SLiCK

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Overcoming obstacles to solar cooking in the UK

Mission

SLiCK has been exploring the limits of solar cooking in the UK:

- **Can we cook this far north in the Winter?**
- **What sort of solar cooker could achieve this?**
- **What will convince the UK population to try solar cooking?**

Obstacles to adoption

In addition to the usual reasons given for rejecting solar cookers (e.g. SCInet, 2016., Ahmad, 2000), there are additional obstacles in the UK: two quotes from a recent UK solar cooking presentation:

"I've never heard about these before."

"The sun is not strong enough here."

Few people in the UK have heard of solar cooking, and, even if they have, they don't believe it will work there.

Desirable features:

For outdoor cooking, there is strong competition from barbecues and gas stoves. To compete, a solar cooker will need to have the following attributes:

- **Controllable**
- **Durable**
- **Inexpensive**
- **Compact**
- **Convenient**
- **Safe**

A solution:

Evacuated tube cookers already meet most of the listed requirements. They can be more convenient and durable if fixed permanently to a wall, where they are always ready to cook, and unlikely to get damaged. Easily added basic reflectors can make them more controllable.

Equipment:

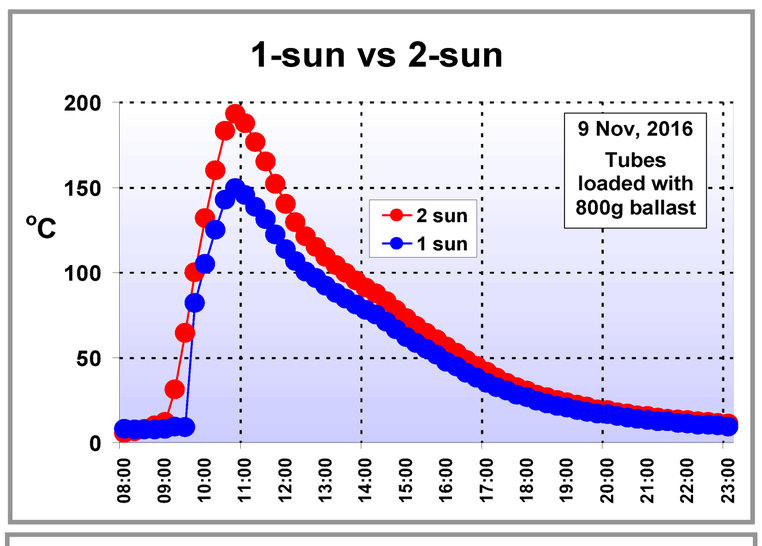
Pairs of evacuated cooking tubes were mounted in three UK locations, using standard pipe fittings. Adding flat plastic reflectors increased the power available. In the picture (above, right), the upper 'naked' tube receives '1 sun' and the tube beneath, with two reflectors, receives '3 suns'. The 5.5 cm (int.dia.) cooking tubes cost less than $30 each.

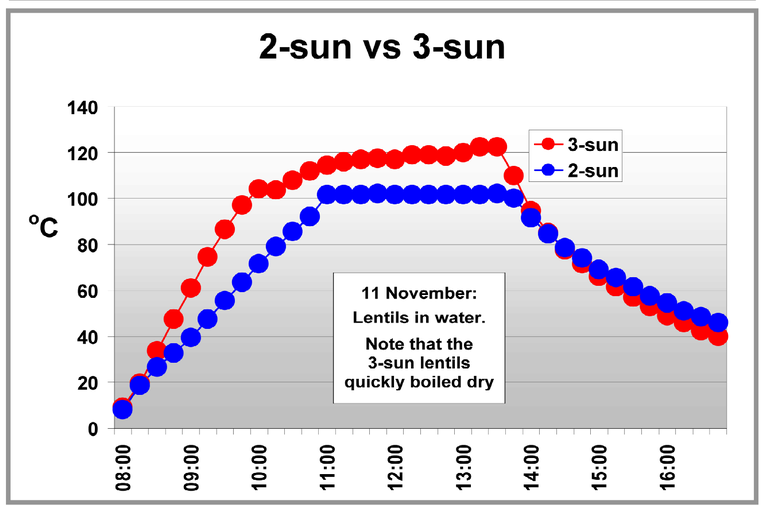
Method:

