

# Cooking With The Sun



**RENEWABLE ENERGY**  
THE INFINITE POWER  
OF TEXAS

## HIGHLIGHTS

- **Solar cookers can be used everyday or for solar picnics**
- **They come in many types**
- **They are easy to build, or can be bought ready-made**
- **Solar cooking works well, is easy, fun, and good for the environment**

## SUMMARY

Most of you know how it can be hot enough to fry an egg on the pavement. But have you ever seriously considered actually cooking with the sun? In some parts of the world, solar cooking is very popular. In Texas it works just as well and can be used for everything from picnics to everyday cooking.

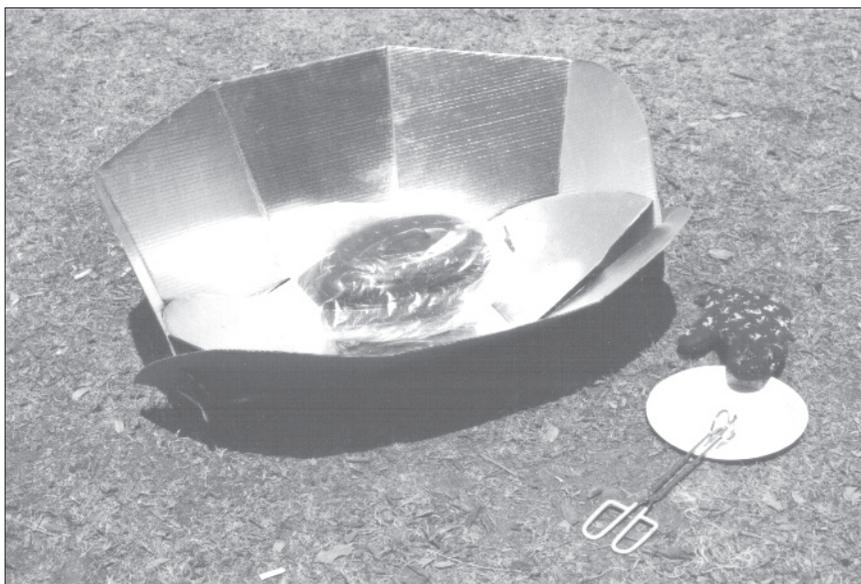
## SOLAR COOKER BASICS

Solar cookers work because sunlight carries lots of power. For

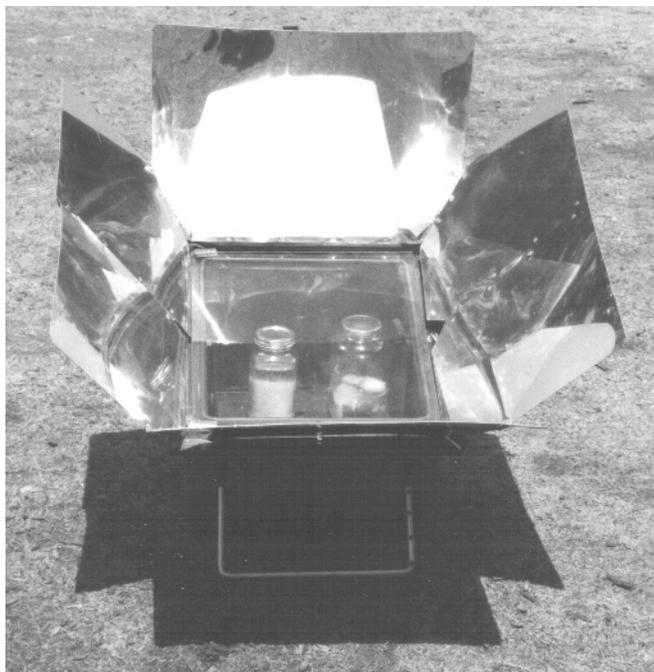
example, when sunlight hits a surface with an area of 1 square meter, there is about 1,000 watts of energy from the sun on that surface. Compare this to your toaster oven, which uses about 1,000 watts. In a solar cooker, sunlight is concentrated into a cooking area that gets hot enough to cook food. If more sunlight can be captured, more power can be generated. Solar cookers sometimes have an insulated cooking chamber to prevent heat from escaping.

