



Solar-Cooking

A parabolic cooker, or solar cooker, is a device which uses the energy of direct sun rays to heat or cook food or drink. A parabolic cooker has a reflective mirror of polished glass, metal or metallised film which concentrates light and heat from the sun on a small cooking area, making the energy more concentrated and increasing its heating power. A dark coloured cooking pot is placed in the spot where the concentrated sun rays meet and a temperature high enough to cook food is reached.

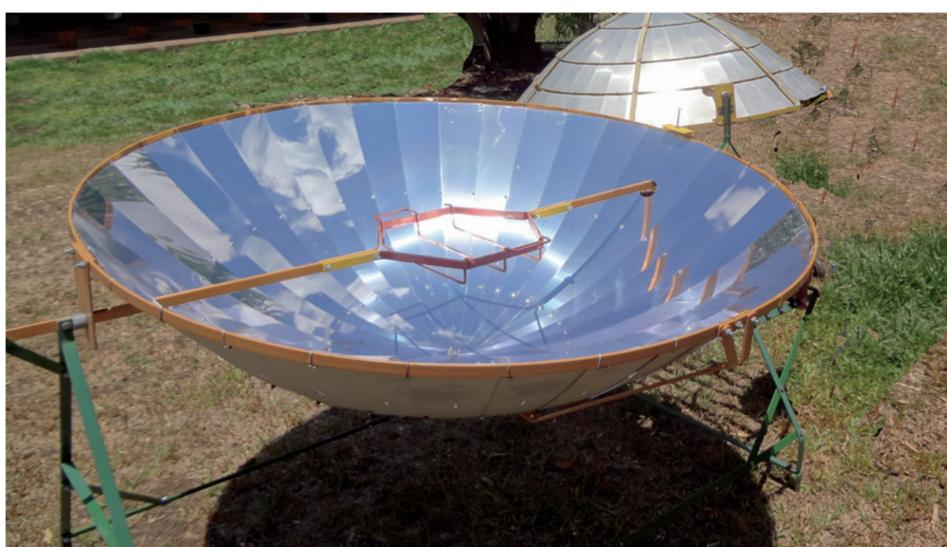
Concentrating sunrays to achieve high temperatures has a long history. Already Archimedes (287-212 b.C.) wrote literature (which has unfortunately been lost) on the subject of concave mirrors. It is said that Archimedes hometown was saved from an attacking roman fleet through the use of such a mirror construction.

In the 17th and 18th century mirrors and lenses were used in experiments to melt metals.

The French solar pioneer A. Mouchot (1825-1912) built a very noteworthy solar cooker and demonstrated its numerous uses.

An intensive development of solar cookers has taken place in the last 20 years. It's use is being promoted in developing countries in order to help reduce fuel costs (for low-income households) and air pollution, and to

slow down the deforestation and desertification caused by gathering firewood for cooking. The production does not require complicated machines, just simple devices without power and is easy to learn. The solar cooker has proven to be especially advantageous since it hardly requires a change in the food habits of the inhabitants of these countries.





