

# Worshipping the sun

Next month, Alice Springs will again play host to the Solar Oven Bakeoff. Yes, it seems like a fanciful idea, but you can bet there'll be plenty of participants and many more onlookers keen to learn more about the ultimate in environmentally friendly cooking. Sean McGowan reports.



Parabolic oven via EG Solar, Germany.

No doubt you've heard the expression "hot enough to fry an egg"?

Well, many people around the world, including here in Australia, have taken this notion a step further and are making meals "Masterchef-style" simply by harnessing the power of the sun – and using some simple household materials!

From rice, stews and hotpots to hamburgers, biscuits and even whole chickens, solar ovens seem to be able to cook just about anything provided the design can achieve enough heat – and you're not necessarily looking for your meal right away.

## Solar ovens 101

There are three major styles of solar oven – panel, box and parabolic. All work on the three fundamentals of reflecting and concentrating sunlight; turning sunlight into heat; and containing the heat – with each design having its own advantages and disadvantages.

Panel ovens are the most simple and economic to build (see the plan below). Typically using cardboard panels covered in aluminium foil they concentrate sunlight to

the centre of their semi-circle form where a plastic bag enclosed pot is placed containing the food for cooking.



Alice Springs' Solar Oven Bakeoff 2008.

Box ovens are a little more complicated to build. They are often a cardboard or plywood box, which is insulated inside, with a glass or clear plastic lid sealing the heat inside. They provide slow, even cooking; and a reflector at the rearward side of the box can also be added to reflect further sunlight into the enclosed box assisting in the heat achieved.

Finally, parabolic cookers are concave in shape, much like the inside of an umbrella or satellite dish. They are said to be able to cook food much faster than the other styles due to the high temperatures which can be achieved quickly by focusing light to the bottom of the pot positioned in its centre. However, they require constant adjustment as the sun moves across the sky, and due to their high heat output, can also be quite dangerous, often reaching temperatures equivalent to a conventional household oven.

A solar oven is best positioned in a sunny location, protected from the wind. Once set up, a dark-coloured vessel containing the food to be cooked can be placed in the centre of the oven. This would typically be a metal pot or ceramic hot-pot.

For best results, the pot should be shallow and made from thin material so it warms up quickly, with a tight fitting lid to retain the heat and moisture.

When using a panel oven, the pot is typically placed within a clear plastic bag or oven bag, which is sealed to retain the heat created by the solar oven. This transparent heat trap allows the sunlight to enter, but keeps the heat generated from escaping. In the case of box ovens, the clear glass or plastic lid acts in the same



## Make your own solar oven

A quick search on the internet will reveal any number of plans and instructions on how to make your own solar oven at home, however, we thought the ingenuity of this design warranted publication.

It looks so easy we reckon you could knock one up before lunch time. But does it really work?

### Materials

- A reflective accordion-folding car sunshade
- A cake rack
- 12cm of Velcro
- Black pot
- A plastic bucket
- A plastic baking bag

### Method

1. Lay the sunshade out with the notched side toward you.
2. Cut the Velcro into three pieces, each about 4cm.
3. Hand sew one half of each piece, evenly spaced, onto the edge to the left of the notch; sew the matching half of each piece onto the underneath size to the right of the notch, so that they fit together when the two sides are brought together to form a funnel.



*Bring the two sides together to form a funnel.*

4. Press the Velcro pieces together, and set the funnel on top of a bucket or a round or rectangular plastic wastebasket (off the ground).
5. Place a black pot on top of the cake rack, all of which is placed inside a plastic baking bag. This is positioned in the centre of the funnel, so that the rack rests on the top edges of the bucket or wastebasket.

Since the sunshade material is soft and flexible, the rack is necessary to support the pot. It also allows the sun's rays to shine down under the pot and reflect on all sides. If such a rack is not available, a wire frame could be made to work as well.



*Hey presto, solar oven.*

Let us know how quickly it can warm up a Four 'N Twenty pie.

Source: [www.solarcooking.org](http://www.solarcooking.org) and Kathy Dahl-Bredine.



*Sophisticated store bought solar oven.*

way. The extreme heat from a parabolic oven often means that a plastic bag does not need to be used in this way.

Solar ovens can reach temperatures in excess of 80°C, right up to around 140°C – which may not seem high compared to your typical household fan-forced oven, but given they are using nothing more than the sun's rays for heat, it is still fairly impressive, and obviously enough to cook with.

