

## ENERGY FOR LIFE - BEST PRACTICE AWARD 2011

*System / Location*

*Generator Zero - Power Backup System / Tanzania*



In Tanzania 14% of the population has access to grid electricity while access is only 2% in rural areas. The current electricity supply by the national utility, TANESCO, is not reliable. In April 2011, the power cut in Dar es Salaam was registered at an average 10 hours per day. In the business centres, entrepreneurs use petrol and diesel generating sets for power backup supply systems. The leading centre for having the most use of the petrol/diesel generating sets is Kariakoo, Dar es Salaam. In Kariakoo, it is estimated that there are 450 generators, and this number is growing. When the generators run they pollute the environment by emitting CO<sub>2</sub>, noise, and oil spillage.

Petrol generators use an average of 3 litres per day of fuel, and run an average of 6 hours per day. On an average, generators are used 6 months per year, when the power generation by the national utility is low due to the low level of water in the dams. During the year 2009, Tanzania Renewable Energy Association, TAREA, started an environmental pollution mitigation project by providing an alternative energy supply system to the national grid, using a grid charged battery backup system. The same year, 3 demonstration stations for raising awareness were installed in 3 shops. The project has to date resulted in the replacement of 95 gasoline generators. In October 2010, the project was modified by using a Solar PV Charged Battery Backup System. The second innovation added to the project was the reduction in the size of the battery bank as the use of a large number of batteries adds to the problem of pollution due to the difficulty associated with proper battery and acid water disposal. The Solar PV Charged Battery Backup System supplies electricity to the photocopier shop at the college. The equipment supplied includes a desktop computer, a printer, a scanner, 3 lights and a photocopy machine.

### Planning/Installation

ENSOL  
www.ensol.co.tz

### Donation/Support

Deutsche Tansanische Partnerschaft eV  
www.d-t-p-ev.de

### Operator

Tanzania Renewable Energy  
Association  
www.tarea-tz.org

### PROJECT DATA SHEET

Year the installation started operating	2009
Type of system	Solar
Type of energy produced	Electricity
Location	Mabibo, Dar es Salaam, Tanzania
Geographical position	Latitude: 6° 47' 60 S, Longitude: 39° 13' 0 E
Size of installation	Not applicable
Thermal Power of installation	405 W
Use of energy produced	Lighting, photocopying and computers
Quantity of energy produced per day	1,822Wh
Type of financing	Grand/own money contribution
Source of financing	TAREA and Deutsche Tansanische Partnerschaft eV
system investment cost	US \$ 5,400
System cost per watt	US \$ 13.33
Income generated from installation	US \$ 2,200
Maintenance cost per year	US \$ 200
Fossil fuel savings per year	1,375 litres
CO <sub>2</sub> reduction per year	2,650 kg
Number of beneficiaries	Direct: 400 shops, indirect 4 million people
Presence of renewable energy country programme	Yes. The government of Tanzania supports and implements renewable energy projects.



## ENERGY FOR LIFE - BEST PRACTICE AWARD 2011

### System / Location

### Generator Zero - Power Backup System/Tanzania

#### LEGAL FRAMEWORK

The Tanzanian Government has promulgated the Environmental Act of 1997, which insists on the production of clean energy as mentioned in paragraphs 28. In paragraphs 40 to 42, the Government of Tanzania opens the door to the NGOs and private sectors to participate in the efforts of protecting the environment. On this basis, the Tanzania Renewable Energy Association had the possibility of implementing a project of awareness raising to the members of the community using alternative source of electricity as to replace gasoline generators.

The Government of Tanzania does not have a financing program for small projects like ours. It offers grants to the large power generation projects. The government of Tanzania has a National Energy Policy that supports our project.

#### FEASIBILITY, SUSTAINABILITY AND REPLICABILITY

The project has a tangible impact on its target group. Those shops that already installed the solar backup systems do not experience the problem of noise and greenhouse gas emissions. The project has a multiplier effect as it includes a campaign to educate the target group as to increase the number of installations. Last year, 30 systems were installed.

The project is sustainable as the installed system is privately owned. The systems used by TAREA for education are financed 80% by TAREA and 20% partner (shops). The systems that are installed through replication are paid 100% by the owners.

#### SOCIAL IMPACTS

The project raises awareness for the members of the community regarding the availability of alternative energy sources to access electricity. The project improved the health of the members of the community and reverses the process of climate change. The project minimizes the production of greenhouse gases that have a negative effect on human health and the environment.

Members of the communities (households) purchase the solar lanterns as a consequence of the project, after perceiving the potential of Solar PV Technology. In this way, households save money from the escalating prices of kerosene and have clean indoor air. Before the project was implemented the target group faced the problem of noise and smoke in the shops. They further spent a lot of money for the purchase of gasoline. Nowadays, those who have installed the system can now live without noise and in the absence of greenhouse gases.

#### FINANCING AND FINANCIAL IMPACT

The financing scheme was suitable for the search in a system where the target group contributed part of the costs for the demonstration stations while others had to pay 100% of the cost. The beneficiaries contributed 20% of the cost of the demonstration kits while beneficiaries now have to pay 100% of the cost to get the system installed.

Once the system is installed, it is 100% owned by the target group and as such, beneficiaries must take full financial responsibility. The results show that the system will be paid back within 3 years while the major investment, which consists of the batteries, will be paid back after six years.

#### ADDED VALUE

The project has major added value for environmental protection. The project results in a clean environment by reducing/eliminating the noise and greenhouse gas pollution.

