



Solar Thermal at a Global Level

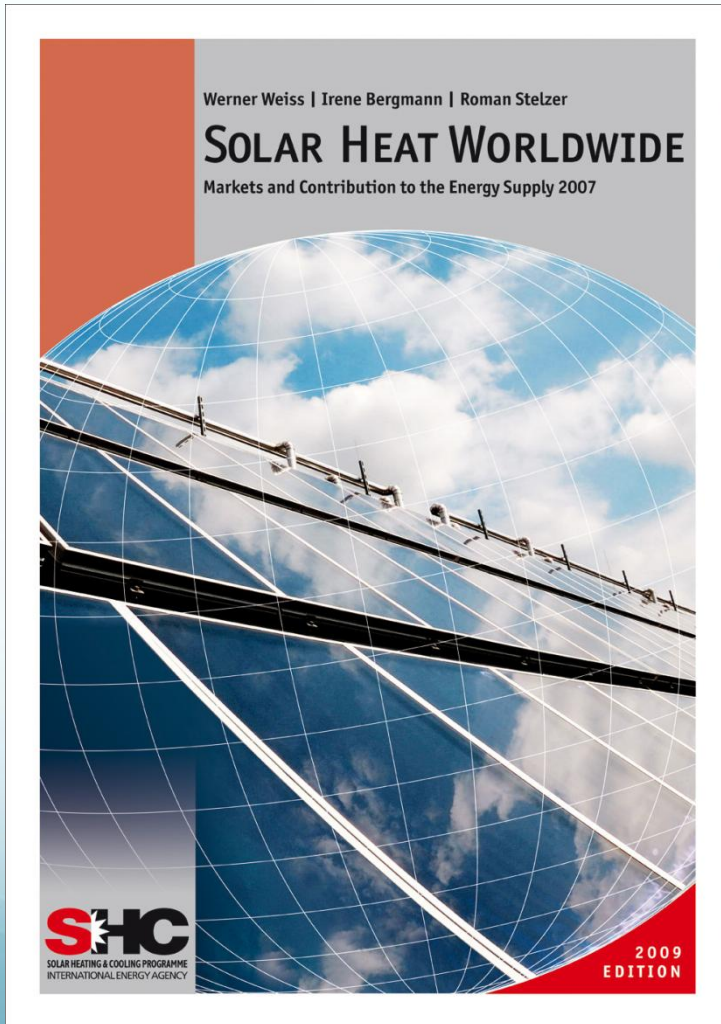
and the need for estimating annual solar collector energy output

