



SOLAR HOUSEHOLD ENERGY

Solar Cooking for Human Development and Environmental Relief

Solar Household Energy in 2015:

**Advancing the Promise of Solar Cooking
on the Ground, in the Lab,
and in the Public Square**



2015 has been a year of substantial progress for Solar Household Energy, as well as the solar cooking movement as a whole. In recent years solar cooking advocates and advocacy organizations have evolved from a loose confederation of dedicated enthusiasts to a more sophisticated and unified force for positive change on the ground, in scientific, development, and environmental policymaking circles. We are proud of what we are accomplishing both independently and in conjunction with our partner organizations.

At Solar Household Energy we have remained focused on pursuing our three strategic objectives:

- 1. Making solar cooking available to those who can benefit from it most, through partnerships with local organizations,*
- 2. Investigation and research aiming to improve solar cooking technologies and dissemination, and*
- 3. Educating the public and policy leaders on the multiple benefits of solar cooking as part of an integrated cooking solution incorporating fuel-efficient stoves and retained heat devices.*

In pursuit of those goals, in 2015 we have:

- Supported the introduction of solar cooking technology in Haiti and Kenya,*
- Laid the groundwork for a significant expansion of our past efforts in Chad,*
- Conducted numerous solar cooking demonstrations and educational sessions at high-profile public events,*
- Earned for ourselves and the solar cooking community a seat at the table of the preeminent international product standards-setting organization, and*
- Strengthened links with allied solar cooking and development organizations.*



Woman cooking with SolSource in Tilori, Haiti

At the same time, we have embarked on an effort to assess the impact of our efforts thus far, while continuing to operate highly economically, leveraging volunteer talent wherever possible. None of this would be possible without the generosity of our independent supporters. **Thank you.**

In the pages that follow you will learn more about how Solar Household Energy is making a difference in the lives of people in environmentally and economically stressed sunny parts of the world.

Why Solar Cooking Matters

Solar Household Energy was founded with the belief that solar cooking is an underutilized resource to address a number of global problems. Solar cooking is a relatively simple solution with the potential to have a major impact in a number of global development fields. Solar Household Energy's mission is to provide sensible, sustainable solar cooking options to improve social, economic and environmental conditions in sun-rich areas around the world.

Since 1998, Solar Household Energy has worked with governments, non-governmental organizations and the private sector to promote solar cooking with modern solar cookers. Solar Household Energy introduces solar cooking in developing countries through projects that distribute solar cookers and provide training for users to incorporate the technology with other improved cooking techniques. Solar Household Energy also provides monitoring and evaluation for implementing partners to demonstrate the positive impacts of solar cooking in these communities.



Women in Gaga Camp, Chad prepare a meal in the HotPot

The use of open fires, traditional cookstoves and fuels is one of the world's most pressing problems. Globally, three billion people rely on solid fuels to cook, causing serious environmental and health impacts that disproportionately affect women and children. According to the World Health Organization, household air pollution from cooking kills over four million people every year and sickens millions more.

Women are primarily responsible for gathering the materials used to cook.

The amount of time they dedicate to gathering wood, especially as resources close to home are depleted, can be up to two days a week of work, time that isn't being used in other household tasks, or income earning activities. Girls helping to gather these materials for their families also lack the time to go to school.

Solar cooking is a solution to many of the problems of cooking over a smoking fire. Solar cooking improves the health of families cooking over open flames, saves them money and time that can be better used for other tasks, relieves the burden on women and girls, and protects

the environment from deforestation and carbon emissions. Using the power of the sun with these simple devices can help to address so many issues facing families around the world.

Many organizations are dedicated to increasing the knowledge and practice of solar cooking both within communities and institutions. Solar Household Energy's long history in this field is vital to forming a global solar cooking community prepared to face the challenges of providing clean, safe, affordable cooking to populations around the world.

Solar Household Energy maintains ties with solar cooking nonprofits such as **Solar Cookers International** and **Bolivia Inti Sud Soleil**, as well as international aid organizations such as the **Global Alliance for Clean Cookstoves**, the **United Nations High Commissioner for Refugees**, and the **Lutheran World Federation**. Through outreach and education programs, Solar Household Energy also works to build new partnerships with interested organizations around the world.

