

SOLAR COOKER REVIEW

Kickstarter Success for SolSource Parabolic Solar Cooker

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Catlin Powers with two attendees at the Eden, Utah, Summit Series, where four SolSource parabolic solar cookers helped to cook for the 850 participants. Courtesy of One Earth Designs. July 2013



After five years of designing and testing fifty-four versions of the SolSource parabolic solar cooker in an MIT laboratory and with nomadic communities on the Himalayan Plateau of western China, One Earth Designs (OED) launched a July 2013 campaign with Kickstarter, an American-based, for-profit company that helps raise funds for creative projects via crowd funding. OED's Kickstarter pledge netted \$142,431, which is 330% of its initial goal

of \$43,000.

Kickstarter backers support projects to bring them to life rather than to profit financially from them. Instead of profit sharing, project creators offer tangible rewards such as samples from an initial production run of a new product.

OED is already manufacturing SolSource cookers for nomads on the Himalayan Plateau. The Kickstarter funds will allow OED to bring the (Continued on page 4)

Can Solar Cookers Reduce Emissions and Improve Health?

In a 2012 video produced by the Global Alliance for Clean Cookstoves, celebrity actress and Global Alliance Ambassador Julia Roberts notes that every year, the simple act of cooking is responsible for more than two million deaths among the nearly three billion people who still cook over open fires using wood or charcoal. (In 2013, the World Health Organization [WHO] revised that figure upward to four million.) The victims—primarily women and children—die mostly from respiratory disease. Cooking in this way is equivalent to smoking up to ten packs of cigarettes per day.

When heating food and boiling water, solar cookers produce no emissions. Their regular use whenever the sun is shining dramatically reduces the need for poor families to cook with combustible fuels.

Despite the fact that solar cooking has been shown to dramatically reduce this dangerous exposure, the Global Alliance and others in the international development community continue to deride this technology as unworkable and ineffective for improving the health of the world's poorest populations. (Continued on page 5)

SCI Supports Projects in Kenya and Nepal

This year SCI's board of directors has set new goals that will significantly increase the practice of solar cooking and help provide people with clean drinking water. To this end, SCI is providing grants to NGOs in Kenya and Nepal. In the coming year SCI plans to expand its partnerships to NGOs in other countries. The NGOs that SCI has chosen to fund have demonstrated their ability to adapt to their communities' unique cultural, environmental, and economic circumstances. SCI also selects projects that strengthen the economy of target communities by providing employment for the local population.

The Natural Resources and Waste Management Alliance (NAREWAMA) will provide solar and integrated-cooking training for highly motivated communities in the Nairobi region of Kenya. Another Kenyan NGO, Friends of the Old (FOTO) will receive funding to support its work to improve the welfare of the elderly and orphans in the Lower Nyakach region, with a population of 70,000. The third Kenyan NGO being funded by SCI is Sustainable Utilization of Renewable Energy (SURE), which promotes a number of renewable technologies (solar, wind and biogas) for generating electricity, cooking food and pasteurizing water. SURE serves grandparents, widows and widowers also in Lower Nyakach, Kenya.

SCI provides these Kenyan NGOs with Safe Water Packages (<http://solarcooking.org/swp>), which include all the necessary components for using the Integrated Cooking Method: a CookKit to heat water and kill pathogens when the sun shines; a fuel-efficient biomass stove for use in the morning, evening or during inclement weather; and a retained-heat basket or "fireless cooker" to keep cooked food warm, and to conserve fuel. Working with its partners, who provide the training and follow-up, SCI distributed 212 Safe Water Packages between November 2012 and April 2013.

These packages are providing over 1,000 people with a virtually cost-free way to maintain a healthy water supply and prepare their meals. SCI has set a goal to increase the number of packages it funds from 35 per month to 100 per month through 2013. Your donation to SCI helps continue providing Safe Water Packages to families in these communities.*

In Nepal, the Foundation for Sustainable Technologies (FoST) helps those who suffer most from a lack of alternative fuel options. The FoST project funded by SCI empowers single women and (Continued in next column)

orphanages in Kathmandu and Lalitpur with tools and training. In addition to the Integrated Cooking Method, FoST also promotes the use of fuel briquettes made locally from biomass waste. Sanu Kaji Shrestha, founder (Continued on page 6)

The **Solar Cooker Review** (SCR) is published by Solar Cookers International (SCI) to disseminate information on solar and other clean cooking technologies. It is also available online at: www.solarcookers.org

SCI is a 501c(3) non-profit organization working to harness the sun to benefit people and the environment.

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SCI welcomes submissions, all of which are subject to editing.

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Letter from SCI's Executive Director

North Americans like me recognize smoky fires as an integral part of the camping experience.

Gathering around a campfire evokes many memories: smoke drifting into my face, bringing tears to my eyes and making me cough; tasting the smoke in our food; smelling smoke in our sleeping bags; scrubbing soot from our clothes. So many smoke-related memories...

Once I took my three small children camping as the solo adult on the adventure. I was so afraid my 15-month-old would crawl into the fire, that I refused to light one. We ate cold food.

In July we camped at the South Rim of the Grand Canyon in Arizona (USA). Our food solar cooked while we hiked the canyon and we returned to a convenient, smoke-free hot meal. Much to our surprise, the other campers also experienced a smoke-free campground that week. Because of the extreme fire danger in the western U.S., all campfires were prohibited. There was no smoke in our clothing

or supplies, and most importantly, no smoke in our lungs.

