

Solar Cookers International

# SOLAR COOKER REVIEW

## **In This Issue**

- Solar Cooking: A Technology We Wouldn't Use Ourselves?  
p. 2
- Letter from SCI's Executive Director  
p. 3
- SCI's UN Statement  
p. 3
- Solar Cooking in the Movies  
p. 4
- Scaling Up: The California Sunlight Solar Cooker Story  
p.6
- News You Send  
p. 8
- Guest Editorial  
p. 9
- Solar Tech Talk  
p. 10
- Tribute Gifts  
p. 12
- SCI's FY2012/2013 Financial summary  
p. 13
- SCI Store  
p. 13

## **SCI – Changing Lives in Kenya and Nepal**

by Julie Greene, Executive Director, SCI



*A FOTO staffer teaches a Kenyan grandmother how to pasteurize water with her new CookIt solar cooker. Courtesy Dinah Chienjo, FOTO*

Starting in late 2012, and thanks to the generosity of its supporters, Solar Cookers International (SCI) expanded its work with partner organizations in Kenya and now Nepal, helping thousands of people to cook food and produce safe drinking water with zero-emission solar cookers and other energy-saving devices.

Between November 2012 and October 2013, SCI and its Kenyan partners provided Safe Water Packages\* to more than 9,000 people in the Lower Nyakach region of western Kenya near Lake Victoria. *(Continued on page 5)*



## **The Importance of Accurate Standards for Testing Solar Cookers**

*“Solar stoves can produce fires without warning.”  
“Parabolic solar cookers automatically receive a safety rating of poor.” (Iowa State Safety Protocol)  
International Workshop Agreement, Guidelines for Evaluating Cookstove Performance, International Standards Organization (2012)*

In February 2012, the Global Alliance for Clean Cookstoves hosted a meeting in The Netherlands to

begin the process of establishing globally accepted standards to measure the efficiency of improved cookstoves for use by the three billion people who still cook over smoky biomass fires. Prior to last year's meeting Global Alliance member organizations were invited to comment on the source documents that would be used as the starting point for developing the new standards. Members of *(Continued on page 7)*

## Solar Cooking—

### A Technology “We Wouldn’t Use Ourselves”?

A Commentary from SCR reader Sharon Ryals Tamm

I was an SCI supporter for three years before I asked myself, “If solar cooking is so good, why don’t I use it?” A University of California Berkeley professor, who has refused to study solar as an open fire alternative, had contemptuously asked a similar question: “Why would we ask the poor to use technologies that we wouldn’t use ourselves?” I took up the challenge.

How would solar cooking work on my urban porch—elevation 330 ft., 37° north latitude, mild temperatures, limited sunlight, frequent wind, fog and clouds, and seasonally changing day length and sun angle. Would animals knock over the stove or someone steal our dinner? With two to six hours of summer sunlight between 10 a.m. and 5 p.m., I would be able to cook one meal per day from March to September. The money saved would be significant since these are “peak usage” hours when gas and electricity cost four times more than for off-peak usage. I soon solar cooked almost daily and to date no animal or thief has interfered.

Equally important was being able to cook familiar foods. Our family favorites don’t generate the deep cultural continuity of traditional foods made the same way for hundreds of years, yet they comfort us. They connect us to each other, to memories, ancestors, descendants, neighbors and friends. For solar cooking to come into daily use, it had to adequately, or even better, reproduce dishes we knew and liked.

I’ve had mixed successes and failures. Beans and grains excel—particularly rice pilafs. I’ve also had great success with stews, spaghetti sauce and anything slow-cooked in a crock-pot, simmered on a stovetop or baked covered in the oven. (My box solar cooker can’t fry to a crisp, or quick steam or sauté to brightest green like a parabolic solar cooker.) I never mastered solar pasta and my cakes and cookies don’t thrill, but I believe a better solar baker exists. *(Editors note: There is an expert solar baker in Washington, D.C. – Michaela Borghese, a professional pastry chef, who frequently bakes with her solar cooker.)*

There are many reasons for the U.S. and other techno-saturated nations to solar cook—unmitigated waste from nuclear power *(Continued in next column)*

and increasingly destructive oil and gas extraction. Is solar cooking an appealing option for first world foodies? I believe so. As a foodie, with access to an overwhelming variety and quantity of good food, I have found solar cooking deeply satisfying. I hope many more solar cooks sprout here. It’s good for us, and good for our planet.

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](http://www.solarcookers.org)

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



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

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### Letter from SCI's Executive Director

An unusual article revealed an unexpected resemblance between medieval and present-day life: "In a world lighted and warmed by fire, not electricity, torch-lit banquet halls and bedchambers.... and the smoky braziers used in army tents...caused the kind of lung damage that today could be found in coal miners." [Smithsonian Magazine, July/August 2013, pp.52-53] For the authors, these basic cooking and lighting technologies are antiquated. But for those of us familiar with the plight of the nearly three billion people who still cook over open fires, it is a sad, alarming and contemporary fact.

Since long before the Middle Ages, smoky cooking fires were the norm. Today they remain the norm for least a third of humanity. These three billion people are also likely to rely on kerosene or other dirty fuels for their lighting needs.

Solar cooking technology has rapidly accelerated during the last 25 years, but is still held back by uneven distribution, erroneous perceptions, and affordability. This contrasts with the rapid acceleration in other technologies during the same period, like medicine and transportation. Changing perceptions, improving solar cooker designs, and putting solar cookers into the hands of the cooks who need this technology is expensive. It's thanks to a dedicated group of passionate solar cooker designers, project managers and private donors that solar cooking has progressed as rapidly as it has.

