

Solar Panel Photovoltaic (PV) Systems

Photovoltaic systems use solar cells to capture the sun rays and convert that energy into electricity. Such systems allow homeowners to generate electricity in a clean, reliable, and quiet way that can offset the cost of future electricity costs and decrease their dependence on the energy grid.



Photovoltaic cells are generally made from modified silicon, or other semi conductive materials, that absorb and convert sunlight into electricity. Photovoltaic cells are long lasting (the first PV system ever installed in the USA – in 1954 – is still operating today). Most manufacturers warranty their products power output for a minimum of 20 years. But most solar professionals agree that a system should last at least 25 – 30 years.

Types of Solar Cells

There are three basic types of PV modules: monocrystalline, polycrystalline, and thin-film. All modules work well though monocrystalline cells often yield the greatest efficiencies. Thin-film technology typically costs less and its efficiency is ever improving as demand for solar panels grow. A growing variety of manufacturers and models are available in the marketplace today. A solar pro can walk you through the advantages and disadvantages of each system so that you find a design that performs optimally over its multi-decade long lifespan for your application.

How solar electric systems work

Photovoltaic panels are often mounted on a roof and wired into a building via an inverter. The inverter converts the direct current (DC) energy generated through the solar panels into alternating current (AC), the most common type of current used to power buildings in the USA.

Orienting solar panels to the south maximizes the effectiveness of energy collection, and most roofs – from flat to 60-degrees – can accommodate photovoltaic cells.

For more detailed information on how PV cells generate electricity, check out our [How Photovoltaic Cells Work](#) page.

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Solar Panels vs Building Integrated Photovoltaic Products (BIPV)

Solar panels are flat panels of photovoltaic arrays mounted on a roof or a pole to capture the sun's rays. They are the traditional arrays used to catch energy from the sun. Because of their standalone design, solar panels are well suited for home retrofits or remodels.

Solar photovoltaic cells, however, are increasingly incorporated into building components such as windows, walls, or roof tiles. The effect provides a seamless integration into a building's design since the BIPV components essentially disappear into the skin of your home. BIPV products work particularly well for new home construction or a significant remodel. And because BIPV panels are made for both photovoltaic and

thermal collection systems, designers often place both technologies side-by-side to further maximize efficiencies.

For more information about solar electric costs, visit our Solar Power Cost page or visit our Solar Power Financing Options page for information on how to pay for your system.

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