Working on the Ground

Haiti

In August 2015, Solar Household Energy in collaboration with the **Solar Electric Light Fund** (SELF) introduced SolSource parabolic cookers in Tilori, Haiti, a small town near the border with the Dominican Republic. The project was a follow-on to an earlier Solar Household Energy project in the same community in which we had partnered with **The Nature Conservancy** (TNC) to introduce Sun Oven box cookers and "Stove-Tec" fuel-efficient stoves.



SolSource recipients attend a training

After a year of the original introduction of solar ovens and fuel-efficient stoves in Tilori, Solar Household Energy and TNC evaluated usage by community participants in the program and found that not only were all women regularly using the combined cooking system, but there was also a list of more women requesting to be integrated in the clean energy program.

Solar Household Energy recommended, however, that more powerful parabolic solar cookers be introduced for faster cooking and larger meals. In 2013, TNC introduced 85 "Sun and Ice" parabolic stove solar cookers along with an additional 177 "StoveTec" fuel-efficient stoves and

30 pots to 177 families in Tilor. Beneficiaries were selected based on need (favoring single mothers and lower-income households) and level of expressed interest.



Assembling a SolSource in Tilor, Haiti

The continued use of the existing parabolic cookers in Tilor, and demand for more cooking options, led to Solar Household Energy's proposal to SELF to introduce the SolSource parabolic cooker.

In October 2015, trainer **Onel Joseph**, at the behest of Solar Household Energy, travelled to Tilor to distribute the 25 SolSource cookers, and to provide training in their use. Interested recipients were all initially trained collectively, and the 25 participants were chosen by a local leader.

Participants provide monthly data on their utilization of the device. Training covered assembling the SolSource, safely using the powerful parabolic cookers, how to prepare food on the device and how to store the SolSource to keep it safe and functional.

Home visits were performed with participants as well, giving the trainer the opportunity to make sure recipients were safely and effectively using their solar cookers. The initial survey data revealed that most users were able to cook staple foods like rice and beans, as well as chicken.

Kenya

In July Solar Household Energy entered an agreement with the **Rotary Club of Nairobi Mashariki** to provide strategic guidance and oversight for a project involving the local manufacture and distribution of Haines solar cookers. The Haines cooker, developed by **Roger Haines** of San Diego, features a black cooking pot, a flexible curved reflector, and durable flexible clear plastic material that forms a cylinder to surround the cooking pot, capped by a clear plastic lid, to create a greenhouse and retain solar energy.

The Kenya project, a follow-up to a 2013 pilot program, is being managed on the ground by a local NGO, the **National Resources and Waste Management Alliance**, lead by Kenya's "Mama Solar," Faustine Odaba.

The project calls for the manufacture of up to 1,200 units, and their



Faustine Odaba prepares a meal in the Haines cooker

sale at a subsidized price through selected retail distributors in **Nairobi**. **A local marketing campaign will include radio and** newspaper advertising. Purchasers will have access to training, and a sample will be surveyed on their solar cooking habits. The project was funded primarily by nine Rotary clubs in the San Diego area.

Chad

Based on the continued success and utilization of HotPots in the Gaga refugee camp, first introduced by Solar Household Energy in 2011, the **United Nations High Commissioner for Refugees** (UNHCR) and Africare's successor, the **Lutheran World Federation** (LWF) has invited Solar Household Energy to expand the HotPot project to reach 2,500 additional families, covering 80% of the camp population. Solar Household Energy has made great progress toward this goal in 2015. Board President **Cora Shaw** met with **Bolivia Inti-Sud Soleil** (BISS) in Nantes, France, in May. Solar Household Energy had utilized BISS trainer **Patrick Fourier** in 2011, and plans to continue working with BISS on this project.

In June, Cora met with UNHCR representatives in Geneva to be briefed on the overarching energy plan for Chad, and how Solar Household Energy can support it.



Patrick Fourier with a newly trained HotPot owner in the Gaga refugee camp.