From a distance of 93 million miles, the sun is still powerful enough to cook a pot of rice, roast meat or bake cookies and cakes here on Earth. However, our experience with harnessing its immense power is still in its infancy compared to humans' thousands of years of experience cooking with wood over an open fire.

Too many cooks still rely on unsustainable fuels including biomass, natural gas or fossil fuel-generated electricity—fuels which must be either gathered or purchased. Policy leaders and decision-makers are often drawn to increasingly expensive and scarce fossil fuels as a replacement for biomass.

Our expanding global population is forcing more people into their local forests and savannahs every week to harvest greater *(Continued next column)*

and greater quantities of wood to burn in their cooking fires.

By contrast solar cooks use zero emission, free fuel requiring no processing, no supply chains and no middlemen. Solar Cookers International receives worldwide feedback from women about the incredible liberation they find when they can cook with sunlight instead of with gathered or purchased fuels. We learn from women that the time and money saved by solar cooking gives them longed for opportunities for other pursuits: starting a business, caring for elderly family members and keeping their children in school.

Hundreds of solar cooker designs successfully cook all kinds of traditional foods in surprising places, not only in sun-drenched equatorial countries. SCI celebrates solar cookers frying meat and making tea on the Himalayan plateau; simmering quinoa in the Andes; roasting potatoes in Nepal; pasteurizing water and baking cakes in Kenya; and cooking native tubers and rice on the Micronesian island of Chuuk.

We laud every new development that makes solar cookers more efficient, less expensive, and better suited to a cook's needs. We thank all of you for your contributions, which literally help people out of the dark ages.

*Julie Greene, SCI's executive director, welcomes your comments at [julie@solarcookers.org](mailto:julie@solarcookers.org)*

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### Safe, Sustainable and Affordable Cooking Energy Should Be a Post-2015 United Nations Sustainable Development Goal

*Excerpts from a statement presented in October 2013 to the UN Economic and Social Council by Arline J. Lederman, SCI's New York UN Representative:*

Solar thermal cooking technology will positively affect many aspects of people's lives. Food, water, health, environmental sustainability, personal safety, time and funds for education and discretionary time are all benefits of Solar Thermal Cooking and justify stating that access to renewable, safe, and affordable household energy is a basic human right.

Solar cooking should be given serious consideration by United Nations member states and *(Continued on page 4)*

## Solar Cooking in the Movies

Since I'm now living on a small boat in southern California and especially since I'll go to any movie starring Robert Redford, I took myself a few weeks ago to our local multiplex to see "All is Lost", the saga of a solo sailor adrift in the Indian Ocean and trying to stay alive against incredible odds. It was a gripping and beautiful film. Best of all is what Mr. Redford's character does when he reaches the point in the story when all really does appear to be 'lost'. He has abandoned his sinking sailboat, is exhausted, sunburned, bobbing on a leaky life raft, and has finally run out of fresh water.

Much to my surprise, he pulls out his knife, cuts one side off a five-gallon jug, stretches a big transparent plastic bag over the opening, and turns that jug into a device that looks very much like a solar box cooker. With a few more simple but brilliant alterations he 'macgyveres' his plastic solar cooker into a solar still that provides him with enough fresh water until.... Sorry. I can't spoil the ending. You'll have to see the film yourself to find out what happens.

Other than the sad image of George Clooney kicking over his non-functioning, megaphone-shaped solar cooker in the Iraqi desert during "The Men Who Stare at Goats," I was unaware of my favorite cooking technology appearing in any other films until someone recently sent me a YouTube clip from a 1978 French comedy, "La Zizanie" (The Spat) in which an eccentric inventor played by Louis de Funès, fries an egg for a Japanese delegation using a parabolic solar cooker. You can see the clip on YouTube here: <http://tinyurl.com/foursolaire>

I had also seen little evidence of solar photovoltaic power featured in films—until now. Scheduled for release later this year is "Under the Same Sun," a hopeful tale set in the near future about an Israeli Jew and a Palestinian Muslim businessman, who against all odds start up a solar PV panel business and ultimately bring peace to the Middle East. You can watch the movie trailer on YouTube.

Solar power is also beginning to appear in TV shows. In the "Walking" Dead series, the town of Woodbury is powered by solar panels.

Better still, is the casting call for an upcoming, *(Continued in next column)*

post-apocalyptic, cooking/survival TV show <http://eater.com/tags/survivor> which asks potential cast members to: "Take a few cans of food, a box of Jello, a jar of beans, a car windshield, fashion a solar cooker and create something unexpectedly delicious."

Any volunteers?

My fictional war memoir, Farishta, which includes the use of solar cookers by Afghan refugee

women as a major plot point, may also be coming someday soon to a theater near you. The screenplay, written last year and based on my novel, has placed in the finals of two LA screenwriting competitions, and now a production company (can't name them) has asked to speak to my agent. All I need to do is find an agent. PM-Editor



*Robert Redford drinking solar distilled seawater in "All is Lost", Lions Gate/ Roadside Attractions 2013*

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## SCI UN Statement *(continued from page 3)*

agencies because the costs are modest and the positive impact very great. Women and children in particular will benefit because the quality of food, water and health are intimately connected to their lives.

Solar cooking, utilizing a direct solar thermal process, (non-photovoltaic) can provide vast benefits to the lives of one third of the people on earth.

More than three billion people—largely the world's poorest—are living in sun-rich, fuel-stressed regions. Currently billions rely on low-grade biomass fuels and polluting fossil fuels for daily household cooking and water sterilization. Both biomass and fossil fuels are non-sustainable at current use levels, and they dangerously contaminate the earth's environment.

