



Solar Household Energy

Solar cooking for Human Development and Environmental Relief

Solar Household Energy in 2012:

A Year of Progress in Advancing Solar Cooking Practice, Awareness and Technology Development

Since 1998, Solar Household Energy has served as an effective catalyst for harnessing solar energy to alleviate urgent global human and environmental challenges. Our mission is to unleash the potential of solar cooking for global health, economic development and the environment around the world, and deliver it to those whom it can benefit most.

We have developed new solar cooking technology, demonstrated its effectiveness on five continents, trained tens of thousands of new “solar cooks” and persuasively articulated the benefits and potential of solar cooking to private citizens, relief organizations and public officials around the world.

Our important work continues. In our 2012 fiscal year, we have remained active through our three principal areas of strategic focus:

- **Making solar cooking available** to those who can benefit from it most, through partnerships with local organizations,
- **Educating** the public and policy leaders on the multiple benefits of solar cooking as part of an integrated cooking solution (that also includes a fuel-efficient stove and retained heat device), and
- **Carrying out investigation and research** to improve solar cooking technologies and dissemination.

Highlights of our recent achievements in each of these areas are outlined in this report. As you learn about our efforts, it is our hope that you will be inspired to think about ways you can support our mission, including by contacting us with ideas, suggestions and opportunities for collaboration.



Making solar cooking available

In an expansion of a pilot project that began last year, Sudanese families living in the 20,000-resident United Nations-administered Gaga settlement camp in eastern Chad received and were trained in the use of 200 HotPot solar ovens. The cooking devices, originally designed and developed through funding and leadership provided by Solar Household Energy, were provided through a grant from the United Nations High

Commissioner for Refugees (UNHCR) by way of Africare, a large U.S.-based charitable organization dedicated to improving the lives of the inhabitants of the African continent.

The 200 solar cooking devices benefit refugee families in several ways. First, they enable families to conserve limited allocations of firewood distributed by camp authorities. Secondly, the reduced need for firewood allows women and children to avoid risks of crime and hazards while scavenging outside the safety of the refugee camp. Health risks due to smoke and fire are also reduced.



Residents of the Gaga refugee camp in eastern Chad learn how to use HotPot solar ovens.
Photo: P. Fourier for Solar Household Energy

As reported to the UNHCR, the pilot effort that led to the 2012 follow-up project resulted in a reduction of wood use by solar cooks “by an average of 25-40% after only two months. These savings are likely to grow over time.”

Recognizing the potential of solar cooking, the COMO Foundation of Singapore and the Dorothy Ann Foundation provided grants to evaluate the Chad Gaga Refugee Camp Solar Cooking Project regarding fuel savings, testing evaluation methodology and prospecting Gold Standard certification for similar projects. The field work began in December 2012.



In Haiti, Solar Household Energy introduced solar cooking and the broader concept of integrated cooking to twenty-five women in the village of Tilor (population: 15,000) which sits on the border of the Dominican Republic, as well as five women on the Dominican side.

This project is part of a larger reforestation program in the region of The Nature Conservancy.

With limited trees in Haiti due to massive ongoing deforestation, Tilori residents have been gathering wood for cooking fuel by crossing into the less de-forested areas near their town on the Dominican Republic side of the border. The average family consumes significant quantities of wood each day for cooking purposes. The goal of this project was to remove the incentive for this foraging.

Integrated cooking involves the coordinated use of solar ovens, fuel-efficient stoves (that burn wood but only small quantities) and heat retention devices, which enable solar-cooked foods to continue cooking and remain hot for meals served in the evening when the sun is no longer a source of cooking “fuel.”

The cooking devices chosen for this project were the Global Sun Oven, a high-performing solar box oven, as well as a Stove Tech fuel-efficient stove.



Mankosa, a new solar cook in Tilori, Haiti, prepares to serve a cornmeal staple dish cooked in a Global Sun Oven. *Photo: L. Meyer/ Solar Household Energy*

The project is part of a larger reforestation effort (which includes tree-planting a “family forestry garden” project) by The Nature Conservancy to reverse ongoing deforestation in that region. Unsustainable harvesting of trees for cooking purposes has already devastated Haiti, and the Dominican Republic is encouraging efforts to prevent that pattern from developing along the border region.

While in the region, Solar Household Energy also conducted a solar cooking training workshop for 22 Peace Corps volunteers serving in the Dominican Republic. Peace Corps volunteers, equipped with solar cooking equipment, can raise awareness of the practice by using it in their own meal preparation in the communities where they serve.