Solar Household Energy has also been in discussions with the **Lutheran World Federation**, UNHCR's local implementing partner in Gaga refugee camp, to make plans for the expansion of Solar Household Energy's project there over a three-year period.

A study of Solar Household Energy's earlier Chad project found that 85% of households provided with a HotPot in 2011 regularly use them, and that 50% of households were preparing a meal in the HotPot when the surveys were taken. Two months after HotPot distribution, recipients solar cooked 36 out of 73 meals; their firewood provisions lasted twice as long (from 6 to 12 days), and fewer women were forced to travel outside the camp to forage for firewood (from 80% to 54% of women), decreasing sexual and gender-based violence.

Mexico

In 2015 Solar Household Energy co-founder Louise Meyer and board member Margarita Battle traveled to Mexico to re-establish relationships with organizations we worked with nearly a decade ago including the **Mexican Foundation for the Conservation of Nature** and former **Peace Corps** volunteers. In addition, Battle, a resident of Queretaro, has been serving as a liaison between Solar Household Energy and the **University of Queretaro**, where students are engaged in a project to promote solar cooking. The students have already collected data on the impact of solar cooking in three rural communities, and Solar Household Energy will be analyzing the results.

Research and Development

Establishing standards for solar cooking devices

In November, clean cooking experts and vendors from around the world gathered in Accra, Ghana for the Clean Cooking Forum hosted by the **Global Alliance for Clean Cookstoves**. An important presentation, long awaited and championed by Solar Household Energy, was made at this event. The presenter, Jim Jetter, of the **National Risk Management Research Laboratory** of the **Environmental Protection Agency** (EPA), announced that solar cooker power data from tests performed by the lab are complete and will soon be published. The tests used the **American Society of Agricultural and Biological Engineers** (ASABE) S.580.1 standard protocol developed by Dr. Paul Funk. Getting these test results was helpful to confirm that the standard is workable and to increase the recognition of solar cooking.

Prior to the Forum, a meeting was convened of the **International Organization for Standardization** (ISO) technical committee TC-285, which develops standards for testing improved cooking devices. This process, it is hoped, ultimately will raise the quality standards for cookstoves so that consumers can have confidence in their performance, efficiency, durability, safety and other features.

Solar Household Energy board member **Paul Arveson** is a member of the U.S. delegation and the Field Testing working group. He attended the event to assure that solar cooking devices were accurately included within the scope of “clean cookstoves”. The effort was successful for the benefit of the whole solar community: Two ISO “working groups” now include solar cooker protocols. The drafts include a reference to the ASABE S.580.1 standard as the recommended method for measuring cooking power.

Work on the standards is long from done, however, with many details yet to be ironed out. Arveson and his colleague Dr. Paul Funk will continue to be involved in the discussions in 2016.

Product Research

Ongoing research into improved solar cookers and solar cooking techniques are a vital part of Solar Household Energy's work. Our product research allows us to refine our solar cooking techniques and cookers to create the most efficient cooking experience. Arveson continues to test the HotPot solar oven under a variety of conditions, and with a number of modifications to both the glass pot and aluminum reflector. There is no one ideal solar cooker for all conditions, but Solar Household Energy strives to continue testing and improving all models to make solar cooking more appealing and accessible to communities around the world.

