

Off-Grid Solar Systems

Off-Grid or standalone solar systems work completely independent from any utility grid. Batteries are charged during the day by the solar panels via the controller for usage as and when electricity is required. Some high end inverters will also allow a secondary power source to supplement charge to the batteries if required.

Components

- Solar PV panels
- Solar controller / regulator
- Batteries
- Off-Grid DC Inverter

An Off-Grid system involves a battery bank for storage, a solar controller and dc inverter. Optional bi-directional inverters are also available with increased management and functionality. Larger systems will also include a sophisticated battery and system monitoring unit.

Advantages

- No utility grid connection needed – ideal for rural and remote locations
- Own generation facility – no dependency on utility grid
- Not affected by outages
- Long term cost saving
- Capital value added to property

Disadvantages

- Expensive due to battery bank
- Consumption limited and dependant on storage capacity of battery bank
- Limited lifespan on batteries
- More expensive and difficult to install

solar panels



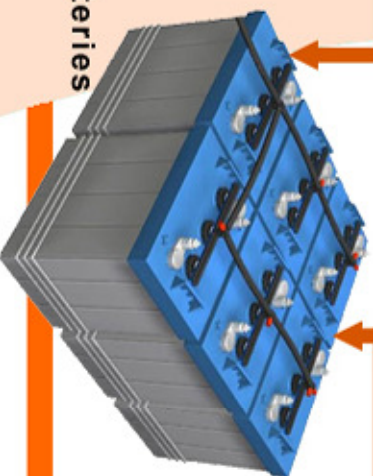
ac/dc inverter



home appliances and lights



solar controller



batteries



optional input source



house db board

grid



Grid-Tie Solar Systems

Components

Advantages

Grid-tied, on-grid, utility-interactive, grid interactive and grid feed-in are all terms used to describe the same concept – a solar system that is connected to the utility power grid. Surplus generated electricity can be fed back into the utility grid at specified feed-in tariffs. These systems feed directly from the solar panels to the utility grid and home distribution board via an inverter.

- Solar PV panels
- Grid-Tie inverter

Grid-tie systems do not have a battery bank or solar controller. The inverter used is also a different type of inverter as opposed to the normal off-grid inverters and would normally have integrated solar pv management. These inverters would normally have an integrated controller managing the power from the solar panels. Sophisticated management technology allows these inverters to adjust phase and match the phase of the grid connection.

- Less expensive than Off-Grid systems
- Cheaper and easier to install
- Shorter return on investment than Off-Grid systems
- More efficient than Off-Grid systems
- Higher monthly cost savings due to feed-in / net metering
- Supply will always be supplemented by the utility grid if required

Disadvantages

- Dependant on a utility grid connection
- Does not generate any electricity during grid outages
- Does not provide power outside daytime sun hours

solar panels



home appliances and lights



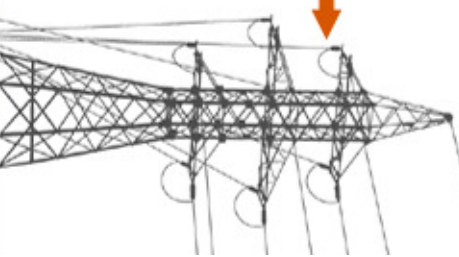
grid inverter



house db board



grid



Hybrid Solar Systems

Hybrid of Grid-Tie with battery solar systems are essentially a combination of both Off-Grid and Grid-Tie systems incorporating the best of both solutions. They can be both independent and connected to the grid - store its own power for use outside day light hours and also feed surplus back into the grid.

Components

- Solar PV panels
- Grid-Tie inverter
- Off-Grid DC inverter (bi-directional)
- Batteries

A Hybrid system involves a grid inverter feeding power from the panels directly to a bi-directional inverter. The bi-directional inverter in turn keep batteries charged and feeds to the distribution board. The grid-inverter can now also feed any surplus to the grid if all batteries are fully charged and no immediate power is being consumed.

Advantages

- Own generation facility – no dependency on utility grid
- Not affected by outages
- Monthly cost savings due to feed-in / net metering
- Supply can be supplemented by the utility grid if required
- Long term cost saving
- Capital value added to property

Disadvantages

- Expensive due to battery bank
- Limited lifespan on batteries
- More expensive and difficult to install

solar panels



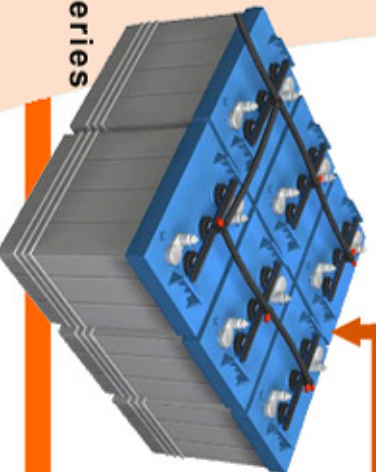
ac/dc inverter



home appliances and lights



batteries



optional input source



house db board



grid

