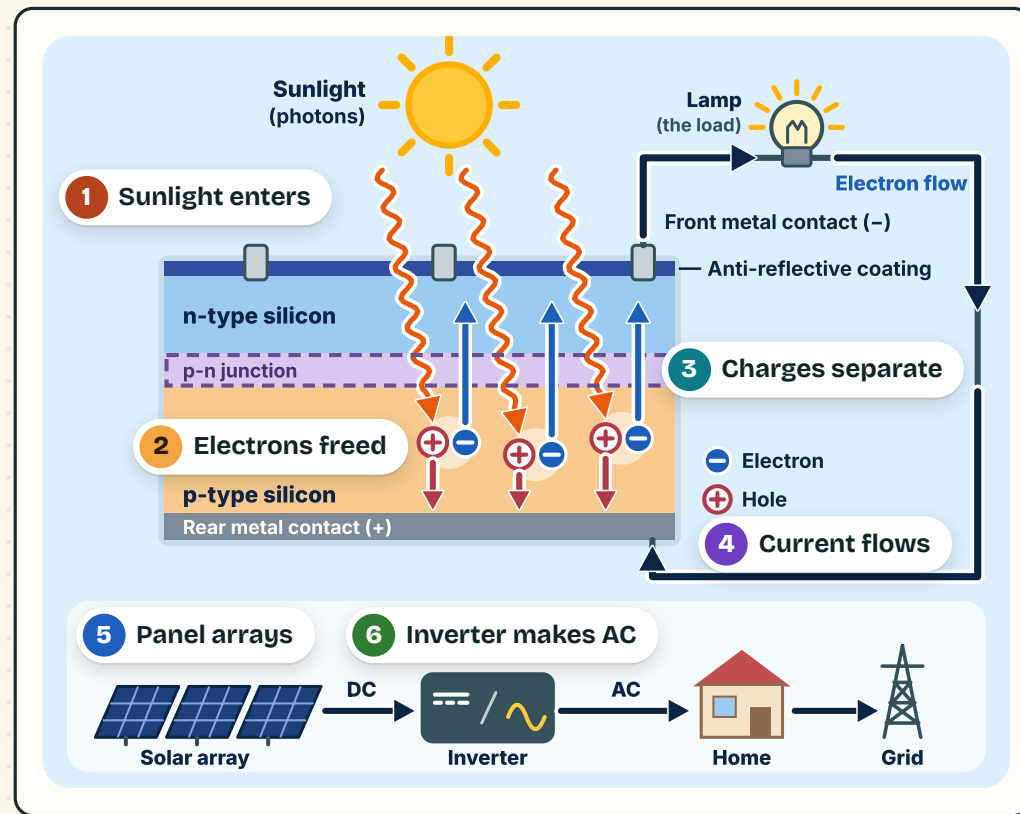


How Solar Panels Work

Inside every panel, thin layers of silicon turn light into a flow of electrons, with no moving parts and no fuel.



1 Sunlight enters

Sunlight arrives as tiny packets of energy called photons. An anti-reflective coating on top helps more of them pass into the silicon instead of bouncing off.

2 Electrons freed

When the silicon absorbs a photon with enough energy, an electron breaks loose. It leaves behind a gap called a hole, which behaves like a positive charge.

3 Charges separate

Where the n-type and p-type layers meet, an electric field pushes freed electrons towards the n-type side and holes towards the p-type side, like the two ends of a battery.

4 Current flows

Electrons leave through the front metal contacts, pass through a load such as a lamp, and return through the rear contact to fill holes. This one-way flow is direct current (DC).

5 Panel arrays

One cell gives very little power, so cells are wired into sealed panels and panels into arrays. Output is highest when panels face the Sun; heat, dirt and shade reduce it.

6 Inverter makes AC

Homes and the grid run on alternating current (AC). An inverter converts the panels' DC into AC so it can power appliances or be sent to the grid.



How much sunlight becomes electricity?

Less than a quarter. The best panels on sale convert roughly 18–22% of the light energy that hits them, and a silicon cell can never do better than about 32%.