

# News

gtz | HERA – Household Energy Programme

## Editors

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## News from GTZ

### Here comes the sun – options for using solar cookers in developing countries

Cooking with the sun has repeatedly been seen as a solution to the firewood problem in developing countries. It allows the use of a free, inexhaustible source of energy that not only protects the environment, but also lessens the workload of women and children and reduces the harmful health effects that cooking with traditional biomass fuels sometimes has. Although solar cookers have now been promoted for several decades, a larger breakthrough has not yet been achieved.

A recently published analysis of the differing global approaches to solar cooker dissemination reported both successes and constraints. The main constraints were a lack of acceptance by users (due to stoves not accommodating traditional cooking practice), high costs, and shortcomings in maintenance and after sales services. However, in regions where virtually no alternative fuels are available, and where it fits with existing cooking methods, a solar cooker offers a feasible solution to the problems at hand.

Solar cookers have been especially successful in Tibet and on the Altiplano in South America. In Tibet, solar cookers play a major role as solar irradiance (resource) on the Tibetan plateau is very high by global standards and the cookers can be used for nine or ten months of the year. In addition, the dietary habits of the population also fit the technology as hot water is not only needed for every meal but also to make tea many times a day.



**Figure 1.** Solar cooking is taking hold in the Andes where alternative fuels are hardly available. (Photo: GTZ PROAGRO)

Today, there are some 70,000 solar cookers in use in Tibet, most of them concentrator cookers of the butterfly type.

In most African countries it has not been possible to set up independent local production and so important parts still have to be imported from Germany. Cooking practice and weather conditions, e.g. desert winds carrying dust and sand, have not offered a favourable environment for the dissemination of solar cookers, despite high levels of solar irradiance in many countries. A pilot project implemented by GTZ in South Africa showed that annual wood consumption could be reduced by at most 30 to 40%, due to solar cooker use being limited to days where the sun is shining. Trials where cookers were sold through a loan system have had little success and even in South Africa, with its well-developed infrastructure, solar cookers have not caught on.

To sum up, acceptance is still the problem. In many cases solar cookers cannot be integrated into families' everyday working and domestic lives without further complications. Cooking habits are very much part of the culture of the kitchen, and are generally not easy to change. Where cooking is carried out in the evening, a solar cooker is not a real option. Furthermore, for users there is still a lack of access to maintenance services as well as systematic training on stove use. Experience also reveals that, apart from Tibet, dissemination strategies are no longer directed at poorer segments of the population but instead at the middle class.

Based on the analysis of past efforts, ten basic rules promising the successful dissemination and use of solar cookers are given in the publication. It is important, for example, that solar cookers are promoted where biomass is sparse and difficult to obtain. The target group should not have easy access to other cheap fuels.

**Figure 2** Students in Lesotho enjoy cooking with the parabolic cooker. However, the dissemination of solar cookers in Africa faces difficulties e.g. due to cooking habits. (Photo: Marlis Kees)



It must be possible to prepare the most common dishes and there must be places within the living area where cookers can be positioned favourably for capturing sunlight and at the same time be safe from theft. Furthermore, affordable cookers must be available locally, and after-sales service and maintenance must be assured. Last but not least, cookers should not be offered as the only solution but in a package with other energy-saving technologies.

An alternative to solar cookers does exist in the form of energy-efficient Rocket Stoves. These improved stoves can compete with, or even beat, solar cookers in terms of their energy-saving potential. Improved stoves when adapted to people's cooking needs are usually the preferred choice of poor families.

The report "Here Comes the Sun – Options for Using Solar Cookers in Developing Countries" was recently published by HERA and is available for download, in both English and German, via the @HEDON link at the end of the article. If you would like a hard copy then please email Lisa Feldmann (lisa.feldmann@gtz.de).

### Malawi: Study shows benefits of institutional rocket stove

The use of energy efficient stoves in the canteens of institutions and companies shows positive impacts at both micro and macro economical levels. A recent cost-benefit analysis of stoves in Malawi quantified the benefits not only to stove users, but also of the national and global impacts of stove use.

