Ten years of experience with the mobile solar kitchen and pancake shop

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Topic(s) addressed: Examples of solar food projects

1. Abstract

For more than ten years, the mobile solar kitchen / pancake shop (owned by the Swiss NGO GloboSol) has been used every summer in Central Europe to prepare pancakes on ecological fairs and music festivals and to feed youth groups in summer camps. In principle, the kitchen is part of our promotional work to spread solar cooking in Europe, but the campaigns have to be auto-financed by food sales and rental fees. This paper resumes what we have done and learned in these years.

2. Introduction / Background

2.1 History of the ULOG group

Ulrich Oehler and his wife Liesel Oehler-Grimm had founded the ULOG group in the early 1980s in Switzerland, a group of people with the aim of promoting solar cooking. 'Teaching by doing' has been one of the main ideas from the beginning. While the ULOG group didn't have any legal structure for many years, an association to financially help it has been founded in the 1980s as well. After a change of name, this NGO is now called 'GloboSol'. In the meantime, ULOG became legally part of GloboSol; ULOG is the so-called 'operational unit' of GloboSol, while GloboSol includes many 'passive members' as well.

2.2 The dream of a mobile solar kitchen comes true

Members of the ULOG group have been solar cooking on public events since the beginning. In 1996, Christoph Sutter had the dream of building a complete kitchen on a car trailer, a unit which needs less preparing for an event, which looks nice and professional and which can be rented or lent to partner organisations without problems. (Lending the kitchen without staff has proofed to be unrealistic as we will show later). Thanks to Christian Koch of Koch Anhängerwerke in Germany, a brand new trailer was made available, together with funds for the solar cookers, the kitchen equipment and the interior finishes as well. In the spring of 1997, the trailer has been transformed by members of the ULOG group into a complete solar kitchen. It was inaugurated in April of the same year in the Swiss capital of Berne.

3. Project

3.1 The mobile solar kitchen

The “mobile solar kitchen” is a car trailer with a fully integrated solar kitchen. It is equipped with two Scheffler cookers of 1.8m^2 each, with a ULOG box cooker, a 'hay box', kitchen utensils, cooking pots and dishes for a limited amount of people. It also has an integrated kitchen sink and a working table.
For rainy days, there is a propane gas stove and since 2006 also a unique wood pellet stove which will be presented later. There is no built-in fridge, but an icebox is used for events. On

sunny days the kitchen is independent of an electrical plug, but not free of a carbon footprint as the transport is done by fossil fuel and the ice is prepared in an electrical fridge beforehand.
Space is limited in the trailer and cooking is best done by 2 or 3 people. If the crew on an event is larger, one person can be assigned to explain the technology to the visitors and to answer their questions.
Setting up the kitchen and orienting the two Scheffler cookers takes at least one hour for two people. Cleaning and folding everything in the end of the event needs at least as much time again. An untrained crew will take much longer for both operations! The orientation and location is very important and reason for negotiation with organisers of events: the kitchen has to be placed east-west with the two Scheffler dishes oriented perfectly south – and sunshine should reach the place all day.

3.2 Organisation chart and internal money issues

The legal owner of the trailer is the association GloboSol. The kitchen is used by different groups. Most events have been organised by the authors' former company, CNCS (Centre Neuchâtelois de cuisine solaire), or its successors ExSol and Solemyo. Other events were run by ULOG Freiburg (Rolf Behringer) and some more in the name of GloboSol itself.

The key idea on the financial side is that investments in infrastructure are sponsored, but that the use of the kitchen in every summer season is auto-financing. All expenses and a small remuneration for the team are to be recovered trough rental fees and food sales. (It is only 'fair' that the campaigns do not have to pay the full cost *including* the investments. Our expenses are indeed higher than the expenses of a competing non solar snack stand without any educational purpose.) Sponsoring has been found in the beginning from Koch Anhängerwerke and lately from the Swiss NGO 'SolarSpar'.

If the kitchen is used by someone else than GloboSol, a given amount of money has to be paid to GloboSol per *day of use*. It will cover the expenses for insurance, licence plate, technical control (TüV), a parking lot, etc. The users of the kitchen are then free to decide how to distribute a potential benefit. Accounts are normally settled on an event-by-event basis.

