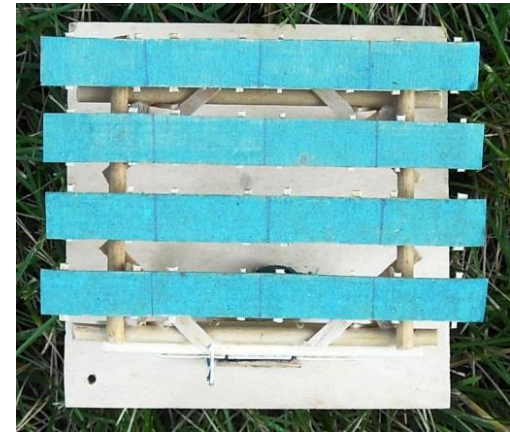
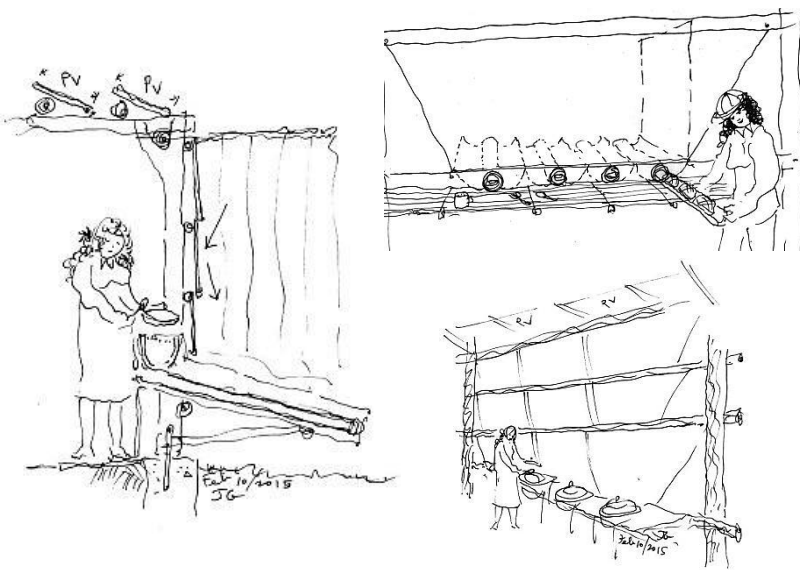


PV Pergola Cooker Studies

Joel H. Goodman
Oct. 7, 2015



THRU-REFLECTOR-WALL for cooking PV Pergola
JH Goodman

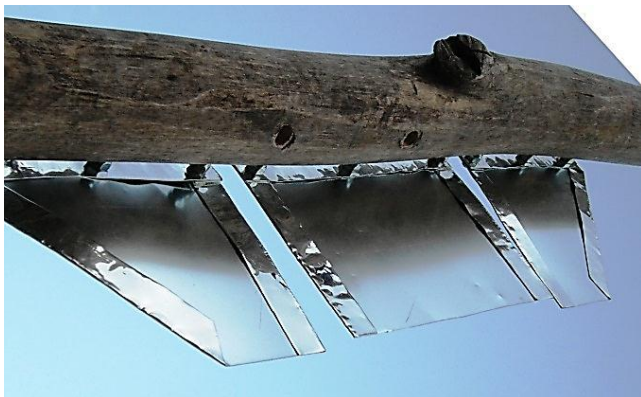
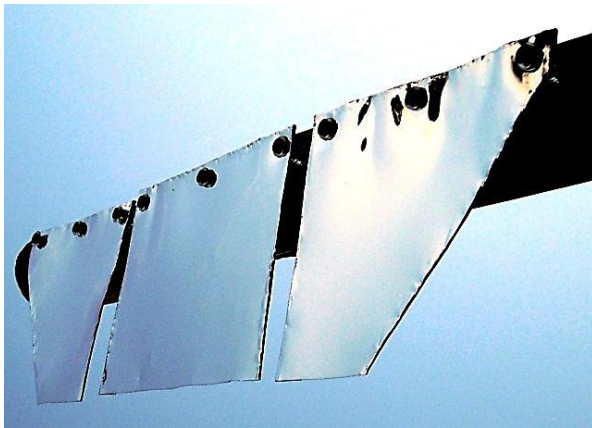


