



# **Solar Thermal at a Global Level**

## **and the need for estimating annual solar collector energy output**

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Chairman

# Worldwide Statistic

## IEA SHC Solar Heat Worldwide



53 countries included (4 new)  
South Korea, Chile, Uruguay, Zimbabwe

4.5 billion people represent

85-90% of the solar thermal  
market worldwide

Data provided by:

10 ExCo members

56 external experts,  
governmental sources and  
associations

# The initial problem



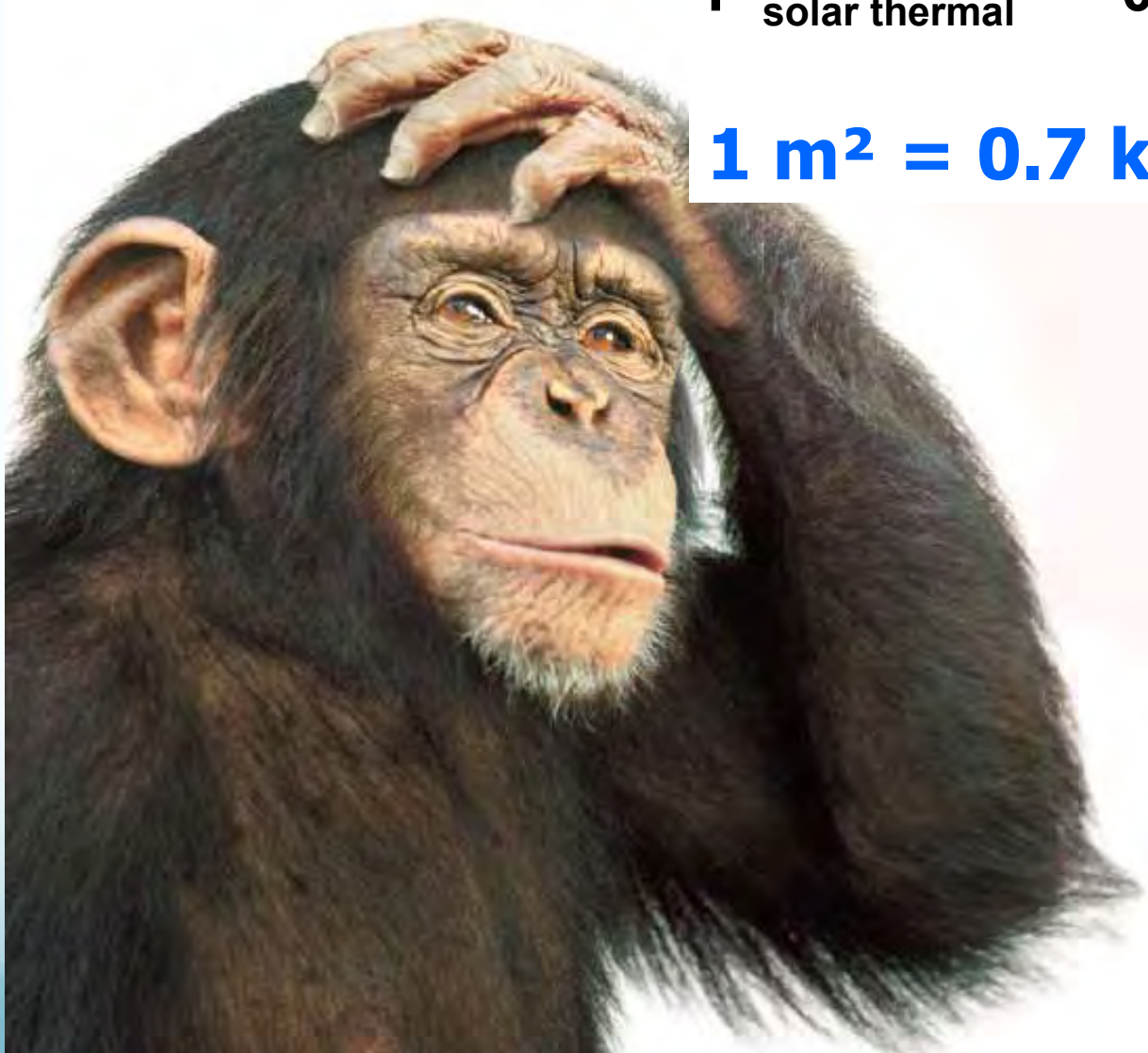
What is a  $m^2$  in terms of power?



