

American Made Solar Prize Technical Assistance Request

TEAM SUNSPOT, Germantown, MD 20874 <https://sunspotpv.com/>



Figure 1 - First Generation SUNSPOT

The SUNSPOT™ is an off-grid solar electric cooking system designed to replace traditional biomass cookstoves around the world. We have deployed ten first generation systems for a pilot project with EarthSpark International in rural Haiti and are currently planning for larger scale demonstrations as well as a scale up to production quantities.

Current systems use commercial-of-the shelf (COTS) power and control electronics. Improving the reliability and reducing the cost of the power and control electronics is a key part of future development. We have built and tested a proof-of-concept for an electronics package based on a DC-DC converter and have designed a high-efficiency converter circuit. We will be using the award from the American-Made Solar Prize to complete development and fabrication of a “Control and Power Electronics Module” (CPEM) which will integrate the DC/DC converter, MPPT charge controller and monitoring / control board into a single package.



Figure 2 - DC SUNSPOT Proof-of-Concept

Our technical Assistance Requests fall into three categories:

1. Assistance in selecting a shop to manufacture the CPEM module in prototype quantities, followed by assistance in selecting a US based contract manufacturer to build medium quantity CPEM modules (10k-30K per year within three years). (Nation of Makers)
2. Assistance with battery management / charge control algorithms for advanced batteries (lead-carbon and LiFePO4) optimized for this specific application. (NREL / Sandia)
3. Potential coordination with existing US projects addressing innovative clean cooking in developing countries and underserved areas of the United States. (NREL / Sandia)