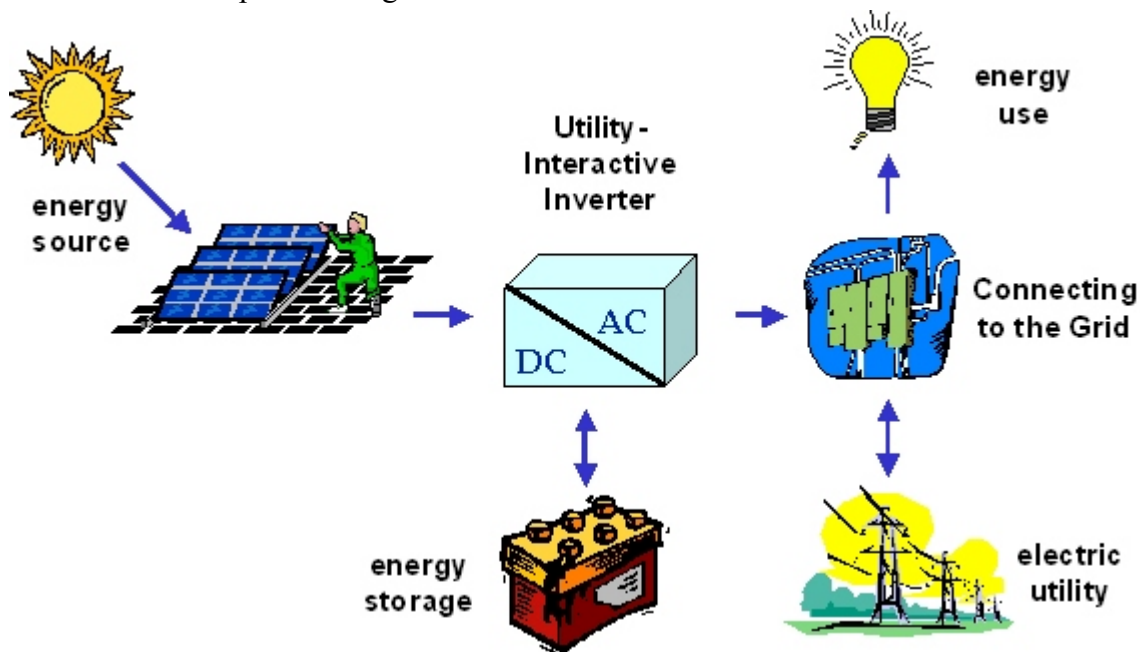




SunSmart Schools Emergency Shelter Program Information



As part of the SunSmart Schools Emergency Shelter Program, each shelter school will be competitively selected to receive a minimum of 10 kW Photovoltaic (solar electric) emergency shelter power system. This system will feature a battery back-up that provides power to critical loads in the emergency shelter in the event of electrical power outage.



The Photovoltaic System Equipment

The program's solar electric photovoltaic (PV) system is directly connected to the utility grid during normal operation, but can also operate independently from the electric grid using the batteries in the system. The PV system includes only UL-listed hardware and meets all local, state, and national electric code and utility equipment and interconnection requirements.

The PV system primarily operates in parallel with the utility grid. Should utility power be lost, the PV system will automatically switch to stand-alone mode as required by utility safety requirements. The AC power from the PV system will be tied into the building's critical loads circuit panel for connection to the facility's 120/208 three-phase service.

Each system features a photovoltaic array using modules that have been tested and approved by the Florida Solar Energy Center (FSEC). A 10-kW PV system requires approximately 1000 sq. ft. of unobstructed, unshaded space—larger systems need incrementally greater space. The system also features one or more inverters which convert DC electricity from the solar panels to AC electricity which can be used by items in the school.

The Data Collection Equipment

The Florida Solar Energy Center will use hardware that is connected to the photovoltaic array to collect and display data. This data (in 15 minute data points) can be used in classroom learning objectives. The data is automatically analyzed to display daily and cumulative electricity generation. The software will calculate and display avoided production of certain air pollutants that would have been emitted had the electricity been generated instead by the typical energy mix of power plants in Florida.

The Energy Whiz website includes the following teacher and student friendly features using data from your school:

- general school information and photo
- kWh meter (electricity)
- DC power, current and voltage (electricity coming from the solar array)
- AC power, current, and voltage (electricity going into the electric grid)
- irradiance (solar radiation)
- ambient temperature (outdoor air temperature)
- module temperature (temperature of the solar panels)
- amount of air pollutants avoided by the use of the PV panel versus what would have been produced had fossil fuel electric power plant electricity been used.