Werner Weiss

IEA Solar Heating & Cooling Programme
Chairman

Worldwide Statistic

IEA SHC Solar Heat Worldwide



53 countries included

4.5 billion people represent

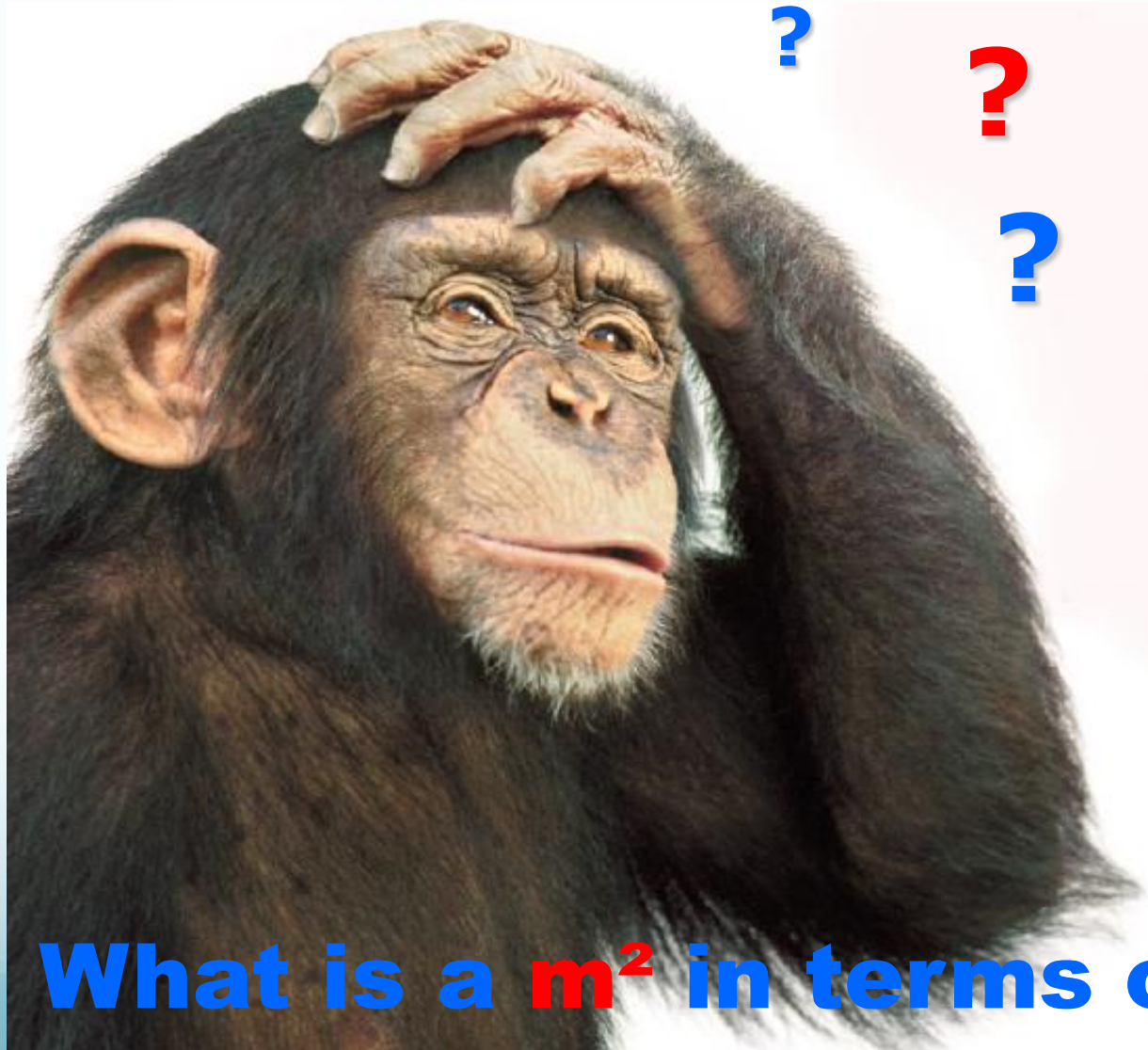
85-90% of the solar thermal market worldwide

Data provided by:

