Solar Panel Installation Meeting Kit



Solar panels are a great way to generate clean, green power. Know how to install solar panels safely so you don't have to pay the price of accidents and injuries while you help customers and the environment.

THE HAZARDS

There are four significant hazards during installation and maintenance: Lifting, Trips and falls, Electrical, and Ladders.

1. **Lifting.** Solar panels are awkward and heavy. Improperly lifting panels can cause strains, muscle pulls, and serious back injuries.
2. **Trips And Falls.** In construction, falls accounted for nearly 39.2% of fatalities in 2017. The most common height of fatal construction falls was from more than 30 feet (107 deaths out of 325 fatal falls).

Workers who are six feet or more above a lower level need to have some protection.

1. **Electrical.** Solar systems include many components that conduct electricity. Electricity comes from two sources: the utility company and the solar array (i.e. the sun). Even when a building's main breaker is shut off, the PV system will continue to produce power.
2. **Ladders.** In 2016, there were 849 fatalities from falls; 170 of those fatalities were falls from ladders.

HOW SOLAR PANELS WORK

The amount of sunlight that reaches Earth's surface within an hour and a half has enough energy to satisfy the world's energy consumption for an entire year. Here is a step-by-step breakdown.

- Solar panels, rely on a tiny component called a photovoltaic cell. These cells are typically constructed from silicon. When the sun shines on a solar panel, the silicon cells absorb the photons.
- The photons of sunlight knock electrons out of the silicon atoms, which are now free to move. They travel through the layers of the cell, creating an electrical current.
- The electric current flows to the edge of the panel, funneling into a conductive wire. This wire delivers the electricity to the inverter, which converts the direct current (DC) energy into alternating current (AC) energy, which is what is used to power buildings.

- This electricity then transfers to the building. Excess electricity is transferred to the utility grid if the solar panels are connected to the utility meter. This causes the meter to run backward, crediting the property for surplus generation.

SOLAR PANEL TAKEAWAY

“How does solar energy work?” A simple, short explanation is that solar panels are filled with solar cells that harvest light from the sun. These cells contain materials that can turn energy from sunlight into electricity, much like how chloroplasts in plants gather sunlight and turn it into fuel.

SOLAR PANEL INSTALLATION PROCESS

The roof is the most common location for installing solar PV panels.

1. **Set Up Scaffolding.** You have to erect scaffolding to ensure safety during the whole installation process when being on the roof.
2. **Install Solar Panel Mounts.** Then, the solar panel mounting system has to be set up. This will support the base of the solar panels. The whole mounting structure must be tilted and have an angle between 18 to 36 degrees to have maximum sunlight exposure.
3. **Install the Solar Panels.** When the mounts are set up, the solar panel itself has to be installed on the mounting structure. Make sure to tighten up all the bolts and nuts so that it stays stable.
4. **Wire the Solar Panels.** The next step in the installation process is to install the electrical wiring. In most cases, MC4 connectors are used because they are suited for all types of solar panels. Make sure to shut off the household’s electricity supply during the wiring installation.
5. **Install Solar Inverter.** After that, the solar inverter must be connected to the system. It is typically installed near the main panel, and it could be both indoors and outdoors. Inverters are more efficient if kept in a cooler place.

If the inverter is outdoors, it should be kept out from the afternoon sun. If it is installed indoors, the garage or utility room are usually the best places, since they stay cool for most of the year and have ventilation.

1. **Bond Solar Inverter and Solar Battery.** Thereafter, the solar inverter has to be connected to the solar battery. Solar battery storage can save you from worrying about the lack of usable energy during cloudy times, and it can also lower the solar battery storage system costs during installation.
2. **Connect the Inverter to the Consumer Unit.** The inverter should be connected to the consumer unit to generate electricity. A generation meter should also be connected to monitor the amount of electricity the solar panels produce. You can use your computer or other device to check your solar system’s performance.
3. **Start and Test Solar Panels.** The final step is to switch the power on and test the newly installed solar panel system.

Solar Panel Maintenance Best Practices

- Inspect them a few times per year for dirt or some other things that might have piled on top. It is important that the panels are clean and nothing is blocking them from efficiently absorbing the sun.
- Before cleaning the panels yourself, should consult with your installer about the warranty conditions. Some solar panel manufacturers could terminate the warranty if any self-cleaning is done.

- For general cleaning, use a normal garden hose to wash the face of the panels. Do this in the morning or evening. Avoid spraying them with cold water while they are hot because that might damage them.
- If the panels need some more cleaning that the hose cannot provide, use a sponge with soapy water to scrub them. Get the services of a cleaning company.
- Have your system examined every 4-6 years by an installer.

FINAL WORD

Proper training, planning, PPE usage, and equipment installation need to take place to mitigate the dangers associated with solar panel installation work.