*(Continued on page 11)*

## Changing Lives in Kenya and Nepal

*(Continued from page 1)*

Dinah Chienjo, Director of Friends of the Old (FOTO) an SCI partner, reports that 80% of project beneficiaries continue to use the solar cookers and other devices two months after initiation. FOTO Staffers will monitor beneficiaries, offer additional training and answer questions to ensure the successful use of the solar cookers, *upes* biomass stoves and retained heat containers.

Follow-through will continue as the project matures so we can accurately measure adoption. SCI cares not only about how many people receive Safe Water Packages\*, but also how many use them over time—a true indicator of a technology being successfully adopted. We won't be satisfied until  
*(Continued in next column)*

we've done everything we can to make the transition in cooking practices complete, including improved product design and training, and better monitoring and evaluation. Our goal is achieved when using a solar cooker is simply "the way we cook whenever the sun is shining".

Approximately 50,000 of Lower Nyakach's 70,000 inhabitants need but cannot afford to buy a Safe Water Package. Poverty is so pervasive that for many of this region's inhabitants an outright purchase of an SWP may never be an option. With donor assistance, SCI's goal is to provide these life-saving kits to the remaining 41,000 impoverished residents of Lower Nyakach who are currently cooking over inefficient, smoky wood fires and who have limited access to safe drinking water.

*(Continued on page 14)*

### What is a Safe Water Package?

It's a suite of tools for sustainable, energy-efficient cooking and water pasteurization. Every SWP includes:

- A CooKit solar cooker for use on sunny days
- An efficient combustion stove for use at night and on cloudy days
- A heat retention basket for use with both cooking technologies
- A black-painted cooking pot
- Five reusable plastic greenhouse cooking bags
- A reusable Water Pasteurization Indicator (WAPI), which shows precisely when water has reached pasteurization temperature
- A lidded clay jar with a stand to keep pasteurized water safe from recontamination.



we could not do it **without you**

A Safe Water Package recipient, Lower Nyakach, Kenya

## Scaling Up: The California Sunlight Solar Cooker Story

by Julie Greene, Executive Director, SCI

Dr. Bing Gu and Rick Noss of the Sacramento-based company California Sunlight have developed a multifunctional, modular, concentrating solar cooker, which includes automatic solar tracking, a barbecue grill, an oven, a stove top burner, as well as attachments for water-distillation and food-dehydration. A working model is on display at Gu's Home in Sacramento.

Gu and Noss characterize the California Sunlight Solar Cooker as a design that can be used in developing countries as well as in a typical American backyard.

Unique features of the design include a concentrating Fresnel lens and the ability to control the cooking temperature. They report that their solar cooker can produce "high, consistent temperatures in the 232° – 260° C range (450°-500° F)." Gu states that with the addition of a "cooking stone," the oven can "give you a nice crust on a baguette" or "continue cooking for an hour or two after sundown." The automatic sun tracking technology

*(Continued in next column)*

allows the Sunlight to be used from sunup to sundown. Gu laments the lack of understanding of solar thermal cooking technology in both the business and development communities.

According to Noss, "Many people think of solar cooking as a school experiment... [they] don't yet understand they can put fish or burgers on a solar grill." Gu adds, "If you have a window on a south or east side of your house, you can cook through your window for two to three hours."



*Courtesy California Sunlight 2013*

Gu and Noss are looking at possible hybrid designs including a combination of solar and charcoal. They are also working on thermal storage devices and have shared their current technology with other researchers including a young Ph.D. student from UC Davis who needed concentrated energy for his heat-storage technology research. The California Sunlight tracker/concentrator gave the student exactly what he needed.

Gu says that California Sunlight's greatest challenge is to find a source of funding to initiate and sustain large-scale production. "We appreciate the feedback of NGOs and especially SCI's help as a communications platform to other solar cooking organizations. We need many more organizations to work together with us to bring this technology to end users."

***--Julie Greene, SCI's executive director, welcomes your comments at [julie@solarcookers.org](mailto:julie@solarcookers.org)***



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Go to

**<http://tinyurl.com/littlefootprintlighting-sci>** to learn more about this LED desk lamp made in the USA from recycled e-waste, and to place your order.

## Accurate Standards for Solar Cookers

*(Continued from page 1)*

the solar cooking sector responded with detailed comments since one of the documents contained significant errors regarding solar thermal cooking technology.

The Iowa State Safety Protocols, which had been selected as the basis for international safety standards for clean cookstoves, contained a number of misleading statements and conclusions about the safety of solar cookers including the following: “Solar stoves.... can direct large amounts of heat onto surrounding materials without showing much result until catastrophe.... Therefore array [parabolic] collectors with open mirror configurations... automatically receive a [safety] rating of *Poor*. Solar cookers that are more enclosed [box and panel] and have a better limit on where sunrays are directed receive a rating of *Fair*.... Ratings were chosen with knowledge that solar stoves can produce fires without warning.”

The reality known to anyone who has used a solar cooker is that solar panel and box cookers never reach combustion temperature and are thus incapable of starting a fire. Also, while it is true that certain parabolic solar cookers can generate focal points outside the parabola, and if left unattended focus a concentrated beam of sunlight on a nearby object, the Iowa Protocol’s blanket poor/fair rating of all solar cookers and their characterization as ‘firestarters’ is neither fair nor accurate.

