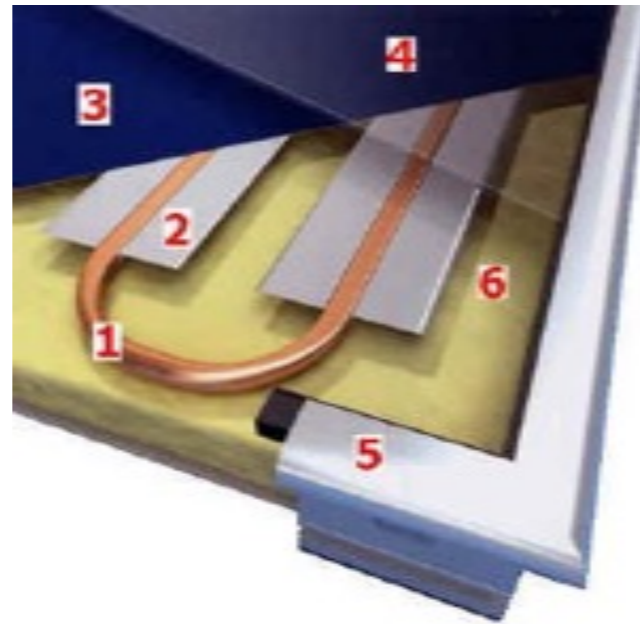
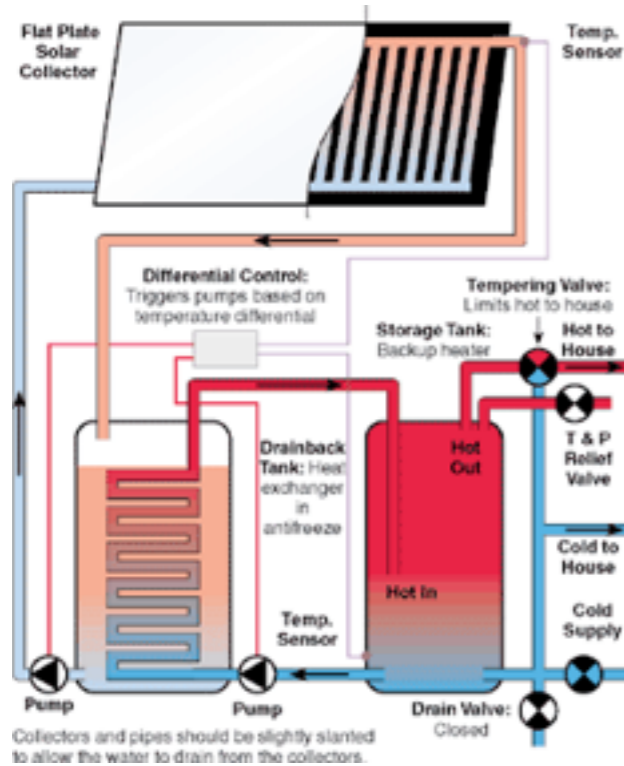


## The solar heater problem 2 : how much power can we expect to collect ?



- use Stefan-Boltzmann's law to calculate the power emitted by the Sun
- use the geometrical factor for two disks to calculate the power reaching the Earth, the solar constant
- as a side result, solve the Donald Trump problem at zeroth order : show that with a completely transparent atmosphere, it would be difficult to play golf on Earth
- determine the power collected on a  $10\text{m}^2$  solar heater

Diameter of the Sun:  $1,4 \cdot 10^6$  km  
Surface temperature of the Sun : 5800 K  
Distance to the Sun:  $1,5 \cdot 10^8$  km  
Diameter of the Earth: 12700 km

Effective albedo of the Earth: 0.3

power emitted by the Sun per unit area :  $\sigma T^4 = 64 \text{ MW/m}^2$   
total power on a disk of radius  $R_s = \sigma T^4 \pi R_s^2 = 9.6 \cdot 10^{25} \text{ W}$