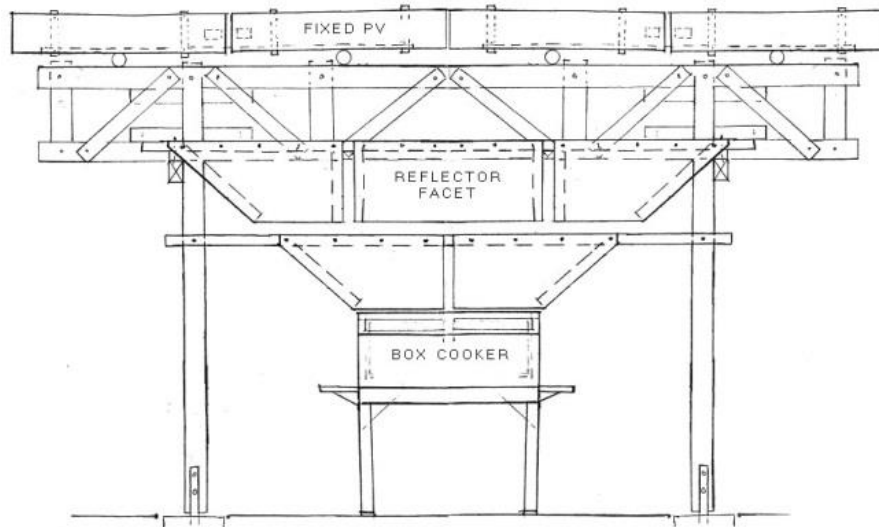
Reflector augmented solar cookers with PV pergola shade for open air kitchens

Anodized aluminum sheet facets secured to horizontal poles provide shading to cooks, and bend in strong winds while augmenting solar cookers.

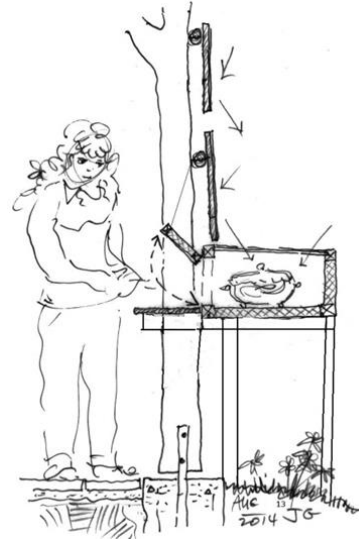
A four column PV pergola open air kitchen can reflector augment solar cookers (box, evacuated tubes, etc.) with a vertical reflector area and a weighted fabric reflector at the east and west sides repositioned at noon.

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Elevation



Box (glazed) cooker + exterior reflector PV pergola

“...the reflector is an extremely important part of the cooker...” (1). Fabrication of augmenting reflector facet prototypes would help determine: size, shapes, material thickness, etc. Aluminum (anodized, etc.) bent-over edges (to avoid accidental cuts) double material at the facet top fasteners to horizontal structural-members to avoid tearing during extreme wind-storms, stiffen at the vertical edges, and dirt-catch and insect nesting are concerns for facet bottom edges. At higher wind speeds facet flutter noise may be annoying, or musical. Clearance space between the box top edge and facet lower edge movement is needed for high/extreme wind storms. Cable-net supported reflector facets may be designed to stow when there are warnings of extreme high wind speeds coming, and stored for the snow season. Reference (1) Maher, Amy and Erin Talmage, Testing components of solar box cookers , Solar Today magazine, March/April 1992, p24-25.

