

Solar Photovoltaic (PV) Systems Descriptions & Components:

A PV system is sized based on your energy usage and the type of system chosen, discussed further below. The system components consist of one or more PV modules that resemble skylights. PV module output is based on the number and efficiency of the solar cells it contains. Solar cells are made from semiconductor materials that convert sunlight directly to electricity. PV modules have no moving parts and unlike conventional back-up generators there's no need for annual maintenance or periodic start ups not to mention any fuel costs. The other system components depend on the type of system.

- ❑ **Day use systems** directly power a direct current (DC) appliance w/ no storage. Examples include a PV module connected to a water pump, a fan or the circulator on a solar DHW system. These are the simplest systems which include a PV module and a compatible DC device.
- ❑ **Battery charging systems** where solar energy is stored for use at any time. PV modules are connected to a charge controller then to a battery bank which can power DC loads directly. Note recreational vehicle and marine systems often use DC devices. If alternating current (AC) is required an inverter is used to power these more conventional appliances.
- ❑ **Utility Grid interconnected systems** send excess PV electricity not used by the home/business back to the grid. PV modules are connected to a grid-tie inverter which connects to the main breaker panel. These systems incorporate safety switches that shut off the power to the grid if there is a power failure. Another option is to incorporate a battery bank to provide power during a blackout.
- ❑ **Hybrid independent power systems** are usually used in sites where the cost of extending the power line is excessive. Since PV power is weather sensitive another power source is used to supplement the battery charging to insure adequate power year round. PV modules are connected to the battery bank and either a propane or gas powered generator automatically charges the batteries as needed.