For many global citizens—nearly three billion—cooking over an open, smoky fire is not an occasional recreational cooking choice, but a daily survival reality, as are respiratory disease, red, irritated eyes and debilitating burns. And if fuelwood, charcoal or animal dung aren't available to cook food and sterilize water, people eat cold food and drink water containing disease-causing pathogens.

Each year, four million people die prematurely from respiratory disease caused by smoke from open fires. Nearly 50% of pneumonia deaths among children under the age of five are due to particulate matter inhaled from household air pollution. Burns are preventable, yet seven million more people including children are disfigured or die from burns caused by open fires.

The solution? The World Health Organization recommends using safer cookstoves. Solar cookers are the safest cookstoves of all. These zero-emission cookers create no smoke or flames. Using a solar cooker every day the sun shines reduces the risk of a child falling into a fire or a woman catching a

sleeve on fire. Using a solar cooker means a woman who is blind can cook successfully without being burned. Solar cooking means no smoke to inhale from a cook fire.

So many people need to escape the respiratory illnesses and burns, which can be avoided by cooking with safe, zero-emissions solar energy every day the sun shines. Solar cooking gives people an alternative to breathing smoke and catching loose clothing on fire when they prepare the family meal. Solar cooker designers worldwide continue to make this technology more efficient and less expensive for everyone who would benefit from it. Your generous support helps SCI spread this technology to help improve health and quality of life—for all of us.

Julie Greene, SCI's executive director, welcomes your comments at julie@solarcookers.org



Solar cooking at the smoke-free Greene campsite in the Grand Canyon. Courtesy of Julie Greene 2013

The Most Significant Solar Cooker Projects in the World

Solar Cookers International's webmasters have created a page that documents the most significant solar cooker projects in the world.

This information can be accessed here:

<http://solarcooking.org/significant>



Are you an Amazon shopper? If you enter Amazon.com® via...

<http://tinyurl.com/amazonshopsci>

...and start shopping, SCI will receive a portion of the total purchase price at no additional cost to you. It's an easy way to support SCI!

SolSource Kickstarter Success

(Continued from page 1)

SolSource to the U.S. and other international markets. Since funding of this magnitude has been largely missing in the solar cooking sector via government and corporate grants, OED's success with Kickstarter may pave the way for other entrepreneurs to generate capital for the manufacturing and distribution at scale of new zero emissions, solar thermal cooking technologies.

Catlin Powers, OED's co-founder and chief operating officer, attributes this success to "the great interest of people around the world in using the sun for cooking and grilling." Powers adds that, "it's up to all of us to continue making this technology more accessible, convenient, and fun to use."

Powers, a graduate of Wellesley and Harvard, collaborated with MIT-grad Scot Frank to found OED's non-profit branch in 2009 and its for-profit branch in 2012. Frank's engineering skills and Power's chemistry and public health background came together on the Himalayan plateau. Working with local nomads, OED and its international team developed the SolSource, a durable, portable and powerful parabolic solar cooker that has the potential to dramatically reduce the need for nomads to use dung and wood for cooking and heating water. Design improvements that make the SolSource unique include its low weight, its stability in windy conditions and its proven durability.

Also a cutout in the parabola's design allows users to stand close to the pot for stirring but also remain in the shade during cooking.

User-friendly modifications for shade while cooking can also be found in the [Devos](#) and [Primrose](#) solar cookers and in Ajay Chandak's (Continued in next column)



Making popcorn in the shade with a SolSource in Washington, D.C. Courtesy of Pat McArdle 2013

institutional [PRINCE-40](#) solar cooker.

An important advantage of parabolic solar cookers in the dry, treeless plateau of Western China with its harsh winters, sparse rainfall and cloudless blue skies, is that they can generate intense heat from sunup until sundown, even in sub-zero temperatures. Powers notes that with SolSource, "the nomads can save up to 70% of their energy costs and feed their families while breathing cleaner air."

Four thousand people are currently using the SolSource in western China, where the World Health Organization estimates that household air pollution produced by biomass and coal-burning cookstoves is responsible for more than 500,000 premature deaths annually.

The OED team has collaborated with some heavy hitters in the tech industry on its design including David Gordon Wilson, MIT professor emeritus, and Tom Chi, the inventor behind Google Glass and Google's self-driving car. OED has two patents on the design and one on the reflective material, a polymer they developed in-house. This polymer, which is more than 90% reflective, can be produced with a 3D printer, and it should last for 10-plus years according to third party accelerated weathering and use tests.

OED is testing different grill plate materials (although not Teflon) to determine which can heat quickly and evenly and maintain heat for a long period of time. They are also working on a lid design that will help retain the heat, reduce oil splatter and maintain moisture in the food while it cooks.

With their partners on the Himalayan Plateau, OED is also developing a solar thermal electric generator that can be used with the SolSource. Frank said OED might run another Kickstarter campaign to fund the launch of this product and will likely seek beta testers for this add-on to the SolSource.

In addition to their international promotions, members of the OED team are currently traveling around the U.S. to promote their product for use by campers and others who simply want to reduce their carbon footprint when grilling in their backyards. Frank pointed out that during the last Fourth of July holiday, barbecue grills in the U.S. produced more CO₂ in a day than some African nations produce in a year. OED is making a special "Burning Man Edition" of the SolSource available to solar cooking enthusiasts attending the annual August arts and sustainability festival in Nevada's Black Rock Desert in the western United States.

One Earth Designs has won many awards for the SolSource including the United Kingdom's prestigious St. Andrews Prize for the Environment in 2009, the 2010 European Union Green Challenge, the (Continued on page 5)

GoodShop

You can benefit SCI when you shop at more than 600 top stores—including Target, Staples, and Best Buy through this link to GoodShop.com:

<http://tinyurl.com/goodshopsci>

Can Solar Cookers Reduce Emissions and Improve Health?