# The 1<sup>st</sup> Solution

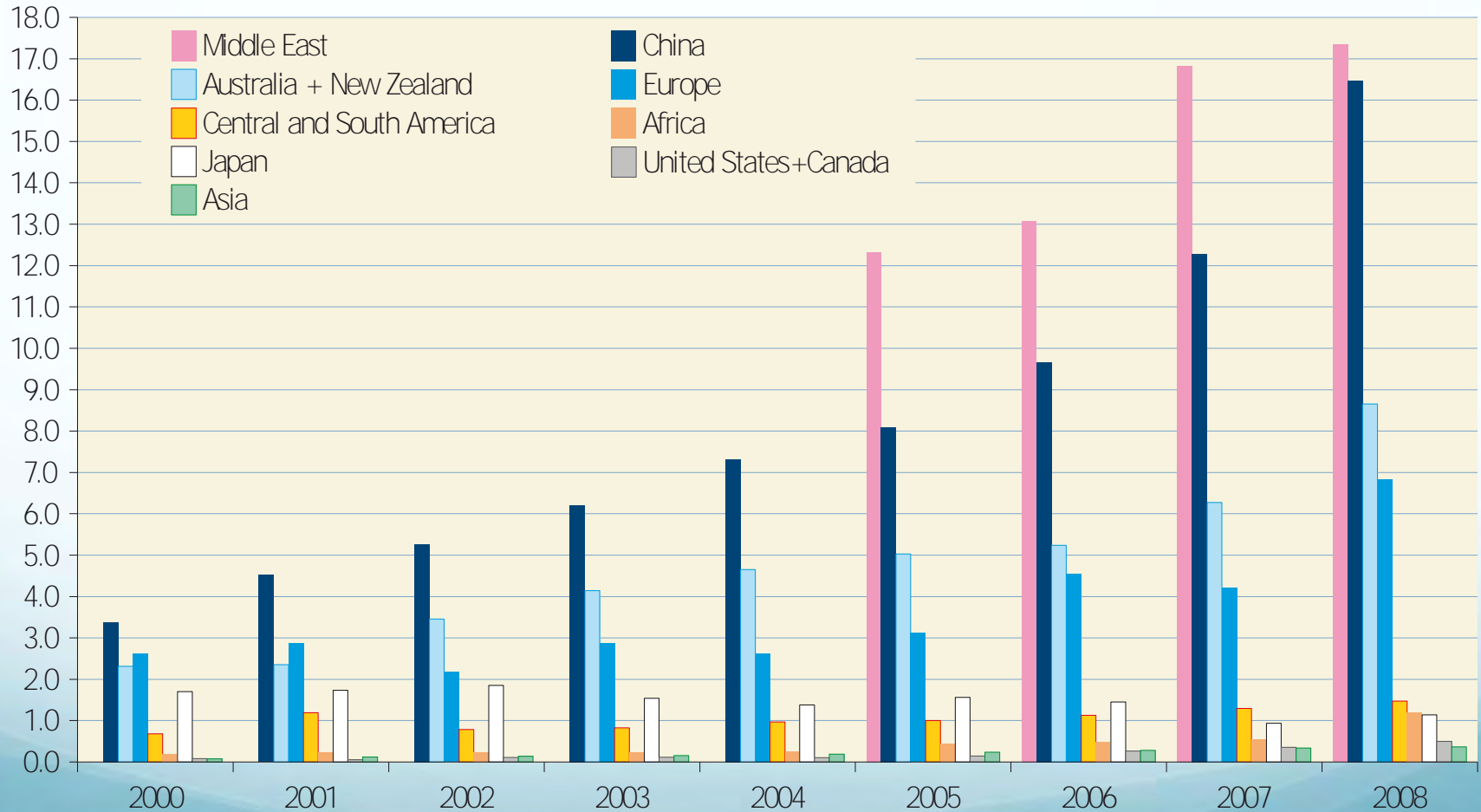
$$P_{\text{solar thermal}} = 0.7 \text{ kW/m}^2 * A_a$$

