



# Solar panels with individual inverters

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Solar panels, while important, are just one part of the solar array--the complete system that produces energy from sunlight. Another essential component is the inverter, and thanks to technological advancements, there are inverter options. Keep reading as we walk you through what an inverter is, how it works, how different types of inverters stack up, and how to choose which kind of Inverter for your solar project.

A solar inverter is really a converter, though the rules of physics say otherwise. A solar power inverter converts or inverts the direct current (DC) energy produced by a solar panel into Alternate Current (AC.)

Most homes use AC rather than DC energy. DC energy is not safe to use in homes. If you run Direct Current (DC) directly to the house, most gadgets plugged in would smoke and potentially catch fire. The result would be that most appliances, computers, power strips, TVs, entertainment systems, home security devices, and a whole host of other electronics would become fried. Solar arrays use inverters to change the DC to AC, which is safe for home usage.

The solar process begins with sunshine, which causes a reaction within the solar panel. That reaction produces a DC. However, the newly created DC is not safe to use in the home until it passes through an inverter which turns it from DC to AC.

Also known as a central inverter. Smaller solar arrays may use a standard string inverter. When they do, a string of solar panels forms a circuit where DC energy flows from each panel into a wiring harness that connects them all to a single inverter. The inverter changes the DC energy into AC energy. Most standard string inverters are mounted on the home, garage, or near the power meter if the house connects to the power grid.

Microinverters convert DC to AC at the panel level. They differ from a power optimizer in that a power optimizer only deals with DC. The microinverter installation occurs on each panel. Some may be factory installed or physically installed on-site, and there is no central inverter on a solar array with microinverters. The energy conversion occurs at the micro-inverter--on the roof at each solar panel.

NOTE: The initial cost of microinverters may be offset by the fact that their warranty matches the solar panel at 25-years. String inverters have a warranty that ranges by brand from 10-15 years.

A hybrid solar power inverter system, also called a multi-mode inverter, is part of a solar array system with a battery backup system. The hybrid inverter can convert energy from the array and the battery system or the grid before that energy becomes available to the home.

NOTE: Ideal for situations where energy options come from multiple sources--array, batteries, grid. It can also

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be ideal in cases where you plan to add a battery backup.

Oversizing means that the inverter can handle more energy transference and conversion than the solar array can produce. The inverter capabilities are more significant than the solar array maximum energy production rating. Undersizing means that the solar array can make more energy than the inverter can handle. Extra power is lost or clipped.

There is only one situation where you would want oversizing to occur, and that is when a pre-planned expansion of the solar array will occur. Oversizing in that situation saves the owner money by not paying extra labor and buying a bigger inverter during the expansion.

Undersizing can be beneficial if the environmental impact of location, weather, and usage means the solar array will rarely hit its top energy production. There are only a few days when too much energy is produced for the inverter to handle, making buying a larger inverter a waste of money.

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