(Continued from page 1) With a box or a panel solar cooker, families can leave nutritious and inexpensive dried beans and grains to simmer unattended for hours using no fuel at all.

A 2011 World Bank survey on the health and environmental impact of household cookstoves does not include a single solar cooker in its list of the stove interventions that are analyzed in this fifty-page document. WHO states on its website that the Global Alliance for Clean Cookstoves “is promoting improved biomass and biogas cookstove designs that can substantially reduce indoor air pollution.” WHO is conducting health impact studies on these biomass stoves in cooperation with the Global Alliance, but it is conducting no studies on the health impacts of solar cooker use.

A quick Internet search reveals that millions of dollars have been spent over the past decade on health-related biomass cookstove and cooking fuel research in the developing world by the World Bank, the World Health Organization, the Shell Foundation, the EPA and now the Global Alliance for Clean Cookstoves. Only one peer-reviewed study has ever been published on the health impact of solar cookers, and it argues against the further dissemination of this technology.

After a long and concerted effort, D.C.-based members of the solar cooking sector convinced the EPA to include three solar cookers in a series of tests on improved cookstoves and fuels: the Global Sun Oven, Solar Household Energy’s HotPot, and the SunPower parabolic solar cooker.

At the April 2013 Global Alliance Forum in Cambodia, the lead EPA cookstove researcher presented his team’s preliminary test results and announced that the cleanest of all the stoves they had tested were the three solar cookers. This was great news for the members of the solar cooking sector in the audience.

The bad news came when the (Continued in next column)



EPA testing: Sun Oven, Hot Pot and Sun Power solar cookers--all with zero emissions. Courtesy Jim Jetter. 2013

keynote speaker, UC Berkeley Professor Kirk Smith, who has been studying the effects of biomass cooking smoke on the health of the world’s poorest families for the past two decades, and who is considered to be the preeminent expert in the clean cookstove world, was asked by an audience member why he had not included solar cookers in his research. His response: “Let’s not ask the poor to use technologies we wouldn’t use ourselves...like solar cooking.” (Continued on page 6)

SolSource Kickstarter Success

(Continued from page four)

2010 Dutch Postcode Lottery Green Challenge (the largest sustainable business plan competition in the world), the Clinton Global Initiative University Outstanding Commitment Award for 2009, the Muhammad Yunus Innovation Award in 2008 and the U.S. Environmental Protection Agency’s 2010 People, Prosperity and the Planet design competition. Funds from these awards allowed the OED team to continue their development work with counterparts in China.

Powers is pleased that, “Nathan Perry of Cantina West has shared with us his goal of getting solar cookers into the hands of five million Americans in the next five years.” SCI’s goal is for 20% of all families worldwide to have access to solar cooking technology by 2030. Powers said the OED team looks forward to “working with our fellow solar cooks and solar designers to realize these goals.”

“During the last Fourth of July holiday, barbecue grills in the U.S. produced more CO₂ in a day than some African nations produce in a year.”

Scot Frank, CEO, One Earth Designs



You can raise funds for SCI just by searching the Internet. Simply visit [GoodSearch.com](http://www.goodsearch.com) (<http://www.goodsearch.com>), make sure that Solar Cookers International is the designated cause, and start searching. You can even download a GoodSearch toolbar for your Web browser.

<http://www.goodsearch.com/toolbar>

SCI-Supported Projects: Kenya and Nepal

(Continued from page 2) and director of FoSt writes that in Nepal as in many developing nations, housewives spend up to a full day collecting a three to four day supply of firewood. In Nepal, 90% of the forest areas are under government jurisdiction. There are heavy penalties when people gather wood in protected areas. There is no other alternative energy source for cooking when income is low and commercial fuels like liquefied petroleum gas (LPG) and kerosene are expensive. FoST offers a solution by training people to cook with the sun when it shines, use improved cookstoves and/or fuel briquettes made from biomass wastes at night or during inclement weather, and use retained-heat baskets with both technologies.



Women in Nepal learning to make and use solar cookers. Courtesy of FoST 2013

For more information about these projects, and to learn how you can contribute, go to:

www.solarcookers.org.

*Associated video link:

<http://tinyurl.com/safewaterpackage>

-PM, Editor

Can Solar Cookers Reduce Emissions and Improve Health?

(Continued from page 5)

During Smith's presentation, he said that, "the full benefits from reducing household air pollution can only be achieved by switching to truly clean cooking, which means LPG (Liquefied Petroleum Gas) and electricity." (This, despite the fact that neither LPG nor fossil fuel-generated electricity are clean, sustainable energy solutions.) Smith also acknowledged that the world's poorest billion people, who suffer the worst health effects from smoky cooking fires, will likely never be able to afford to purchase LPG and will still need efficient biomass stoves. In a 2011 CNN report, Smith highlighted the urgent need to develop and deploy truly clean-burning stoves for these people, although he acknowledged that there were "few examples of such stoves anywhere."

A WHO publication, Addressing the Impact of Household Energy and Indoor Air Pollution, authored by Professor Smith and five other (Continued in next column)

researchers, does not recommend solar cookers because they "frequently require the user to cook under the midday sun, or change cooking practices and habits." The authors add that the use of solar cookers "is limited for practical reasons." The reality is that many cooks in the developing world, who live in single room dwellings, also cook outside with their biomass stoves or three stone fires to avoid filling their homes with smoke.