$$1 \text{ m}^2 = 0.7 \text{ kW}_{\text{th}}$$



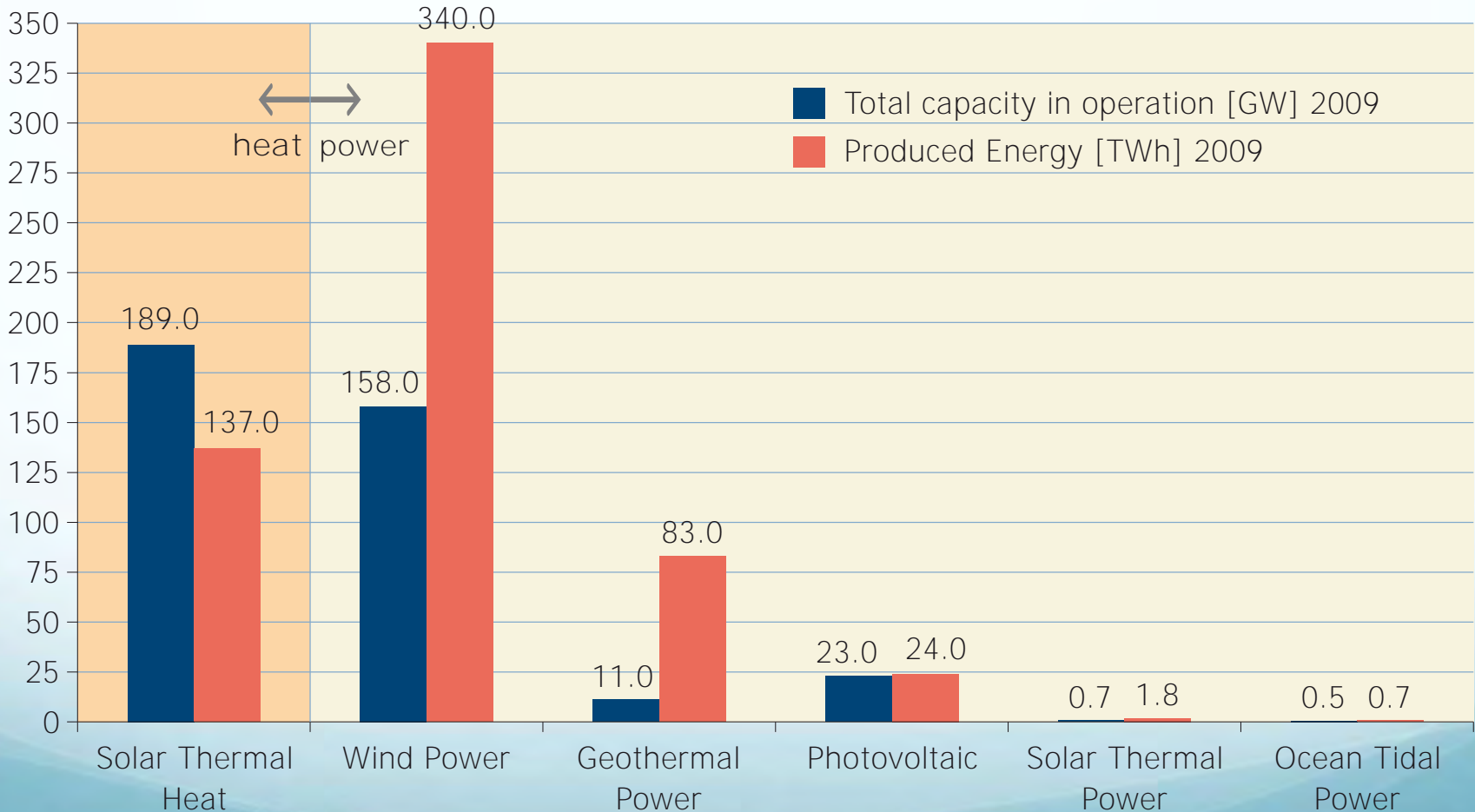
# Market Development

**Installed capacity [ $\text{kW}_{\text{th}}/\text{a}/1,000 \text{ inh.}$ ]**



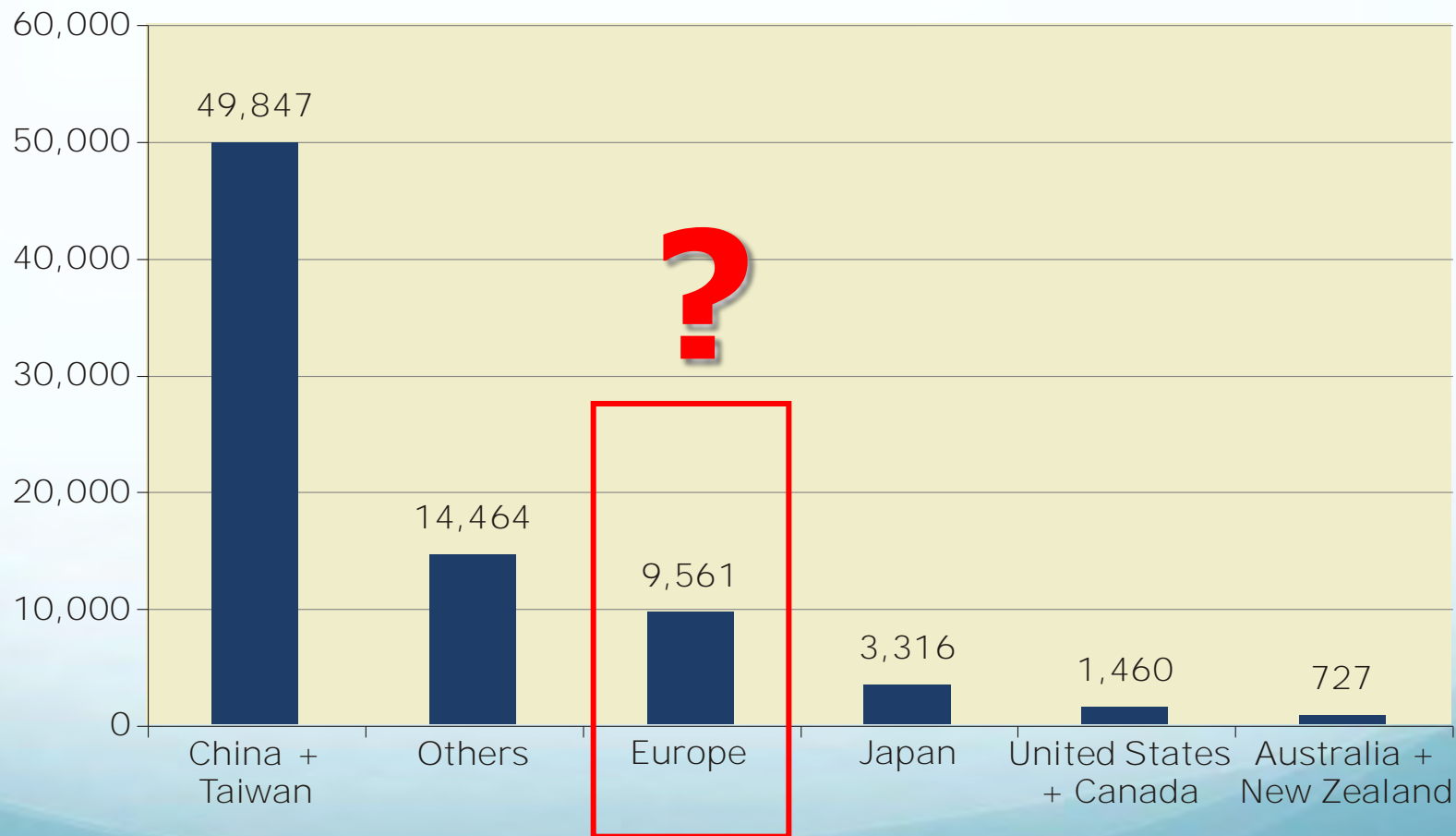
# Solar Thermal's Global Contribution

**Total Capacity in Operation [ $\text{GW}_{\text{el}}$ ], [ $\text{GW}_{\text{th}}$ ] and Produced Energy [ $\text{TWh}_{\text{el}}$ ], [ $\text{TWh}_{\text{th}}$ ], 2008**



# Collector Yields – IEA SHC

Collector yield [GWh/a]



