Introduction to the MDG10,000PVP

The attached sheet, reading across, demonstrates how the power of the Sun is converted into useful applications which improve the quality of life.

Solar Energy

Solar photovoltaic technology converts light energy into electricity, while solar thermal technology uses direct heat from the sun (typically to heat water). The insolation map shows the distribution of solar energy in Nigeria. The lower insolation is greater than 3kWh/m²/day. Six highlighted states in the adjoining map are the EU-PRIME focal states. The third figure is a compartment layout of an MDG400PVP unit. [A] Holds 1 solar vaccine refrigerator, [B] A refrigerator or freezer, to make ice and cool beverages for sale. [C] Solar and automobile batteries are charged here. Battery charging is a necessary application to sustain operations. [D & E] Multi-purpose room(s) have a movable partition. 

Benefits

Pictures show a barrow water-vendor distributing water, deep-cycle 2V solar batteries (of high capacity and exceptional endurance), small solar home system kit (battery required), and satellite phones for communication outside GSM coverage and via GSM networks where available.

8 MDGs

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development

Applications

Respectively: a Sunfrost vaccine refrigerator, a Sundanzer refrigerator, an 800W Grundfos SQ Flex pv water pumping system, a multiple battery charging system and several internet-connected PCs.

Solar Systems

A typical solar pv system comprises an array (modules) producing direct current (DC) electricity which is regulated by controllers and stored in batteries to be used by loads (e.g. refrigerators, pumps, fans, phone, TVs, drills, etc.). Shown in the next picture is a schematic of the communication system at a pv site which is being monitored, in order to validate its real time energy production data and automatically to track pv system performance.

The National Programme on Immunisation (NPI) is distributing solar photovoltaic (pv) vaccine refrigeration systems nationwide, and intends to install them in every local government district over the next few years. The primary use of the equipment is to strengthen routine immunisation.

Harnessing Technologies of the Sun for Millennium Development Goals in Africa

Figure 1 The MDG10,000PVP - To support Regional Capacity Building

The container in the foreground, with doors marked A to L has the facilities described overleaf. Behind it, on the ground, is a warehouse unit to store modules and balance-of-system components. On the next level are two residential containers, with bedroom and office facilities. Both levels are separated by an insulated floor with a ventilation atrium. The third level is a tank container, holding 24,000 litres of water. Water is automatically pumped from the borehole during the day, and the tank acts as a buffer while water is discharged to water tanker lorries. The buffer ensures that no water is wasted.

Total energy (kWh) generated and used, and water volume (litres) pumped, is monitored and information transmitted via GSM or VSAT to the national network operator, who can monitor all systems on a PC.