

SOLAR EDUCATION 101:

GUIDE TO YOUR FREQUENTLY ASKED QUESTIONS & SOLAR TERMINOLOGY

Q: Is there a way to learn the basics of solar?

A: The internet provides a breadth of knowledge, and sites like IronRidge.com offer solar training materials. Training opportunities also exist through the Department of Energy's [Solar Training Network](http://SolarTrainingNetwork.org).

Q: Will vendors help branch associates and customers learn solar?

A: Absolutely! Many of our branches/districts have already set up training days specific to solar with our vendor partners. Training days are a great way to help your customers and your branch team learn more about renewable energy products.

Q: What products make up a solar job?

A: At ABC Supply, we're selling the essential components of a solar system. They are solar panels, tiles or shingles, inverters, racking and batteries if the end customer wants to store power.

Q: Do I need to know electrical systems to sell solar?

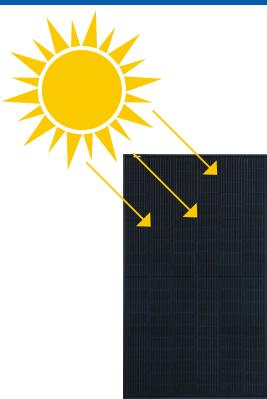
A: No, having a vast knowledge of electrical systems is not necessary to sell solar. However, having a basic understanding of the solar system is beneficial. Solar manufacturers like [IronRidge](http://IronRidge.com) or the Department of Energy's [Solar Training Network](http://SolarTrainingNetwork.org) offer online resources to help you and your customer become more knowledgeable in solar installation and related skills.

Q: Is net metering or battery storage better for the end customer?

A: Different circumstances can make net metering or battery storage more attractive than the other. For example, a battery backup makes sense in areas prone to power outages or if the state has undesirable net-metering policies or no programs available. However, these options don't necessarily need to be an either-or scenario. For example, if a homeowner has a battery and it's full, some municipalities may allow homeowners to feed extra electricity back to the grid for credit.

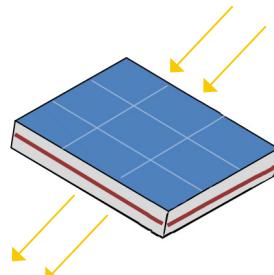


HOW DOES SOLAR WORK?



1 Sunlight

When sunlight hits a solar panel, photons (particles of energy) are converted into electrons.



2 Solar Cell

As electrons pass through the cells of a solar panel, they're converted into direct current (DC) electricity.



3 Inverter

That electricity is sent to an inverter which converts it into alternating current (AC) power.



4 Home Appliances

That AC power runs through your home, ready to power appliances, charge devices and more.

Q: What is solar offset, and how do I calculate it?

A: Solar offset is the yearly difference between the electricity generated by solar panels and the electricity the home uses. It is calculated by dividing the yearly solar electricity generated in kilowatt-hours (kWh) by the annual electricity consumed in kilowatt-hours (kWh).

Example: Solar panels generate 9,420 kWh of electricity in a year. The home used 8,640 kWh in a year. $9,420 / 8,640 =$ a solar offset of 1.090 or 109%

Q: How do you calculate the number of solar panels needed for a specific-sized solar system?

A: To determine the number of panels needed for a specific system size, multiply the home's hourly energy requirement by the peak sunlight hours and divide that number by the panel's wattage.

Example: The average solar panel is around 320 watts. If a job requires a 4kW system, divide 4 kW (or 4,000 watts) by 320 watts = 12.5. Round up, and that's the number of panels needed.

Terminology

- **Array:** Multiple solar cells make up a solar panel, and multiple panels are wired together to form a solar array.
- **Authority having jurisdiction (AHJ):** The civic authority for a town or county responsible for permitting and inspecting improvements to property.
- **Balance of system (BOS):** All of the other physical parts that make up a solar system outside of the panels: inverters, wiring, mounting hardware and the monitoring system.
- **Grid:** The grid is the electricity infrastructure run and maintained by the electrical company.
- **Net metering:** When a grid-tied solar system produces more energy than is needed, the excess power is sent to the public-utility grid to be redistributed (known as "back feeding" the grid), allowing customers to offset the cost of energy drawn from the utility.
- **Micro-inverter:** Inverter placed on the back of each solar panel to optimize energy production for each individual solar panel. Allows each panel to perform at its maximum potential. Like a single-string inverter, it converts direct current (DC) electricity to alternating current (AC) electricity.
- **Photovoltaic (PV):** The conversion of light into electricity using semiconducting materials, such as silicon.
- **Permission to operate (PTO):** Local electric utility's written authorization to interconnect the solar system to the local electric utility's electrical grid. Officially allows the solar user to turn on their solar panel system.
- **Single-string inverter:** A device connected to multiple panels aggregating the power output. The inverter takes the DC electricity generated from the solar power system and uses it to create AC electricity to power electronic devices in a home or business.
- **Solar batteries:** Comprised of high-capacity rechargeable batteries that can store excess energy generated by a solar system for use at night, as a backup during outages or when the solar system cannot generate energy in real time.
- **Solar cell:** A single light-capturing unit in a PV solar panel. They are made of silicon-like semiconductors.
- **Solar offset:** Measures the amount of energy a solar system produces compared to the amount of electricity a home consumes.
- **String:** A series of panels connected together.
- **Units of Measure**
 - **Watts (W):** The unit of measure for power.
 - **Kilowatt (kW):** Measure of power. It is the rate at which something uses energy. There are 1,000 watts in a kilowatt.
 - **Kilowatt-hour (kWh):** Measure of energy. kWh is the capacity to do work.
 - **Megawatt (MW):** Measures the output of a power plant or the amount of electricity required by an entire city. One MW equals 1,000 kW or 1,000,000 W.
 - **Gigawatt (GW):** Measures the output of large electric power stations. A gigawatt equals 1 billion watts.