For the events in the name of GloboSol itself, a distribution key for the remuneration of the organiser and of the staff had to be found. The following rules have been set up:

- only full-day helpers are paid (helpers 'by the hour' get free pancakes!)
- every helper is paid from his 2nd day onwards. For the first day, he is considered to be an apprentice
- remuneration is paid per *day of use* (preparing time is not covered)
- the amount is the same *per person and per day* for a crew of one or two
- a crew of three or more people *shares* a certain amount of money (a bit more than a crew of two)
- ideally, the total income of all events of one summer cover the total amount of remunerations and expenses. More commercial cooking levels out small and more fun oriented events.

This distribution key has been used from 2005 to 2007. Every season between 4 and 11 helpers have been involved. The idea of this system (as compared to a team of unpaid volunteers) was to enlarge the circle of helpers and to facilitate their involvement in the organisation. While the first point worked out well, the second was disappointing. Hardly anybody could be gained to take on more responsibility other than helping to cook.

For 2007, another form of organisation was planned: The kitchen was to be run by a team of young people during several weeks in summer. The (changing) members of the 'solar team' would have been living together during the summer. Due to a lack of sponsors and a lack of

interest of event organisers to book the kitchen, the project 'solarteam07' had to be stopped in late spring and the 'distribution key' system was applied to the events which had already been confirmed.

In the beginning it was planned to lend or to rent the kitchen without staff. A handbook was prepared. But it soon proofed to be unrealistic that anybody without training could set up the kitchen in a reasonable time and use it without problems. Just setting up the Scheffler dishes needs good training! So this idea was abandoned and the kitchen is never rented without at least one experienced person.

3.3 Relation with event organisers

There are two ways of collaboration with an organiser of an event, a festival or a youth camp:

- The organiser rents the kitchen for a fixed price as an attraction. The kitchen crew brings all the food and sometimes even disposable dishes as well. Any net income deriving from food sales (after deduction of the expenses) reduces the renting bill. The renting organisation is responsible to procure all licences if they are needed.
- The kitchen crew cooks at an event at its own risk. Normally a fee is due to the event, but often a reduction (or no fee at all) can be negotiated as the solar kitchen is an attraction for every festival.
  This kind of arrangement is limited to 'commercially interesting' events with a lot of visitors.

3.4 Statistics of use

The mobile solar kitchen has been in use every summer since 1997 for about 20 days per year. A maximum of 22 days has been reached both in 2000 and in 2006. It is important to mention that actual *days of use* (public events) only are counted, even though 20 days of use mean about 30 days of direct involvement. Indeed, preparing the event, shopping, fixing of small problems, driving to the location and back as well as final cleaning all take up time.
From the point of view of helpers, some 50 people have been involved in 11 summer seasons of the kitchen.

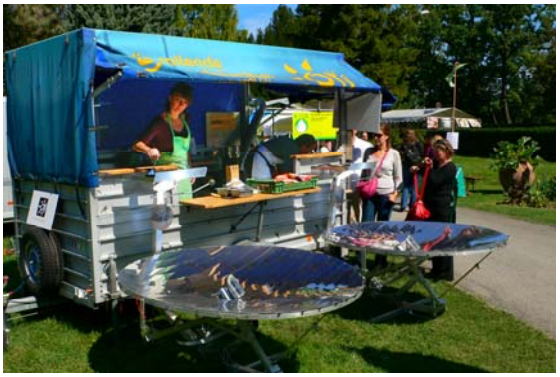
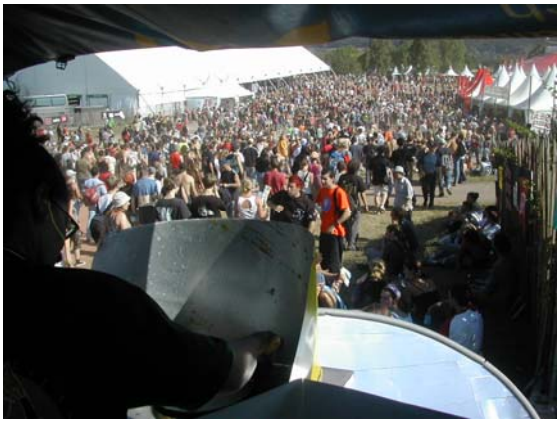
3.5 First type of use: mobile pancake shop

Every summer, the mobile kitchen is used as pancake shop ('crêperie solaire') on music festivals and ecological markets and fairs. Music festivals have been chosen as 'target market' in order to reach young people and also 'outsiders' with our message and to not only 'preach the convinced' which is typical for ecological events. Only festivals with a daytime program are interesting as we depend on sunshine. This excludes many music festivals which open their doors in the late afternoon only. Two examples are given:

Jardin des énergies renouvelables: This small renewable energy fair takes place once a year in the countryside in Switzerland. The fair is part of a larger farmers festival which has a lot of visitors (up to 30'000 visitors for the entire festival in two days). The 'crêperie solaire' is one of the about 15 participants of the renewable energy sector. In one week-end, the crew of 2 or 3 people makes and sells between 120 and 220 pancakes.

