

Solar Food Processing – Network 2009

*Rolf Behringer
Solar Food Processing Network
Wiesentalstraße 50
D-79115 Freiburg
Germany
solarfood@robeh.de*

ABSTRACT

Solar Food Processing offers many advantages for users and the environment. While many dissemination attempts are on-going at the grass-roots level, in the last few years small scale activities are being observed for income generation and money savings from using free and clean energy, namely the sun. More and more solar food products are entering the market and the variety is growing.

The Solar Food Processing Network aims to support this initial impact in order to boost solar food processing activities around the globe.

Keywords: Solar Cooker, Solar Food, Network, R & D, Dissemination, Food Processing

1. INTRODUCTION

Solar food processing is an innovative and multi-faceted technique capable of addressing various problems faced by people in the developing world. The implementation of technologies for food processing and conservation using solar energy can indirectly help to reduce poverty, improve health conditions, create sustainable local economic opportunities, and limit environmental damage by promoting the use of clean and renewable energy sources. This project targets countries with a high solar radiation potential, in particular those countries in need of unique and sustainable development assistance and ideas that relate to solar food products. Solar Food processing has a huge potential in reducing carbon emissions in the food processing chain, not only in developing countries.

The project aims to extend and develop efficient methods of solar food processing for the following activities:

- Conservation of fruits and vegetables
- Drying crops
- Roasting different kind of nuts
- Pasteurising juice, fruits and vegetables
- Baking bread and cake.

Objectives:

- Improvement in the quality of food;
- Creation of local jobs and income;
- Demonstrating environmental benefits (with high potential for CO₂ emissions reduction)
- Involvement of local personnel and local resources
- Creation of a new market and encouragement of economic competition in this field.

The project consists of three phases:

Phase 1: Setting up a network with interactive website and conducting a workshop, providing training (2005/06)

Phase 2: Developing and implementing solar food processing technologies (2006 – 2008)

Phase 3: International Solar Food Processing Conference in India, Indore from 14-16 January 2009. Dissemination of Solar Food Processing Network results. Perspectives and Targets for future activities.

2. BACKGROUND

Solar cooking and processing technologies are relatively unknown. While projects have been mostly small-scale, the potential for large scale implementation exists.

In many rural areas of developing countries, biomass in the form of wood is the tradition form of energy for cooking. However, wood is becoming more and more scarce, and overuse is leading to deforestation which has more drastic effects on the environment. Biomass is being used unsustainably when consumption is higher than the natural replacement rate.

By using the sun to provide energy for food processing forests and CO² can be saved. In rural areas, firewood is being used to provide thermal energy for food processing and conservation. Even modern food industries have the option to use renewable energy in order to reduce their energy costs and carbon emission. Institutions, such as school kitchens providing food or cooperatives producing sheer butter, in West Africa for example, burn tons of firewood during a year.

For the implementation of this project, ISES has a unique position to draw together the experience and expertise of its international members and contacts to assist in developing this field of solar utilization and improve the knowledge and visibility thereof. Phases I to III (May 2005 – February 2009) of the Solar Food Processing project is financed by [WISIONS](#).

The project coordinator, Rolf Behringer, has 15 years of experience in this field, and has developed excellent contacts internationally.

In January 2009 the network consists of 179 members from 38 different countries listed on the project website. Members are NGOs, Small and Medium Enterprises producing solar food processing devices or producing solar food products for a market, consulting agencies, R & D institutes and individuals.

The network supports exchange of information through the website, during workshops and conferences. On one hand it is aimed to raise more awareness and attention for solar food processing by providing an international platform where project examples and ideas can be shared by everybody who is interested or active in the field of solar food processing.



Fig. 1. Screen shot of project examples on www.solarfood.org

3. THE POTENTIAL OF THE PROJECT

The implementation of solar food processing and conservation is an activity that will primarily be implemented at a local level by local actors. However, this project can approach people and organizations from an international perspective in order to support local implementation. As such the network members aim to encourage international exchange of information and experiences, and help to identify issues for basic standard development to increase the effectiveness of the available technologies.