# Collector Yields – IEA SHC Calculation



## Based on:

- installed capacity
- share of applications

## Calculation of the collector yield

- Reference Collector
- Reference System / application
- Reference Climate

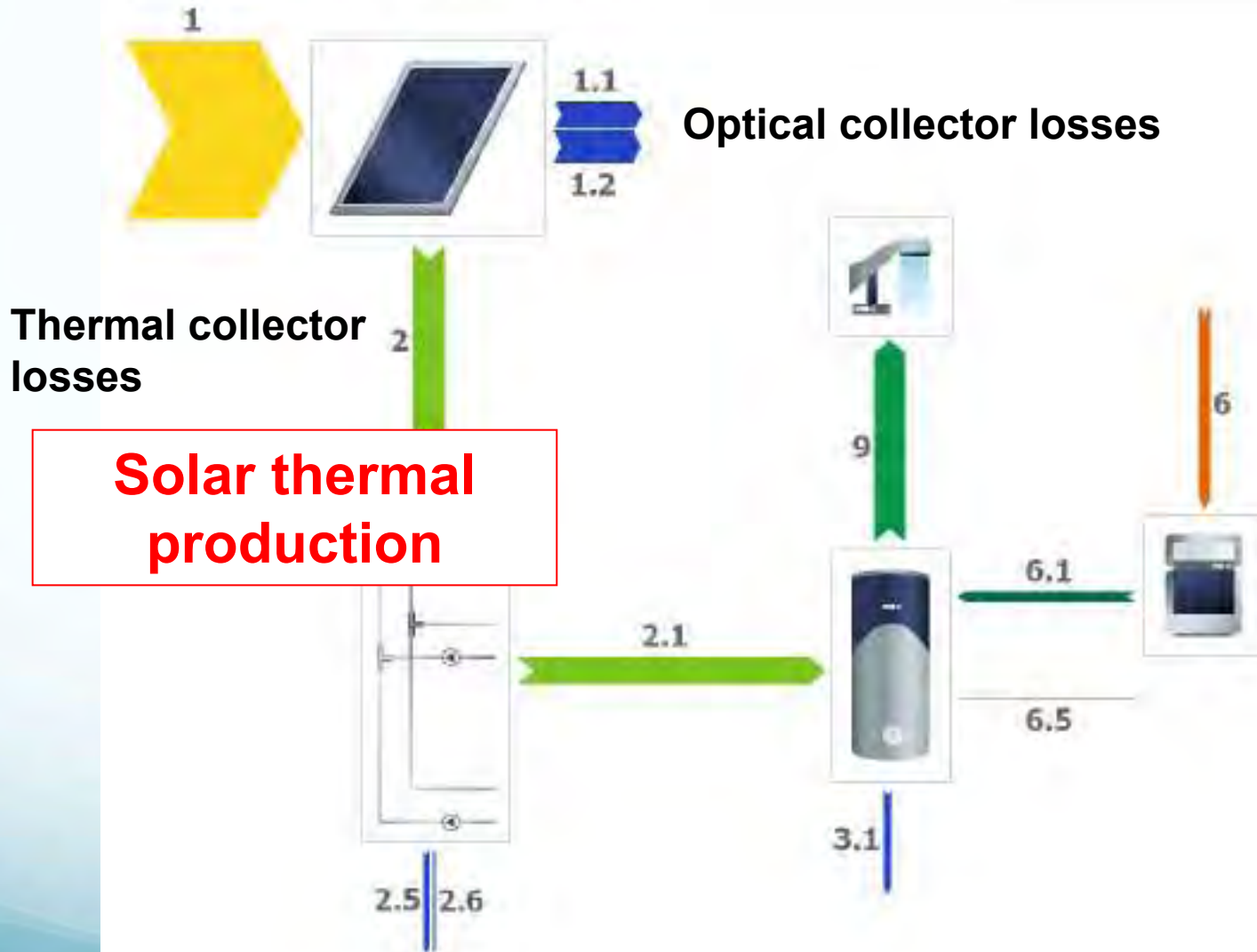


# Solar thermal production

For solar thermal energy IEA and Eurostat consider as **primary energy** the first usable form of energy

This is defined as: “**Solar thermal production is the heat available to the heat transfer medium minus the optical and thermal collector losses**”

# Energy Balance Schematic



# Simplified method for the calculation of annual collector output

Based on:

- Final summary report from the EU ThERRA project, 2009
- Detailed calculations of IEA SHC Solar Heat Worldwide

# Thank You