The misleading information in this and several other statements about solar cookers in the original Iowa protocol document were brought to the attention of EPA/Global Alliance officials prior to the 2012 meeting in Europe. A Global Alliance official replied that any inaccuracies in the protocol report should be forwarded to Nathan Johnson, who was the principal author of the Iowa State Safety Protocols.

When Johnson was notified of the errors, he responded that he had developed the guidelines “principally for biomass cookstoves.”

*(Continue in next column)*

*(continued from column 1)* He added that his comments regarding solar cookers were “based on the little information and people I had access to at that time.”

Although most of the inaccurate statements about solar cookers have been removed or corrected by Johnson, the statements about fire danger remain in reference tables of the International Workshop Agreement on Clean Cookstoves published in June 2012, by the International Organization of Standards.

Members of the solar cooking sector are rallying to ensure that the final international standards document on cookstoves will contain accurate information for the rating of solar thermal cooking devices. A decade ago, the American Society of Agricultural and Biological Engineers published the first U.S. standard for the testing and rating of solar cookers. This standard, which was developed under the leadership of USDA engineer and solar cooking expert Dr. Paul Funk, was updated this November. Other national standards for solar cookers have been developed and are being used in India, China and several countries in Europe.

Solar Household Energy’s Paul Arveson attended a Global Alliance-led planning meeting earlier this year at GACC headquarters in Washington, D.C. Thanks to Arveson’s initial intervention, Funk will represent the solar cooking sector at the international standards meeting that the Global Alliance will host in Nairobi in 2014.

Another solar cooking expert Dr. Ajay Chandak (an Indian professor of engineering, the inventor of many solar, biomass and biogas stoves, and a long time member of the Solar Cookers International Network) has applied to join the Indian Bureau of Standards team in order to attend next year’s meeting in Nairobi. Solar Cookers International and Solar Household Energy are working to raise funds from SCINet members (who will all benefit from these new standards) to cover the travel expenses for Funk—and for Chandak if he is able to attend. PM-Editor

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## NEWS YOU SEND

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Solar Cookers International invites the 502 registered members of the Solar Cookers International Network (SCI<sup>net</sup>) 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/joinseinet>

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

### BURKINA FASO

Atouts Soleil, an organization founded by French solar cooker designer Xavier Devos, has produced many of his solar cooking tables over the past



*Courtesy Xavier Devos 2013*

decade for African families, using sheet metal, steel tubing, wood and mirrors. The Devos Cooker allows women to cook their food while standing.

In Burkina Faso these foods include:

beans, yams, fritters, and traditional tomato, onion and gumbo sauces that are served with rice at the main meal of the day. The Devos solar cooking tables also allow the cook to stand in the shade while concentrated light from the array of mirrors heats the cooking surface to above 232° C (450° F). The Burkinabé women in the photograph say they now prefer standing to squatting while they cook. They also say that Mr. Devos' solar cooking table has changed their lives. [tablesol@yahoo.fr](mailto:tablesol@yahoo.fr)

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### GERMANY

At an international event to celebrate the 20th anniversary of the Development Assistance Group EG-Solar, founder Dieter Seifert spoke about "The solar cooker as an example of a peacemaking technology." He cited its potential to reduce conflicts over increasingly scarce firewood, the importance of collaboration to develop sustainable technologies, and the value of promoting sustainable living everywhere. Seifert argued that the most important place to promote this technology is in schools like one in Bavaria where the children assembled *(Continued in next column)*

one of Seifert's AlSol 1.4 parabolic solar cookers. Imma Seifert taught the children how to use the cooker to make jam. In his lecture Mr. Seifert noted that fuelwood consumption in traditional cooking fires can be reduced by up to ninety percent by using the Integrated Cooking Method ICM with its combination of a solar cooker, a retained heat container and an efficient combustion stove. He added that savings are even greater if charcoal reduction is accomplished since it takes six kilos of wood to make one kilo of charcoal. [www.eg-solar.de](http://www.eg-solar.de) [www.alsol.es](http://www.alsol.es)



*Courtesy Dieter Seifert 2013*

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### INDIA

Two PRINCE 40 institutional parabolic solar cookers will soon be cooking noon meals for students at a school in North Coimbatore. Each PRINCE unit (designed by Professor Ajay Chandak) costs 68,000 Indian rupees (\$1,000 US) and includes a 35-liter (32 quart) pressure cooker. The first two units will be used on a test basis. If successful, the municipality will order PRINCE cookers for all sixteen schools in the region. The Indian National Ministry of New and Renewable Energy provides a sixty percent subsidy for the solar cookers, which will cut expenses by reducing the consumption of LPG and wood. [renewable.india@gmail.com](http://renewable.india@gmail.com) *(Continued on next page)*

## Extinguishing the Three Stone Fire

A guest editorial by Dar Curtis, co-founder of Solar Household Energy (SHE)

Time was when cooking with wood over a three-stone fire didn't bother our planet much because there weren't all that many people lighting fires. It wasn't that long ago. The world's population has gone from two billion to seven billion just in my lifetime!

The UN's World Health Organization reports that emissions from smoky cooking fires are now killing four million people a year. Many of the world's poor who are compelled to buy their cooking fuel are sometimes forced to choose between food and something to cook it with. The release of CO<sub>2</sub> and soot from cooking fires is conservatively estimated as contributing 18% of greenhouse gases implicated in climate change. Increasingly, environments are being degraded by the daily harvest of trees and bushes for cooking fuel. As the world's forests vanish and its human population increases, it is obvious that people are far better at growing more people than they are at growing trees. Finally, the processing and shipping of fossil fuels to *(Continued on page 15)*

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### News You Send *(continued from page 8)*

#### INDIA

On December 9, 2013 Professor Ajay Chandak, a global leader in the solar thermal cooking sector, was elected to the Board of Directors of the International Solar Energy Society (ISES). Chandak will represent "Solar Heating and Cooling". ISES is a UN-accredited NGO that is active in over 110 countries.

