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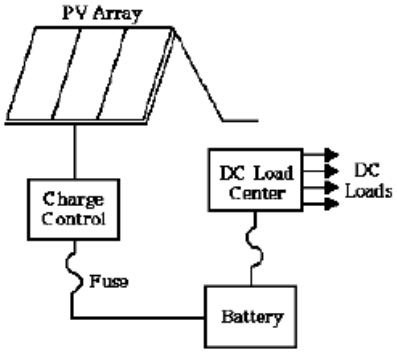
SolarPower

Types of Photovoltaic Systems

Small Stand-Alone DC System

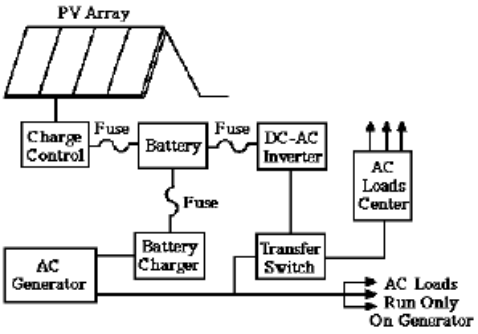


The small stand-alone system is an excellent replacement for propane or kerosene lights in a remote cabin, a recreational vehicle or a boat.

The size of the photovoltaic (PV) array and battery will depend upon individual requirements. The actual sizing methods are discussed elsewhere. The PV array charges the battery during daylight hours and the battery supplies power to the loads as needed.

The charge regulator terminates the charging when the battery reaches full charge. The load center may contain meters to monitor system operation and fuses to protect wiring in the event of malfunction or short circuit in the house.

PV - Generator Combination



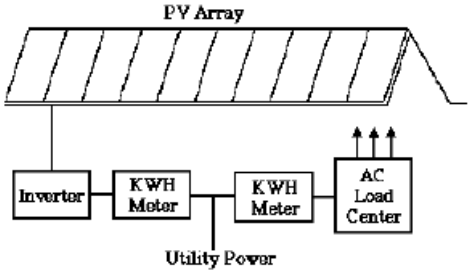
The PV - Generator Combination system may be an economical alternative to a large stand-alone PV system, because the PV array does not have to be sized large enough for worst case weather conditions.

A gasoline, propane or diesel generator combined with a battery charger can supply power when the PV array falls short. If the PV array is sized for average conditions, then during extended overcast situations or periods of increased load, the generator can be started.

When batteries are low, the generator will power the AC loads in the house as well as a battery charger to help recharge the batteries. If the PV array is sized much smaller than needed for normal use, the generator can power peak loads such as doing laundry or pumping water and simultaneously run the battery charger to charge the battery bank.

In addition to allowing for a smaller PV array, a back-up charging system may also allow use of a smaller battery bank. Generator and battery bank size must be chosen carefully for reliable system operation. See the system sizing section for more details on equipment choice.

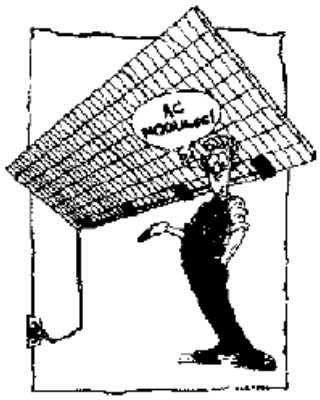
Utility Intertie



The utility intertie system is also used in a grid connected house. Instead of storing power in batteries, it is sold to the utility company. The Utility Intertie System employs a special type of inverter, which inverts DC power from the PV array into low distortion AC, acceptable for purchase by the local utility power company. Batteries are not required for storage.

The power is delivered through a kilowatt-hour (kWh) meter to the utility grid as it is produced by the PV modules. A second kWh meter is used to measure the power consumed by the loads in the house. The user of this system will notice no difference from any utility system, except lower utility bills or possibly payments from the power company for excess electricity that is generated.

AC Photovoltaic Module Intertie



At last ordinary home owners can begin to reduce their dependence on utility power for their electricity. This type of utility sellback system is comprised of PV modules with small inverters mounted on them. This allows the output of the inverter-module combinations to be connected directly to the AC line.

The utility may require a second meter and disconnect. The installation cost of this type of intertie system is much lower than that of a large inverter system.

A small system can be installed, and as finances allow, additional AC PV modules can easily be added to the system.

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