10 ExCo members

53 external experts,
governmental sources and
associations

The initial problem

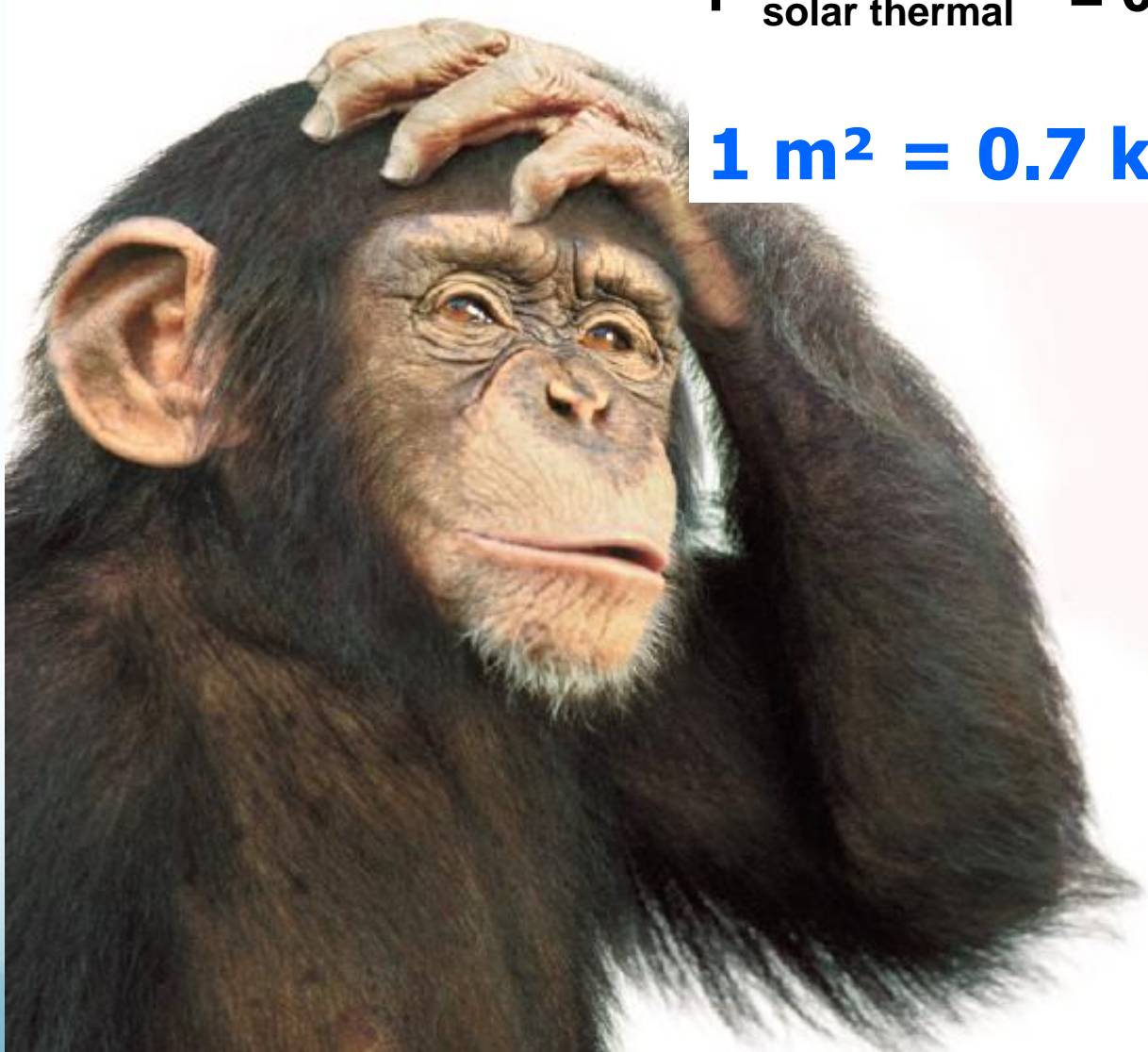