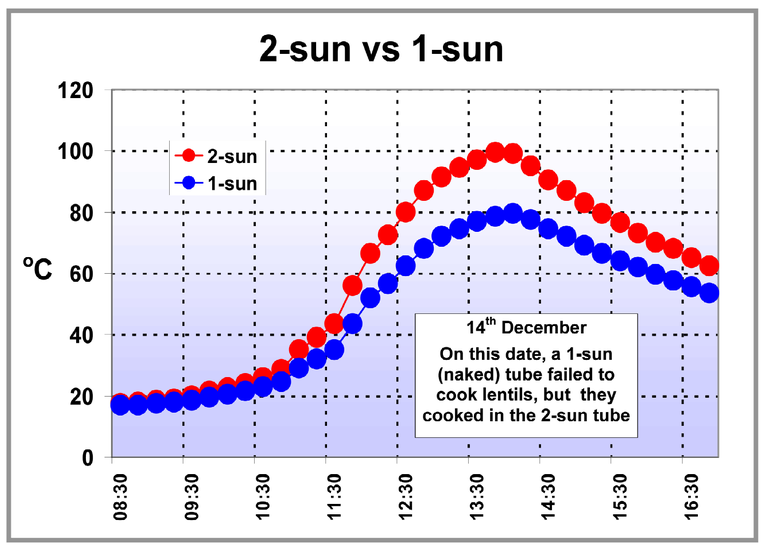
On various dates after the autumn equinox, pairs of tubes were loaded with either stainless steel ballast, or food, in order to test cooker performance in the approaching UK winter. Thermocouple probes were used inside the tubes to log the temperature of the ovens or the food. To test a 'worst feasible case' environment for a fixed cooker, one pair of tubes was situated on a west-facing wall. The other pairs of tubes were on south facing walls.

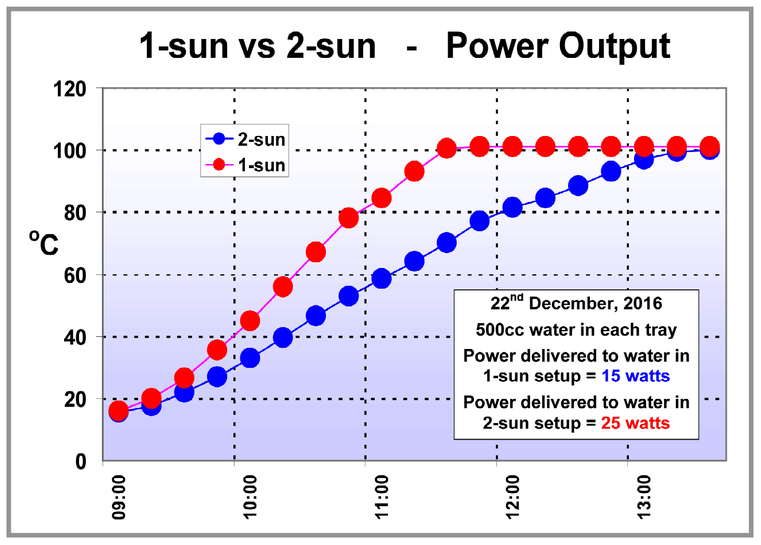
Results:

The graphs below show the logged oven or food temperatures, the date, and various observations. The addition of one or two reflectors increases the power available, and so reduces cooking time, or compensates for cloudy weather. 1-sun tubes (no reflectors) function as slow cookers and may be left unattended.









Conclusions:

- **Fixed architectural evacuated tube wall-cookers overcome many of the obstacles that dissuade people from using solar cookers in the UK.**
- **They are cheap, durable, safe and convenient, and they require no additional storage.**
- **They allow solar cooking to be attempted with as little as 90 minutes of UK winter sun.**
- **Standard reflectors can be added to increase the power available.**
- **They can be configured to cook rapidly (attended) or slowly (unattended)**

References:

Ahmad, B., (2000) *Users and disusers of box solar cookers in urban India – implications for solar cooking projects*. Solar Energy. Vol 69 pp 209-215

SCInet. *Solar cooker dissemination and cultural variables.* Downloaded 1st December, 2016: http://solarcooking.wikia.com/wiki/Solar_cooker_dissemination_and_cultural_variables

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