Social Innovation Challenge

Problem 1: Solar Cooker.

The idea is to use PETE(reference) based solar stoves. This technology, developed by the Stanford students, harnesses both heat and light components of solar energy thus increasing efficiency.

The energy from sun is stored in battery and induction stove is used for heating. This provides cooking temperature required for all types of food unlike the conventional solar cookers.

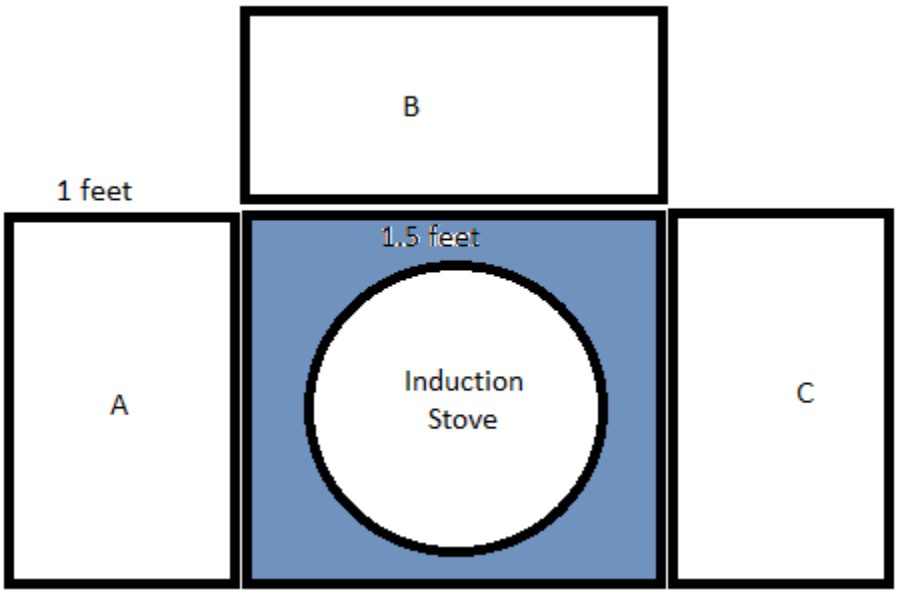
Induction Coil Based Stove will consume 1kwh power consumption at the higher end. Say 80% battery storage and conversion efficiency. So, for 4 hour cooking, around 5 kwh.

For PV cells, there is 10% conversion conversion efficiency. So, with 10 hours of sunlight and 10 watts per sq. ft. for solar panel, we can satisfy the day's requirement with a 50 sq. feet panel.

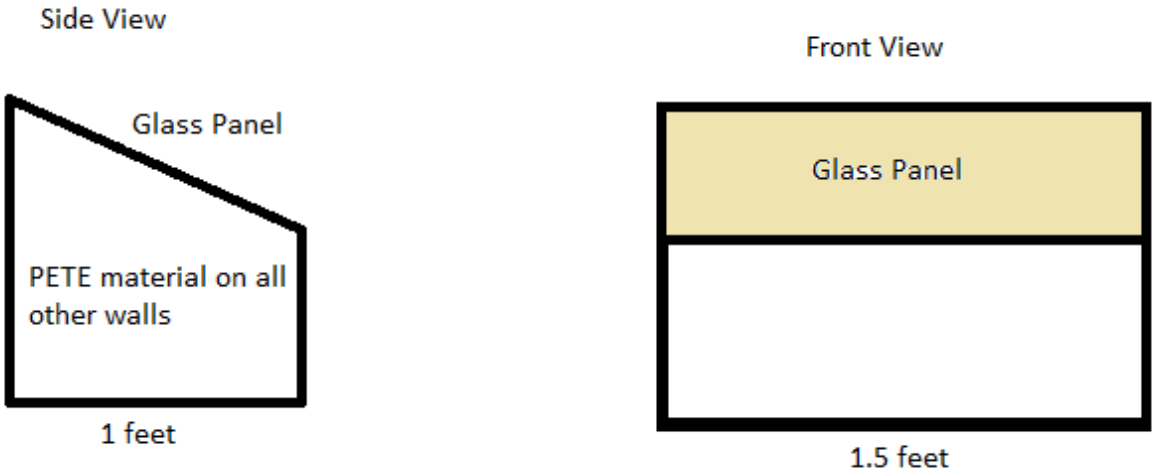
Since using PETE, we can attain upto 40% . But assuming 25% conversion, we would require only 20 sq feet of area.

The Design

Top View



A, B and C are boxes, similar to the box type solar cooker model where the glass panel system helps raise internal temperature. Blue color is the placement of the battery.



References:

Solar Panel Energy Calculation : http://www.solar-estimate.org/index.php?verifycookie=1&page=solar-calculations&subpage=&external_estimator=

PETE Device: Jared W. Schwede et.al. ; Photon-enhanced thermionic emission for solar concentrator systems ; Nature 2010