



sun connect

rural electrification with photovoltaics

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Harald Schützeichel

Solar rubbish for rural people

Currently, organizations and enterprises are outbidding one another with their announcements of how many people they will supply with light. Talk is of hundreds of thousands or even a million. These success stories announced at conferences in reality often turn out to be no more than hot air.

Most “success stories” are based on the use of small solar lamps produced at a cost of less than fifteen US dollars. What people in the rural regions of Asia and Africa get for this is a dim LED lamp with a battery that rarely has a lifetime of more than a year. The cheap plastic housing lasts no longer and is thrown away together with the battery. Repairs or exchanges are intended as little as recycling. More disturbing than the ecological damage caused by this solar trash is the question: How are users meant to experience solar energy as an energy source to be taken seriously, one that fosters their economic development? The message given here is: Solar energy is for the poor.

The success is in terms of marketing. These users are henceforth cited in the success statistics of international conferences, and carbon dioxide certificates are sold for their old kerosene lamps. Regrettably, ever more large foundations and organizations are giving in to the temptation of such illusory declarations of success.

A different scenario is also possible: More and more people in developing countries have the possibility to make comparisons and know what quality is. And they are willing to pay for it—should they even be offered such solar products. And if a stable, durable solar product is, in the end, too expensive, then there are often MFIs available, allowing for installment payments.

Sustainability is costly, but it is the only way to lead people in rural regions of Asia and Africa out of poverty on a permanent basis. These people should not be misused by being sold solar rubbish as technology of the future.

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“Fill’er up!”

Approximately eighty percent of the rural population in Africa is not linked to the supra-regional electrical supply. Alternatives, such as petroleum or batteries, are not only expensive, but also cause additional problems when it comes to disposing of them. In Senegal, the Energy Kiosks developed by Kaïto provide relief.



The “Energy Kiosk” is a small, decentralized village electrical plant based on solar energy; it is equipped with a central PV facility with a charging station. For a fee, the village residents can “fill up on electricity” there, and, for example, charge lamps, mobile phones, and other batteries. In this way, they are able to cover their primary energy demand. In addition, they can use an AC connection, and a freezer to make ice for refrigerating their food. The facility functions independently and can be expanded if necessary. The rural population thus progressively enjoys the benefits of an electrical supply. Producing electricity at the site where it is used saves the material and costs necessary for laying cables. User fees for fill-ups, which also cover maintenance and replacement batteries, run roughly the same as the costs for the kerosene previously used by village dwellers to run their lamps.

The Energy Kiosk, an in-house development by Kaïto, arose in close collaboration with partners in Senegal. The greatest challenge was to simplify the highly complex European PV system for the local African market. “It is not possible to simply export to Africa a system that works perfectly in Germany. We carried out a number of discussions on site in order to figure out what the electricity would be used for, and what the facility had to be capable of achieving,” explains Wolfgang Hofstätter, responsible for technology at Kaïto.

The modular concept foresees a stepwise development of individual solar facilities in villages through to supra-regional networking into energy clusters. A comprehensive network of village kiosks is the first stage. With an increasing energy demand, the plan is to expand with a vegetable oil or wind power facility and join together as a regional electricity network.

Three kiosks, each with a yield of 1 kW, were installed in spring 2009 in the Senegalese province Casamance, five further facilities followed by the end of the year. Aiming for a comprehensive solution, by the end of 2010, a network of twenty kiosks should cover the country’s southwest province.

They are financed by private economic means, without subventions. The facility must therefore generate a return and all electricity must be paid for. “If something is free, it is often not considered valuable; this is also true in Africa,” says Heidi Schiller, co-owner of Kaïto. The financing is carried out through Kaïto Energie AG, local marketing is taken care of by the appropriate subsidiary. The building site and the construction costs of the kiosk are covered by the village community. In this way, the investment costs are lowered and the electricity can be sold at a slightly lower price.

Perspectives for structurally weak regions

The facilities also create jobs on site: local business people run the kiosks as Kaïto’s partners. They are chosen by the village community and receive a basic salary and a commission. Installation and maintenance are taken care of by local electricians. The electricians are trained by Kaïto and are also capable of carrying out repairs and maintenance at other local firms. During the installation phase, Kaïto is, indeed, on site, but at start-up, responsibility is handed over to the African business partner.

The Munich enterprise was awarded the German Solarpreis (solar prize) in the category “Eine-Welt-Zusammenarbeit” (One World Cooperation) in autumn 2009 for the “comprehensive solution in the area of rural electrification.” *me*

Energy Kiosk in numbers

Preparation time:	3 months
Construction time:	6 weeks
Investment costs:	according to the yield 3000–10 000 € (without building and rental equipment)
Space needed for the solar collectors:	ca. 15 m ² on the roof
Running time / lifetime:	solar technology: 20 years; electronics: 10 years; batteries: 5 years
Max. daily yield:	600–1800 W
Burning time of a rental lamp:	ca. 12 hours
Average rental time:	4 days
Average catchment area:	within a radius of ca. 3 km
Number of households covered:	30–100
Minimum earnings for a kiosk operator:	ca. 50 € monthly
Average maintenance interval:	four weeks