

ANNUAL REPORT OF SOLAR HOUSEHOLD ENERGY, INC.

FY 2010

A Year of Transition

This report covers our work from June, 2009 through May 2010 and is arranged under these headings: Administration and Personnel, Strategic Planning, Outreach Actions, Technology, Consultancy, Evaluation, and Summary.

ADMINISTRATION AND PERSONNEL

Having completed a series of successful, but costly and labor-intensive solar cooking pilot demonstration projects in several countries, SHE shifted from an employee-based staffing model to conducting its activities through part-time contractors and volunteers for the near future. (More on that strategy change below.) Most of this work has been conducted by the Board members serving as volunteers.

By November, our salaried personnel had moved on to other pursuits. Richard Stolz, a former part-time employee, has remained as a contractor to SHE, working on financial administration and operational matters, as well as carrying the title of Executive Director.

Last October SHE co-founders Louise Meyer and Dar Curtis returned to serving on the Board of Directors. As of March, Pat McArdle and Mark Starik had resigned, and we welcomed Paul Arveson, a scientist, strategic planning consultant and ardent solar cooking advocate. Thus, with Dorothy Zbicz, SHE's Board now has four members, and is currently looking for more.

At the suggestion of Dorothy and Paul, SHE's Board of Advisors has been revived. SHE has already profited from contacts some of its members have provided. It is likely we will seek to expand and take better advantage of this asset in the future. The current members of the Advisory Board are:

Dr. Roger Bernard, Ph.D

Professor of Physics, University of Lyons (Ret.), Inventor of the Solar Panel Oven.

William Holmberg

Chairman, New Uses Council and Biomass Coordinating Council, American Council on Renewable Energy.

Dr. Mary Hill Rojas, Ed.D

Rojas International, Consultants - Advocate of community-based, sustainable natural resource management, including solar cooking.

Lorenzo Rosenzweig

Director, Fondo Mexicano para la Conservacion de la Naturaleza, and partner of SHE, Inc. in HotPot realization.

Diane Straus Tucker

Publisher, *Washington Monthly* magazine

Michael Caplin

Washington Lawyer and advisor to NGOs.

Neville Williams

Founder and ex-CEO of Solar Electric Light Company; founder and chairman emeritus of Standard Solar, Inc. which had installed over 40,000 solar home systems by the end of 2008.

SHE, Inc. has also benefitted from the help of volunteers during the year. Of particular note is Arthur Hairumian, an experienced solar cook from Armenia, who was sent to us by the Montgomery County, Maryland Volunteer Center in the Spring. Arthus has assisted with demonstrations throughout the year. He had supported the work of the Peace Corps in the past, and he now seeks to revitalize SHE's association with that organization here in Washington.

STRATEGIC CHANGES

With all these changes in staffing and Board composition, the time had arrived for a serious re-thinking of SHE's objectives and how to address them. It was serendipitous for SHE that Paul, among his other talents, is a professional consultant for organizational strategic planning. He led the SHE Board through such a process, which began in March and continued through the end of this reporting period. Board members seized the moments for meetings when all were in town and available simultaneously. A draft Strategic Plan is now written and will be published after final review in early 2011. Implementation of strategic initiatives will commence immediately after that, although the foundation is already being laid. Key excerpts of the strategic plan are as follows:

Mission Statement: In April 2010 the Board conducted a revalidation of the mission of SHE, and proposed various alternative mission statements, as usually happens in such an exercise. We tentatively agreed on a simple mission statement that identifies the common ground of everything we do:

"To promote solar cooking."

Vision Statement: A vision statement is a brief description of our "picture of the future" when our mission is highly successful. There were numerous proposals for SHE's vision, and only a tentative statement was agreed on:

"An exponential increase in solar cooking."

This statement recognizes that self-sustaining organic growth, based on the profit motive, is the most likely way for solar cooking to reach the scale needed to make a significant impact on social, economic and environmental needs of the world.

