

Solar Cookers International Regional Convention 2015 Sacramento, CA, USA

Presentation Abstracts

Expanding the Solar-Cooking Infrastructure in Nepal

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A consortium of eco-development centers is proposed to enhance resiliency in Nepal. The consortium will comprise a network of training and manufacturing facilities across Nepal and it will include a branch for concentrated solar thermal applications, including solar cooking using: institutional solar cookers, parabolic reflectors, Fresnel mirror systems; solar ovens, panel cookers, and retained heat. The mission of the solar-cooking branch is to promote and expand the solar-cooking infrastructure in Nepal and to serve as a development model for other countries. The solar-cooking branch will: 1) survey regional needs for solar cooking; 2) identify appropriate applications for residential market, commercial sector, and tourism industry; 3) pool expertise from solar-cooking project sites to foster collaborations among education facilities, the solar-cooking industry, the tourism industry, and development organizations; 4) develop relations between training centers and neighboring communities for feedback and business opportunities; and 5) survey for adoption and impact of solar cooking.

Evolution of Solar Concentrating Systems for Cooking in India and Exciting Days Ahead

Deepak Gadhia, Chief Mentor, EnerSun Power Tech Private Limited, Mumbai, India

During my presentation which will be with slides in PPT I will share how Solar Cooking Technology in India has evolved starting from Promotion of Box Cooker to the introduction of Parabolic Solar Concentrators first for domestic cooking, then for community cooking and then for Institutional Cooking.

I will share some successful projects like Shirdi Temple where we have installed the World's largest Solar Steam Cooking System.

I will also share developments of other Solar Concentrating Systems that have also been successfully developed and introduced in India and how the Indian government is supporting it with capital subsidy etc.

I will end sharing exciting development/technology where a new type of Solar Concentrating system has been developed and besides the concentrator they have also developed an automatic rice cooking system that can cook automatically by inserting rice and hot water at one end and on other end comes our cooked rice and it consumes fraction of energy compared to solar steam cooking systems and other methods and that too with minimal power and hygienically.

Photovoltaic Solar Cooking: How Far in the Future?

John Sekerak^{1,2}, Devin Mast², Nick Hayes^{1,3}, **Pete Schwartz¹**

Cal Poly (1) Physics, (2) Mechanical Engineering, (3) Electrical Engineering

Electric cooking is convenient and widely adopted globally, while photovoltaic cells are ideal for small-scale electricity generation in many areas. Assuming the continuing decrease in photovoltaic prices, when might we expect PV solar cooking systems to be cost competitive? Should we start designing them?

Solar Dome Cooker and Oven: Creating a Model for a Micro-Solar Oven Factory and Off Grid Bakery.

Tom Hallquist

Solar Oven Reflectors has spent the last five years building prototypes of solar ovens. This effort is best described as a cottage basement industry. We have concluded there are five design essentials for solar ovens are: Affordable, Simple, Portable, Durable, and Nesting for Shipping of Components.

Our current design is based on purchasing materials for 160 or more solar cookers. This allows anyone manufacturing this solar ovens to obtain price breaks for bulk purchase of materials. Assemble is done using good quality hand tools. We are currently using Granite Ware 517 pots which do not nest. All other components do nest together. The ovens use a polycarbonate dome that sits on a reflector assemble. The reflector tilts to the sun allowing one to cook from mid-morning to mid-afternoon. The domes nest.

The Dual Mirror Parabolic Cookers

Devin Mast

In the world of solar cooking, there are countless designs to use sunlight to cook food. Some high power, efficient designs use off-axis parabolic concentrators (e.g. the Scheffler) to focus sunlight onto a cooking surface. If fixed, these parabolic concentrators must deform shape to adjust for seasonal change. Under the direction of Professor Pete Schwartz, two Cal Poly mechanical engineering students are investigating the possibility of using a primary reflector to redirect light onto the fixed concentrator, eliminating the need for deformation of the dish. The primary reflector is made from a flat mirror with a tracking system to adjust for daily and seasonal movement of the sun, and directs light along an axis parallel to the Earth's onto the parabolic concentrator. The students are investigating the feasibility of the design including functionality, sourceability of materials, and cost.