[renewable.india@gmail.com](mailto:renewable.india@gmail.com)

#### JAPAN

Members of the Japan Solar Energy Educational Association traveled to Fukushima Prefecture in May 2013 to conduct a workshop on solar cooking for children in this region that was impacted by radiation leaks from their nuclear power plant. SJEEA trainers told the students about climbing Mount Everest and using solar cookers in 2003.



*Courtesy JSEEA 2013*

Although the group cooked fried eggs and tea instead of rice, SJEEA reports that the students enjoyed their first solar cooked meal.

[solar\\_energy@hyper.cx](mailto:solar_energy@hyper.cx)

#### JORDAN

In October 2013, HRH Prince Nayef bin Assem of Jordan visited a Jordanian Renewable Energy Society solar cooking demonstration near Amman. As a result of this visit, Prince Nayef is leading an initiative to introduce solar cooking to low-income citizens of Jordan through the manufacture of simple solar box cookers. **The Prince recently became a member of the Solar Cookers International Network.** Mohammed Alta'ani of the Jordanian Renewable Energy (JRES) has led the effort to teach Jordanian students about the benefits of solar cooking. [mtaaniq@gmail.com](mailto:mtaaniq@gmail.com)

#### NAMIBIA

The Namib Desert Environmental Education Trust (NaDEET), a non-profit in southern Namibia teaches sustainable cooking technologies with a focus on fuel-efficient stoves and box and parabolic solar cookers. A recent NADEET survey of new students revealed that those living in large towns who had solar cooked before and knew that it was good for the environment still complained about only being able to cook when the sun was shining and *(Continued on page 11)*



*Courtesy NaDEET 2013*

### SOLAR TECH TALK

Technologies featured in “Tech Talk” celebrate innovations that elevate solar thermal cooking via improved design, materials, creative funding, distribution systems and innovative local production strategies. Inclusion in Tech Talk does not imply that SCI endorses or promotes any of the featured technologies. SCI cannot be held liable for the accuracy of the contributions submitted by designers and inventors.

The Henry Samueli School of Engineering at UC Irvine has received a \$100,000 Gates Foundation Grand Challenges Explorations grant to fund additional research by a team of students on a molten-salt heat storage unit for use with solar cookers. The students are using a Chinese-made parabolic solar cooker to test their thirty-pound heat storage box. They are hoping to increase the surface temperature and decrease the weight of the box. John Garman, a former Mechanical Engineering professor at UC Irvine, who applied for the grant on behalf of the School of Engineering, spent two years working with undergraduates on the solar heat storage device. Derek Dunn-Rankin, a Mechanical Engineering professor at UC Irvine is now the project's principal investigator.  
[lbrandt@uci.edu](mailto:lbrandt@uci.edu)

The Albedo Solar Cooker, which resembles a Devos Solar Cooker (*see p. 8*) is currently in the prototype stage. The Albedo is being developed by Dyteca, located in Worcestershire, UK and Isis Innovation Ltd., the technology transfer company of the University of Oxford. According to its designers, this parabolic solar cooker is inexpensive but robust, and is easy to assemble and operate. The Albedo provides heating in excess of 200°C (392°F) in a small enclosure mounted on a portable work surface at a comfortable height. The Albedo's reflectors fold flat for transport but form perfectly curved surfaces when assembled without the need for skilled labor. The oven is intended to remain stationary, while the reflector rotates to maintain orientation to the sun.

<http://solarcooking.org/Albedo>

Egyptian solar inventor Ahmed Ismail Megahed received the 2012 Energy Globe award as well as the Arab Organization for Industrialization Award, and he was short-listed for several other awards for his prototype design of a multiple-use solar thermal cooking device. <http://tinyurl.com/aiMegahed>,  
[patents\\_designer@hotmail.com](mailto:patents_designer@hotmail.com)

Dehydration is an excellent preservation technique for fruits and vegetables. It moves warm air slowly over thinly sliced food, and allows humidity to escape as the food dries. Plans can be found on the Instructibles website.

<http://www.instructables.com/id/Solar-Food-Dryer/>

Green energy technology designer and architect Joel Goodman has developed a solar cooker concentrator with four attached reflector segments in the form of a pyramid. The cooking pot is placed above this reflector, which bounces the light onto the underside of the pot. Goodman believes that his design could create local jobs since the flat, lightweight, anodized aluminum components could be transported to workshops for assembly. This design could also be used at night to amplify the light given off by an LED lantern.

[http://solarcooking.org/Joel\\_Goodman.htm](http://solarcooking.org/Joel_Goodman.htm)

A tubular solar cooker the GoSun Stove has raised over \$200,000 from 955 individual backers on Kickstarter. GoSun folds up and has built-in carrying handles. Weighing less than four pounds, GoSun can fit in a backpack. Go Sun will be released in 2014 and will retail for \$279. [www.gosunstove.com](http://www.gosunstove.com)

## News You Send

(Continued from page 9) about the slow cooking time of box cookers. Many from rural areas knew about solar cooking but had not tried it before. They viewed the use of solar cookers as an opportunity to save money through reduced reliance on firewood, gas and electricity. However, many noted that the cost of buying a solar cooker was a significant barrier. [admin@nadeet.org.au](mailto:admin@nadeet.org.au) <http://www.nadeet.org>

### NEPAL

In November 2013 a breakthrough 'green' expedition led by Dutch environmentalist Maarten Olthof, used three parabolic solar cookers designed by Indian Professor Ajay Chandak to cook food



Courtesy M Olthof 2013

during a trek into the Himalayas.. Twenty Dutch, one Swiss, three American trekkers, and their Nepalese porters transported two PRINCE-15 and one PRINCE-40 solar cooker and used them to prepare 90% of their meals.