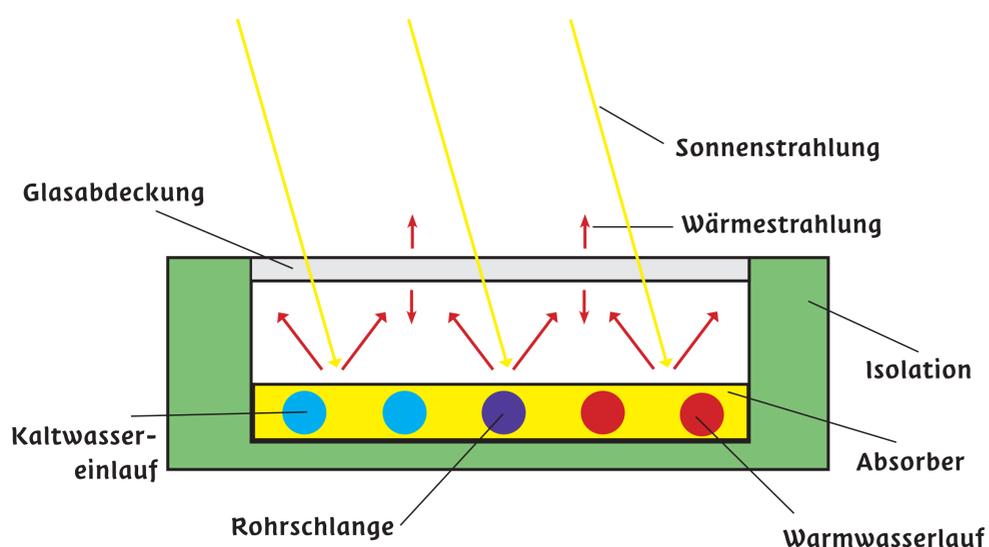
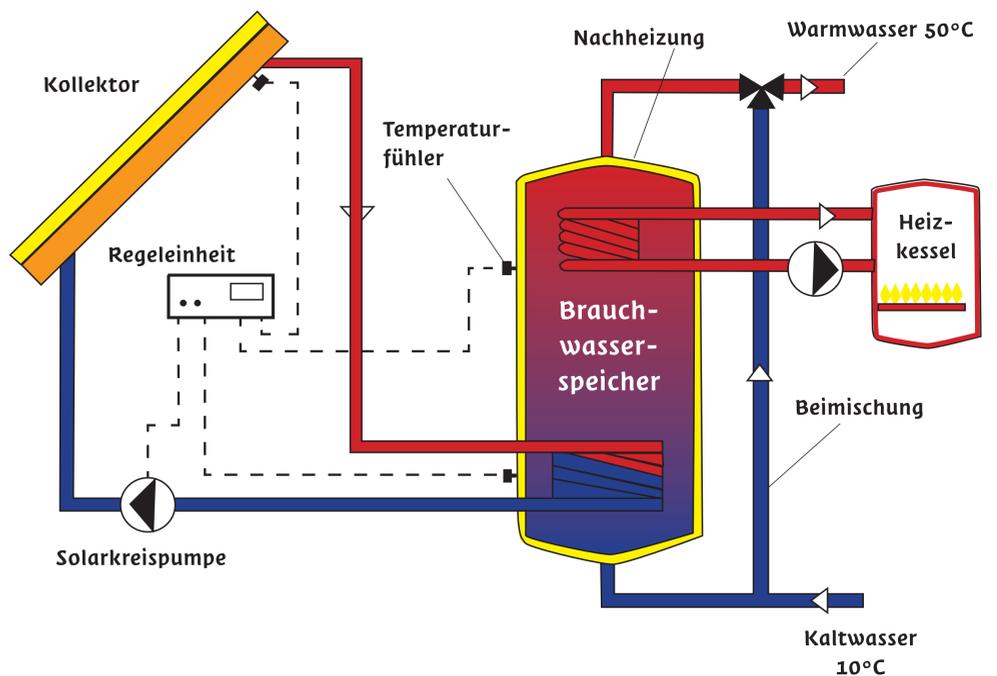
Production of warm water using solar energy

Solar collectors are appliances for producing warm water. The heat energy is “collected” and used to heat water. The most common form of solar collectors is the flat plate collector, with is easily positioned on e.g. a roof. Important is that the heat inside the collector is not lost, therefore different types of isolation materials or vacuum insulation is used.

The sun rays fall on the glass plates of the solar collectors. An absorber inside absorbs the sun rays and heats up. The heat is transferred directly to copper or aluminum pipes. Thus, the liquid inside the pipes heats up and can be used for domestic purposes.

However, it is not always necessary to use a complicated system to heat water using solar energy: fill a dark plastic bag with water and let it stand in the sun, after a while (depending on the intensity of the sun rays) you have warm water at your disposal. This easy but effective method of heating water is recommended for camping!

Schema einer Solar-Warmwasseranlage





Photovoltaic:

electric energy from the sun

Photovoltaic refers to the direct transformation of light energy into electric energy using solar cells made from a special material (semiconductors). These materials possess the astonishing property that, when being struck by electromagnetic waves (e.g. sun rays), they immediately produce an electric tension between the irradiated and unirradiated surface. It is now possible to use this uninterrupted electric energy by connecting, e.g. a light bulb to the circuit.

Important is, that it is not only possible to transform direct solar irradiation. The system also works when light is diffused, for instance on a cloudy day, and electric current can still be produced.

Electric current can either be used directly, be collected in so called accumulator batteries or entered into the electric circuit by transforming the continuous current using an alternating-current converter.

The use of photovoltaic has increased strongly in the last couple of years, as this type of power production has proven to be very efficient. Furthermore, solar energy is inexhaustible and therefore a future-oriented technology.

Admittedly, the production of semiconductors for the solar collectors still represents a large problem. Also the proper disposal remains an awkward matter. Momentarily, there are only very few recycling plants for photovoltaic.

Photovoltaikanlage in der Mojave-Wüste von Kalifornien