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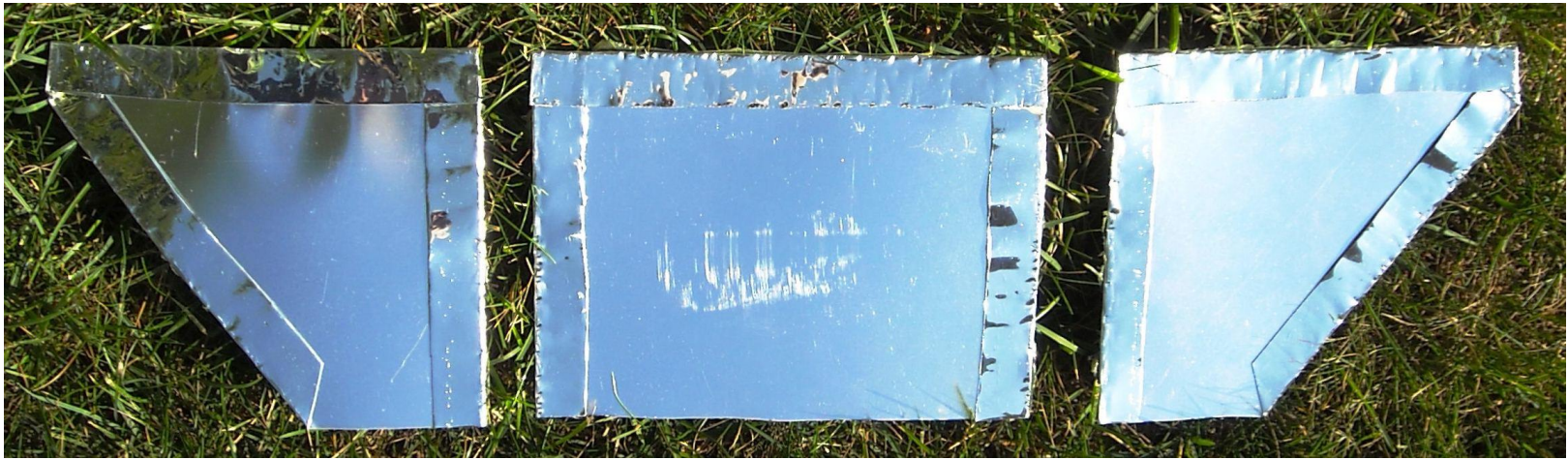


Augmenting reflector facets for nonimaging troughs.

Refector facets (annodized aluminum, fiberglass, fabric, etc.) attached only at the facet tops on a horizontal pole (round wood, etc.) could bend in extreme wind loading opening spaces for letting the wind pass thru.

