

Hybrid Solar Oven

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Solar Clutch : Harness the Power of the Sun

A case for solar cooking

Solar cooking is a clean way to cook food and a great way to protect the environment. Why has it not taken off like many of us assumed it would?

1. Cultural change is difficult in many places especially among the very poor.
2. The other difficulty is the lack of consistent sunshine to make solar cooking a reliable replacement to traditional cook stoves.

A case for a hybrid solar oven.

It appears that we need to utilize a solar oven that maximizes the sun when it is shining but also will be able to use other sources of energy for heating during the times when the sun has not able to do the job. The oven needs to be able to use a fuel source that is readily available to all and burn it cleanly. The Rocket Stove design does this by burning sticks and small branches cleanly without smoke before exiting the chimney.



Cost factors

The more complex a stove the more it will cost. So adaptation and changes will always need to happen on a local level. Using electricity or gas as an alternative heat source is not feasible because of the cost. If we do use them as fuel then we need to just use a gas or electric stove from the start and subsidize the fuel. The Hybrid Oven will need to be made with local materials and promoted to a pilot group. Subsidizing the oven cost may be needed at the onset.

A 55 gallon drum cut in half gives a solid outer shell for a hybrid oven. Insulated with fiberglass and a black inner liner the drum becomes an effective solar cooker. Reflectors and a glass lid seal in the heat and the door hinged on the end allows for retrieving food when cooked.

A rocket stove made from steel tubing is the alternative back up heat source. The chimney of the stove runs through the bottom of the drum and inside the oven between the inner liner and outer drum. It eventually exits out the back and carries any fumes away from the cooking area. When a fire is started in the rocket stove it will heat the inner surface of the oven enough to bake and cook food. The chimney is the heat exchanger for the oven. This hybrid oven become a reliable source of cooking no matter the weather.



The hybrid solar oven:

1. A half metal drum for the outer shell
2. The steel tubing from the rocket stove traveling through the drum as a chimney
3. An angle iron frame for the glass top
4. Fiber glass used for the insulation
5. Thin aluminum sheeting for inner liner
6. Chimney from rocket stove exits above oven
7. Rocket stove is below the drum and feeds into the stove from under it

Using materials that are readily available will keep the cost down and allow the hybrid solar oven to be more local in its make up and allow it to be more affordable to the common person.



Cooking Foods:

The hybrid solar oven will need to be able to cook the local food for it to be accepted by the people. Fried food has always been difficult for a simple solar oven to accomplish. Using a hybrid oven will allow for more diversity in cooking and open the door for frying food when using a rocket stove.



Link to video on YouTube:

<https://youtu.be/cW8y4ArDs08>

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