What is a m^2 in terms of power?

The 1st Solution

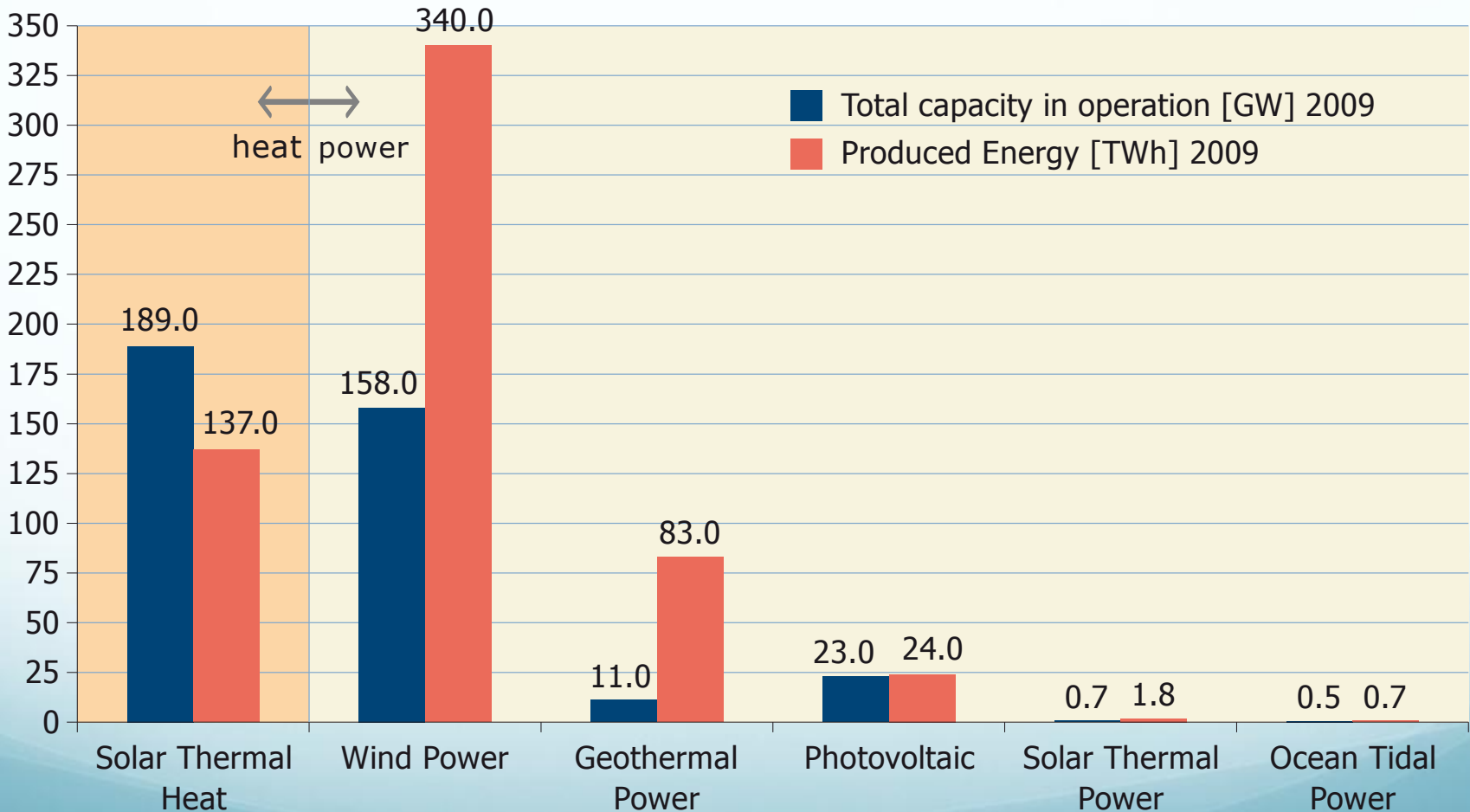
$$P_{\text{solar thermal}} = 0.7 \text{ kW/m}^2 * A_a$$