To implement this vision, the SHE board agreed on the following Strategic Themes and Results:

Theme 1. Knowledge and Research

Strategic result: *SHE's experience and knowledge of solar cooking technology, training and use is fully documented and distributed to targeted audiences in many formats and media, including direct consultation. Analysis of previous experience is used to plan for and instigate future research required for achieving SHE's strategic vision.*

Theme 2. Advocacy

Strategic result: *Broad awareness of the various benefits of solar cooking and integrated cooking systems is shared by others in the development, public health, refugee and environmental sectors and translated into action and support.*

Theme 3. Strategic Partnering

Strategic result: *SHE, Inc. is engaged with strategic partner organizations around the world to help bring solar cooking to scale, with SHE supplying expertise to ensure successful implementation of integrated cooking projects.*

The Board is currently formulating and prioritizing a list of strategic projects and activities to implement this strategy. All agree that successful fundraising efforts are required to expand support for this work.

OUTREACH ACTIONS

In spite of reduced staffing, SHE, Inc. accomplished many important activities promoting solar cooking in 2009-2010.

September 2009

Louise Meyer set up a booth at the Black Family Reunion for the second year. This annual gathering in Washington, D.C. attracts some 70,000 visitors.

October 2009

Louise organized a booth for SHE at the Green Festival for the fourth time, where she, staff and friends introduce solar cooking to hundreds of people each year. Useful contacts are made here each year in the DC community including the school system. The booth also attracts foreign journalists and visitors from developing countries who learn about solar cooking.

Pat McArdle and Paul Arveson again displayed a spectrum of solar cookers at TIDES (Transformative Innovation for Development and Emergency Support), an exposition of equipment at Fort McNair in Washington. Several high-ranking US and foreign leaders examined the products.



Pat McArdle explaining solar cooking to a TIDES delegate from Afghanistan.

January 2010

Louise and Dar conducted a class in making a solar cooker at the National Council on Science and the Environment Conference in January at the behest of our then-director Professor Mark Starik.

March 2010

Louise and Pat entered four solar cooking videos in the annual Washington, DC Environmental Film Festival in March. This is the 7th year in a row that SHE has submitted entries into this prestigious festival. This year SHE featuring projects in Madagascar, Burkina Faso and nearby Arlington, Virginia ("Snow Bank Solar Cooked Chicken Soup" produced last winter by Pat McArdle). Films were viewed by students, faculty and the public at American University, and we answered questions about solar cooking afterwards. You can see the "snow bank" video here:
<http://www.youtube.com/watch?v=ddd8RUtV9VU> .

April 2010

Louise Meyer and Pat McArdle recommended that the National Geographic Society should have solar cooking demonstrations as part of their exhibit on "Design for the Other Ninety Percent", which was on loan from the Cooper-Hewitt Smithsonian Museum of Design in New York.

On Earth Day, Louise demonstrated the Hot Pot at the All Souls Unitarian Church on 16th Street, N. W. in Washington. The church was awarded the "Green Sanctuary" award for lessening its carbon footprint.

May 2010

Louise for the second time participated in the American Solar Energy Conference in Phoenix, Arizona, invited by Solar Energy International (SEI) to participate on a panel

and host a booth to demonstrate solar cooking. Her presentation was titled, "Saving Lives with Solar Cooking."

Solar Energy International (SEI) sponsored Louise to be a panelist on "Energy for the other 90%" at the American Solar Energy Conference (ASES) held in Phoenix. This was the second time SEI invited her as a panelist. Consequently Suzanne Nee, a journalist for the Phoenix Solar Energy Examiner wrote an article '*SHE's my hero – using solar to help in underdeveloped areas cook more easily*'

Additional Demonstrations and Contacts

Throughout the year, Louise developed contacts in the Washington, D.C. public schools, demonstrating solar cooking and teaching about it. Her appearances included the Youth Garden at the U. S. Arboretum, the Common Good City Farm where she donated a food drier, the City Blossoms teaching gardens, the East Burke School, The Haynes Elementary School, etc. She met and befriended White House pastry chef Sam Kaas and introduced him to the Hot Pot. She recruited professional pastry chef Michaela Borghese as a volunteer who solar cooks spectacular cakes for demonstration purposes.