The only existing, peer reviewed paper on the health impact of solar cookers, "The Effect of Solar Ovens on Fuel Use, Emissions, and Health: Results from a Randomized Controlled Trial," is a Ph.D. dissertation based on a 2008 study in Senegal. It was supported in part by Solar Household Energy (SHE). SHE's solar panel HotPots were used in the study. Professor Smith received special thanks from the authors for his help with measurement tools.

UC Berkeley published this study, in which the authors acknowledge that, "because 80% of our respondents typically cook for more people than the capacity of the solar oven, even cooks using the solar oven always had a fire going at the same time." Officials at SHE questioned this selection of respondents who have large families, noting that it was comparable to saying, "The Smart Car is a failure because we tested it as a school bus and 30 children couldn't fit in it." SHE also challenged the study's negative conclusion, which declared that the project had been a *policy success* (italics added), "because its results halted the proposed nationwide rollout of the solar oven, thus avoiding mass distribution of a stove which *cannot reduce Indoor Air Pollution or generate a sizeable decrease in fuel use* for the population." (italics added)

Solar Household Energy has prepared a point-by-point rebuttal of the contested data and the study's conclusion. Although SHE has also asked that the study be removed from the Global Alliance website until the inaccuracies can be corrected, the report remains there as the first document that appears when searching for "solar cooking".

With respected researchers like Professor Smith publicly deriding this technology, and with the sole peer-reviewed study on solar cookers and health declaring that a solar oven "cannot reduce indoor air pollution," it has been difficult for the global humanitarian and development community to accept that solar cookers are a valuable, affordable and sustainable technology for reducing illness, poverty and deforestation among the world's poorest people.

There appears to be less resistance in the international community regarding the health (Continued on page 7)

Can Solar Cookers Reduce Emissions and Improve Health?

(Continued from page 6)

benefits of solar thermal cookers for heating and purifying water. Professor Kenneth Bryden of Iowa State University has learned from his studies in Africa that up to 30% of all energy generated in remote villages is used to heat water from ambient temperature to boiling for cooking, washing and bathing. Although Bryden recommends large community solar hot water heaters rather than single-family solar cookers for this purpose, he does agree that heating water with solar thermal energy and storing it in thermos bottles or other insulated containers for use at night could cut emissions and fuel consumption in these villages by up to one third.

Preventable waterborne diseases are responsible for 80% of all illnesses and deaths in the developing world. Both the UN and WHO have acknowledged that solar thermal cooking technology has made an important and sustainable contribution to reducing this cause of death and disease. On its website, the World Health Organization cites a 1999 study by former SCI Board President and microbiology professor Bob Metcalf proving that solar cookers can be used at the household level to pasteurize water and milk. In 2010 UN Habitat published a guidebook written by Metcalf on how to use his portable microbiology lab to test water in the field and pasteurize it with a solar cooker.

A December 2012 report by Solar Household Energy has revealed the exponential spread of solar cookers in Western China and the strict emissions-reduction monitoring that has been required for these projects by the Kyoto Protocol. This report has compiled the first documented evidence of at scale solar cooker projects which have significantly reduced the need for people to cook over biomass fires. If such objective assessments on the health impacts of solar cooker use become standard practice by sector members in the future, the world will finally have (along with the studies referred to above on solar cookers and water pasteurization) sufficient documented evidence to convince the international community that solar cookers must be a major part of the solution to reducing indoor and outdoor air pollution. Our only obstacle now is funding. –PM, Editor

EMPLOYER MATCHING

Many employers will increase the value of a contribution by matching your charitable gift to SCI. Please consider selecting SCI in a matching gift program if it is available to you.

Solar Cookers International at the United Nations

SCI's UN representatives in Geneva, Joyce Jett and Sonia Heptonstall report that when the UN Economic and Social Council met in Geneva this year, they voted to change the focus of the Millennium Development Goals (MDGs) to include a greater focus on sustainability. Jett writes that, "this is an important policy shift post-2015 from MDGs to Sustainable Development Goals." (For information on how solar cooking contributes to the MDGs please see: <http://www.solarcooking.org/mdg>)

Below is an excerpt from the statement made on June 18, 2013 by Arline J. Lederman, Ph.D., Vice President of Solar Cookers International and SCI's UN Representative in New York City, to the UN-sponsored meeting of the Department of Public Information of Non-Governmental Organizations: "I propose that there should be a right for all human beings to have affordable, truly clean, environmentally-safe, low-cost, cooking fuels for their daily lives. Partnerships for the development of solar thermal cooking for all who have sufficient sun should be a goal for the United Nations... This right should be incorporated into the post-2015 United Nations development goals."



Are you a U.S. federal employee? SCI is a participating organization in the **Combined Federal Campaign (CFC)**. SCI is a beneficiary of the effort through **Aid for Africa**. We are proud to meet their rigorous financial, accountability, and governance standards, and we ask for your CFC support.

Federal employees have the option of supporting SCI with either a one-time gift or with recurring payroll deductions.

SCI's CFC number is 11023.

Thank you, federal employees, for your philanthropy and involvement in the effort to spread this sustainable solar solution.

NEWS YOU SEND

Solar Cookers International invites the 502 registered members of the Solar Cookers International Network (SCI^{net}) to send in news and share success stories with our global solar cooker community.

To join the Network at no charge, fill out the online form here: <http://tinyurl.com/joinscinet>

Please note that SCI does not have the resources to research—nor can we be held liable for—the accuracy of these contributions.