In assessing the investments made in Malawi through the Programme for Biomass Energy Conservation in Southern Africa (ProBEC), economist Helga Habermehl reports that "the promotion of efficient institutional cook stoves is favourable from an overall economic view". Each invested Dollar gives a return of 5.2 US\$, when accounting for avoided fuel costs, greenhouse gas reductions and preserved forest reserves over a period of ten years and at a discount rate of 3%.

From 2004 to 2007 institutions such as schools, nurseries, hospitals, orphanages and tea estates bought or built just under 4300 energy saving Rocket Stoves for their canteens. This has resulted in several hundred thousand children receiving at least one warm meal per day. The training of local producers in the construction of Rocket Stoves was conducted by ProBEC, which is implemented by GTZ on behalf of the governments of Germany and the Netherlands. Each stove gets a certificate that proves its quality and a warranty. The main customers are the World Food Programme (WFP), the Scottish school feeding programme 'Mary's Meals' and private schools.

Depending on size, these efficient stoves save between 60 and 80% of the firewood otherwise needed in a traditional open fire. In 2008, the installed stoves will save over 23,000 tonnes of fuelwood, directly saving 662,000 US\$ in fuel costs as well as offering economic benefits in terms of the preservation of forest reserves amounting to 362,000 US\$. Furthermore, the use of the canteen stoves will reduce greenhouse gas emissions with a total saving of approximately 35 tonnes of CO<sub>2</sub> and 93 tonnes of Methane a year, valued at 256,000 US\$. So in 2008, the total economic benefit due to institutional stove use will amount to nearly 1.3 million US\$.

The use of Rocket Stoves is profitable for each of the individual institutions - an orphanage that prepares two meals a day in a 100 litre pot saves 680 US\$ a year on firewood expenditure. If a 200 litre stove is used twice a day throughout the year, then the net benefit over the stove's 4-year life is 4,200 US\$, some 16 times the cost of the stove installation. So depending on cooking

frequency and size, the cost of the stove can be paid back by fuel savings in the first three to nine months of use, saving up to 40% of annual catering budgets.

Thus, institutional Rocket Stoves not only pay off on a macro-economic level but are also improving the financial performance of each canteen. "We have enjoyed this stove for three years. Can you see the soot on the kitchen walls? This was from the open fire when our kitchen was filled with smoke. It was hard to breathe inside the kitchen. With the modern stove we are no longer suffering from coughing and sore eyes as before. Work is much more fun! Moreover the college saves over half of its budget for firewood and can use the money to buy books and better food for the students. So the students are happy too!", Cooks at a school in Blantyre, Malawi report.

The Cost-Benefit Analysis was conducted by the economist Helga Habermehl on behalf of ProBEC and GTZ's household energy programme HERA. It is available for download via the @HEDON link at the end of the article.

### The Regional Energy Advisory Platform East Africa supports energy projects of GTZ and its partners in East Africa – second meeting

"Creating synergies and the exchange of best practice are the foundation principle behind the Regional Energy Advisory Platform East Africa (REAP-EA), and the essential ingredients of it's success", explains manager David Otieno. REAP is a service-provider to existing bilateral and sectoral assignments and its key objectives are to increase the impact and overall efficiency of these projects and initiatives, to explore and realise synergies, and to provide direct support through targeted services. The expertise of GTZ REAP (EA) covers a wide range of topics including carbon finance, the Clean Development Mechanism (CDM) and renewable energy policy advice. Through high-quality support to the East African Community (EAC), renewable energy associations, lobby groups, NGOs and other organizations in East Africa, GTZ REAP has proved itself a reliable and competent partner on energy-related issues in the region.