Louise also traveled to Europe to maintain contacts with our associates there and to update our knowledge of international developments. Among her contacts was Dr. Dieter Seifert who reported that the non-governmental organization (NGO), *EG Solar*, which sold his SK line of parabolic cookers in Germany, closed in 2008. A for-profit shop was set up in Barcelona to manufacture an improved SK-14 now called the AlSol, which is sold by Spanish NGO, Terra. The German Company Sun & Ice also manufactures a model that is identical to AlSol's, but with a swivel foot. Dr. Seifert indicated that he may want to partner with SHE, Inc. in the future.

Partnership for Clean Indoor Air

In fall of 2009, the EPA's Partnership for Clean Indoor Air, (PCIA), asked Pat McArdle to produce an issue of PCIA's quarterly *Bulletin* on solar cooking. Issue 22 was published for PCIA by Winrock in January, with several articles by written, recruited and edited by Pat and SHE. This issue can be found here:

<http://www.pciaonline.org/files/PCIA-Bulletin-Issue-22.pdf>.

Haitian Earthquake

Immediately after the Haitian earthquake in January, Dar consulted U.S. solar cooking advocates and distributors and composed a brief on solar cooking resources available to relief and reconstruction organizations at work in Haiti. The brief was distributed. He received an introduction to an officer of the UN Foundation and attempted for the next several months to arrange a meeting. He finally was able to meet with someone there in late May, although little came from that meeting directly. This reflects the paramount need for additional advocacy for solar cooking, especially within the development community.

Purpose Prize

Another outreach effort was initiated by Diane Straus Tucker, one of SHE's Advisors. It was to submit an application for Dar for the prestigious Purpose Prize awarded yearly to individuals over sixty who are "changing the world." The very exigent application was prepared and submitted, but was lost by the Purpose organization through technical problems. It was re-submitted, but without a telephone interview. Although Dar did not win one of the \$100,000 awards, he was designated a *Purpose Prize Fellow*. In that capacity, he attended a ceremony in November to celebrate the winners. It was billed as a place to make useful contacts and get publicity. Expenses were paid. Details about the Purpose Prize can be seen here: <http://www.encore.org/prize/about>.

Louise has also initiated contact with two NGOs with which we might collaborate to our mutual benefit. One of them is the Gaia Project in Ethiopia run by Harry Stokes of Gettysburg, PA, which distributes cookers that burn alcohol manufactured from "bagasse" (a biofuel byproduct derived from sugarcane and sorghum). The other is an NGO operated by Nancy Hughes, which distributes fuel-efficient stoves in El Salvador. Partnerships with distributors of fuel-efficient stoves is taking on greater importance since SHE will now be promoting integrated cooking, that includes a solar oven, a fuel-efficient stove and a retained heat device (See below).

TECHNOLOGY

Dar enjoys telling people that it is very difficult to make a solar cooker that doesn't work. They all work. Too often the problem with solar cookers is cost. Cheap solutions work, but they are not durable. Durable solutions work, but they are not cheap. Ours is a hopeful quest for the cheap and durable.

Over a year ago, Charlie Sellers, an "Engineer Without Borders" and a fuel-efficient stove enthusiast (also known as a "stover") and materials specialist, volunteered to assist SHE with our search for a materials. Our objective was a durable and cheap substitute for the Hot Pot reflectors we now have, which at present are one or the other, but not both. Charlie spent a year, on and off, on this project and compiled a table of materials which might serve either as reflective surface or substrate.

We found funding for a new contract with Energy Laboratories, Inc., the solar R&D firm which produced the Morningstar hinged aluminum reflector designed for the HotPot. The task we assigned Energy Labs was to review the materials identified by Mr. Sellers and come up with a prototype reflector which most closely met our requirements. Our hope was that such a material, in addition to being appropriate for the HotPot, might also serve to improve the durability of the CooKit reflector.

It has become clear through our projects in Senegal that there is a significant need for solar ovens large enough to cook for extended families of up to 20 and even more, who share a meal and eat from the same pot. Institutions, such as schools that in Africa often serve the only hot meal a child receives, would also require larger ovens. Such capacities

impose the need for large box ovens or Scheffler-type parabolic cookers. But multiple quantities of panel-type cookers such as the HotPot may offer another simple alternative for increasing the capacity.



Users of solar ovens like the HotPot being used in Senegal (above) can engage in other productive activities while the sun is cooking their food.