In another project, a Solar Household Energy volunteer introduced solar cooking in a small rural community in another part of Haiti. She carried several different solar ovens with her when she travelled there to teach English, and used the devices to introduce solar cooking to the staff and students. She also conducted training in making simple solar ovens.

A grant from the COMO Foundation enabled Solar Household Energy to provide a Tulsi-Hybrid solar cooker with electrical back-up to the Yada Na Man Aung Monastic Education School in Monywa, Myanmar, and another solar cooker to a school in rural Haiti, distributed through an NGO partner there.



Educating the Public and Policy Leaders

This year Solar Household Energy brought understanding of the benefits and potential of solar cooking to key members of the Global Alliance for Clean Cookstoves (GACC), helping them to recognize the importance of incorporating solar cooking devices into the GACC's broader efforts to promote the dissemination of "clean cookstove" devices and clean fuels.



Innovative global chef José Andrés, a fan of solar cooking and owner of several solar cooking devices including the SHE-developed HotPot, serves as a "global ambassador" for the Global Alliance for Clean Cookstoves. *Photo: GACC*

The GACC is a public-private partnership created in 2010, managed by the United Nations Foundation, that seeks to "foster the adoption of clean cookstoves and fuels in 100 million households by 2020."

The Global Alliance’s primary focus has been in fuel-efficient biomass stoves. A member of Solar Household Energy’s Board of Directors has served on a GACC working group on technology standards, and provided a private comprehensive briefing on solar cooking technology to the GACC’s new executive director this year. These and related efforts led to, among other accomplishments, providing accurate information about solar cooking posted on GACC’s high-profile website.

Solar Household Energy was represented at the GACC one-year anniversary in New York, and displayed solar ovens for the attendees, including UN Foundation founder, Ted Turner.



Solar Household Energy’s co-founder, Darwin Curtis was invited to make a presentation at a conference in Nantes, France on the occasion of the UN’s International “Year of the Forest.” The event, sponsored by Solar Household Energy partner organization Bolivia Ínti-Sud Soleil, was held to consider options to finance projects for fighting deforestation in Africa.

In Switzerland, Solar Household Energy also engaged with ADES (Association pour le Développement de l’Energie Solaire). ADES is a Swiss NGO that promotes solar cooking and builds solar ovens in Madagascar to prevent further deforestation and smoke-related illnesses.



Solar Household Energy arranged a solar cooking demonstration at the U.S. Embassy in Santo Domingo, Dominican Republic. The featured “solar chef” (in yellow apron) Ana Carrasco, using a HotPot solar oven with the “Morningstar” reflector, leads the Environment Ministry in the Dominican Republic’s northern province.

Photo: L. Meyer/ Solar Household Energy

Solar Household Energy’s capacity to advance solar cooking was enhanced this year when it was nominated and accepted for membership in the prestigious International Union for

Conservation of Nature (IUCN), the world's oldest and largest global environmental organization.

Over the course of the year Solar Household Energy Board members and other volunteers provided solar cooking briefings and demonstrations to such institutions as the United Nations High Commission on Refugees, World Bank, Millennium Challenge Corporation, the French Embassy (in Washington, D.C.), and the National Geographic Society.

Solar Household Energy's co-founder, Louise Meyer, was invited to give a talk on solar cooking for the TEDx event "Food & Communication: Recipes for Development" in Washington, D.C. Her talk, entitled "A Sun in Every Pot" revealed how solar cooking can be part of the solution to "fuel famine" that contributes to hunger and poverty in many countries. GACC global ambassador José Andrés and California chef, Marcela Valladolid also presented at the event.



Speakers at the Washington Circle TEDx event in Washington, DC – José Andrés, Marcela Valladolid, and Solar Household Energy's Louise Meyer

Photo: TEDx Dupont Circle

Solar Household Energy participated in a special conference in Guatemala sponsored by the Partnership for Clean Indoor Air, a unit in the U.S. Environmental Protection Administration (EPA). That entity has funded Solar Household Energy training and technology distribution projects in Mexico. Solar Household Energy also traveled to Mexico to maintain strategic partnership relationships with the Fondo Mexicano para la Conservación de la Naturaleza A.C., (FMCN) and the Grupo Ecológico Sierra Gorda.

Solar Household Energy also participated with demonstrations at a host of events, primarily in the Washington, D.C. area, including the Aid & Trade Conference, the Solar Decathlon, and several schools and community events. Board member Paul Arveson published an article titled, "Integrated Solar Cooking: An Underutilized Solution" in *Perspectives on Science and the Christian Faith*, the journal of the American Scientific Affiliation.