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



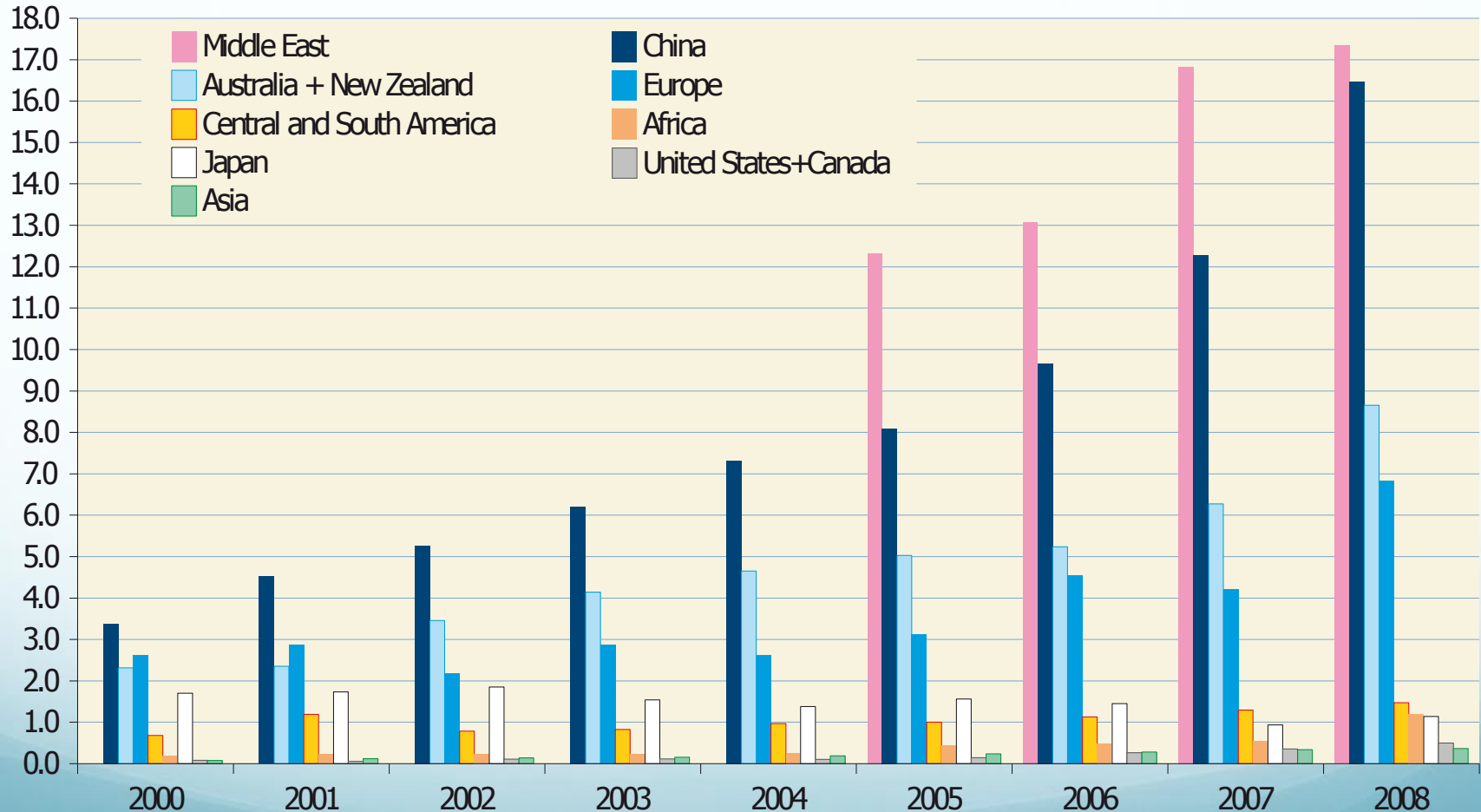
Solar Thermal's Global Contribution

Total Capacity in Operation [GW_{el}], [GW_{th}] and Produced Energy [TWh_{el}], [TWh_{th}], 2008