In Burkina Faso, Marguerite Zoungrana is cross stitching, while working as a telephone service seller and while her HotPot is cooking her meal.

Another lesson learned from SHE's pilot demonstrations has been the need to develop cooking options for times when solar cooking is not possible. The solar cooking community has increasingly recognized that solar cookers do not stand alone, because a) there are cloudy days sometimes even in desert locations; b) people usually expect a hot meal after the sun goes down.

SHE has concluded that to be realistic, solar cooking requires an "integrated" approach, involving three devices:

1. A solar cooker of some type, appropriate for the foods and other local conditions;
2. A fuel-efficient stove for use when solar cooking is not possible;
3. A "retained heat device" or insulated storage container for hot food storage, so that meals will continue to cook and remain safely hot hours after removed from a solar oven. Such a device could be a large basket filled with straw, such as the baskets shown in the figure above, or a hole in the ground lined with wool and blankets.

Therefore SHE, Inc. will focus its promotion on this total solution for cooking. This also implies that we will be collaborating with providers of fuel-efficient cookstoves, and endeavor to partner with them to arrive at designs and methods that incorporate both devices.

Parabolic cookers are prevalent in India and China, so we obtained samples to familiarize ourselves with this very different technology. We now have evaluated the following:

- The BS-3, A “butterfly” unit from Bigstone Energy Science and Technology Co. Ltd. We have satisfied ourselves that this model is too heavy and impractical. However there may be a simpler butterfly design which could prove acceptable. Our associate Jim Lindsay uses one in Somalia which has been working when presented with adequate training.
- The BS-M2, a paraboloid 1.5 meters in diameter, also from Bigstone, costing only \$32. It is very powerful but appears somewhat fragile. The company will not release the names of the customers it claims are using them in Asia and Africa. We will have to find them and learn about their experiences before recommending the use of the BS-M2.
- The Tiny Tech AGE, is a square paraboloid from the Aadhunik Global Energy Company in India. It has been recommended to us by our associate Ajay Chandak. It sells in quantities for \$90. We have just learned that Ajay is also selling a very similar model himself, which we should certainly consider if a possible application arises.
- We have had in hand for some time a sample of the SK-10, now sold in Spain as the AlSol for \$230. It is smaller as well as much more expensive than the AGE, and its design is complex.

In short, we have made a start in addressing the problem of larger cooking units with this exploration into parabolic cooker designs. There is another tack we can take: the simplification of materials for construction of large box ovens. We could provide guidance for this research if we can find an organization willing to take it on.

ADVISING and PARTNERSHIPS

Strengths of SHE, Inc. include our physical location in the nation’s capital, our field experience and the depth of our contacts in the world of solar cooking. We offered these last January after the Haitian earth quake as described in OUTREACH ACTIONS above, but without finding the appropriate opportunity. But, the seed was planted for future situations.

Our association with social entrepreneur Kevin Adair in the Dominican Republic has been a new departure of SHE, Inc. We prepared legal documents to allow him to receive funds for charitable purposes in the U.S. and channel them to an NGO in the Dominican Republic, Grupo Jaragua, which is distributing solar cookers there. Through this partnership opportunity, SHE will be able to promote Grupo Jaragua’s solar cooking projects on the SHE website and raise funds for these projects, thus allowing SHE to maintain its connections with and influence over solar cooking projects in the field.

We were approached by The Central Caribbean Director for The Nature Conservancy (TNC) in February of 2010 for help in adding a solar cooking component to reforestation project on the Haitian/Dominican Republic border. This presented us with the opportunity to test our concept we could act as advisors and consultants bringing our

knowledge and expertise to partner organizations, as opposed to independently implementing our own solar cooking field projects.

The opportunities for such partnerships are too numerous to count, if we consider organizations that traditionally do development, refugee or environmental projects, but do not necessarily have solar cooking knowledge. SHE can bring this expertise to these organizations and help to ensure that solar cooking projects are successfully implemented.

EVALUATION and RESEARCH

It is logical to assume, and it is the expectation of potential sponsors, that the strongest case we can make for solar cooking is to show successes in field work. We are far from making that case -- not because of any basic issues with solar cooking but simply because of a lack of sufficient data. The reports we have written on our projects contain too little follow-up information to definitively describe the impact of solar cooking on the lives of people involved.