AUSTRALIA

In July, Australian solar cooking enthusiasts in Brisbane, Queensland hosted Portuguese solar cooking authority Professor Celestino Ruivo. A winter solar cookout—possibly the biggest gathering ever in Australia of solar cooking enthusiasts—was held in Stretton at the home of Stan and Jane Cajdler. In the last few years, solar cooking groups have sprung up all over the country, from West Australia and Alice Springs to Castlemaine in central Victoria. More than 70 solar cooking enthusiasts attended with 25 solar cookers, roasting and baking food for the event. Solar cooker models varied from a basic pizza box cooker to Prof. Ruivo's "funnel cooker" and Stan's "death ray" which is capable of melting metal. <http://www.masg.org.au>



Celestino Ruivo and friends.
Courtesy of Stan Cajdler, 2013

CANADA

The Greenlearning Canada Foundation reports that despite the rain, this year's Canadian Solar Oven Challenge was hot! Unique designs, a great video, and an array of items from *(Continued in next column)*

SCI CREDIT CARD

Through the Capital One® Card Lab Connect program, you can now sign up for a "Solar Cooking & Safe Water" Visa® Platinum credit card and support SCI every time you shop. In addition to an added bonus of \$50 for SCI with your first transaction, 1-2% of each purchase directly supports our vital work. Apply today at <http://tinyurl.com/scivisacard>



(Canada - continued) S'mores to sausage were cooked to perfection. Students used textbooks to weigh the ovens down and taped them to the fence so they wouldn't blow away. <http://www.greenlearning.ca>

GERMANY

What is so special about renewable energy? Why do we call coal, oil, and natural gas—fossil fuels? These are questions being raised by the Climate Detective Team in Stralsund, Germany with third and fourth grade students. The center of attraction at a recent Climate Detective demonstration was a parabolic solar cooker that boiled corn on the cob for the children. Thea Holm, visiting from South Africa, showed a video to the children about how she cooks with the sun in her country where it takes only an hour to roast a whole chicken with vegetables. Classroom guides for teachers are available at:



Climate Detectives learn about solar cooking. Courtesy of Thea Holm, 2013

<http://tinyurl.com/climategerman> (German version)
<http://tinyurl.com/climateenglish> (English version)
<http://solarcooking.org/classroom>

JAPAN:

The Japan Solar Cooking Association (JSCA) participated in the Eco Life Fair on June 1st and 2nd in central Tokyo's Yoyogi Park. The fair received 78,000 visitors. To demonstrate the power of their solar cookers, JSCA made popcorn, cooked rice, and baked cakes and cookies. solarcooking@hotmail.com



Solar cookers at the Eco Life Fair in Tokyo
Courtesy of JSCA, 2013

(News You Send - Continued on page 9)

INDIA

The Oil and Natural Gas Corporation (ONGC), a public company in Ahmedabad, India, is distributing solar box cookers to villagers as part of a conservation program designed to make people aware that by using solar cookers to bake and simmer they can save their LPG for specific cooking needs and save money by reducing their consumption of this expensive fuel without having to give it up entirely. For more information, contact Devang Joshi at Rudra Solar Energy: <http://solarcooking.org/rudra>, www.rudrasolarenergy.com



ONGC solar box cooker demonstration. Courtesy of Devang Joshi, 2013

MALAWI

Claudia Sansone, whose interest in solar cookers began when she met SCI board members AJ Lederman and Pat McArdle at a UN Commission on the Status of Women in New York in 2011, spent the month of June demonstrating solar cookers to villagers in Malawi. Sansone says that after she read McArdle's novel *Farishta*, she was convinced that solar cooking could be successfully introduced in Malawi. With guidance from SCI executive (*Continued in next column*)



Women making CooKits in Malawi. Courtesy of Claudia Sansone, 2013

In Memorium

The solar cooking community has lost another of its international champions with the passing in April of Dr. Paul Krämer, a physician and a member of Solar Global e.V. (Jülich, Germany). He is co-author of the book "*Solarkocher*" (in German). He was an expert in the acceptance and affordability of solar cookers, especially the *papillon* type (<http://solarcooking.org/papillon>). In addition to books on solar cooking, in 2006 Krämer wrote an important paper titled: "Why are Solar Cookers Still Unpopular Among Development Experts?" This work explains the modernization trap and also addresses misleading views about biomass, issues that are highly relevant today. Read Dr. Krämer's paper at: http://solarcooking.wikia.com/wiki/Paul_Krämer

(*Malawi-continued*) director Julie Greene in Sacramento, Sansone purchased several CooKits and traveled to Malawi where she hosted classes and demonstrations on solar cooking. With a friend, she taught the women at Elizabeth Chikoya's Women's Development Center and members of the Gogo Grandmothers how to make solar cookers with locally available materials. While Claudia was demonstrating solar cookers around the country, her husband Dr. Rob Hampton, DDS worked out of Daeyang Luke Hospital in Lilongwe.

www.gogograndmothers.com www.safe.africa.org

MOROCCO

The new Marrakesh firm *P-Solar* designs and mass-produces parabolic solar cookers. The founder's goal is to help preserve Morocco's forests, which are vanishing at a rate of 30,000 hectares per year. His second goal is to reduce the cost of fuel for Moroccan families who buy LPG, since the Moroccan government has recently announced that it will end subsidies for cooking gas. P-Solar's website notes that Moroccan women and girls in the High Atlas spend half their days gathering wood instead of attending school or tending to household chores. www.maroc-solaire.com

NAMIBIA

To increase ownership of alternative energy equipment in rural communities in southern Namibia, the Namib Desert Environmental Education Trust (NaDEET) has this year invited representatives from the Rietog, Aranos and Maltahöhe communities as well as students from the Agricultural Training Centre in Krumhuk to attend the NaDEET environmental education program. Sixty-eight participants earned solar cookers through NaDEET's voucher testing system. Due to a low turnout for the program last year, NaDEET piloted outreach workshops to ensure that more community members would have the opportunity to gain access to alternative energy equipment in Rehoboth. This year one hundred parabolic solar cookers have been distributed to communities. For more information contact: Vicky Endjala, Environmental Educator-Outreach Coordinator <http://solarcooking/nadeet>