Water Pasteurization with Solar Devices



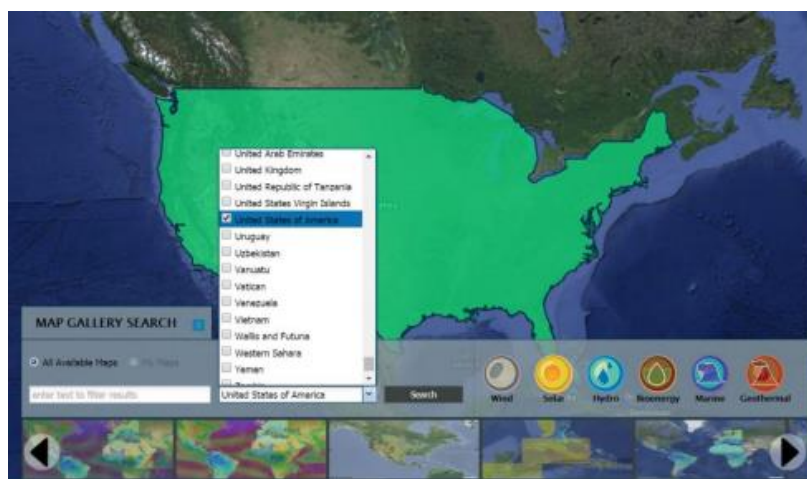
Summer intern **Hannah Rolland** conducted research, in conjunction with her university, regarding the potential to use solar cookers' potential for pasteurization to provide clean drinking water in developing countries. Hannah tested a variety of devices, including the HotPot. She found its performance on par or superior to other solar cookers for pasteurizing water, performing well under most sunny conditions.

HotPot Performance Highlights:

On sunny days, the HotPot has been able to heat 2.5 liters of water to pasteurization temperature (65°C) therefore making it safe to drink, within approximately one hour, and even on partly cloudy days within two hours. On mostly cloudy days the HotPot did not heat the water to pasteurization temperature, but under the majority of solar conditions it successfully pasteurized water.

Solar Energy Mapping

Volunteer researcher **Dr. Henry Potter** provided instructions for utilizing the IRENA (International Renewable Energy Agency) Atlas to map solar energy around the world, which is vital to determining locations suited to solar cooking. Dr. Potter's guide allows Solar Household Energy and interested partners to map out detailed plans of where solar cooking projects may be most successful based on local conditions.



Educating the Public

Solar Household Energy maintained its vigorous public education efforts at a series of events around Washington, DC, introducing a wide variety of new people to the concept of solar cooking, and demonstrating the different types of solar cookers and how they function.



SHE Volunteers display a variety of solar cookers at the EPA National Sustainable Design Expo

2015 EPA National Sustainable Design Expo

Solar Household Energy partnered with **Solar Cookers International (SCI)** to demonstrate solar cooking at this event, which featured innovative technology to promote environmental sustainability. In the P3 (people, prosperity, planet) design competition, teams of college students design projects that will deliver innovative solutions to real-life problems. This event provided a great opportunity for Solar Household Energy to demonstrate solar cooking to students, professors, and other groups involved in developing sustainable technologies.

National Get Outdoors Day

Solar Household Energy demonstrated solar cooking at National Get Outdoors Day, an effort hosted by the **National Park Service**. Solar Household Energy staff and volunteers were able to engage with an audience dedicated to living a sustainable life while enjoying and conserving natural resources. These events allow Solar Household Energy to engage with a wider audience that is not necessarily familiar with solar cooking, demonstrating its ease of use and low impact.



Trish Sheehan demonstrating solar cooking at the National Get Outdoors Day

National Geographic



Louise Meyer stands next to a HotPot while holding a folded reflector. Photo credit: by Becky Harlan, National Geographic

This summer, Solar Household Energy had the opportunity, arranged by co-founder Louise Meyer, to perform solar cooking demonstrations on the Washington, DC campus of National Geographic. Solar Household Energy has worked with National Geographic in the past to spread awareness of solar cooking, and these demonstrations proved to be a great opportunity to reach National Geographic staff and partners in many of their departments, demonstrating the ease of solar cooking and its potential for use around the world. Louise was interviewed for National Geographic's food-oriented blog, *The Plate*, reaching an even wider audience with the message of solar cooking.

STAR-TIDES

As in previous years, Solar Household Energy presented various solar cooking technologies, in partnership with SCI, at the annual **STAR-TIDES** (Sharing To Accelerate Research-Transformative Innovation for Development and Emergency Support) technology demonstration event, a research effort that promotes sustainable support to stressed populations – post-war, post-disaster, or impoverished, in foreign or domestic contexts, for short-term or long-term (multi-year) operations.