The solar-powered, U.S. band Solar Punch joined the trek and provided musical entertainment for the expedition. Their trip documentary will be submitted to National Geographic in 2014. The Vajra Foundation introduced the use of solar ovens to 85,000 people in Nepalese refugee camps resulting in a significant reduction in fuel consumption and deforestation. [olthof@vajra.nl](mailto:olthof@vajra.nl) <http://www.vajra.nl>

(Continued in next column)

## TANZANIA

The London-based Islamic charity, Lady Fatemah Trust (LFT) has shipped 500 solar panel cookers to the Bilal Muslim Mission of Tanzania. These highly-reflective waterproof versions of the traditional CookKit were designed by UK inventor Matthew Rollins, and are intended to reduce the amount of time spent by women and children foraging for firewood. Faustine Odaba, who is conducting the training sessions, will show the women how to cook local foods with these solar cookers that have been manufactured in the UK and shipped to Tanzania on pallets

Although LFT reports that the newly designed solar cookers do not require the use of a plastic bag to surround the cooking pot, they also report that next year LFT will supply foil trays and clear domes to be used as greenhouses over the cooking pot to improve cooking efficiency. LFT is in discussion with Odaba about the introduction of retained-heat cooking technology to be used alongside the solar cookers.

[info@ladyfatemahtrust.org](mailto:info@ladyfatemahtrust.org)

### SCI UN Statement (Continued from page 4)

Solar thermal cooking assists in the achievement of all eight United Nations millennium development goals.

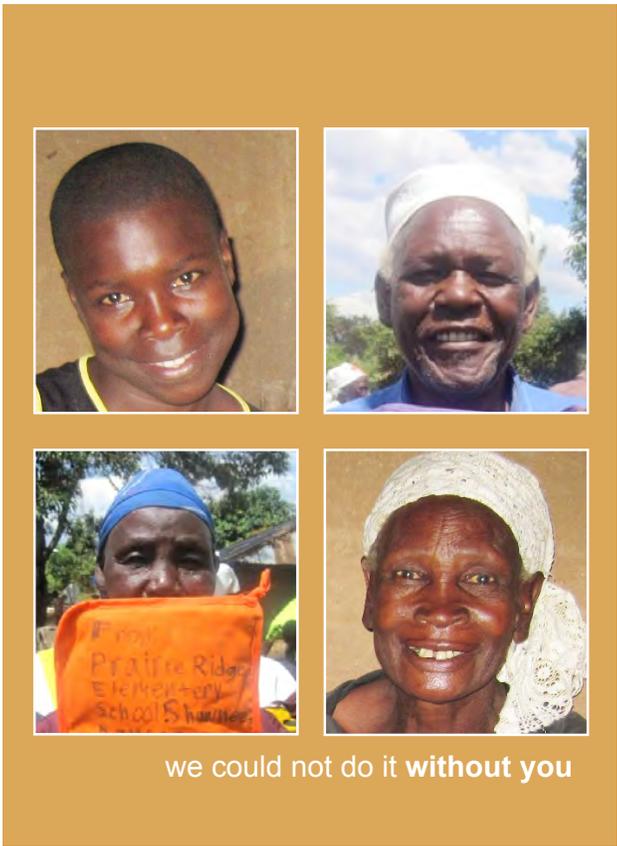
A basic human right to renewable, non-contaminating, freely-replaceable fuel for the daily preparation of food and safe water without contaminating the environment is of global benefit. All people should have access to that right. Supplementary solar lighting and electricity is also appropriate. A sound, low-cost, ecologically sustainable energy system or homes is recommended. Solar thermal technology is appropriate, accessible and affordable. Solar cooking is one of the few sources of energy that is truly non-contaminating, and is therefore of vital interest where the earth's atmosphere and human environments are serious concerns.

Examples of at-scale use of solar thermal cooking technology today are: sanitizing hospital instruments in Nepal; cooking for schools and villages in India; running bakeries in Latin America; and distribution of more than 50,000 cookers for use by refugees in camps in Chad. Local manufacture is encouraged and numerous designs are now available as prototypes.