Namibian men preparing breakfast. Courtesy of NaDEET. 2013

News You Send (Continued on page 11)

SOLAR TECH TALK

Heat Retaining Box Cooker

A solar cooker being developed by Cranfield University in the United Kingdom, and COMSATS Institute of Information Technology in Islamabad, Pakistan, uses a system of mirrored strips tilted at different angles to concentrate sunlight onto an “absorber”, which converts the sun’s energy into useable heat. As well as heating food and water, the cooker is able to store heat, and also has the potential to generate electrical power for essential mobile communications or air conditioning. The Government of Pakistan, by helping fund the development of this cooker, recognizes the need to improve the lives of those living in the remote regions of Pakistan. f.c.siebrits@cranfield.ac.uk

Solar Thermal Engine-for a Car!

Alex Carl, who travels the world developing solar thermal devices for cooking, heating water and generating power, has been working in La Paz, Mexico on a solar powered vehicle steam engine. It is made from recycled materials and is carried on a trailer to provide his car’s propulsion. Carl reports that if his experimental vehicle and trailer are able to collect solar heat for two hours a day, the car can be driven one hour at highway speeds, or 50 km (31 miles) per hour continuously on a sunny day. The trailer that houses the solar engine also converts to a modest living space. The parabolic mirror flips to become the roof of a 1.8 x 7.3 m (6’ x 24’) mobile home. Desalination provides drinking water, and heat can be stored as molten salt for later use (a heat storage technology also used by large, desert solar thermal power plants). alex.carl.cordes@gmail.com

Researchers from Rice University in Texas have developed two prototype solar-powered sterilization devices using solar thermal energy to sanitize medical equipment and sterilize human waste in locations without electricity. A report on these devices was published in the July 2013 issue of *Proceedings of the National Academy of Sciences*. Both are modified versions of modern steam-based autoclave systems. They heat vessels containing water and gold nanoparticles. The reusable nanoparticles absorb the sunlight and generate heat to produce steam, which maintains temperatures between 115 and 132 degrees celsius for the time needed to sterilize the contents of a 14.2 liter volume, in accordance with U.S. Food and Drug Administration’s sterilization guidelines. According to the researchers, these prototypes could be altered to provide steam for water purification, cooking, and the generation of electricity. <http://tinyurl.com/solarnano>

CooKits Made from Scavenged Supplies

Stephen Pearson of Sun-Life Africa is teaching Ghanaians to make their own CooKits using scavenged scraps of thin cardboard, which are then cut to size using rigid plastic templates. The panels are laminated with aluminum foil using starch left over from cooking cassava. The panels are pressed together between two tabletops (one inverted and weighted down). The rigid cardboard sections are then glued together using five cm. strips of discarded clothing.



Making CooKits with scraps. Courtesy of Stephen Pearson. 2013

Pearson reports that Sun-Life groups in humid coastal areas are able to extend the life of their solar cookers by painting the exposed areas of cardboard with an oil-based paint to reduce the destructive effects of airborne moisture. The oxidation of the reflective surface of the aluminum foil is reduced by wiping it with a rag dabbed with a few drops of cooking oil. Pearson believes that teaching people how to make their own solar cookers rather than giving them manufactured devices is the only way to empower them over the long term. www.sunlifeafrica.org

Through-the-Wall Solar Box Cooker

Joel Goodman is currently testing a design for a through-the-wall solar cooker (a variation on the [Kerr-Cole Solar Wall Oven](#)).



Through-the-wall kitchen solar box cooker. Courtesy of Joel Goodman 2013

Materials tested include: mirrors attached to masonry, cement, fabric, bio-plastic substrates, reflector facets attached to metal frames and cable-nets, and fabric reflectors. The potential advantage of this device, installed in a south-facing wall in the northern hemisphere or a north-facing wall in the southern hemisphere, is that it allows the cook to avoid sun exposure while cooking and

working at typical counter height. For more information: <http://solarcooking.org/goodman>

Guest Editorial: Thoughts on the Successful Promotion of Solar Cooking Technology

By Dar Curtis, co-founder of Solar Household Energy

There are still many people who remain skeptical about solar cooking, perhaps based on failures of the past. Others may well be bad-mouthing solar thermal technology because they have an interest in the promotion of other fuels.

Unquestionably, there are also many people of good will, who ignore solar simply because they know nothing about it; or because they have not heard of any successes with this technology; or because, in their ignorance, they view it in a category with such curiosities as the Slinky spring toy or Silly Putty. These people are persuadable but we have not succeeded in persuading enough of them.

It is one thing to write about the initiation of solar cooking projects around the world; or explain how well this or that cooker works. It is quite another to cite the long-term consequences of a project which has introduced solar cooking successfully into a culture in need. These incidents exist, but few have been documented properly.

We must do this. Many more people should know about the Darfur refugee solar cooker projects or the evaluation of the CEDESOL Bolivian village projects done years after solar cookers were introduced. We must collate existing data on any effort we've made that has resulted in cultural acceptance of solar cooking. And we must flaunt it. There should be a chapter titled "Successes" in the marvelous Solar Cookers International Network (SCI) wiki. We also need more white papers like the one about the massive Chinese solar cooker project reported by Trish Sheehan.