Specific countries have been selected to initiate or extend implementation activities in Solar Food Processing. During Phase I and II the following countries had been part of the project:

- **Burkina Faso**, solar roasting of peanuts, production of shea butter, solar drying, production of solar stoves, scheffler cookers and SF 14 (since 1998 ongoing)
- **Namibia**, baking and selling bread, roasting peanuts, solar catering, production of solar stoves, cooking demonstrations (since 2000 ongoing)
- **Tanzania**, production of solar stoves, cooking demonstrations, roasting peanuts (since January 2006 ongoing)
- **Gambia**, selling solar bread and cake, traditional food, solar stove production in preparation (since November 2005 ongoing)
- **Paraguay**, production of solar stoves, scheffler cookers, solar-hybrid dryers, production of marmalade, pasteurizing fruit juice, bread and drying plants and fruits (since 1998 ongoing)
- **Afghanistan**, production of scheffler cookers and dryers. Development of solar tander stoves for traditional bread (since April 2005 ongoing)

The results will show useful examples and motivate many people in other countries and the replication potential is regarded as very high for several reasons:

- The applications are very practical and useful for a wide range of actors.
- The level of expertise that is required to apply these technologies is realistic.
- The technologies are affordable and most of the time local materials can be used to build the products.

- Documentation of practical examples will be developed and presented in four languages in different formats (electronic and printed media).

The importance of involving local actors, with local infrastructure and local materials, is central to the success of this project. As such the development and presentation of useful material – both for awareness-raising and training – will be done in cooperation with local experts, for local actors.

Targets:

- Primary targets - users:
 - Small and Medium-Sized Enterprises (SMEs)
 - Farmers and rural communities
 - Women associations and groups
 - Technicians (from North and South, who need training)
- Secondary targets - support network:
 - Food experts
 - Ecologists / marketers
 - Economists
 - Development NGOs
- Other:
 - Government departments and officials involved in rural development supporting the development of new SMEs

Several media forms are used to reach a target audience as it is possible with limited financial resources:

- Brochures and posters in four different languages
- Radio & TV
- Local newspapers and magazines
- Public project website supporting the network of experts
- Demonstration of technologies and results:
 - Through local implementation
 - Presentation at local trade fairs

Through dissemination of information about solar cooking we have gained great interest and involvement of local participants.

Despite all the positive arguments and benefits of using solar energy for cooking, we must keep in mind that other back-up forms of energy are still required. However these can also be other renewable energy sources such as biomass or biogas. Whilst using other energy forms than solar it is recommendable to choose efficient stoves, cookers and thermal devices.



Fig. 2. Solar cooking demonstration at a local market in Tansania, Moshi January 2006



Fig. 3: Pilot plant for testing solar thermal energy for solar food processing, India 2005, Gadhia Solar

4. CONCLUSION

The Solar Food Processing Network has identified a need to raise awareness in the field of solar food processing and the wide range of RE applications for small-scale and even large scale production. We experienced that potential users have to see the technology in operation and test (taste) the products. By placing a product in the local market the technology becomes much more interesting than targeting only private households. In our partner countries we observed that private households became interested after they have seen solar stoves regularly being used to produce bread, cake and peanuts or solar cookers to produce marmalade for the local market.

To succeed in disseminating solar food technology on a larger scale several aspects are of importance:

- To implement quality standards by cooperative technology transfer and training
- To provide a visual platform for technical- and solar food products
- To exchange information globally to speed up the development of a solar food technology through
 - Networks such as Solar Food Processing or Solar Cookers International Association
 - Conferences and workshops focussing on solar food processing and income generation
 - Media campaigns

The project website www.solarfood.org is an important network tool. Members are individuals, SMEs, research institution and development NGOs from many countries across the globe. It is regarded as a strong potential to have manufacturers of solar food processing devices, researchers and solar food producers. A coordinated action could help to increase quality, effectiveness and use of products. The Solar Food Processing Network needs to be strengthened and maintained in the future in order to disseminate useful examples and new developments.

Solar Food processing needs standards in technology and food quality.
--

As in many other industrial sectors the technical products that are used must be evaluated through standards which are transparent and comprehensive for solar food producers and consumers.

The quality of solar food is a main precondition for entering local and international markets. Therefore we need to develop standards, so that people understand what it means when we are talking and offering solar food products.

Photo courtesy by Rolf Behringer, ISES
Except Fig. 4 by Deepak Gadhia, India