During this fiscal year, Solar Household Energy expanded its use of social networking to promote solar cooking with the introduction of a Solar Household Energy Facebook page and YouTube Channel. The number of fans of solar cooking and Solar Household Energy around the world on these media steadily increasing.



Carrying out Investigation and Research

A research & development priority for Solar Household Energy this year has been creating a reflector for the HotPot solar oven (and similar devices) that will combine the low cost of the traditional cardboard-backed aluminum foil model, with the durability and weather-proof qualities of the hinged aluminum sheet Morningstar design. Towards that end Solar Household Energy worked with a Jacksonville, Florida-based solar engineering firm, Energy Labs, Inc. to develop a prototype that has now been tested in several different field settings.



This early prototype of a weatherproof and inexpensive reflector is undergoing modifications to address remaining durability issues, but shows promise as an economical alternative to a hinged aluminum sheet reflector called the Morningstar.

Photo: Solar Household Energy

During 2012 Solar Household Energy established a strategic partnership with Citizens for Solar, a 30-year-old Tucson, Arizona-based educational and technology demonstration organization. Engineers at Citizens for Solar have conducted measurements of the heating power of the HotPot solar oven (whose design was substantially funded by Solar Household Energy). A research report on this work is in preparation. This collaboration

will allow Solar Household Energy to conduct measurements year-round in a sunny location. These measurements will guide our technology recommendations and decision-making about research & development priorities.

During this year, Solar Household Energy also developed an initial design for a new inexpensive and light-weight box cooker informally called the “Dow Box,” as its primary components consist exclusively of materials, including Tuff-R™ foam and food-safe silicone sealants manufactured by Dow Chemical Company.

Solar Household Energy has also been active in supporting efforts to develop and strengthen global standards for testing the performance of solar ovens. Solar Household Energy has assisted the American Society of Agricultural Engineers in improving its solar oven standards. Solar Household Energy also submitted comments to the United Nation’s Clean Development Mechanism on its proposed methodology for evaluating solar cookstoves. Solar Household Energy also continues to work to have solar cooking devices included in the cookstove standards being developed by the GACC. The current GACC standards apply only to biomass stoves.

In FY 2012, Solar Household Energy intern, Gunjan Gautam of the Georgia Institute of Technology, completed his study for Solar Household Energy on microfinance for solar cooking. The summary of his report, entitled “Microfinance Intervention for Financing Solar Cooking Technologies – Financing with Savings” is available at: <http://she-inc.org/docs/137.pdf>. The final study will be published later in the year.

Solar Household Energy also commissioned research to identify large-scale cooking projects to inform the work of the GACC. Findings revealed that more than 1.5 million solar cooking devices are currently in use in Asia alone, most in China.



Looking Ahead

We look to the future with confidence that the efforts we began fifteen years ago will continue, on three levels:

1. Bringing the benefits of solar cooking concretely, working primarily with “on-the-ground” NGO partners like Africare, The Nature Conservancy, Grupo Jaragua, Fondo Mexicano para la Conservación de la Naturaleza A.C., Bolivia Inti, and others, to thousands of individuals as they put this technology to personal use to feed their families,
2. Tirelessly and effectively advocating the incorporation of solar cooking, particularly in the context of the broader “integrated cooking” model, into public and voluntary sector refugee relief, economic development and environment protection programs, and

3. Pressing on the frontiers of solar cooking technology to create new devices and device components that will improve the durability, performance and consumer appeal of low-cost solar cookers, and continued research on the social and economic factors that improve dissemination and adoption of the technology.

These efforts are being lead by our board of directors and leadership team. This year Solar Household Energy elected co-presidents: **Cora Shaw**, a former World Bank senior economist, currently a consultant on agricultural economics, land-use and related economic development issues, and international environmental policy consultant **Dorothy Zbicz, Ph.D.**, to replace co-founder Darwin Curtis at the helm.

Additional board officers are **Darwin Curtis** and **Louise Meyer**, (vice president and secretary, respectively), and treasurer **Paul Arveson**, a physicist and strategic planning consultant.

Scott Hajost, Chief of Party of the Forest Carbon, Markets and Communities Project of USAID, rounds out Solar Household Energy's Board. Executive Director **Richard F. Stolz** oversees Solar Household Energy's day-to-day operations. Solar Household Energy's efforts are also supported by a cadre of highly dedicated and capable volunteers and college interns.

