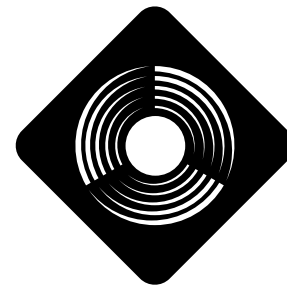


Cooking with the Sun!

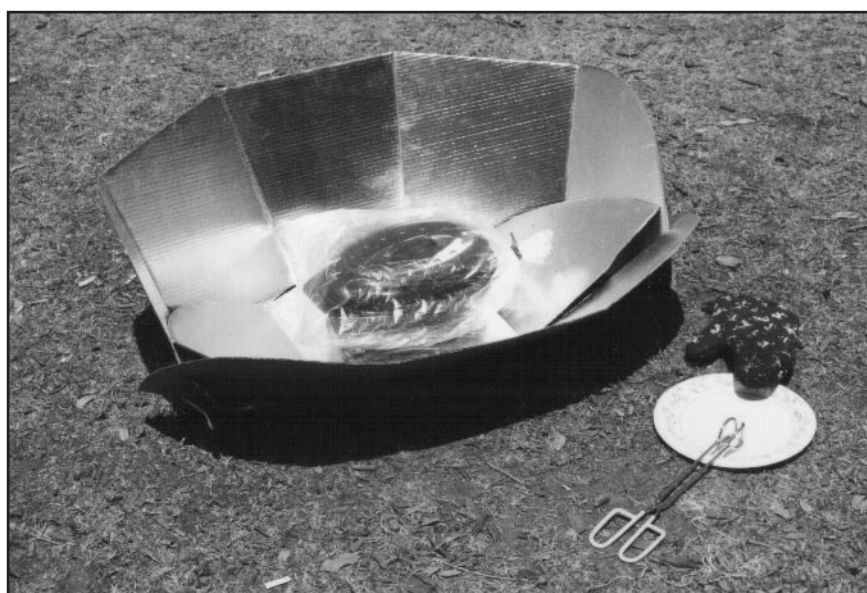


RENEWABLE ENERGY
THE INFINITE POWER
OF TEXAS

SECO FACT SHEET **NO. 23**

HIGHLIGHTS

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



SOURCE: JUDY PEARSON

Figure 1 Panel Cooker *The “Cookit” panel cooker is simple but effective*

SUMMARY

Although most Texans understand how it can be hot enough to fry an egg on the pavement, few have seriously considered actually cooking with the sun. Yet in some parts of the world, solar cooking is very popular. In Texas it works just as well and is suitable for everything from picnics to everyday cooking.

SOLAR COOKER BASICS

Solar cookers work because direct sunlight carries lots of power: on bright days, about 1,000 watts fall on each square meter of surface that it strikes (compare this to your toaster oven, which is likely to use about 1,000 watts). In a solar cooker, sunlight is concentrated into a cooking area that gets hot enough to

cook food. Collecting more sunlight provides more power; this is balanced by heat losses, so solar cookers sometimes feature an insulated cooking chamber.

SOLAR COOKER DESIGNS

Just as there are many kinds of conventional cookers (ovens, stovetops, broilers, microwave ovens), there are



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SOURCE: JUDY PEARSON

Figure 2 Box cooker *Box cookers are excellent for slow cooking*

many kinds of solar cookers. Perhaps the simplest solar cooker is the “Cookit” shown in Figure 1. It consists of a single piece of aluminized cardboard folded into a reflector. A dark pot placed in a plastic bag serves as the cooking vessel. This design performs similarly to simple box cookers.

Figure 2 shows a box cooker, which is basically an insulated box, black on the inside (to absorb sunlight) with a transparent cover (commonly glass), and one or more reflective panels to increase the amount of sunlight that enters the cooking chamber. Food to be cooked is placed inside, usually in a dark-colored pot to increase energy

absorption. Box cookers behave much like conventional ovens operating at medium temperatures.

Parabolic designs, illustrated in figure 3, have a dish reflector with a parabolic shape that reflects sunlight

into a focal region where a cooking vessel, usually dark in color, is placed. Depending on the size of the reflector, very high temperatures can be reached. Such designs may have a large solar collection area and therefore high power; but they typically do not have an insulated cooking chamber, so they are used similarly to a conventional stovetop.

