | glazed    | evacuated tube | unglazed        | glazed |                         |
| Albania   |                   | 9,740     | 104            |                 |        | 9,844                   |
| Australia | 600,000           | 277,000   | 14,000         |                 |        | 891,000                 |
| Austria   | 15,220            | 343,617   | 4,086          |                 |        | 362,923                 |
| rBarbados |                   | 2,731     |                |                 |        | 2,731                   |
| Belgium   |                   | 82,000    | 9,000          |                 |        | 91,000                  |
| Brazil    | 116,110           | 555,046   |                |                 |        | 671,156                 |
| Bulgaria  |                   | 4,000     |                |                 |        | 4,000                   |
| Canada    | 89,577            | 13,173    | 1,083          | 34,135          | 1,191  | 139,159                 |
| Chile     |                   | 9,000     |                |                 |        | 9,000                   |
| China     |                   | 1,550,000 | 29,450,000     |                 |        | 31,000,000              |
| Cyprus    |                   | 40,290    | 1,000          |                 |        | 41,290                  |

**Newly In stalled collector area in 2008 [m<sup>2</sup>/a]**

**Flat plate solar collectors only account for 5% in China**

## Reasons for the growth of flat plate solar collectors in the Chinese market



1. Due to safety reasons, more and more high-rise building users choose to install flat plate balcony solar water heaters

## Reasons for the growth of flat plate solar collectors in the Chinese market



**2. Due to the reasons of economic development, customers are more concerned about the stability of the hot water system and the comfort of use, more and more customers are more willing to choose the pressurized hot water system, and the flat plate solar collector has won more development opportunities**

## Conclusion:

- **China's thermosiphon solar water heaters face strong competition from Electric water heater、 Gas water heater、 heat pump water heater, also PV. and the market continues to decline, so many companies have turned their eyes to solar district heating and industrial and agricultural applications, and even heat pumps.**
- **But thermosiphon solar water heaters have huge potential in South America and Africa, for example: China exports nearly one million vacuum tube solar water heaters to Mexico every year.**

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Thank you for  
your attention!