WORKING WITH THE WORLD BANK AND THE U.S. ENVORONMENTAL PROTECTION AGENCY TO PROMOTE SOLAR COOKING

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ABSTRACT

Solar Household Energy Inc., an NGO based in Washington, D.C., has received financial support from the World Bank and the U.S. Environmental Protection Agency to disseminate solar cooking technology in rural Mexico. The World Bank-funded project, now completed, resulted in the training of hundreds of users and the sale and distribution of approximately 1,000 "HotPot" solar ovens, a new panel oven mass-produced in Mexico. The World Bank deemed the project a success, and has supported Solar Household Energy's efforts to introduce solar cooking to other parts of the world. Such efforts are in progress. Solar Household Energy also received funding from the U.S. Environmental Protection Agency to analyze the beneficial health effects of solar cooking, as a follow-up to the World Bank project in Mexico. That project is ongoing.

Key words: Solar Household Energy Inc. … HOtPot … World Bank … Development Marketplace … U.S. Environmental Protection Agency

1. INTRODUCTION

Solar Household Energy, Inc. (SHE) was founded in 1998 in Washington, D. C. as a non-governmental organization to advocate solar cooking. It complements the work of Solar Cookers International by its concentration on engaging private enterprise in the distribution of solar cooking equipment.

The first question for SHE was: What has impeded the popular acceptance of solar cooking in the developing world? Based on research and field experience SHE concluded that among the major reasons was absence in adequate supply of affordable, commercially viable solar cookers.

In 1999, SHE composed an extensive list of requirements for a new-generation solar oven and contracted with the solar R&D laboratories at the Florida Solar Energy Center (FSEC) to realize them. The requirements postulated a direct descendent of the CooKit, a panel oven invented by Dr. Roger Bernard in Lyons, France and successfully adapted by SCI. The new design was dubbed the "HotPot." It retained CooKit's efficiency and portability, while increasing its durability, allure and convenience. (It also increased the cost to $26.21 at the factory door, drowning hopes it could be retailed for $30.) See: "Solar Oven Development and Testing Project on: http://www.fsec.ucf.edu/solar/projects/solarcooker/cooker.htm

In 2003, 60 proto-types of the new HotPot were manufactured in Monterrey, Mexico. 20 were shipped around the world to solar cooking experts for technical evaluation; SHE introduced 30 in rural Mexico to measure cultural acceptance. In December of that year, SHE partnered with the Mexican nature conservancy fund, Fondo Mexicano para la Conservacion de la Naturaleza (FMCN). The director, Lorenzo Rosenzweig, had taken an active interest in the HotPot and provided major support including arrangements for manufacturing of the 60 prototypes.

For a description of the HotPot see: http://she-inc.org/hotpot.htm It is now in mass production.

2. THE WORLD BANK

In December 2003, FMCN/SHE won a 1-year grant from the World Bank's Development Marketplace (DM) for "The HotPot Initiative in Mexico." The initiative addressed four related problems:

1. Hardship caused by diminishing fuel wood supply and rising costs of petroleum products used for cooking.
2. Time-intensive requirement of food preparation that dominates the daily activity of rural women and inhibits pursuit of other productive activities.
3. Disease caused by long-term inhalation of smoke from cooking fires.
4. Environmental degradation and physical hardship caused by foraging for fuel wood.

(DM had come to SHE's attention when Dr. Mercy Bannerman won Development Marketplace funding in 2002 for her project in Ghana which promoted the CooKit for pasteurizing water.)

What is the Development Marketplace? A World Bank program begun in 1998 by young professionals urging more flexibility in the Bank's lending policies. DM supports innovative ideas for fighting poverty which are proposed by individuals, social entrepreneurs and NGOs. Its awards are between $80,000 and $250,000 per project.

SHE's DM project goal was to manufacture and sell 2,000 HotPots to Mexican families in need of alternative cooking fuel for $35 per unit. The World Bank's Adriana Moreira, a biodiversity expert, was responsible for oversight of SHE's project. There were four meetings over the project year. The first to finalize the project agreement, to establish benchmarks and to sign contracts. Progress was assessed at the 2nd meeting. The 3rd meeting was a site visit for Ms. Moreira to Cuauthemoc, an "ejido" (communal village) in the State of Coahuila. There, 18 SHE trained women had eight HotPot-cooked dishes ready to eat. The last meeting was to present the completed report.

Photos above: Women and children in Cuauthemoc, Mexico, learn how to use the HotPot solar oven.

The mounting of the World Bank project was accomplished in three phases:

A) Program Organization

A market survey was conducted to select sites for the project. FMCN hired the Balam Group, a local consultancy firm specialized in environmental projects. Balam selected regions where the rural population consumed the highest quantity of fuel wood for cooking and where there was greatest need for alternative energy. It also researched potential user's ability to pay for a HotPot. Balam's report concluded that 11,000 households in the areas surveyed needed alternative fuel and had the ability to pay, some in full, most in payments, some only with subsidy.

FMCN selected 12 Mexican NGOs identified by the Balam report as having strong environmental programs. Their directors were asked to make HotPot promotion part of their 2004-05 agenda. They were reminded that the HotPot would help them address their Millennium Development Goals.

B) Preparations

- Design and production of a pictorial User's Guide booklet in Spanish.

- Preparation of training materials for solar cooking trainees.

- Composition of a Trainers Manual in note-book format. The loose leaves could easily be removed and replaced with updated pages.

- Drafts of publicity materials such as posters, banners, flyers and recipe books were reviewed and edited at the planning meeting in the spring of 2005.

- Selection, recruitment and training of solar oven retailer/instructors.