Solar Cooking Adoption and Impact Survey

Caitlyn Hughes Solar Cookers International Monitoring and Evaluation Specialist

The Solar Cooking Adoption and Impact Working Group, created at the SCI Global Convention 2014, identified the need for a globally consistent and comprehensive, solar cooking specific way to gather adoption and impact data. Documents including past program evaluations and the Global Alliance for Clean Cookstoves' guidelines were referred to in the process. The survey includes baseline and post distribution questions, required and supplemental questions, and questions for the surveyor and the respondent. Required questions involve frequency of use, acquisition, recommendation, stove stacking, and fuel and financial savings. Supplemental questions include training, gender, family size, location, time of day, weather, maintenance, pot suitability, and type of food cooked. Next steps include pilot field testing, dissemination, use, reporting and feedback on the survey. Widespread dissemination and use of this survey will allow consistent solar cooking data to be collected and compared, creating a more in depth, accurate global understanding of solar cooking.

Quantifying Energy Savings of Solar Cookers in U.S. Households: The Feasibility of Measuring the Savings

Natalia A. Blackburn

What will grow the solar cooking industry? One important effort is adding to the understanding of the saving potential of solar cookers as they are actually used. With this in mind, it has been proposed to instrument kitchen appliances of solar cooking households to measure real-time energy savings. There are portable loggers, and monitoring techniques commonly used in energy auditing in the U.S. that should be adaptable to this type of work.

During this pilot study three solar cooking households were instrumented for two weeks in the fall of 2014. Daily records of cooking activities were kept during the monitoring period.

The focus of this pilot study is to test procedures. This paper presents how procedures may need to be adjusted. This is essentially a progress report, an intermediate step to arrive at a bigger goal: to undertake a full study that measures energy savings in U.S. solar cooking households.

Solar Cooking Testing Center: Feasibility Study

John Sekerak

With hundreds of designs utilizing concentrated solar power, SCI recognizes the need to have a system of comparison between the different models. Two Cal Poly students are researching current systems to identify a set of standards and tests that can be used internationally. They will also design a testing/certification facility similar to one at UC, Berkeley that tests fuel efficient stoves. These standards should identify, categorize, and evaluate quality solar thermal cooker designs by consistent, scientifically-accepted, and replicable methodology; and provide the basis for establishing a tiered, performance-driven consumer standard.

“Jimmy Factor” in Developing, Transferring & Sustaining Solar Cooking Technologies in Central India

Dr. (Mrs.) Janak Palta McGilligan¹ presented by Deepak Gadhia

Sustaining successful operation and use of various types of Solar Cooking technologies after installation, has been a challenge and a common issue all over the world in general and India in particular. Based on about two decades of hands on experience of being involved in developing, installing, transferring solar cooking technologies at Barli Development Institute For Rural Women and at Jimmy McGilligan Centre For Sustainable Development, in India, it has been found that one of the main factors of successfully sustaining and functioning of the solar systems has been ‘Jimmy Factor’.

‘Jimmy Factor,’ refers to James (Jimmy) McGilligan ¹O.B.E, a highly self-motivated, champion of Solar Cooking/ and many other sustainable technologies in Central India. This factor was recognized by Adrian Konrad from Switzerland who did research on success of Scheffler Cookers in India and more than 10 years before. Recently in Jan 2015 after visiting both these places Ms. Julie Greene, the Executive Director of Solar Cookers International, specifically attributed the successful implementation of Solar Cooking to the passion and perseverance of Jimmy McGilligan ‘Jimmy Factor’. She also stated it is often an intangible piece that is overlooked but essential!”

As a co-worker with Jimmy for 23 years, the author defines ‘Jimmy Factor’, means an attitude, passion and commitment to ‘keep it going’, learning innovating, and acquisition of solar engineering skills, information, self-reliance, training, researching, manufacturing, using, testing, making mistakes and take corrective measures, improving developing, documenting, disseminating information and then

empowering the locals as well as overseas volunteers by imparting training. It is important to mention that Jimmy had no professional degree, no academic or technical background in this area, no research and development funding, no technical infrastructure.

It is recommended that intangible factors like “Jimmy Factor “, need to be further studied and taken into account for advancement of the Solar Cooking movement.

ⁱ The Author is the director of Jimmy McGilligan Centre For Sustainable Development
<http://jimnymcgilligancentre.org/>

ⁱⁱ For more information visit <http://jimnymcgilligancentre.org/>