However, while you could be excused for thinking solar ovens sound like the domain of high school science students, backyard scientists or green revolutionists, their use is becoming far more widespread, and for good reason.

## Beyond the science experiment

Solar ovens have become one of the frontline tools across many parts of the third world where humanitarian organisations are distributing these simple devices to not only provide a heat-source alternative to firewood, but to also aid in the fight against waterborne diseases.

In the war-ravaged Sudanese region of Darfur, cardboard, aluminium and plastic bags have been distributed to a number of refugee camps in neighbouring Chad; where refugees are able to construct the ovens themselves.

According to the Jewish World Watch (JWW), one of the humanitarian organisations responsible for the project, the use of solar ovens for meals ensures women do not have to leave the safety of the refugee camps, and their children, in order to collect firewood for cooking.

"Refugee women face assault and even rape when gathering firewood for cooking outside of the relative safety of their camps in Darfur and Chad. In order to reduce the incidence of these attacks, JWW began a program to convert refugee camps in Chad to solar cooking," JWW says.

"The JWW Solar Cooker Project provides the raw materials for the production of the solar cookers; women in the camp are paid to assemble the cookers and train each family in the camp in their use. Currently the project is functioning in three of the twelve refugee camps in Chad, with plans to expand."

The use of solar ovens is also being expanded in rural villages across India in a bid to eliminate firewood collection and reduce the villages' reliance on fuels such as LPG and kerosene.



*An entry in Alice Springs' Solar Oven Bakeoff 2008.*



*The Two Sun Oven cooked this winning entry in the sweet category, a pavlova.*





Solar cookers come in all shapes and sizes.

According to Indian non-governmental organisation Eco Centre ICNEER, the collection of firewood in deforested areas can take up to six hours per day and its use contributes to deforestation, global warming and health problems.

With the financial assistance of an Austrian non-governmental organisation, Intersol, and the Austrian community of St Johann, the rural silk-producing Indian village of Bysanvaripalle now uses solar ovens exclusively, thanks to the donation of 26 German-built SK14 parabolic solar ovens.

These ovens cook for up to 12 people a day using just two to three hours of sunlight, and are used to prepare

rice, fry potato chips, roast peanuts as well as everyday meals.

The town, located in the south-eastern state of Andhra Pradesh in what is commonly referred to as the rice-bowl of India, became the country's first solar and smoke-free village when the solar cookers were installed along with 23 biogas units in 2005.

In a report featured in India's national newspaper, *The Hindu*, it is reported that the village now saves on 72 tonnes of firewood, or 5,800kg of LPG and in doing so has cut its carbon emissions by 104 tonnes a year.

Not bad for a town with just 36 families.

## Closer to home

Despite the fact that solar ovens are serving a basic purpose in some of the world's poorest communities, their popularity is increasing across the developed world, including here in Australia, where the novelty of such a simple, environmentally friendly device has many people hooked.

At last year's Alice Springs' Sustainability and Desert Garden Fair, the annual Solar Oven Bakeoff captured the imagination of the town, stealing the limelight from demonstrations on non-dig gardening, micro wind turbines and grey water systems.

According to Kat Taylor, from the DKA COOLmob, a network of households in Alice Springs committed to reducing greenhouse gas emissions, spectators were impressed by the temperatures the solar ovens reached and how quickly food could be cooked.

The winning entry, the Two Sun Oven designed by local Steve Sawyer using plywood, recycled glass and recycled solar hot water panels, was able to reach between 100°C–120°C and cooked the winning entry in the Sweet category, a pavlova topped with banana, blueberry and wattleseed.

Other ovens were also on show featuring various shapes and styles, including some with manual tracking devices which enabled the user to position the oven to best take advantage of the sun's position in the sky.

One, designed by Hans Pfau, used a recycled TV screen mounted on a four legged frame and was able to reach high enough temperatures to fry hamburgers and eggs. According to Taylor, the temperature at the oven's focal point exceeded 250°C.

Such was the success of the bakeoff that Taylor is in the midst of compiling a new book, *Solar Cooking in Australia*, which will include recipes and cooking hints for Australian solar oven cookers.

And if you happen to be in or travelling near Alice Springs in September, then you'll be pleased to know that this year's Solar Oven Bakeoff will again be part of the Alice Springs' Desert Smart Eco-Fair, to be held on Saturday September 19, 2009 at the Olive Pink Botanic Garden.

For more information visit [www.alec.org.au](http://www.alec.org.au) ▲



The Two Sun Oven designed by Steve Sawyer.



Panel Cooker. Image credit: solarcooking.org