GOOD PRACTICES IN SME

Solar collectors

Designed by freepik

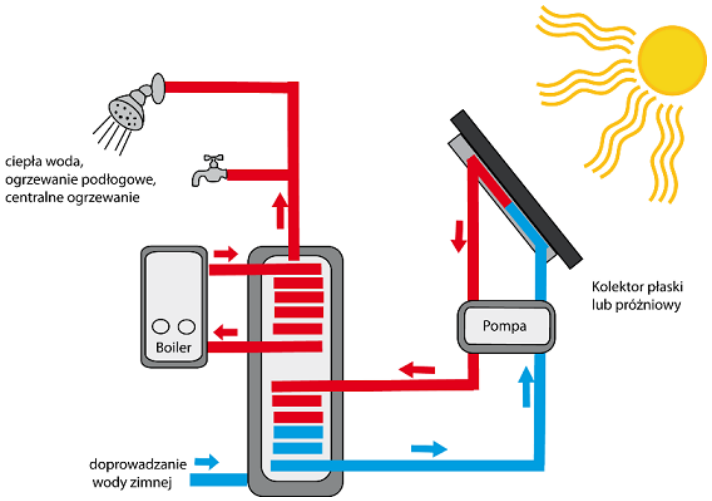
The following document was developed using European Union financing as part of the “Technical support for the promotion of energy audits and energy efficiency investments in small and medium-sized enterprises in Poland”. The opinions presented in this document should not be treated as the official stance of the European Union.

The project was financed by the European Union as part of Structural Reform Support Programme (SRSP) and realized by the Polish National Energy Conservation Agency (KAPE SA) in cooperation with the European Commission on behalf of the Ministry of Climate and Environment.

How do solar collectors work?

Solar collectors use the suns energy to heat up water, meaning they often find application in heating domestic hot water (DHW) and les often in central heating installations. Solar radiation is absorbed by the absorber (usually made from copper), and then using a medium (water or glycol solution) heat is transferred to the water in the storage tank.

The performance of the using collectors will vary with the availability of solar energy. This means the collector heats more water in the summer months in comparison to winter months. It is for this reason solar collectors are rarely used in central heating installations, where demand is predominantly in the winter. They are primarily used to prepare DHW as demand remains at similar levels throughout the year.



Pic. 1 cogitoenergy

Top left to bottom right: warm water, floor heating, central heating, flat plate or vacuum tube solar collector, boiler, pump, cold water supply

What are the types of solar collectors?

There are two types of solar collectors – flat plate and vacuum tube. Vacuum tube collectors collect both direct and dispersed radiation, which increases their efficiency in comparison to flat plate collectors, however, they are also much more expensive. Another factor affecting the price is the heat transfer medium – water is cheaper than glycol but cannot be used in winter due to its freezing point. All-year-round collectors will use a non-freezing glycol solution as the heat transfer liquid.

Pic. 2 DeDietrich: vacuum tube collector

Pic. 3 Viessmann: flat plate collector

Which collector to choose – flat plate or vacuum tube?

Flat plate collectors are cheaper, which means an installation of a given power consisting of flat plate collectors will be cheaper than a vacuum tube installation.

Vacuum tube collectors are more efficient, meaning that an installation of a give power consisting of vacuum collectors will have a smaller surface area than a flat plate installation.

Vacuum tube collectors are a better choice when the available installation area is limited.

Where to place the collectors?

Most often, solar collectors are installed on the building's roof. In the case of roofs with a 30°-60° inclination there is a possibility of fully integrating the collectors with the roof. In other cases, mounting frames are used to correct the angle of the collectors.

In cases where the roof area is too small, the building's façade can be used. Here (where collector position is not optimal) it is better to install vacuum tube collectors due to their better performance.

Solar collectors should face south with a ±15° accuracy. It is also important to ensure that the installation is not shaded by trees or other buildings.

Source: KAPE

Pic. 2 HEWALEX