Several levels of evaluation and research are needed. Scientific inquiry and research, with its precise data collection protocols, statistical formulae and peer reviews is needed to scientifically document the impacts of solar cooking in scientific publications. This type of research and publications provides the tested and validated analysis that judge the true merit of solar cooking and how it can best be implemented. It is essential for advocacy. It is often time-consuming and can be expensive.

SHE's best possibility for realizing such research results will likely be through partnerships with academics at research institutions. SHE may potentially partner with academic researchers to apply for specific research grants to study those issues most needed for solar cooking advocacy. As an initial foray into research partnerships, SHE is teaming with a graduate student to examine the possibilities of microfinancing for solar cooking. More will be reported on this in the next annual report.

In addition to research on solar cooking technologies and its implementation, high quality evaluations are needed of solar cooking projects to evaluate the implementation and outcomes of those endeavors, for funders and for the public. While evaluations can and should be conducted by project implementors, evaluations by outside professional evaluators are often considered to be more objective and reliable. These professional evaluations are also costly. Ideally, they should be funded at the time that initial funding is acquired for projects to be implemented. Evaluations that provide the most robust and useful results are built into the project design from the beginning.

A third type of evaluation that is also very useful for advocacy, involves documenting projects through stories, photos and video. This anecdotal information, while having less scientific credibility than academic research or professional evaluations, is invaluable for showing funders and the public the realities of solar cooking project. Such information serves to capture attention, define problems, illustrate solutions, nourish comprehension

with anecdote, and even inspire. This type of material helps to tell the story of solar cooking and is invaluable for use on the SHE website and in SHE publications. As a part of SHE's new strategic mission, SHE will begin compiling this type of information and tailoring it for specific audiences.

Three years ago, we were delighted to learn that a Ph.D. candidate at The University of California (Berkeley) wanted to evaluate our project in Senegal. SHE was promised data from that work upon its completion in the summer of 2008. In spite of our pleading for research results on a regular basis over the following 15 months, the "early draft" finally arrived in November of 2009. Unfortunately, it proved to be of somewhat limited value for SHE's needs.

Researchers also worked on an evaluation of SHE's Hot Pot projects in El Salvador. While providing basic information about Hot Pot acceptance and usage, this evaluation was limited by lack of availability of quantitative baseline data for comparison. SHE prepared a summary sheet based on the information received. In pursuit of more useful data, Louise Meyer has begun making telephone contacts with directors of the local NGOs in El Salvador with which we worked. Distribution of a summary report on evaluation findings has been suspended until we obtain the results of Louise's inquiry.

Perhaps because of the frustrations with the Berkeley and El Salvador projects, we still have insufficient information from our previous projects for our advocacy. In order to rectify this, at the end of this reporting period, we received an indication that Dorothy Ann Foundation, a long-time supporter of SHE, would consider providing some funding for this purpose.

By far the most fertile ground for evaluative data on the introduction of solar cookers to settled communities is Mexico. Here, our colleagues at the Mexican Foundation for the Conservation of Nature (led by our advisor, Lorenzo Rosenzweig) have been the executors. They, as we, recognize the importance of thorough research for results. To date, neither they, nor we, have the money to fund it. In the near future, we will jointly be pursuing such funding.

Thus, to date we are still not satisfied with the evaluations and even the anecdotal information that we have from SHE's projects in Mexico, Senegal and El Salvador. Also, ex post facto research will always have its limits, documenting the results of these endeavors to the extent possible will be a high priority for the future year. In their solutions we will find guidance for improving the introduction of solar cooking and the data critical to our future advocacy.

SUMMARY

Transition is the governing word for this fiscal year. We have been undergoing a very thorough strategic planning process. We have maintained our contacts around the world and continued outreach activities here at home. Our new directors have sought to stimulate new interest in SHE, Inc. through the contacts they brought with them. We have placed new emphasis on R&D in recognition of a significant need for larger solar cookers. Finally, we have made preparations for assessing the impact we have had with our field projects. Such data are critical to a strong advocacy program.