Some cooker designs combine the high concentration of a parabolic cooker with an insulated cooking chamber. Such designs, called concentrator ovens, can rival a conventional oven in performance. Figure 4 shows one such unit that is sold commercially.

As you can see from these examples, solar cooker designers have been

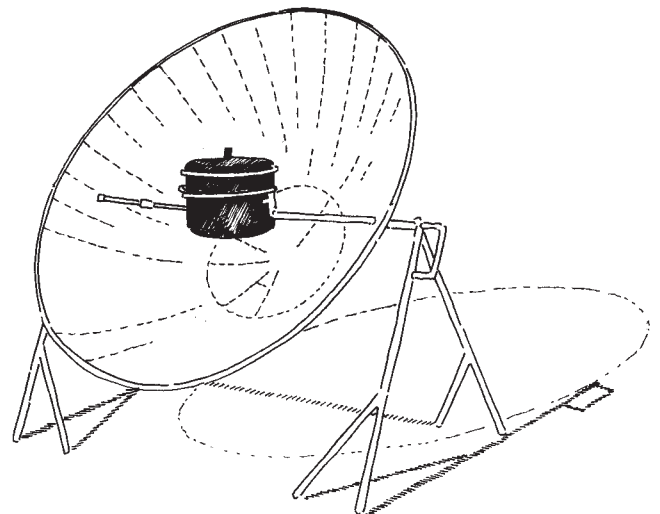


Figure 3 Parabolic Cooker *Parabolic solar cookers produce concentrated heat*

innovative in creating different models. The resource materials presented on page 4 will lead you to an even wider variety, including 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 one cooks differently with stovetops, ovens and microwaves, different types of solar cookers are used differently. Whereas a parabolic unit might be used like a stovetop, heating a pan or pot to high temperature, a box cooker is most effectively used like a crock-pot, and a concentrator oven can be used like a conventional oven.

Consider the simple box cooker. On a sunny day in Texas, May through September, it will cook at around 250 degrees, which will cook or bake most foods. The slow cooking brings out the flavor in many foods. Expect to cook food about twice as long as with a conventional oven; but cooking time is uncritical, since it's almost impossible to burn food in this type of cooker. Box cooker users typically prepare their dish, put it in the cooker, and go away



SOURCE: JUDY PEARSON

**Figure 4
Concentrator
Oven** *Combining high concentration with an insulated cooking compartment can deliver excellent performance*

until it's ready to eat, perhaps repositioning the oven a couple of times to better capture sunlight.

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

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

OBTAINING A SOLAR COOKER

A rewarding way to get started is to build your own solar cooker. The

“Cookit” design shown in Figure 1 is the ultimate in simplicity and can be surprisingly 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. Instructions and plans are available in the materials presented in the resource list. After building one from plans, some people even decide to design their own. Many of the most successful designs originated in just this way.

If you are more serious about cooking than building, excellent units are commercially available, some of which rival conventional ovens in performance. The resource list will help you locate a variety of these.

ORGANIZATIONS

Sources of inexpensive cookers and how to use them:

Solar Cookers International

1919 21st St., Suite 101
Sacramento, CA 95814 USA
(916) 455-4499

www.solarcooking.org

Texas Solar Energy Society

PO Box 1447
Austin, TX 78767-1447
(512) 326-3391 or (800) 465-5049

www.txses.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 or call us at 1-800-531-5441 ext 31796. Ask about our free lesson plans and videos available to teachers and home schoolers.

ON THE WORLD WIDE WEB:

The best place on the web to start:

www.solarcooking.org

El Paso Solar Energy Society.

www.epsea.org/cook.html

Commercially available ovens:

www.solarbakeovens.com

www.solarchef.com

www.realgoods.com

BOOKS AND MAGAZINES

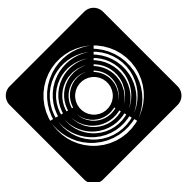
Home Power Magazine. Occasional articles on solar cooking, advertisements for solar cookers. www.homepower.com

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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