S.T.E.V.E.N.

Sustainable Technology and Energy for Vital Economic Needs

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N E W S L E T T E R 2 0 1 3

2013 has been a fairly quiet year for S.T.E.V.E.N. Foundation—supporting efforts for Sustainable Technology and Energy for Vital Economic Needs, from Ithaca, New York. Nevertheless, we have several endeavors to report, and one important announcement:

ALUMINIZED, REFLECTIVE MYLAR PLASTIC FOR FREE! Thanks to a generous donation, we can ship modest quantities of Mylar (up to 20 square feet) free of charge to anyone in USA. For larger quantities or overseas addresses, we ask $1. per square foot. We hope that people building a solar cooker or icemaker will take advantage of our offer.

SOLAR BOX COOKERS: In 2013 the STEVEN Foundation continued to support the Engineers for a Sustainable World solar oven project in the College of Engineering at Cornell University, through the work of Francis Vanek and his consultation with project director Tim Bond and interaction with students involved in various research projects related to solar cooking. Although Francis did not visit the partner organization in Nicaragua, the Mujeres Solares de Totogalpa ("solar women of Totogalpa") cooperative this year, other members of the ESW team visited for a week during spring break to bring some new prototypes for demonstration and for technical consultation with the women of the cooperative. The research at Cornell is continuing during the 2013-2014 academic year, with a full complement of individual projects within the solar oven team and a small team of students working on each one.

Away from Cornell, we have been busy accumulating experience with solar ovens in Ithaca. Francis is now using two ovens, a homemade rectangular oven (on the left in the photo) of the type explained in the solution manuals part of the STEVEN website, and a mass-produced Sun Oven from Sun Ovens International (www.sunoven.com) (on the right). With two ovens available simultaneously, it is possible on a sunny summer day, especially around the summer solstice, to cook back to back dishes in each oven, allowing for up to four "runs" per day. The Sun Oven is a good "benchmark" for home-built solar ovens: it is generally tighter and better insulated, so it bakes hotter, allowing the user to cook faster, or else finish a dish that might not cook all the way through in shoulder season (April or September). For research purposes, the closer the homemade oven can perform to the standard set by the Sun Oven, the better.

It is interesting to compare the seasonal productivity of solar cooking from one year to the next as well, based on the tracking of usage that Francis undertakes each season. Summer 2012 was extremely dry in the Ithaca area, so the weather was ideal for solar cooking. We ended the season with 65 runs from the two ovens combined, with anywhere between one and four runs on a given day that the oven was in use. In summer 2013 more normal rains returned, so that home gardens were more productive but the ovens were not – we totaled 51 runs. Predictably, runs are more frequent closer to the solstice, and become scarcer closer to either equinox. One interesting development for 2013 was that we were able to use the Sun Oven past the fall equinox, with one last run in early October.

In the meantime, we have also modified the box portion of a homemade box oven to be used as a "hot box" for cooking in the winter months. Although the hot box still requires the use of nonrenewable energy (natural gas in our case) to partially cook dishes like rice or casseroles, the partly finished pot is then placed in the insulated hot box and cooks in its own heat, saving energy. The photo shows how an insulated lid has been added to the insulated solar oven box, as well as the old blankets and jackets that take up space inside the box and further insulate the pot. We are using this hot box on a regular basis.

All of this effort has inspired a further idea that could be refined: an oven that is a combination solar oven and hot box. The oven would have a removable glass cover that could be replaced with an insulated cover, or perhaps the insulation would fit over the glass. This oven could be used year-round. In the warm months, it would serve to keep food warm between mid-afternoon and evening, by removing the reflector and glass, and replacing it with the cover. Then in the cold months (typically November to March), the glass and reflector could be put into storage, and then the box would be moved indoors to be kept in the kitchen and used purely as a hot box.

SOLAR ICEMAKER: Our icemaker was tested in 1995. It ran 10 to 20 times and made a total of 2 – 3 pounds of ice, showing proof of the concept. The work is described in an article in HOME POWER, June 1996 [http://www.homepower.com] We receive a number of inquiries annually, and are in contact with commercial producers of solar refrigeration, including Energy Concepts Corp., Annapolis, MD [see: www.energy-concepts.com]. This year we learned of another alternative refrigeration technology, SureChill, developed in Wales [see: www.surechill.com].

In connection with the S.T.E.V.E.N. icemaker, we noted this year with regret the passing of its co-developer and coauthor on the Home Power article, David "Mott" Green, who worked with Steven Vanek on our machine. Mott had gone on to work in Grenada on sustainable production of chocolate from local cocoa beans. His obituary was posted in the New York Times: http://www.nytimes.com/2013/06/10/business/mott-green-47-dies-founded-grenada-chocolate.html . Mott was dedicated to using solar energy and to sustainable development, and his passion for his work and projects will surely be missed by all who knew him.

WINDMILL: Jaroslav Vanek, now age 84, has had some health problems which have put the development of a family-size windmill presently on hold. When Jaroslav's health is stronger he may continue.

We send our greetings to all who read these lines. Best wishes for the year ahead, and success in what you can do to promote a more sustainable community and world. From us at S.T.E.V.E.N.