**TRIBUTE GIFTS\* HAVE BEEN GIVEN TO SOLAR COOKERS INTERNATIONAL BY:**

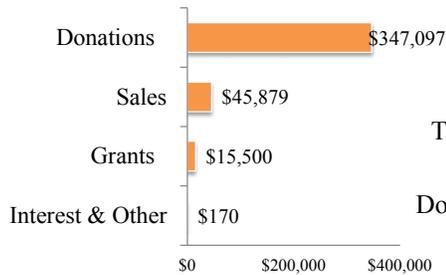
- Anonymous in honor of Ed and Susan Mahler
- Andrea Armin on behalf of Joel Armin-Hoiland
- Barry Viuker & Jill Banister in honor of the 50<sup>th</sup> wedding anniversary of Ed and Susan Mahler
- Carol Millsom on behalf of Steve Faust and Mary Alice Favro
- Charles Lowrie in memory of Karin Lowrie
- Chris Scammon in honor of Nancy Bancroft
- Cindy Jennings on behalf of Altrusa International of Richmond, VA for United Nations Day
- Deborah Lamb in honor of Lizzy Auld
- Deborah Mytels in honor of Oliver Bock
- Hamid & Lawdan Shojaee on behalf of Kourosch Shojaee
- Hans Vandebovenkamp in honor of Mary Frank
- Jeffrey Kittay on behalf of Mary Frank
- Johnette Orpinela in honor of Rob Harman
- Joseph & Diane Audia in memory of Tammy Peckenpaugh
- Julie Greene in honor of Dave and Susannah Nelson
- Julie Greene in honor of Dr. Carolyn Reynolds
- Julie Greene in honor of Dr. Robert and Mrs. Laura Greene
- Julie Greene in honor of Gail Bravos-Krueger
- Julie Greene in honor of Jane Michalski
- Julie Greene in honor of Jeff and Sue Webster
- Julie Greene in honor of Maria Donaghy at the Kerr-Cole Sustainable Living Center
- Julie Greene in honor of Melisse Bouziane, Laudison Lopes and family
- Julie Greene in honor of Mme Lorraine Plante
- Julie Greene in honor of Richard and Nancy Cross, III
- Julie Greene in honor of Todd and Carol Greene
- Julie Greene in honor of Walt and Betty Benson
- Julie Greene in memory of Marie Weldon Taubeneck
- Karen Blomquist in honor of Edna McCollum
- Maria Savage in memory of Willy Wilson
- Marlene Siegel in honor of Ed and Susan Mahler
- Mary Frank in honor of Alex Treitler
- Mary Frank in honor of Alice Radosh
- Mary Frank in honor of Barry Benepe
- Mary Frank in honor of Ben Siegel
- Mary Frank in honor of Bob Thurman
- Mary Frank in honor of Charlie Bergman
- Mary Frank in honor of Chip Notman
- Mary Frank in honor of Christina Brady
- Mary Frank in honor of Chuck Close
- Mary Frank in honor of Dan and Toby Talbot
- Mary Frank in honor of Dr. Marguerite Collins
- Mary Frank in honor of Dr. Nate Tindel
- Mary Frank in honor of Edward Hirsh
- Mary Frank in honor of Eliot Coleman
- Mary Frank in honor of Gara Lamarche
- Mary Frank in honor of Garry Kvistad
- Mary Frank in honor of Greg Djanikian
- Mary Frank in honor of Holland Cotter
- Mary Frank in honor of Jacki Lyden
- Mary Frank in honor of Jeffrey Kittay
- Mary Frank in honor of Jonathan Cott
- Mary Frank in honor of Judy Quinn
- Mary Frank in honor of Krista Tippet
- Mary Frank in honor of Linda Asher
- Mary Frank in honor of Marc Disuvero
- Mary Frank in honor of Marco Eres
- Mary Frank in honor of Paul Sperry
- Mary Frank in honor of Peter Kayafis
- Mary Frank in honor of Peter Mattheissen
- Mary Frank in honor of Rob Shetterly
- Mary Frank in honor of Stella Chasteen
- Mary Frank in honor of Uma Thurman
- Mary Frank in honor of Virginia DeJani
- Mary Frank in memory of Pablo Frank
- Natalie Asewana in honor of Michael Cowen
- Ruth Haasl in honor of Barbara Fay Wiese
- Sima Saeidi on behalf of Kourosch Shojaee
- Stephanie Smith in memory of Derek E. Smith
- Steven Foster on behalf of Gloria Foster
- Susan Scott in honor of Tom Sonandres
- Sylvia Bray in honor of Bill and Mary Weinhold
- Therese Edlin in memory of David R. Toma
- Trudy Lionel on behalf of The Colliers
- Valerie Carter in honor of Karen Gates
- Walter & Jane Day in memory of Dr. Roger Willey
- Werner & Helen Muller on behalf of Frances K. Tyson

*\*Received as of 10:00 am PST December 19, 2013*



SCI Financial Summary July 1, 2012 - June 30, 2013

**Revenues**



**Other Contributions**

Number of SCI Volunteer Hours, 2013: **1,794**  
 Total Value of SCI Volunteer Hours, 2013: **\$44,402**  
 Donated Goods & Professional Services, 2013: **\$25,395**

**Expenses**



**"I like working with people who are passionate about promoting solar cooking throughout the world."**

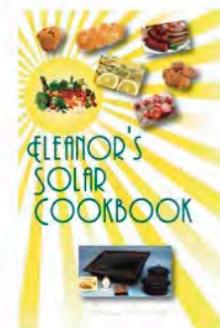
-Cathy Vollmer, SCI Volunteer

\*Store expenses = \$19,388

To see Annual Reports visit [www.solarcookers.org](http://www.solarcookers.org)



**Copenhagen Solar Cooker Light**  
\$33.00



EVERY PURCHASE SUPPORTS SOLAR COOKING WORLDWIDE

## Changing Lives in Kenya and Nepal

*(Continued from page 5)*

Research shows that people who contribute to the cost of a new technology will be more invested in making it work for them. Even in this region of rampant poverty, each participant is asked to contribute toward the cost of their SWP and training, either with a cash payment such as one-day's cost of biomass fuels or with their labor on another project that will benefit the community.

This contribution is determined by the project partners in Kenya who know the culture and economics of the region intimately and who understand the circumstances of the beneficiaries.

Some of the target beneficiaries in SCI's Kenyan projects are the impoverished elderly. While the elderly make up only 5% of the national population, they provide 50% of the support for vulnerable and orphaned children.