## SOLAR COOKER DESIGNS

Just as there are many kinds of conventional cookers (ovens, stovetops, broilers, microwave ovens), there are many kinds of solar cookers. The simplest type of solar cooker is the “Cookit”



**FIGURE 1. PANEL COOKER** The “Cookit” panel cooker is simple but effective.



SOURCE: JUDY PEARSON

**FIGURE 2. BOX COOKER** *Box cookers are excellent for slow cooking.*

shown in Figure 1. It consists of a single piece of cardboard with aluminum that is folded into a panel that acts like a reflector. A dark pot placed in a plastic bag can be the cooking container. The dark color allows more heat energy to be absorbed by the cooking container.

Figure 2 shows a solar box cooker. A solar box cooker consists of an insulated box, black on the inside (to absorb sunlight) with a transparent cover (usually glass), and one or more reflective panels that allow more sunlight to enter the cooking chamber. Food is placed inside the chamber in a dark-colored pot. Box cookers can reach temperatures in the mid to high 200 degrees F.

Solar cookers that use parabolic designs, as shown in Figure 3, have a dish reflector with a parabolic shape. The dish reflects sunlight into the focal region of the parabolic curve. A dark colored pot is usually placed at this focal region to get the most sunlight. Depending on the size of the reflector, very high temperatures can be reached. Parabolic solar cookers may

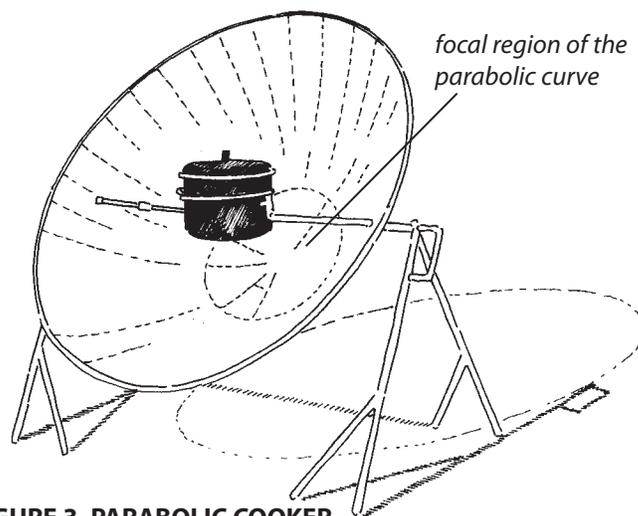
have a large area to collect sunlight and therefore can generate high power; but they typically do not have an insulated cooking chamber. Therefore, these solar cookers are used similarly to a conventional stovetop.

Some solar cookers use both a parabolic cooker, which can focus direct sunlight in a particular area resulting in high heat, and an insulated cooking chamber. These cookers are called solar concentrator ovens. These ovens operate like a conventional oven because they can reach high temperatures. Figure 4 shows one such unit that is sold commercially.

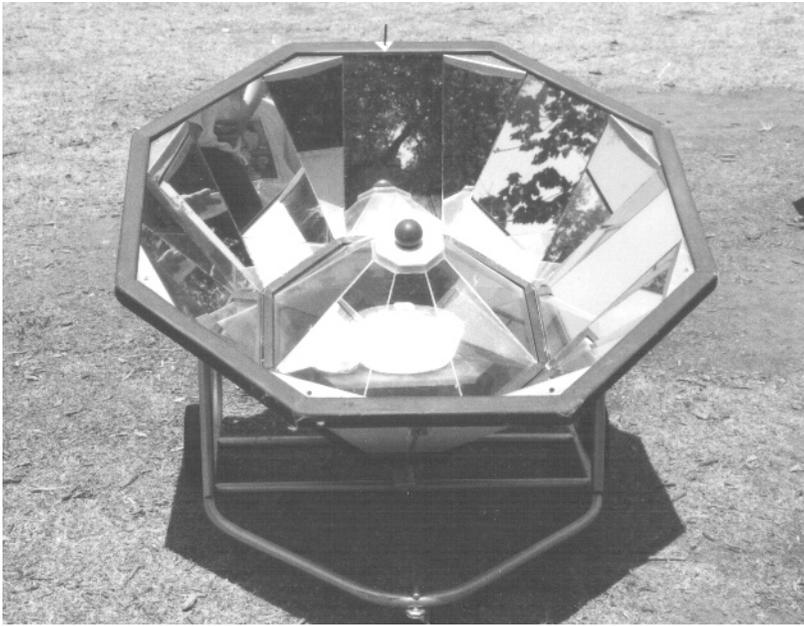
As you can see from these examples, there are many different types of solar cookers that can be made. There are even cookers that are built into a south wall, cookers that can fold into backpacks, cookers that are like stovetops and more.