Mounting Options

Several mounting options for the system are available:

- **Roof Mount:** The PV system can be mounted on the south-facing side of a roof, using an aluminum and stainless steel mounting system. Any penetrations to the roof are completely sealed.
- **Ground Mount:** The PV system is mounted on the ground behind a locked fence. The modules are raised by using aluminum legs.
- **Pole Mount:** The modules are mounted on a metal or concrete pole located on school grounds.
- **Canopy Mount:** The PV system is mounted so that it provides roofing over a walkway, or becomes a canopy over an entrance or a bank of windows.

Permitting, Installation and System Commissioning

The PV system installer has assumed responsibility for designing, installing, commissioning, and maintaining the PV System during the program. The installer will be expected to coordinate with the local utility to ensure that the system is properly interconnected to the utility grid and that all the necessary permits are secured. The installer will obtain all necessary building and electrical permits from the responsible jurisdiction, and also assist school and district personnel in completing the required interconnection agreement from the local utility. The Florida Solar Energy Center (FSEC) will conduct an acceptance test on each site upon system commissioning.

Product Warranty

Inverters have a standard five-year unconditional warranty, which states that the inverter will be free of defects in materials and workmanship. The warranty states that the manufacturer will, at its option, repair or replace the inverter, refund the purchase price, or provide the purchaser with a new inverter, provided that the degradation is determined to be due to defects in materials and workmanship under normal installation, application, and use. Installers or FSEC may charge a minimal fee to cover the cost

of additional labor associated with warranty claims.

The photovoltaic modules come with a limited warranty, which states that the power rating of the individual PV modules at standard test conditions (STC) will remain at 80% or greater of the module's original power rating for either a 20-year or 25-year period, depending on manufacturer. The warranty states that the manufacturer will, at its option, repair or replace the product, refund the purchase price, or provide the purchaser with additional modules to make up for lost power. Installers or FSEC may charge a minimal fee to cover the cost of additional labor associated with warranty claims.

Five-Year System Warranty

The system installer warrants the school's PV System to operate as specified in the installation manual and to be free of material and labor defects for a period of five (5) years following the date of commissioning. This warranty runs in parallel with the module and inverter warranties.

Educational Component

The overall educational goal of this program is to increase the number of educators who teach the science and technology of renewable energy and therefore increase the number of students who are exposed to these concepts.

The energy education component of the SunSmart Schools Emergency Shelter program will create a venue for teachers to explore renewable energy, energy efficiency and energy conservation using inquiry based activities, as well as materials in science kits and data presented on the Energy Whiz website. Through expanded content knowledge, educators will gain confidence and understanding of the energy concepts to help them in teaching these concepts in the classroom.

Educational Objectives

- Students will gain a basic understanding of how solar thermal and photovoltaic systems work
- Students will improve their skills in science and mathematics through the use of inquiry methods as they explore concepts of energy
- Students will understand the importance of renewable energy, energy efficiency and energy conservation to their future
- Students will be exposed to careers in the renewable energy and green industries

Program Timeline

- March 29, 5:00pm EST - School application due date
- April 9, 2010 - Selected schools will be posted and notified
- April 14, 2010 - Informational Webinar
- August 2010 through February 2012 - Teacher and Facility Managers workshops
- April 20, 2012 - All systems installed, program closing date.

The Florida Solar Energy Center reserves the right to extend these deadlines if deemed necessary.

Program Implementation

The school will send a minimum of two faculty members to attend a six hour regional orientation workshop hosted by the Florida Solar Energy Center. The workshop will provide educators with valuable guidance on incorporating the FSEC solar educational materials and curriculum into the classroom as well as using the EnergyWhiz web based learning tools. A kit of hands-on solar classroom

laboratory materials will be provided to each school, as well as a stipend for either travel or substitute pay. Each teacher upon attendance will also receive classroom curricula materials.

The school will send a minimum of one facilities management personnel to attend a seven hour regional facilities manager workshop hosted by the Florida Solar Energy Center. This program will provide facilities managers with tips for appropriately and safely operating, maintaining and troubleshooting their PV system, as well as additional information about efficient building use and energy practices. County emergency management personnel will also be invited to participate in the facilities manager workshop.