SCI partner John Amayo of Sustainable Utilization of Renewable Energy (SURE) recounts the story of an elderly Kenyan woman with no income who was selected to receive a SWP. Though she was accustomed to sleeping on the dirt floor of her hut, when John and his team arrived at the woman's home after the rainy season to deliver her SWP and teach her how to use it, they found her ill and sleeping in the mud since flood waters had entered her hut. The SURE staff located a mattress for the woman to provide her with a dry, comfortable place to sleep.

Another elderly Kenyan woman, who received a Safe Water Package from Friends of the Old, is raising orphaned, primary school age grandchildren. She supports these two children by weaving mats and ropes to sell in the local market.

With her new SCI-provided SWP she is able to significantly reduce the time she spends collecting firewood and devote more time to her weaving.

In the fall of 2013, SCI's partner in Nepal, the Foundation for Sustainable Technology (FoST), completed three, SCI-funded training workshops. Women from twenty-seven households in the Kathmandu and Laliptur districts spent two intensive days learning solar cooking and solar  
*(Continued in next column)*

cooker construction. They spent a third day learning to make crop-residue briquettes for fuel-efficient combustion stoves, which can be used at night and on cloudy days when solar cooking is not possible. Training expenses covered by SCI included the round-trip transportation of the women from rural areas to the workshop and the transport of their new solar cookers and briquettes back to their villages. Each participant was asked to contribute toward the cost of the devices and training.



*Courtesy FoST Nepal 2013*

Nepal, which is rapidly being deforested by the hundreds of thousands of people cutting down trees for firewood, desperately needs alternatives to biomass fuels. Liquefied petroleum gas (LPG), which is subsidized by the government, is not a sustainable solution and is only available to wealthier people in urban areas or in rural areas with good roads. The integrated cooking technologies being taught by FOST are providing truly sustainable alternatives for cooking in Nepal.

**--Julie Greene, SCI's executive director, welcomes your comments at [julie@solarcookers.org](mailto:julie@solarcookers.org)**

## Extinguishing the Three Stone Fire

(Continued from page 9)

countries in need strains their economies and leaves a significant carbon footprint.

**At last the Global Alliance for Clean Cookstoves has mounted an effort to mitigate these afflictions that are affecting our planet and its people. As impressive as their efforts are however, they have not extended them to include the application of solar thermal energy for cooking.** The sun hammers the planet 24-7, lavishing enough energy to supply many of our needs. That's what the Chinese, the Indians and we western solar advocates know and have demonstrated again and again. Nevertheless, **our efforts have yet to inspire significant interest in this technology at the Global Alliance. Why?** How can we improve our advocacy? I think the key is in better education and field assessments. Our efforts over the years have been conducted on a shoestring. We have not had the resources to pay for objective project evaluations that can convince decision makers. We need to work on that.

We have gained extensive field experience and a great deal of knowledge about the capabilities of existing solar thermal devices and their use, but we need more documentation and the funding to provide it. At the same time we are also aware of the need for further R&D.

We should also be reporting on the type of in-country support required for successful field projects—such as infrastructure for training and micro-financing. We can explain how we have learned to work with host country community development projects. We should highlight the economic and environmental savings that come with the use of solar energy, a fuel that is ubiquitous, endless, safe and free.

We have frequently noted the serendipity of the fact that a high percentage of three-stone fires burn in areas of abundant sunshine. That is a profound reality. However, **decision makers cannot properly assess the potential of solar cooking unless they possess accurate data on climate and cultural habits in each of these areas.** Of great importance as well is the widespread understanding and practice of "Integrated Cooking," in which solar cookers (when properly combined with the use of (Continued in next column)

improved combustion stoves and retained heat containers) can provide the world's poorest citizens with the most economical and fuel-efficient way to cook food and heat water.

**We must also urge a study of the real cost of cooking. The strategy for replacing three-stone fires must be based on a clear understanding of the long-term affordability of the various options.** There are several types of affordability to consider. If biomass is a country's major fuel, can it afford and sustain the attendant degradation of its environment over many more decades? **If the country's cooking fuel must be produced or imported, will it have to be subsidized to be affordable to the population?** If so, what will be the impact of these subsidies on other national priorities like health, education, and infrastructure? **What percent of the population will not be able to afford to purchase fuel at any price?**

Even if imported fuel is deemed to be affordable monetarily, we need to know its cost in terms of CO<sub>2</sub> release. In addition to extraction and processing, this calculation would need to include the maritime shipping of petroleum fuels from producing countries to consuming countries, from ports of entry to in-country distributors and from distributors to customers. When cooking fuel is produced in country, a life cycle analysis of CO<sub>2</sub> emissions from the manufacture of cooking equipment, canisters and other infrastructure is also needed.

**It appears to me that policy makers at the Global Alliance are projecting a replacement for the three-stone fire with the *exclusive* use of stoves employing combustible fuels. If this is true, how can they guarantee the uninterrupted, permanent, environmentally sound, global resupply of such fuels at scale? When earth's population reaches nine billion in a few decades, will combustible fuels be accessible, much less affordable if they are the only source of cooking for the 1.5 billion who make less than \$1.25 a day?** Can the cost and the consequences of promoting the sole use of combustible fuels be justified under the glare of a sun that provides the Earth with enough energy every hour to power all human activity for a year?

## Solar Cookers International

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### THANK YOU AND PASS IT ON

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.



*Important memories — Darfur refugee children with a CooKit, Iridimi camp, eastern Chad. Courtesy of Karyn Ellis, 2009*