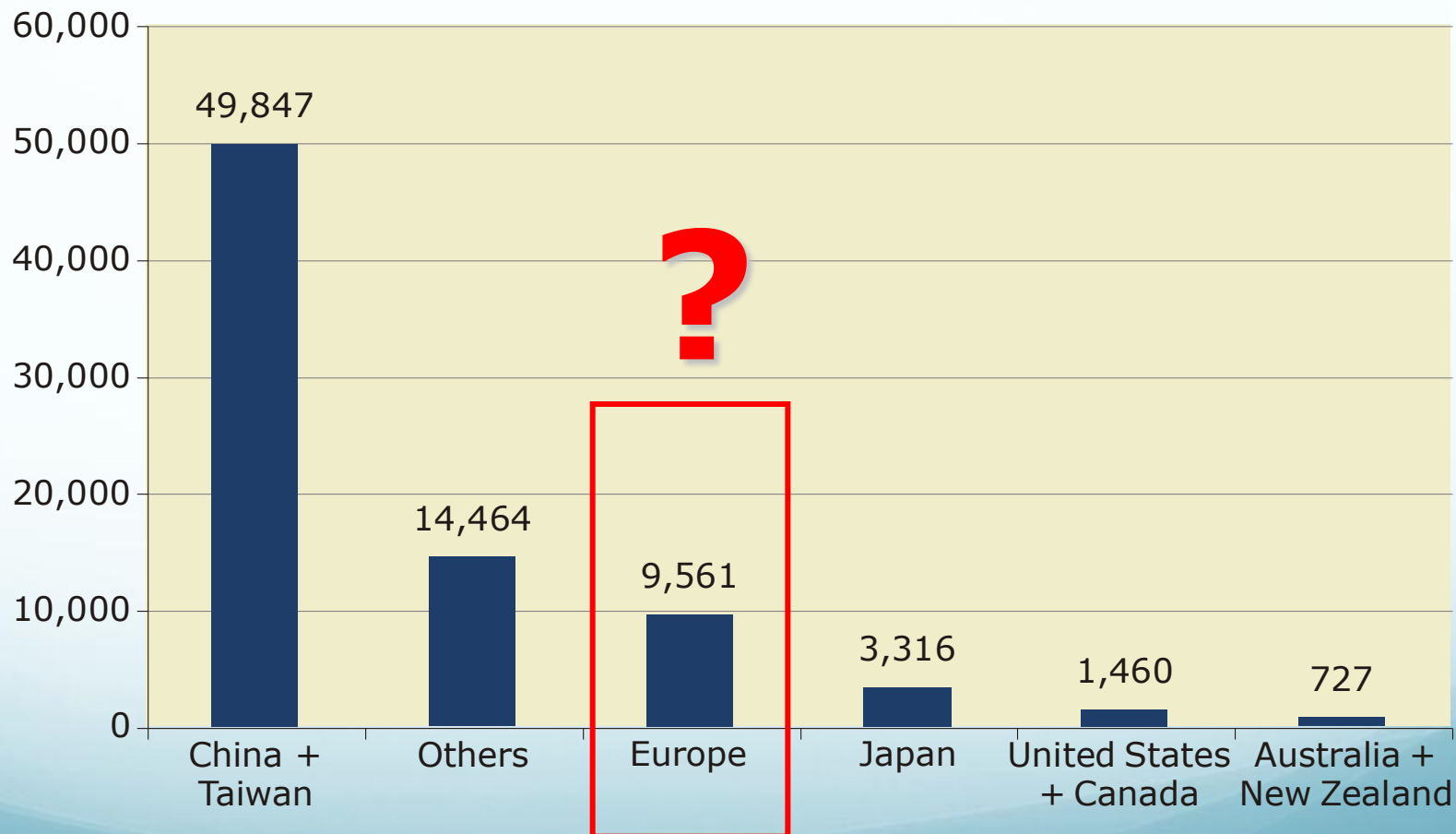
Market Development

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



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

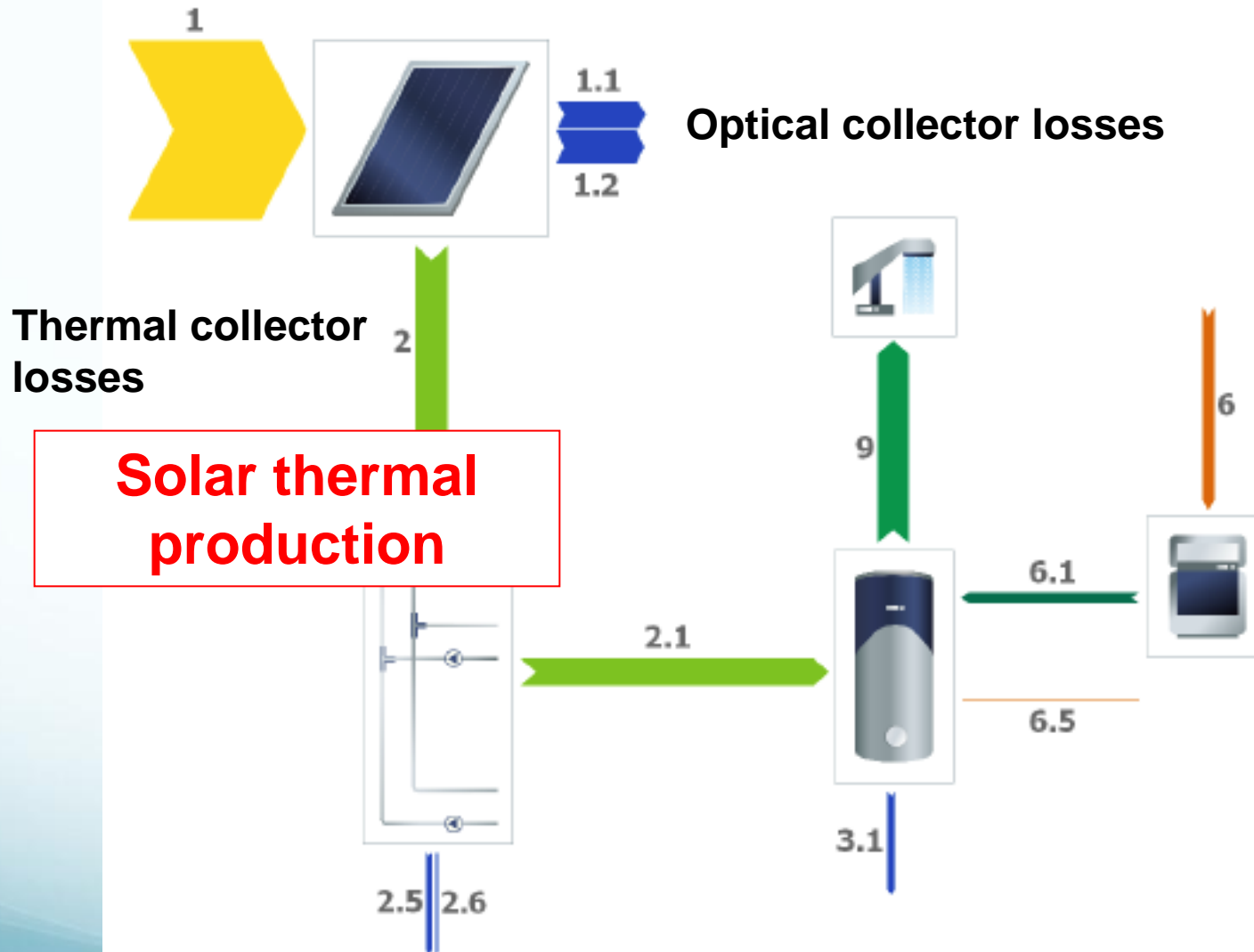
- Reference Collector
- Reference System / application
- Reference Climate

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