

## Making and Selling Solar Cookers

**Make cheap, simple cookers that use the power of the sun to cook food and sell them locally at a profit!**

**START UP COSTS: \$150 (boxed cooker) - \$3,000 (more complex designs)**

**PROFITABILITY (time/output): \$700 over 1-5 months based on sale of 500 boxed cookers at \$4 each**

**NEEDED: Knowledge & belief in solar cooking, materials, market**

**BARRIERS: Lack of community awareness of solar cooking, weather**

### Introduction



Everyone needs to cook. Solar cookers are an easy way to use less firewood and save money. Families in the developing world spend 20 – 30% of their income on fuel for cooking, yet in many places there is a much cheaper way of cooking –using the sun!

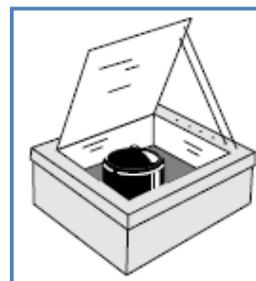
Solar cooking will never fully replace traditional forms of cooking but can complement it and radically cut down on fuel costs. Solar cookers can be made out of cardboard boxes and can last for years – they are produced cheaply and sold cheaply too – making them attractive to families in the developing world.

#### What types of solar cookers are there?

Which type of solar cooker you decide to make and sell will depend on the demand in the local market, the availability of materials and your expertise in making them. The following three are the most widely used and accessible designs:

#### 1) Boxed Cooker

The boxed cooker are the most widely available solar cooker – both in the developed and developing world. A number of types are available. It is possible to make them out of cardboard very cheaply, but some groups have made longer-lasting metal boxed cookers too. The boxed cooker is extremely robust and is therefore recommended for frequent use.



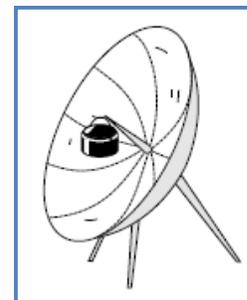
**Boxed Cooker**



**Panel Cooker**

#### 2) Panel Cooker

Panel Cookers or ‘Combination Cookers’ incorporate elements of both the boxed and curved concentrator cookers. They are the easiest and cheapest to make and use, do not require windows or insulation like the boxed cooker, and can also be folded up and stored away easily. The cooker is however, not quite as robust as the boxed cooker, and cannot cook as much food at once as the curved concentrator cooker.



**Parabolic Cooker**

#### 3) Parabolic Cookers

Sometimes called ‘Curved Concentrator Cookers’ they cook at very high temperatures, but require more frequent supervision. They are more suited to large-scale cooking, say within a school – but are more complicated to construct and use, so are not covered further in this sheet.

### Obstacles to solar cooking

- **Requires Good Sunny Weather:** Solar cooking will never replace fully other energy methods. Solar cooking only works when the shine is shining. So you cannot use your cooking in the evening or when it is cloudy. As a result, solar cooking is an addition to traditional cooking methods.
- **Knowledge.** Solar cookers are not used more widely because they are not well-known and are a new and strange technology. Convincing people of their benefits - i.e. the money and time they will save if they use one - can be hard. Getting past people’s scepticism will be very important if you are to succeed in selling them the cookers.
- **Cannot fry foods.** In cultures and societies where frying is common, take up of solar cookers will be less as the cheaper models cannot fry foods.

**Advantages of Solar cooking**

**1) Save Money and Time**

Sunshine is free! Less firewood has to be bought and searched for, cutting down on costs for the family, and time saved for the women and children who previously searched for firewood. The cost of making and buy solar cookers is also very low.

**2) Safe, Healthy & Convenient**

There is no flame to cause burns or uncontrolled fires, and there is no smoke to injure eyes or cause breathing problems. Water can also be pasteurized (made safe to drink), food retains nutrients and doesn't get burned, and finally many of these cookers can easily be packed away and transported.

**3) Environmental Impacts**

The cutting down of trees and forests for firewood is a big problem internationally. This in turn leads to soil erosion which damages agriculture. Solar cookers lessen the demand for firewood – saving 1 ton of wood per year for each solar cooker!

**4) Versatile & Adaptable**

The cookers can be made out of a variety of materials, designs and sizes. They can cook a wide variety of foods in a variety of ways (cook, boil or bake) and also purify (through pasteurisation) water.



Man constructing box cooker

**Why make and sell solar cookers?**

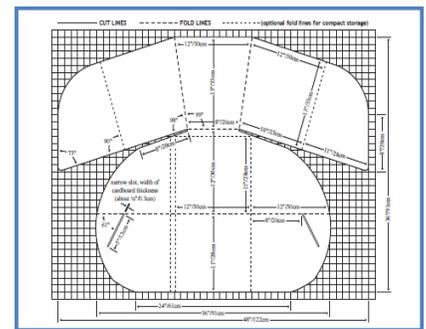
Everyone needs to cook and eat, so there will always be demand for cookers! Solar cookers are relatively easy to make, but require the materials and skills to do so. The materials (such as cardboard, glue) can be bought locally in most places, and the skills required to make them can be self-taught from guides found on Teach a Man to Fish's website. Makers can quickly become experts in solar cooking making, and use this talent to sell them in their community. Solar cooking is of great benefit to many communities – so once you have begun to sell some, people will begin to notice the benefits and want to buy one too – leading to more and more demand that you can supply!

