# HOW TO EXPLOIT SOLAR ENERGY

Record-high oil prices make both wind and **solar energy** increasingly competitive. Fear of **climate change** should brighten prospects for any alternative to fossil fuels, which release the greenhouse gases that cause global warming.
That is the reason why more and more multinationals are making long-term investments in solar energy.
The sun gives us energy in two forms: light and heat. For many years people have been using solar energy to make their homes brighter and warmer. Today, we use special equipment and specially designed homes to capture solar energy for lighting and heating.
**Solar collectors** trap the sun's rays to produce heat. A solar collector may be a box, a frame or a room containing these parts:

- clear covers, which let in solar energy;
- absorber plates, which soak up heat;
- insulation materials, which prevent heat from escaping;
- vents or pipes, which carry the heated air or liquid from inside the collector to where it can be used.

## COVERS

Many clear materials can be used as **covers** for solar collectors, but glass is perhaps the most common. A special type of glass, which resists breaking and scratching, is generally used for solar collectors. When sunlight passes through glass and hits a surface inside a solar collector, it is transformed into **heat**. While allowing sunlight to pass through, glass traps the heat produced inside the collector.

## ABSORBERS

**Absorbers** are dark-coloured objects that soak up heat. The heat produced inside a solar collector is soaked up by metal sheets or containers filled with water, rocks, or bricks that have been painted black or another dark colour. Without absorbers, solar heating systems would not produce enough heat to warm a house.

## VENTS AND PIPES

The heat produced by a solar collector is moved to an area where it can be used. If the collector's task is to heat air, then **vents**, ducts and fans carry the heated air from the collector to another part of the house. If the collector's task is to heat water, then **pipes**, tubes, and pumps move water from the collector to water heating or space heating equipment. If fans or pumps are required to move heated air or water, the heater is called an **active solar heater**. If the heated air or water from the collector moves to another part of the house naturally without fans or pumps, then the heater is called a passive solar heater.

## SUNSPACES

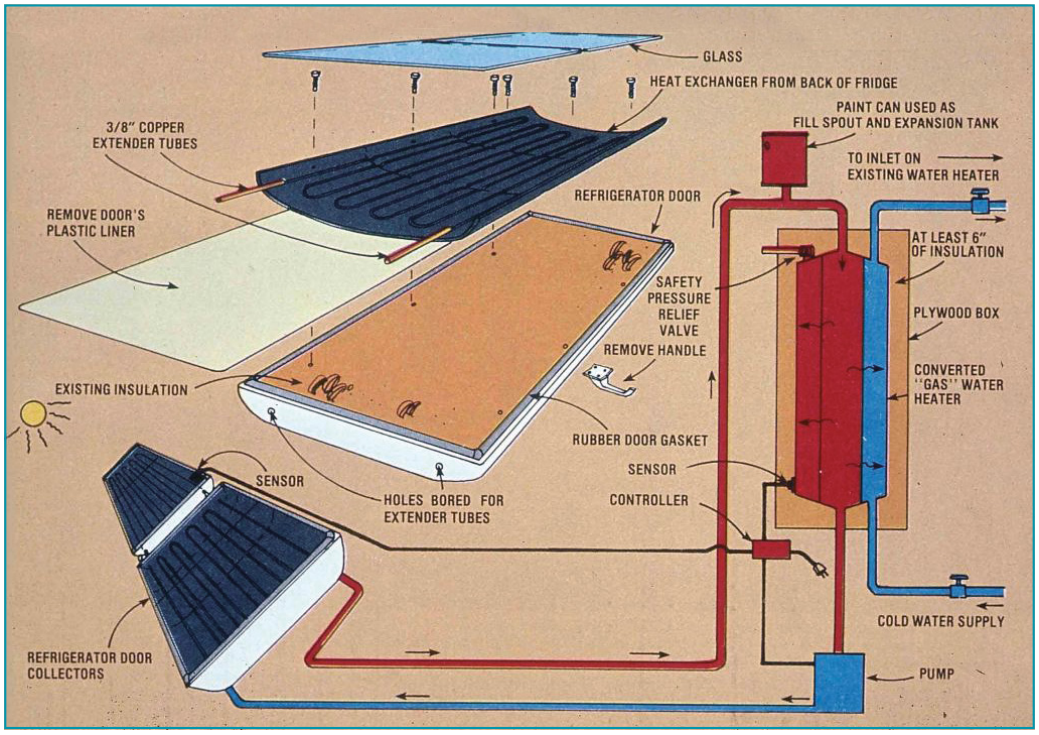
Solar collectors have various shapes and sizes. A home that uses a room or another part of the building as a solar collector is called a passive solar home. In many cases, passive solar homes use rooms called sunspaces to capture solar energy directly. A sunspace can be either a room that faces south or a small structure attached to the south side of a house.
Sunspaces have a large amount of glass and large areas of dark stone or concrete walls and floors. These materials make up the **thermal mass**, which absorbs heat.

Vents placed against the black wall of a sunspace allow heated air to move naturally into nearby rooms. At the same time, cooler air from nearby rooms can move into the sunspaces.

## FLAT-PLATE COLLECTORS

Another type of solar collector is the **flat-plate collector**. Flat-plate collectors look like large, flat boxes with glass covers and dark-coloured metal plates inside that absorb heat. Flat-plate collectors are usually placed on **roofs** of houses where no trees or tall buildings will block the sun's rays. Air or liquid, such as water, flows through flat plate collectors and is warmed by the heat stored in the absorber plates. The air or water heated inside the solar collectors then heats air or water inside the house. In an active solar air heater, a fan pushes the air heated inside the collector into a large bin full of rocks under the house. The heat is stored there so it can be used later. In an active solar water heater, the water heated inside the collector is pumped through pipes into a hot water tank.

The first flat-plate collectors were installed on the roof of a house in Los Angeles in 1909. Since then, millions of solar water and space heaters have been installed in homes and other buildings all over the world.





*Flat-plate collectors.*

## READING COMPREHENSION

ACTIVITIES

- *Answer the following questions.*

1. Which kind of energy does the sun provide?
2. What are solar collectors and how do they work?
3. What is a flat-plate collector?
4. What is the difference between active and passive air solar heaters?
5. What is a passive solar home?

## VOCABULARY

- *In the text, find the English equivalents of the following Italian words and expressions.*

1. A lungo termine .....
2. Materiali isolanti .....
3. Assorbire .....
4. Forme .....
5. Calcestruzzo .....
6. Raggi solari .....

## SPEAKING

- *Talk about the main advantages of solar energy.*