The second meeting of the REAP-EA took place in October 2007 in Nairobi, Kenya. Representatives from energy interventions

**Figure 3** Volunteers cooking for school kids in Malawi. (Photo: Christa Roth)



in Ethiopia, Uganda, Tanzania, Rwanda and the host country Kenya attended the meeting. Further expertise was brought in by colleagues from West Africa, Mozambique, Thailand and by sectoral programmes from GTZ head quarters. Several parallel sessions provided time for experience exchange in rural electrification, grid connected electrification, utilisation of bioenergy and biogas, and cooking energy. Further topics discussed were the progress of the Biomass Energy Strategy (BEST) initiative, the latest developments of the Dutch-German cooperation programme Energising Development (EnDev) and the new Bioenergy sector initiative. Another topic of interest was capacity development, more specifically sectoral capacity needs assessment with regard to energy. The latest regional developments in the energy sector were presented, such as private sector participation in East Africa, biogas in Rwanda and CDM projects and potential in East Africa. The cooking energy discussions focussed on sustainability. A set of standard criteria with specifications as prepared by HERA was agreed upon. The first sustainability assessment is now being implemented in Kenya, where household energy interventions have been carried out for about 30 years.

Ethiopia will host the next REAP exchange in 2008, focusing on impact and sustainability assessment as well as exit strategies. For more details see [www.regionalenergy-net.com](http://www.regionalenergy-net.com)

### **GTZ shares international award with Ethiopian Ministry of Agriculture and Rural Development (MoARD)**

GTZ received the award in early 2007, at the third Biennial Partnership for Clean Indoor Air (PCIA) Forum in India. The energy project of the Ethiopian-German programme for Sustainable Utilization of Natural Resources (SUN) was honoured by PCIA for its commercial strategy for increasing the use of clean and efficient MIRT cook stoves. These stoves use significantly less firewood and reduce indoor air pollution thus improving peoples' health and quality of life.

Handing over the award in November 2007, GTZ pointed out that without the full support of MoARD, the owner of the project, this result would not have been achieved. "Let this award be a reminder of what is possible to achieve and a motivation to work even harder", Amhare Worku from the Ministry said at the ceremony. SUN Energy is currently operating in 215 towns in Amhara, Oromiya and Tigray with about 341 small scale stove production enterprises. Through the market approach more than 140,000 stoves have been sold in the regions of intervention. Samson Tolessa, Manager of the GTZ-SUN Energy project explained, "Selling the stoves rather than distributing them for free proved to be a sustainable and successful way of creating public acceptance for the stove."

### **Tobacco Rocket Barns successfully introduced to Malawi**

In 2005 a new flue-cured tobacco processing barn for smallholder farmers, the 'Rocket Barn', was developed in cooperation between the Programme for Biomass Energy Conservation (ProBEC) and the Malawian tobacco industry, who have now adopted the technology. The new barn reduces wood consumption by over 50% as compared to traditional smallholder technologies, which use more than 15kg of wood to produce 1 kg of finished tobacco. To date 86 Rocket Barns have been built in Malawi, with 500 more to be added this season, paid for by bank loans. A special testing facility has been expanded to include 20 barns to enable continuous research and development. In addition, Rocket Barns are also being constructed in Tanzania and Zambia.



Figure 4 Rocket Barns cure tobacco more efficiently, Malawi (Photo: GTZ)

### **Successful start for improved cook stove dissemination in Bangladesh**

Since January 2006, GTZ's Sustainable Energy for Development (SED) programme has promoted the dissemination of improved cook stoves (ICS) in rural households, social institutions and small businesses. Additional financial support is provided through the Dutch-German cooperation programme Energising Development. Most rural households in Bangladesh are highly dependent on biomass cooking fuels such as cow dung, crop residues or scarce firewood resources.

The improved stoves, which are made from clay and are equipped with a chimney, reduce biomass use by about 50% and cut indoor air pollution and related health problems that mainly affect women and children. The dissemination of the ICS is carried out by established local NGOs that possess a sound infrastructure at the village level. The NGOs follow a market-based approach with small short-term loans offered to low-income households.

Up to December 2007, more than 10,000 stoves were disseminated throughout the country and as the experience of households has been very positive, NGOs are now facing a growing demand. Thus, the scaling-up of dissemination activities is imperative and so SED supports the NGOs in activities such as stove manufacturer training and marketing campaigns. The quality of stoves as well as socioeconomic impacts are being closely monitored.

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