Components and Outputs

A solar system?s components depend on whether or not the system is connected to the electricity grid. If it is not connected to the electricity grid, the main parts include the solar module, the battery (for energy storage), the battery regulator (also known as a charge controller), attachment structure and associated connections, and wiring. If it is connected to the electricity grid, the main parts include the solar module, an inverter (which translates direct current power to alternating current), associated wiring, and support structures.

A solar system will generate electricity on a cloudy day, though only 10-20% will be captured compared to a sunny day. For systems that are not connected to the electricity grid, the modules charge the batteries. At night, the batteries provide energy. If you are connected to the grid, you can draw on solar energy during the day and switch to the grid during the night.

A solar system should be in a shade-free location. For best energy performance in the northern hemisphere, solar modules should be oriented to the south. In the southern hemisphere, orient solar modules to the north. The system can be retrofit over a roof structure or integrated as part of the main roof structure.

Module Outputs

Solar energy systems are usually marketed in prices per watt peak. A 1 kilowatt (1,000 watt) peak system will generate nearly 1,000 kilowatt hours per year of energy in cloudy climates (northern Europe, Canada, northern Japan), and up to 2,000 kilowatt hours in sunnier climates (the sunbelt states in the US, Brazil, Mediterranean countries, Africa, India, and Australia).

Solar energy systems can be configured to virtually any power load and sized according to the need. For any module with a defined peak power, the actual amount of electricity in kilowatt hours (kWh) depends mainly on the amount of sunlight it receives. The electrical power output of a PV module equals the current that it generates multiplied by the voltage at which it operates. The bigger the module, or the solar array, the more power that is generated.

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