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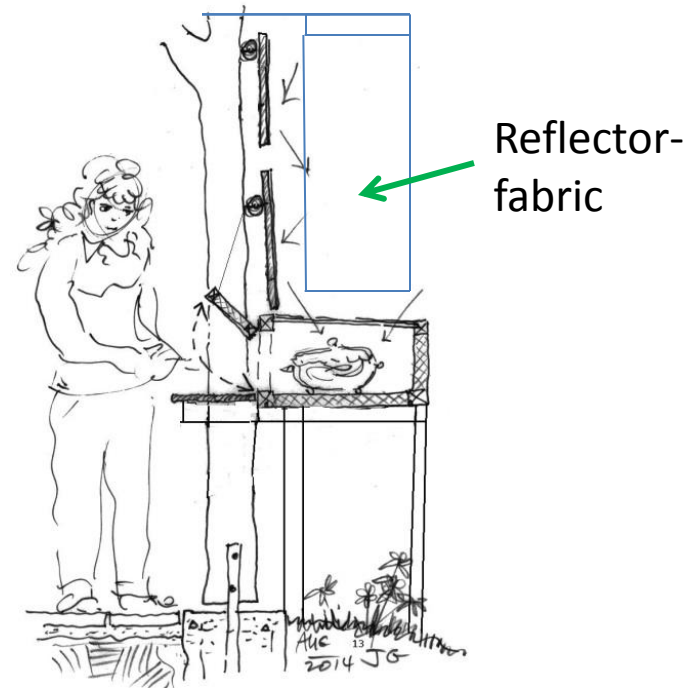
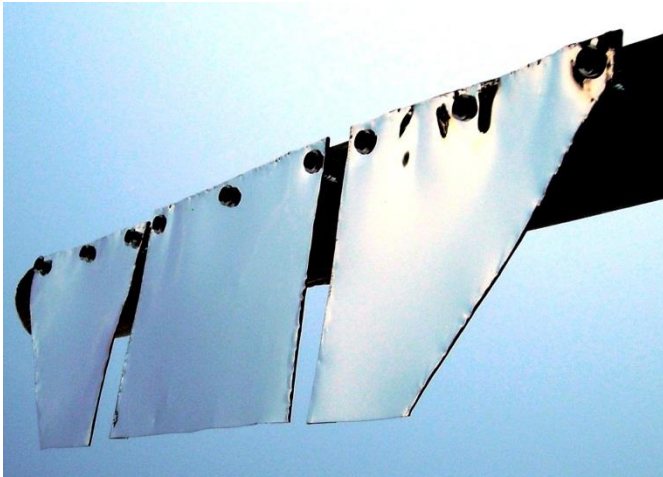
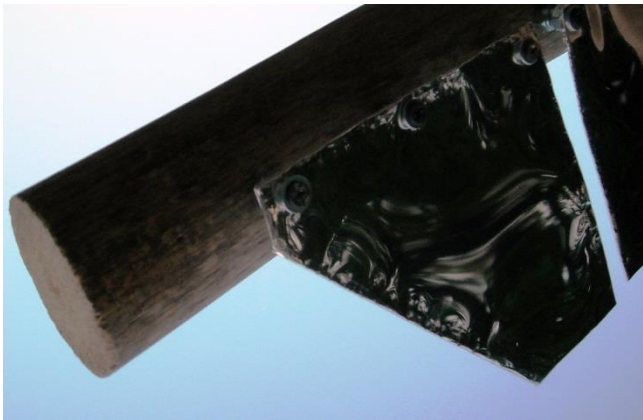


Reflector exterior facets-anodized aluminum

Bend-crease folding-over facet edges for strengthening has a decorative reflector edge-trim expression when viewed from the backside. Outdoor testing was started in low wind/gust speeds for a full size facet without bent over edges.