'Hors Tribu' music festival: This tiny music festival is a typical 'fun' event of only little commercial interest. After several participations, the visitors of the festival are in no way astonished by the presence of a solar pancake shop, but appreciate the tasteful 'crêpes'. The festival lasts four days, two evenings and the week-end. The music scene is a fenced-in area opening in the afternoon only (and all Sunday). Luckily, there is a camp-site next to it. The kitchen is placed inside the fence but directly touching it. In this way, pancakes can be sold 'over the fence' into the camp-site at noon and inside the festival in the afternoon. Typical sales

numbers are 150 to 250 pancakes in three days (with a minimum of 54 on a rainy edition with hardly any visitors).

	
The mobile solar kitchen sells pancakes on an ecological fair.	*The 'crêperie solaire' at a big music festival in France.*

In general, no more than 30 pancakes can be baked per hour by both Scheffler reflectors together (maximum sunshine). Depending on the number of visitors and on how many other food stalls are present, between 50 and 200 crêpes are typically sold per day. The maximum was about 300 crêpes in one Saturday from 11 AM to 11 PM, first made with sunlight, later with propane gas. How to explain these exceptional sales numbers? Not only were people hungry, but the crêpes were also sold at less than half their regular price.
As Switzerland is not the most sunny country, only about half of the pancakes are made with sunlight throughout the whole year, the others with the backup cooking stoves.

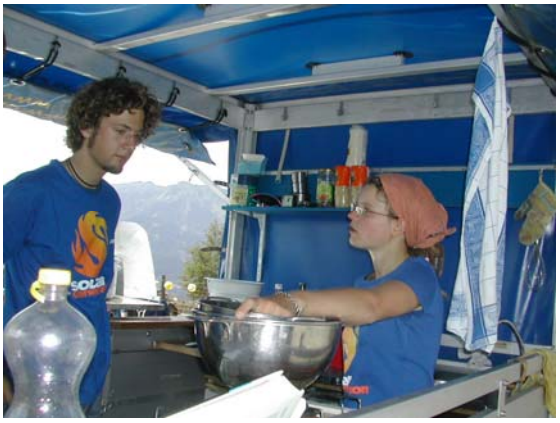
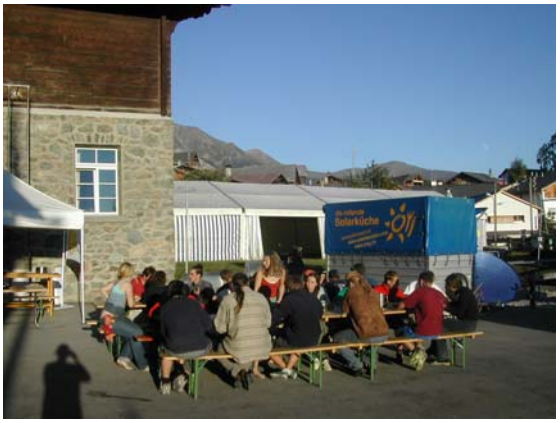
3.6 Second type of use: mobile kitchen for summer camps

In the first years, the kitchen has also served as 'catering service' for parties and ecological events. We prepared dishes like couscous, chilli con carne, soft cheese with potatoes, curry with rice, coffee and tee. An example:

Couscous in front of the Swiss government in Berne: In 1999, a youth demonstration took place in front of the Swiss government building. The mobile solar kitchen was used for the catering at the end of the event.
The kitchen had access to the place at 1 PM only, despite the fact that 200 people were to be fed at 6 PM. 60kg of vegetables were peeled and chopped in the morning in a private house. As soon as the kitchen was set up, cooking started on two Scheffler dishes and one SK14 parabolic cooker. Every load of vegetables or chick peas was brought to cook and immediately shifted to a 'hay box' to make room on the cookers for the next load. The cereals (couscous) were of a simple type which needs to be covered by boiling water only. About 250 dishes of couscous were ready to be served at 6 o'clock!

