

# Solar Power

The sun is the single greatest power source on Earth by a long way. There are multiple ways of generating electricity from sunlight, from direct conversion (photovoltaic) techniques, and to concentrating and gathering the heat from sunlight.

## Using physics to heat and move water without needing a pump

These heaters use the sun to heat water, and the thermal expansion of water and steam to move that water to where it's needed.

## Mirrored tubes guide direct sunlight into your home

Another way to let sunlight into your home without being exposed to the elements!

## Solar water heating in batches

This website has multiple designs for solar water heaters that heat set amounts of water at a time.

## Direct sunlight without windows

This system uses lenses to concentrate sunlight, and fibre optical cables to transmit that light to places that don't get sunlight.

## Solar medicine

This team has developed a [portable, solar-powered autoclave](#) that can sterilize surgical tools (and any other tools) without needing electricity or the large, immobile autoclaves that exist in most hospitals (PDF).

## Using Sun to prevent pipes from freezing

These designs are for [solar water heating systems](#) that are designed to prevent your water pipes from freezing.

## Solar thermal power

Port Augusta, Australia is working towards replacing their coal-fire power plant with a [stand-alone solar thermal plant](#). This is both an advance in solar power, and a new example of a community taking action on climate change!

## Solar roadways

Solar Roadways is a company that is using solar power, engineering, and programming to create a [new kind of road](#) that could work for transportation, power generation, power transmission, internet, and emergency lighting all rolled into one!

## Increased photovoltaic efficiency from tree leaf patterns

A 13 year old took inspiration from the way trees are able to get enough sunlight to grow even in a forest, and used it to develop a [new layout of small photovoltaic cells](#) that increased the efficiency of existing technology.

## Solar cells from plants

This technique to create photovoltaic cells can even use grass clippings to make solar cells.

## Solar hybrid technology for 24/7 power generation

Using solar power to heat air drives hot air turbines to produce electricity during the day, using no water, and methane produced by cows produces electricity at night. [Learn More](#)

## Crystal balls to concentrate sunlight

This architect has designed a system that uses a huge, [water-filled glass sphere to concentrate sunlight](#) on a photovoltaic cell, increasing its efficiency by 35%.

## Scalable ball lens technology

In case there was any question, ball lenses can be used at any size—[this one](#) concentrates sunlight on a photovoltaic panel one centimeter square.

## Robot solar panel cleaners

A clean solar panel is an efficient solar panel. A solar field in Israel now has [robots that clean](#) their panels without using water—a precious resource in the desert!

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