# COMMUNITY SOLAR-WIND HYBRID ELECTRIFICATION AT ELUNYENI, MZIMBA DISTRICT IN MALAWI

## 1.0 BACKGROUND INFORMANTION

Malawi Government through the Department of Energy is implementing a village electrification project using Solar-Wind (Hybrid System) in villages in few districts where there is no access to the national grid provided by Electricity Supply Commission of Malawi (ESCOM). The total cost of the project for each village is K50 Million Kwacha (150, 000.00 US.$). The project concept is to electrify a village using a centralized Solar-Wind Hybrid System (60% Solar and 40% wind) with an estimated system output capacity of 25kw. The aim of the project is to transform the rural communities who are far from the national grid. One of the beneficially is Elunyeni village in Mzimba district situated about 70 km away from the City of Mzuzu in the Northern region of Malawi. The figures 1 and 2 below show some parts of the solar-wind hybrid system at Elunyeni village in Mzimba.

**Figure 1: Solar panels of the Solar-Wind Hybrid System**

**Figure 2: One of the three wind mills of the Solar-Wind Hybrid System**

## 2.0 SOLAR-WIND HYBRID ELECTRIFICATION AT ELUNYENI

The Solar-Wind Hybrid System at Ulunyeni was installed in 2007 and there were 150 houses benefiting from the project. The project is managed by the community through an established committee and the Department of Energy provides technical services. Currently, there are 128 houses benefiting from the projects. Each house hold has five lighting points and one socket outlet. Each household pay a minimum contribution of K200.00 per month (0.56 cents of a dollar) towards security of the system as well as salary of the operator.

## 3.0 APPLICATION OF THE SOLAR-WIND HYBRID ELECTRIFICATION

This solar Solar-Wind Hybrid System provides both electricity and water to the people of Elunyeni and surrounding villages.

## 3.1 ELECTRICITY PROVISION

All the 128 beneficially houses at Elunyeni have access to electricity for a period of three hours in the evening. The system has improved the life standards of people from the village because the are no longer using paraffin for lighting in the evening, and they have bought TV Screens and other electrical equipments like fridges to be used for business. Economic activities of the area have increased as they continue to take place even during night as illustrated in Figure 3 below.

**Figure 3: Business taking place at night**

At times electricity is provided in the afternoon when there is an important event which people can watch from television. Besides connection to houses the village has some street lights as shown in the figure 4 below.

Figure 3: A **house which is benefiting from the Solar-Wind Hybrid System and a streetlight**

Besides houses, a community secondary school with 141 students and 7 teachers is also benefiting from this Solar-Wind Hybrid System. This has tremendously improved their performance during exams as students are able to study comfortably at night. As for teachers the system is an incentive which has led to improved teaching performance and they are able to prepare their lesson plans during the night as their houses are also electrified. Electricity has also managed to retain teachers holding bachelors degrees to teach at the school. The churches in the village are no exception from benefiting from the system.

## 3.2 WATER PROVOSION

The solar Solar-Wind Hybrid System also provides water to the inhabitants of Elunyeni village. The system assist in pumping water from underground and the water is stored into a tank before distribution. The system has improved the access to water in the village tremendously and even the surrounding villages are able to access water.

## 4.0 PROBLEMS FACED BY THE COMMUNITY

- Out of the 140 batteries used by the solar wind hybrid system, only 80 are working, this has negatively affected the efficiency and output of the system.
- The operator of the system has very little knowledge of the system such that he consults the energy department for assistance in all the problems of the system.
- Only one out of four classrooms of the community secondary school has electricity connection and the school computers are not in use because of the shortage of electricity supply.
- The tank which keeps water before distribution has a capacity of 100 litres and this cannot sustain the entire village.

## 5.0 RECOMMENDATIONS

- There is a need to replace the 60 batteries which are not working in order to improve the efficiency as well as the output of the system.
- There is a need to build the capacity of the operator of the system so that he may be able to handle some of the problems of the system
- The power output of the system should be upgraded to allow electricity provision to the nearby health center, connection to more blocks of the community secondary school as well as provision of electricity in the afternoon.
- There is a need to scale up the project so that other areas of the country may also benefit