## COOKING WITH A SOLAR COOKER

Just as we cook differently with stovetops, ovens and microwaves, different types of solar cookers are used differently. A parabolic solar cooker might be used like a stovetop by



**FIGURE 3. PARABOLIC COOKER** *Parabolic solar cookers reflect sunlight into a fixed point.*



SOURCE: JUDY PEARSON

**FIGURE 4. CONCENTRATOR OVEN** *Solar concentrator ovens combine a parabolic cooker and an insulated chamber to reach high temperatures.*

heating a pan or pot to a high temperature. A box cooker is most effective when it is used like a crock-pot (slow cooking or low heat over a long time). And a solar concentrator oven can be used like a conventional oven.

Let's consider the simple box cooker. On a sunny day in Texas, May through September, it will reach temperatures around 250 degrees, which will cook or bake most foods. The slow cooking brings out the flavor in many foods. Expect to cook food in this type of solar cooker about twice as long as with a conventional oven. But since it is almost impossible to burn food in this type of cooker, it does not matter how long food is left to cook. People who use solar box cookers usually prepare their dish, put it in the cooker, and go away until it is ready to eat. They can also move the oven a couple of times as the sun moves across the sky to better capture sunlight.

In general, solar cookers work best on bright, sunny days, and when the sun is high. But they can still cook food even if the sky is hazy or partly cloudy.

Because solar cookers use the sun as their source of heat, they save natural resources. They also can help keep your house cool in the summer by keeping the cooking heat outside!

Where you live and the weather can affect how well a solar cooker cooks food. The type of conditions that could affect it are: how high above sea level (higher altitudes should be better), latitude, seasonal rainfall and air pollution.

## HOW TO GET A SOLAR COOKER

A good way to get a solar cooker is to build one yourself. The "Cookit" design shown in Figure 1 has the simplest design and can be very effective. A simple box cooker can be made in a couple of hours at home from scrap cardboard, aluminum foil, a piece of glass and some black paint. After building one from plans, some people decide to design their own. Many of the most successful designs started in just this way.

If you are more serious about cooking than building, then ready-made solar cookers are available, many of which can match conventional ovens in performance.

## ORGANIZATIONS

### Solar Cookers International

1919 21st Street, Suite 101  
Sacramento, CA 95814  
(916) 455-4499

[info@solarcookers.org](mailto:info@solarcookers.org)

[www.solarcookers.org](http://www.solarcookers.org)

### Texas Solar Energy Society

P.O. Box 1447  
Austin, TX 78767-1447  
(800) 465-5049

e-mail: [info@txses.org](mailto:info@txses.org)

[www.txses.org](http://www.txses.org)

### Texas Renewable Energy Industries Association

P.O. Box 16469  
Austin, TX 78761-6469  
(512) 345-5446

[www.treia.org](http://www.treia.org)

## RESOURCES

### FREE TEXAS RENEWABLE ENERGY INFORMATION

For more information on how you can put Texas' abundant renewable energy resources to Use in your home or business, visit our website at [www.InfinitePower.org](http://www.InfinitePower.org) or call us at 1-800-531-5441 ext 31796. Ask about our free Teacher Resource Guides and CD available to teachers and home schoolers.

### ON THE WORLD WIDE WEB:

The best place on the web to start:

[www.solarcooking.org](http://www.solarcooking.org)

El Paso Solar Energy Society

[www.epsea.org/cook.html](http://www.epsea.org/cook.html)

Commercially available ovens

[www.solarbakeovens.com/solar-oven.shtml](http://www.solarbakeovens.com/solar-oven.shtml)

[www.sunoven.com/](http://www.sunoven.com/)

[www.realgoods.com](http://www.realgoods.com)

### BOOKS and MAGAZINES

*Home Power Magazine.* Occasional articles on solar cooking, advertisements for solar cookers.

[www.homepower.com](http://www.homepower.com)

*Heaven's Flame: A Guide to Solar Cookers.* Joseph Radabaugh, Home Power Publishing, 1998

*Solar Cooking: A Primer/Cookbook.* Harriet Kofalk, book Publishing Company, 1997

*Solar Cooking Naturally.* Virginia Heather Gurley, SunlightWorks, 1995

*Cooking with the Sun: How to Build and Use Solar Cookers.* Beth and Dan Halacy, Morning Sun Press, 1992



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