In short, proof of **cultural acceptance** is the missing link in our advocacy. By "cultural acceptance" I refer to the long-term embrace by a community of solar thermal energy as an integral cooking resource. Such data have been scarce because they are so costly to collect. We have rarely had the resources to do so. Given the level of resistance to solar cooking that we are encountering today, we must somehow budget for such evaluations from now on.

SCI's Executive Director Julie Greene has met in person with the founders and directors of Washington, D.C.-based Solar Household Energy. The two non-profits continue to develop their cooperative relationship and their shared goal of promoting solar cooking worldwide. A collection of existing project evaluations can be found here: <http://solarcooking.org/evaluations>.

NEWS YOU SEND *(Continued from page 9)*

SENEGAL/USA

New York teacher Amy Alter's interest in solar cooking began in January 1999 when she accompanied her husband, a professor at New York University, and twenty NYU students to Senegal to perform community service in local schools. Amy has continued to teach her students in New York about solar cooking using Solar Cookers International's teaching materials.

Her learning disabled *(Continued in next column)*



Amy Alter's New York students learn about solar cookers. Courtesy of Amy Alter 2013

students have learned that many people in the world still rely on wood to cook their meals, and that wood consumption has harmful effects on people and on our planet. Not only do her students cook various foods, including traditional African ugali (corn-meal) in their schoolyard, they also raise

money to provide solar cookers for a Senegalese partner school. With the solar cookers provided by Mrs. Alter's class, the Senegalese school has established a snack shop of solar cooked foods.

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Improving health, quality-of-life, and the environment is what drives Solar Cookers International (SCI). Gifts of any size to SCI make a difference. We offer many ways for you to achieve your charitable humanitarian and environmental goals.



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SCI Thanks You

Your generous donations help support our overseas projects and allow us to produce this and future issues of the *Solar Cooker Review* to educate governments, foundations, NGOs, schools, communities and individual users about the potential of solar cookers to provide a clean, cost effective way to cook food and heat water with sunshine. Your donations also help us maintain the popular [Solar Cookers International Network Wiki](#), which has helped millions of users in hundreds of countries to discover, make and use solar cookers.

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Please consider monthly donations to SCI to provide uninterrupted, long-term support for the mission you love. Your regular support helps Solar Cookers International tackle critical global solar cooking issues and make a positive impact around the globe for those who need it most.

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For a complete listing of SCI's products, go to SCI's On-Line Marketplace -- <http://shop.solarcookers.org>



The lightweight, compact **CooKit** panel solar cooker made of cardboard and aluminum foil is one of the most widely used solar cookers in the world. Simply unfold it and clip the panels into place to use. Directions in English are printed on the non-reflective side. The CooKit was developed for use in refugee camps in 1995. It holds one black, covered pot (not included—see our "3-Pound (1.36 kg) Roaster"). Cooking temperature range is 180-240° F (82-116° C). The CooKit is convenient for home, camping and emergencies. It folds flat into a 13" x 13" x 2" (33 x 33 x 5 cm) square. The shipment includes two wooden clothespins to hold the opened CooKit panels in place, two retained-heat bags to trap heat, and a 12-page instruction booklet with recipes. Made in the U.S. **\$29.00**

If you want to cook year-round, even when there's snow on the ground, try the **Global Sun Oven®**. This high-performance solar box cooker is made of durable molded fiberglass and kiln-dried hardwood for years of use. Anodized aluminum reflectors come with 15-year warranty not to rust. Reaches temperatures up to 360° F (182° C). Includes an oven thermometer. Use with a black, covered pot (such as our 3-Pound (1.36 kg) Roaster—not included). Weighs a sturdy 21 pounds and features a convenient carrying handle. Measurements: back of outer box is 14" (35 cm) high; front of outer box is 9" (23 cm) high; oven chamber (inner box) is 11" high by 13.5" wide (28 x 34 cm); depth of oven chamber is 7" (18 cm) high; depth of oven chamber is 9" (23 cm); elevator tray (inside inner box) is 9.5" by 12.5" (24 x 32 cm). Manufactured in the U.S. and shipped only to destinations within the continental U.S. Ships directly from manufacturer. Shipping and handling is included in the price of this product for destinations in the continental United States. Shipping time is generally 3-4 weeks. **\$280.00**



The compact, durable **SOS Sport** solar box cooker is made from recycled soda bottles. Reaches temperatures between 350°- 400° F (175°- 200° C) with reflectors. This large-capacity solar cooker holds two 3-Pound Roaster (1.36 kg) pots—which are included along with reflectors, thermometer, manual, recipe booklet, and a Water Pasteurization Indicator (WAPI). Recycled (post-consumer) soda bottles make up the rugged plastic outer casing; insulation is made of closed cell foam, which does not absorb moisture; oven lid is double layered, with dead air space in between which enhances insulating qualities. Floor dimensions of the oven (for cookie sheets, etc.) are 9.25" by 17.5" (23.5 x 44.5 cm). Reflectors are included to increase sun radiation to your oven, to lengthen the cooking season especially in areas further from the equator. Package dimensions are 30" long by 22" wide by 15" deep (76 x 56 x 38 cm). This lightweight (10 lb, 4.54 kg) cooker is stable in normal wind conditions. The SOS Sport is manufactured in the U.S. and ships from the manufacturer. Shipping and handling is included in the price of this product for destinations in the continental United States. Shipping time is generally 3-4 weeks. *Each sale of an SOS Sport will sponsor 10 trees through Trees for the Future (<http://www.treesforthefuture.org/>), beginning with Haiti and spreading to other deforested countries.* **\$197.00**