**How to make a Panel or Boxed Solar Cooker**

**Panel Cooker**

**Cost: Low / Difficulty: Easy**

The simplest type of solar cooker is very simple to make. All it requires is scaling up the template to the right (available in higher quality from Teach a Man to Fish website), place it over a piece of hardboard, and cut out. That is all that is required to make a solar cooker. To see how easy it is and to see the cookers in use, take a look at the following video shot in Chad: ([http://www.youtube.com/watch?v=r\\_aNGYrBGBI&feature=related](http://www.youtube.com/watch?v=r_aNGYrBGBI&feature=related)).



Combination Cooker Template

**Boxed Cooker**

**Cost: Low / Difficulty: Medium**

The more complicated box cooker can still easily be made with few materials. A step-by-step guide to making a boxed cooker is available for download from Teach a Man to Fish's website. The boxed cooker can too be made out of cardboard – but if desired, wood, woven baskets, bricks or metal can also be used to make a longer-lasting, sturdier product.

**Examples of Success: Solar Cooking & Solar Cooking as a Business Model - Kyoto and CEDESOL**



Sara Taberna, KT participant

**Kyoto**

The Kyoto Box in 2009 won the Climate Change Challenge award from The Financial Times (London, UK) for best environmentally friendly product. The solar cooker is now produced in existing cardboard factories and sold across East Africa and South-East Asia. It is sold to the market for only \$7, ready to use and over the coming months Kyoto plan on scaling up their business to include more distributors and new markets.



A Kyoto Box Cooker

**CEDESOL**

Working alongside Kyoto Twist Solar Cooking Society and GTZ, CEDESOL has begun to distribute 100,000 solar cookers across 5 departments in Bolivia. In one community in Cochabamba 30 families were trained on how to build their own box-type solar cookers and learn how to use them effectively.

One recipient of this program - Sara Taborga, pictured above stated: "it is a good invention that saves energy and cares about the environment. The meals don't lose their nutrients and taste very good". Other people noted how easy it is to use and how safe it was.

**Where will Solar Cooking work?**

Anywhere with fuel scarcity and sun is an ideal place for solar cooking to work. Particular hot spots include most of Sub-Saharan Africa, Eastern Asia and Central America/Caribbean. According to Solar Cookers International, countries with the greatest potential benefits from solar cooking include Haiti, Somalia, Ethiopia, Niger, Pakistan and the Dominican Republic, but with deforestation and growing fossil fuel scarcity this could increase dramatically. Currently it is estimated around 500 million people would benefit from solar cookers - however the benefits of solar cooking can be enjoyed anywhere there is frequent sun and where either paying for or collecting fuel is a burden.



**Box Solar Cookers being sold in Bolivia**

**Costing: Solar Box Cooker**

The figures below are a rough estimate of the costs of making your first batch of 500 cardboard box solar cookers. Figures are in US dollars and estimates, based on figures from Solar Cooker's International and Kyoto pricing. There is little very investment required to start up this business.

**Figures: Solar Box Cooker**

Start-up Costs			
Item	Unit Cost	Unit (s)	Total Cost
Start-up Costs:			
Equipment to make boxes:			
Knife	\$2	1	\$2
Tape	\$2	10	\$20
Scissors	\$2	1	\$2
Other	\$20	-	\$20
Marketing:			
Advertising Budget	-	-	\$100
Contingency Fund			\$20
<b>Total Start up Cost:</b>			<b>\$164</b>

Profit Calculation: 500 Cardboard Box Solar Cookers			
Item	Unit Cost	Unit (s)	Total Cost
Operational Costs:			
Materials:			
Inner Boxes	\$0.50	500	\$250
Outer Boxes	\$0.70	500	\$350
Other Materials	\$1	500	\$500
Contingency	\$0.10	500	\$50
Labour	\$0.30	500	\$150
<b>Total Operational Cost:</b>			<b>\$1,300</b>
Solar Cooker Sales	\$4.00	500	\$2,000
<b>Total Revenue</b>			<b>\$2,000</b>
<b>TOTAL PROFIT</b>			<b>\$700</b>

**\$1.40 profit on every solar cooker sold (after start-up costs).**

**Further Information**

For further information please visit the Teach a Man to Fish ([www.teachamantofish.org.uk](http://www.teachamantofish.org.uk)) website. Fantastic detailed information on solar cooking is available from two extremely useful websites:

([http://solarcooking.wikia.com/wiki/Introduction\\_to\\_solar\\_cooking](http://solarcooking.wikia.com/wiki/Introduction_to_solar_cooking)) or Solar Cooking International

(<http://solarcookers.org/index.html> )