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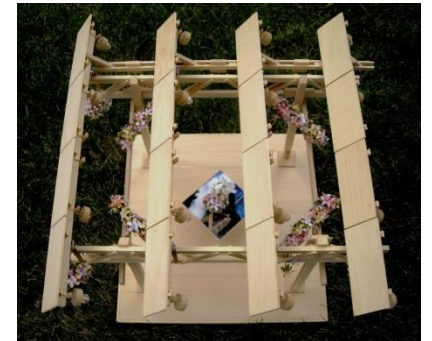
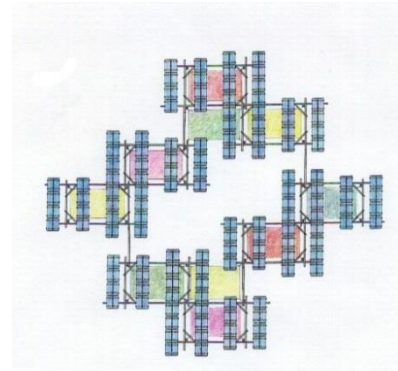
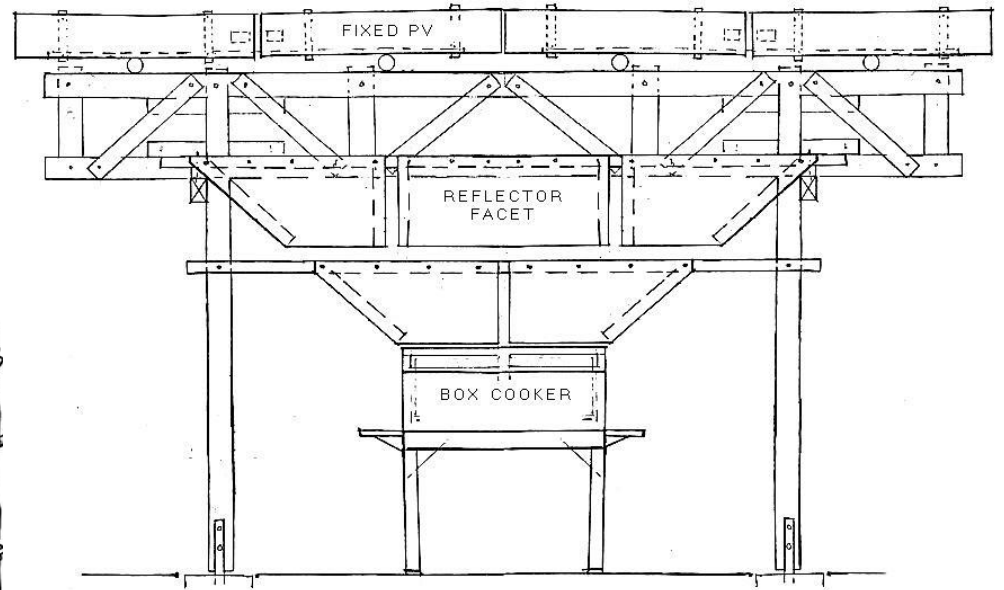
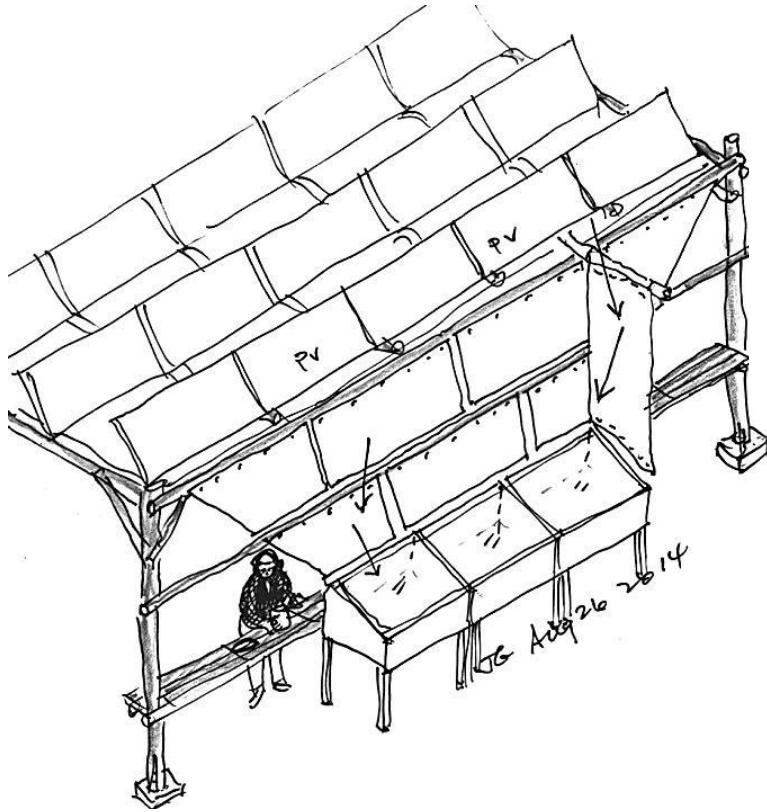
Reflector facets mock-up models with anodized aluminum.

A box cooker with exterior reflector is a type of simple one-sided nonimaging trough, with a short EW line trough.

Reflectors for an open-air kitchen PV pergola utilize two of the pergolas columns to support reflector facets attached to horizontal beams, round wood poles.

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