The **3-Pound Roaster** (1.36 kg) is a round, dark-colored cooking pot with a lid. This pot absorbs the sun's energy and converts it to thermal energy. Holds a 3-Pound (1.36 kg) chicken. Liquid capacity is 3 quarts/liters. Steel with a porcelain coating. Fits in all the solar ovens that we sell. Measurements are 9.75 inches width by 5.75 inches height (24.77 x 14.6 cm). Made in the U.S. **\$14.00**



High Temperature Cooking Bags (sold in quantities of five) trap heat energy in the cooking pot using a mini-greenhouse effect to increase heat and decrease cooking time. These plastic bags, made of heat-resistant polypropylene, measure 19"x 24" (48 x 60cm) and are reusable. **\$2.50**



The **Water Pasteurization Indicator (WAPI)** is a reusable capsule that contains a special wax which melts at 149° F (65° C)—the temperature required to pasteurize water. All human disease-causing organisms in water are killed at this temperature, including E. coli, rotaviruses, Giardia and the Hepatitis A virus. The WAPI now has the added benefit of a tough stainless steel cable and brass end caps so that it can be used when heating water over an open fire as well as in a solar cooker. **\$7.00**

The **Aquapak™** converts sunlight into thermal energy sufficient to kill all known water-borne human pathogens. Ideal for use in remote areas. Can heat three quarts (3 liters) of water to 152° F (67° C) in less than three hours during a typical sunny day. Can be used on boats, vehicles, roofs, the ground, or even strapped to your back. Engineered with a unique cap that houses a built-in, reusable water pasteurization indicator. Uses: emergency preparedness, disaster relief, hiking, camping. Weighs 6 oz. (0.2 Kg) when empty. **\$22.00**



Full Color, Illustrated Posters, blue/orange background: 18"x 24" (45 cm x 69 cm), suitable for framing **\$2.00 each**

Why Use Solar Cooking? "No fuel needed, pasteurizes water, smoke- & fire-free, it's fun!"

How Solar Cookers Work "Convert sunlight to heat, retain heat, capture extra sunlight."

Types of Solar Cookers Includes photos of box, concentrator and panel cookers and cooking systems.



Cooking with Sunshine by Lorraine Anderson and Rick Palkovic. Do you have a few square feet in your backyard, on your balcony, or on a rooftop where you get at least four hours of sunshine a day? If so, you can use a solar cooker. This book tells you how. Bon appetit! Published in 2006 by De Capo Press Lifelong Books: Perseus Books Group. 202 pages. **\$17.95**



Solar Cooking for Home and Camp by Linda Fredrick Yaffe. Quickly toss together the ingredients for Cashew Curry, place it in the solar cooker, point the cooker to the midday sun, and head to work. You'll come home to a ready-to-eat hot meal. Easy recipes can be made at home or in camp with little preparation, and the book even includes instructions for making your own solar box or folding panel cooker. Published in 2007 by Stackpole Books. 120 pages. **\$12.95**

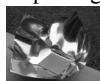


Since its founding in 1987, SCI has spread solar cooking skills and technologies where they are needed most. Hundreds of thousands of people worldwide have used SCI's resources to learn how to make and use solar cookers and teach others to do the same. This extensive knowledge is condensed in **Solar Cookers: How to Make, Use and Enjoy**, a 52-page publication. Chapters include the rationale for solar cooking, directions for making a solar cooker, solar cooker recipes, alternative solar cooker uses and ideas for teachers. Published in 2004 by Solar Cookers International. 52 pages. **\$7.00**

Catherine Scott's documentary film **Suncookers**, about Solar Cookers International's efforts to spread solar cooking and solar water pasteurization in Kenya, won the alternative energy category at the 2008 EarthVision International Environmental Film Festival in Santa Cruz, California. Cooking with solar energy has enormous potential for reducing health and environmental hazards associated with traditional open fire cooking and growing fuel shortages. This film follows Margaret Owino as she trains solar cooks in Nyakach, Kenya, and the Kakuma Refugee Camp in Northern Kenya. Featuring Margaret Owino, Elizabeth Auma Oranga, Pastor Alloys Ogollo, Shadrack Alumai Dima. Contents include: Suncookers (20 min); Cocinas Solares (Spanish version); Recipes; Sun Cookers Slideshow; DIY Pattern; Cooker Stories; Fuel Consumption Graphs; and more! Produced in 2006 by Catherine Scott/ Deep Dish TV Network. **Suncookers DVD ~~\$5.00~~ Special Warehouse sale "as is", \$3.00**

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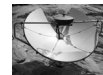
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√ The **Solar Chef's Kit** is perfect for a beginner, or an experienced solar cook. Contains a complete **CookKit** (with two bags), a **3-Pound (1.36 kg) Roaster**, and **Solar Cooking for Home & Camp**. Purchase together and save 8%. **\$52.00**

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√ The **Teacher's Kit** includes everything to start solar cooking, and teach others too. Contains a complete **CookKit** (with two bags); a **3-Pound Roaster**; **Water Pasteurization Indicator (WAPI)**; set of 3 **educational posters** (How/Why/Types); the **Suncookers DVD**, and SCI's classic instruction manual **Solar Cookers: How to Make, Use and Enjoy**. Also includes a 13-page **manual for teachers**. Purchase together and save 8%. **\$58.00**

Note: We invite you to save money on your purchase by calculating the actual shipping costs at our online store: <http://shop.solarcookers.org>

If you have questions, please call the SCI Office at +1 (916) 455-4499.

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Photo of Afghan refugees courtesy of Trust in Education, 2012

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Give this issue of the Solar Cooker Review to a friend. Leave it at a doctor or dentist's office, or in a bus terminal or airport lounge so more people can learn about the fascinating world of solar cooking.