C) Commercial Introduction of the Hotpot

By July 2004, 2,000 HotPots had been manufactured; 300 had been trucked to eight Mexican conservation NGOs that agreed to participate in the HotPot initiative. Two experienced solar cooks were hired to launch the training program: Heike Hoedt from the Solarbruecke organization in Germany, and Ruth Saavedra de Whitfield from Cedesol, Bolivia. Ten weeks were spent in Mexico organizing programs in the states of Queretero, Oaxaca, Nuevo Leon and Coahuila. Ten instructors were trained using the cascade method implemented by Solar Cookers International in refugee camps. By the fall of 2004, two regional coordinators had been hired: Lorena Harp in the state of Oaxaca and Enrique Cisneros in Coahuila.

In the spring of 2005, all parties involved in the HotPot Initiative met at FMCN headquarters in Mexico City to assess progress and plan the remaining six months of the World Bank project. Then, SHE spent another eight weeks expanding the program into the states of San Luis Potosi, Chihuahua and Michoacan.

The short duration of the WB grant did not allow for significant evaluation. However, SHE is conducting systematic evaluation now which will also be useful for the PCIA project. It will not be completed until February 2007, the time needed to confirm permanent technology transfer.

We have often been asked why we were one of 47 winners out of 2,700 DM applicants. According to one judge, there were several factors. The HotPot is "affordable." It was designed by the prestigious FSEC. We created a short video portraying demand and cultural acceptance. It was important that the HotPot would be manufactured in Mexico. Furthermore, our project addressed seven of the eight UN Millennium Development Goals. We benefited greatly from the worldwide respect for FMCN's successful biodiversity projects, some of which had received WB funding in the past. Finally, as luck would have it, the World Bank was taking more interest in renewable energy at the time.

This recognition we acquired at the World Bank is useful to us as evidence of our reliability. For example, it almost immediately caught the attention of the U.S. Environmental Protection Agency.

3. THE ENVIRONMENTAL PROTECTION AGENCY (EPA)

In 2004 SHE won two years of funding from US EPA to participate in the Partnership for Clean Indoor Air (PCIA), an organization launched at the World Summit on Sustainable Development in Johannesburg in September of 2002. PCIA is led by the US EPA and operates with the participation of international organizations, multilateral institutions, academics, corporations, governments and NGOs. See: www.PCIAonline.org

More than 2 billion people in the developing world burn traditional biomass fuels for cooking and heating. According to the World Health Organization, this smoke exposure results in an estimated 1.6 million premature deaths each year, largely among women and children. See: http://www.who.int/ceh/publications/en/09indoorsmoke.pdf

SHE's PCIA task is to determine if solar cooking can improve air quality in rural Mexican households where toxic smoke inhalation results from the use of fuel wood in poorly ventilated kitchens. Of the 11 organizations participating in this project worldwide, SHE's is the only one using solar ovens. The rest are working with fuel efficient stoves.

This project began when we were midway in the World Bank Project year. We were able to "piggyback" on the World Bank infrastructure already in place. We renewed the contracts with our two regional coordinators. We hired a trainer-distributor in Oaxaca with expertise in data collection to run a PCIA-sponsored evaluation of fuel wood use. PCIA goals were similar to the World Banks, but placed less emphasis on sales and more on monitoring results. It is our goal to produce evidence that women would inhale less smoke if they solar cooked.

While the link between cooking over wood fires and respiratory ailments is well documented, the link between enduring poverty in rural Mexico and environmental degradation requires elaboration.

The U.N.'s Food and Agricultural Organization estimates that slightly above 1% of Mexico's forest cover (631,000 hectares) is destroyed annually. Further, FAO estimates that globally, about 55% of all downed trees and branches are used for domestic purposes, primarily cooking. The World Bank's 2002 "country assistance strategy memorandum" for Mexico highlights the link between excessive exploitation of natural resources, and economic hardship.

Life in rural Mexican villages is hard, particularly on women. The World Bank reports that 46% of rural Mexicans live in extreme poverty. In general, women's opportunities are the most limited. Prevailing cooking techniques in poor rural communities are time-consuming, inefficient and unhealthy, and cooking remains "women's work."

4. CONCLUSION

At the end of the World Bank funding year in September 2005, we had only sold just more than half of our projected 2,000 HotPots. Even so, the World Bank was satisfied with this result. Our World Bank liaison officer recognized the difficulty of what we were attempting and proclaimed our project to be one of the most successful. We had built a permanent HotPot distribution network. We had also created solar cooking awareness where little or none had existed. Media coverage via radio and television programs had reached tens of thousands of viewers.

Our initiative would not have been possible without the participation of FMCN. We held monthly conference calls and occasional face-to-face meetings to decide on strategy, evaluate progress, and exchange information.

In addition to our World Bank project, we began marketing the HotPot in other countries through Monterrey-based entrepreneur Oscar Guajardo. He is coordinating the manufacture, packaging and shipping of HotPots on a commercial basis. There are orders for the HotPot from many parts of the developing world, as well as from retailers and individual customers in the U.S., Europe, and Australia.

The HotPot is still too expensive for poor people in most developing countries. Our next task is to find creative ways to reduce manufacturing, shipping and in-country distribution costs. We also seek consumer loan mechanisms, women's support groups, rental schemes, barter arrangements – any way of increasing access to the technology for those who need it most. Direct subsidy is another tactic -- and frequently a necessity. Yet subsidies have a way of vanishing; our goal remains to create a self-sustaining distribution chain for this technology.

Inclusion of SHE in the PCIA partnership has given solar cooking recognition comparable to that afforded fuel-efficient stoves and heat-retention devices. SHE's intention is to advocate a cooking system composed of all three of these complementing devices. We look forward to cooperating with our PCIA partners to this end.