2ND PRIZE

# ENERGY FOR LIFE - BEST PRACTICE AWARD 2011

## *System / Location*

## *Water pumps, driven by photovoltaic modules / Bolivia*

In total 4 systems of water pumps with solar panels and tanks for water storage were installed in small villages. The money for the equipment and for the engineers who planned and organised the installation came from the German Bank Bundesministerium für wirtschaftliche Zusammenarbeit (BMZ) (75%), while 25% was collected by KarEn from private donors. The inhabitants participated in the installation; their work is their share as they do not have the money to pay. The installation was made by experts from Energética (Bolivian NGO) together with the local inhabitants. Energética also did the training of the people and will maintain the systems for the first two years. After these two years the people will be able to maintain the system by themselves. After finishing the installation the beneficiaries started to regularly collect a small amount of money, which will be kept to pay any costs in case there are broken parts, after the first two years.

**Planning/Installation**
Energética, Cochabamba, Bolivia
www.energetica.org.bo

**Donation/Support**
Bundesministerium für wirtschaftliche Zusammenarbeit BMZ (75%), privat donor (25%)

**Operator**
The people themselves

## PROJECT DATA SHEET

| | |
|---|---|
| Year the installation started operating | 2010 |
| Type of system | Water pumps driven by a photovoltaic system |
| Type of energy produced | Electricity for pumping water into tanks |
| Location | Villages in the Department of Oruro, Municipality of Belen de Andamarca |
| Geographical position | Uplands of Bolivia |
| Size of installation | One system: two panels of 54 W, one water pump, one tank and tubes, in one village they only need tubes to get access to swelling |
| Thermal Power of installation | one system: 108 W |
| Use of energy produced | Pumping for drinking needs, lamas and fields |
| Quantity of energy produced per day | One system: approx. 575Wh/d |
| Type of financing | Grant |
| Source of financing | BMZ and private donors in Germany |
| system investment cost | 61,880 € project costs in total |
| System cost per watt | 6.5 € per W only the panel |
| Income generated from installation | Sufficient drinking water for the inhabitants, possibility to grow more animals, vegetable garden, which will help the inhabitants to get sufficient food, especially vegetables |
| Maintenance cost per year | For the first two years the maintenance is included (Energética), during this time the people are trained to maintain the systems themselves |
| Fossil fuel savings per year | To pump the same amount of water with a diesel generator means an amount of 500 l diesel/a (all systems) |
| CO2 reduction per year | It is not really a reduction, because without the project, people are too poor to buy a diesel generator, means people would continue living without sufficient food and water, equivalent for produced energy would be 1,300 kg/a (all systems) |
| Number of beneficiaries | 4,000 persons |
| Presence of renewable energy country programme | Yes |

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### LEGAL FRAMEWORK

No special programme is supporting this project.
A contract with the local government was signed confirming that they will give financial support, if after the first two years, parts of the installation have to be changed and the cost cannot be paid by the inhabitants.

### FEASIBILITY, SUSTAINABILITY AND REPLICABILITY

Yes, it offers the inhabitants the possibility to get sufficient water and food; they can increase the amount of lamas or till more land to grow sufficient food to reach a good nutritional level for themselves and for their children. Therefore people are really keen on this project. This leads to a great interest in the correct function of the system. They really like to participate in the work and to know how it works and how to maintain it. Neighbouring villages are also interested. Renewable energies are very well received by indigenous populations because of their strong connection to the “mother earth”; the people share their good experiences with their neighbours.
The financial sustainability is described above. We (KarEn and Energética) started the next project with the same aim, but with a larger investment. Additionally we are working to involve the government.

### SOCIAL IMPACTS

The improvement of the living situation gives the chance for people, especially young persons, to stay in the community alongside their families. They are not forced to leave their families to look for a poorly paid job in urban regions, if they manage to find employment, and to suffer humiliation because they are indigenous. They have the chance to continue with the work they are experienced in, farming or lama breeding. Moreover, the old people are not left alone.
The more of these installations exist in a region, the more the necessity for local technical support, thus creating jobs and generating income. Before the project, people did not have sufficient food and water. Especially in the dry season they had to leave their homes to find water. They did not see a future because of the climate change which brings less rain than years ago; and this phenomenon is getting worst. Therefore, many people left their homes, trying to get some income in the urban regions. The systems helped the people to control last year’s dry season without suffering a shortage of water.

### FINANCING AND FINANCIAL IMPACT

The financing scheme works perfectly.
As described above, the involvement of the beneficiaries consists in their participation in the work and now in paying a small amount every month as to ensure maintenance. The inhabitants have not been involved in the financing, but it was their decision to collect money for possible repairs. Due to the fact that the people now have sufficient drinking water and food, the costs of the project could even have been significantly higher with satisfactory result. This implies that the cost to benefit ratio is perfect.

### ADDED VALUE

This project gives support to indigenous people (women, men and children) to improve their living condition and gives them the opportunity to stay in their community with their families and maybe create a small income by selling additional vegetables and lamas. Moreover, elderly persons are not left alone. In one community where the implementation of the project was organized by a woman, the project improved the standing of women, because the men could see that one of their women achieved a major improvement in the living conditions for the whole community.
Our aim is always to spread the knowledge of renewable energies especially to disadvantaged people. Not only can renewable energy improve their living conditions and open possibilities for the communities, but it can also bring them into real contact with these clean technologies that are the basis of our future energy supply.
Additionally, such projects can bring a community together as the whole community has to discuss and overcome internal difficulties to realize the project as a joint venture.