Slowly, we moved from single day catering to weekly engagements to provide food for youth groups during summer camps. The mobile kitchen can feed 20 to 40 people 3 times a day. Most bookings are youth camps from Greenpeace's 'Solar Generation' youth campaigns. The kitchen is run by only one person from our side who is assisted by two youngsters of the group. The helpers are assigned to the kitchen all day and change every day. Another group is responsible for cleaning the dishes after every meal. In 'Solar Generation' camps young people build a photovoltaic or solar thermal installation within a week. Helping in the kitchen is not seen as a service, but as a chance to learn how to cook with sunshine! An example:

Greenpeace summer camp in Ruswil, Switzerland: The 2008 Ruswil camp combined groups of the international 'Solar Generation' youth camp – participants aged between 16 and 22 years and coming mainly from Europe - and the 'skill share' camp of the leaders of all GP youth projects. Latter participants were from Europe and Asia. All together, between 30 and 44 hungry people had to be fed three times a day! On the menu were nourishing meals based on cereals, potatoes and pasta like spaghetti, lentil soup, spring rolls with rice, vegetable salad, etc.

	
Greenpeace volunteers preparing food for their group in a youth camp.	*Food is ready in a youth camp.*

3.7 Technical issues

Almost as important as the solar equipment is the way how to handle bad weather and reduced sunlight in the late afternoon. Besides the solar cookers listed earlier, the kitchen is equipped with two standard propane gas stoves.
It's most striking feature, however, is a unique cooker using wood 'pellets' (chips of compressed sawdust) as a second renewable energy source. This woodstove is a commercially available barbecue set which provides an automatic supply of wood pellets. An optimised burning chamber with room for one cooking pot was added as well as a chimney. Unluckily, the wood pellet stove needs electrical energy for the fan and for the 'worm' transporting the pellets. We tried using a solar panel with a battery, but since we use this cooker on *rainy* days only, too big a battery is needed to cook on several successive rainy days. We therefore use electricity from the grid and gave up the idea of total autonomy on rainy days.

For pancakes, a special Scheffler cooker equipped with a heat storage unit based on a phase change material (metallic tin) can be added to the kitchen. This storage unit allows to continue cooking when a cloud is passing and when the sun is getting weak in the evening. Actually, one of the problems of the 'crêperie solaire' is that clients are less hungry at the hottest moments of the day, but they queue up as soon as the sun is getting weaker. The storage unit responds to that demand to a certain degree. On the other hand, there is only enough energy stored for a dozen or two of pancakes and it does not really allow selling at night. The metal also takes some time to get hot before the first pancake can be sold in the morning (one hour in perfect conditions, more on less sunny days). Technical details are described in [2].

3.8 Transport

Transport of the kitchen is by far the most energy consuming part of the project. The kitchen is mainly used in Switzerland, but also in other countries like France or Germany. Once it was even used in Croatia. The fuel consumption exceeds the gains from cooking with solar energy

by far. The whole project therefore only makes sense, if it has an educational or promotional value. This question is discussed in more details in [1].

4. Future

After a renovation of the kitchen in 2007 and the replacement of the old steel Scheffler dishes with new aluminium ones, the kitchen can be used for many more years in a similar way, as long as motivated organisers and helpers can be found.

The 'next generation' of solar kitchens needs not to differ a lot from the old one in its ways of cooking, but certainly by its means of transport! This could be a simple unit (more of a snack stand than a kitchen) on a three wheeled cycle, to be used in one city only. Or it could be a unit with an electrical motor run by solar electricity. A new kitchen should also have a fridge run by a solar panel.
Funding for either of these units is being looked for.

5. Conclusion

The mobile solar kitchen was built as a promotional tool and served this purpose very well. Thousands of people have seen it at events, more than one hundred youngsters have experienced solar cooking as kitchen helpers, some 50 took part in crews selling pancakes or food on fairs and music festivals. Selling food and rental fees have been covering expenses and a small remuneration for the crew for several years, but they cannot pay back the investment. Finally, the ecological footprint of this project is dominated by transport, not by the cooking energy.

6. References

[1] 'The 'solar crêperie' - Promotion of Solar Cooking by Selling Pancakes', Michael Götz, Paper presented at the 'Encuentro Solar 2002' in Benicarlo, Spain in June 2002

[2] 'Liquid Tin Heat Storage for Scheffler Parabolic Cookers', Michael Götz, Paper presented at the 'Encuentro Solar 2003' in Benicarlo, Spain in June 2003

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