SHE board member Paul Arveson shines at STAR-TIDES

The TIDES event is always a great opportunity to introduce solar cooking technology to organizations such as the **U.S. Agency for International Development**, U.S. military branches, and other organizations working in disaster relief or refugee support. Other solar organizations are also present at the event, giving Solar Household Energy the opportunity to make connections with organizations that may focus more on solar panels and batteries, building connections that may lead to further partnerships or support for solar cooking practices.

Educational Materials

Sophie Makepeace, a Solar Household Energy volunteer and high school senior, created a short video to support our program in the Gaga refugee camp in Chad. The video not only discusses Solar Household Energy's work in the camp and plans for the future, but it also serves as a basic introduction for the potential role of solar cooking in developing nations and underserved communities.



Solar Cookers for Gaga, Chad

Sophie Makepeace discusses SHE Gaga refugee project in a fund-raising video. Sophie's video can be seen by clicking on the Razoo fundraiser link at the bottom of www.she-inc.org

Social Media Outreach

Solar Household Energy volunteers maintain a Twitter account and Facebook page with approximately 600 followers. Solar Household Energy's solar cooking meetup group connects 76 Washington, D.C. area solar cooks, allowing them to attend Solar Household Energy events and to learn more about solar cooking. These networks allow us to quickly spread information about Solar Household Energy projects and events, but also allows for strong engagement with the solar cooking community. Facebook posts including recipes, solar cooker sales, and news stories about solar cooking keep interested individuals connected with Solar Household Energy and the solar cooking field.

Archiving and Institutional Knowledge

Founded in 1998, Solar Household Energy has a long history of working in the solar cooking field, with years of experience, contacts, and other information that may be useful both for current efforts, but also other groups and individuals interested in solar cooking. To ensure that this valuable information is maintained and organized in an easily accessible fashion, Solar Household Energy retained two temporary archivists to identify documents that might be of interest to solar cooking experts, enthusiasts and newcomers. These efforts were also supported by volunteers **Maggie Sung** and **Neo Fredrick**.

Who's Who at Solar Household Energy

Solar Household Energy is a small organization, relying on seasoned professionals and dedicated volunteers. Executive Director **Sophie Brock Lyman** is responsible for overseeing and coordinating the work of staff and volunteers, to keep the organization focused and effective in the pursuit of our goals, both in domestic education and research, and international solar cooking projects.

Richard Stolz is responsible for the financial management of Solar Household Energy, as well as operational support. He continues his long association with the organization on a part-time basis. Senior Program Manager **Trish Sheehan** focuses her efforts on development, volunteer coordination, and education, also in a part-time capacity. **John Nash** provides technical and website support at she-inc.org.



Kate McGarrity demonstrates the HotPot at the National Geographic Society headquarters.

Kate McGarrity, a new addition to Solar Household Energy in 2015, originally joined the organization as an archivist. Kate's interest in clean cookstoves began with an internship with the Appropriate Rural Technology Institute in Maharashtra, India. Now serving as a Program Associate, she brings her diverse non-profit experience to support many of Solar Household Energy's projects, especially education, fundraising, and promotion.

Solar Household Energy's distinguished Board of Directors, lead in 2015 by retired World Bank economist **Cora Shaw**, provides vital strategic mission-driven leadership. Solar Household Energy's funding comes primarily from small donors. (Our financial information is available upon request.)

Solar Household Energy would be unable to complete our work without the efforts of our volunteers, including **Esperanza Sanz**, who keeps the organization active on social media, particularly Facebook. Other volunteers who have assisted the organization in 2015 include **Afzal Syed, Zainab Syed, Samina Syed, Peg and Will Barratt, Will Hayes, John Stewart, Mark Mugerwa, Jack Gray, Sandy Tarpinian, Sahil Patni**, and **Michaela Borghese**.

Although volunteers play a vital role in our ongoing ability to carry out our mission, we also require funds to secure the services unavailable for free. We welcome and encourage all tangible support, large and small. Please consider making a tax deductible contribution via www.she-inc.org or by mail (our financial administrative office is located at 5 Lochness Ct., Rockville, MD 20850-2950, attn: Richard Stolz). We also encourage inquiries and suggestions (email: inquiries@she-inc.org).

