

## Solar PV Systems Can Pose Hazards

Interest in solar energy and photovoltaic (PV) systems is growing among homeowners and businesses. Under normal operating conditions, PV systems are safe. But, structural fires in residences and commercial buildings with rooftop or ground-mounted PV systems can pose serious safety concerns for emergency personnel.

Firefighters combating these types of fires are exposed to hazards beyond those associated with conventional fires, including:

- **Potential shock hazard** caused by spraying water onto a PV system and touching or cutting into PV modules, conduit or equipment.
- **Roof hazards** caused by weakened structural integrity due to the weight of the PV system.
- **Inhalation exposure** to hazardous chemicals such as cadmium telluride, gallium arsenide and phosphorus dissipated in the smoke plume.
- **Increased risk of backdraft** because roof venting is restricted by PV system.
- **Ground hazards** due to uneven terrain where ground mounted arrays are located.
- **Battery hazards** especially when fumes and gases are generated by batteries exposed to fire.

To learn more about SCE&G's commitment to solar energy, visit [sceg.com/solar](http://sceg.com/solar).

For assistance during an emergency, call: **1-800-251-7234**.



*SCE&G is providing this information to assist in the awareness of potential hazards. Emergency responders must determine if/how this may apply to "Safe Fireground Operations."*

# Rooftop and Ground-Mounted Solar Photovoltaic (PV) Systems

*Fire Safety for Emergency Responders*

*This information is intended for fire personnel responding to a fire involving homes or commercial buildings where rooftop and/or ground-mounted solar photovoltaic (PV) systems are installed.*

## Identifying a Solar Photovoltaic (PV) System

PV systems can differ in design, appearance and location. Not all homes with a PV system are easily identifiable from the street. On commercial buildings, identifying PV system components can be much more difficult due to size.

Emergency responders should look for key components on the home or business to determine the presence of a solar PV system.

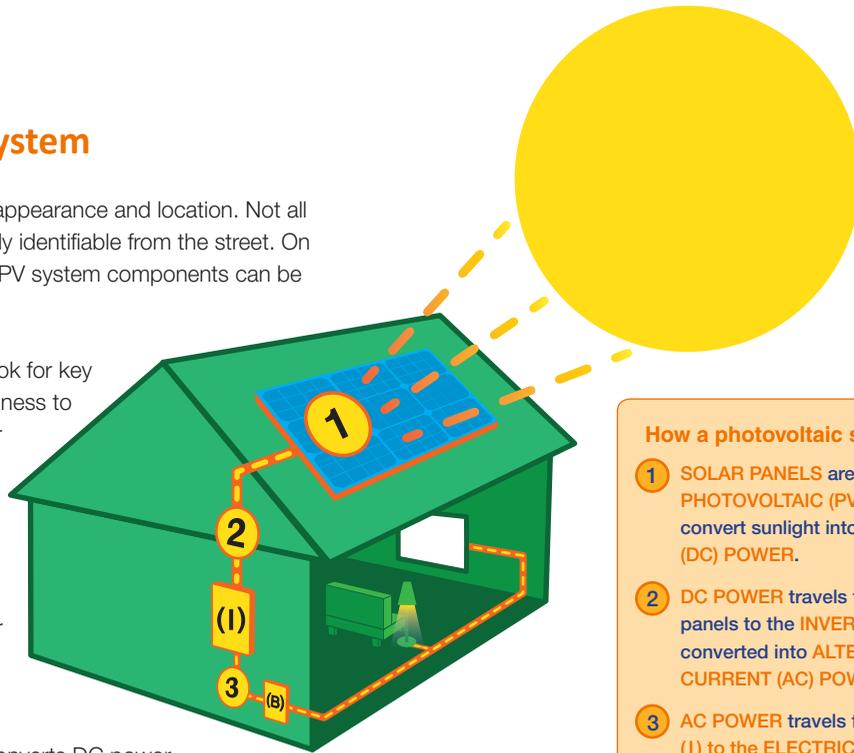
### Photovoltaic or Solar Panels:

Typically mounted on the roof, these panels convert sunlight instantly into DC power. The solar panel array may be rooftop or ground mounted.

**Inverter Cabinet:** The inverter converts DC power into standard household AC power. Do not assume that the inverter cabinet will be located adjacent to the electric meter. The inverter may be in another location, such as inside a garage, attic or basement.

**Associated Components:** Includes DC conductors, DC combiner box, DC conduit, bi-directional meter and DC disconnect.

**SCE&G Meter Label:** Look for a caution label on the electric meter for all **approved** onsite generation on SCE&G's system.



### How a photovoltaic system works:

- 1 SOLAR PANELS are made up of PHOTOVOLTAIC (PV) CELLS that convert sunlight into DIRECT CURRENT (DC) POWER.
- 2 DC POWER travels from the solar panels to the INVERTER (I) and is converted into ALTERNATING CURRENT (AC) POWER.
- 3 AC POWER travels from the INVERTER (I) to the ELECTRICAL PANEL or BREAKER BOX (B) and is now ready to power any thing in the home that uses electricity.

## Conducting Safe Firefighting Operations

Be aware solar panels generate DC voltage at all times regardless of connection to any other equipment. The generation of electricity cannot be turned off. **Disconnecting the service, inverter, meters, disconnects or wire DOES NOT stop the panel from creating DC power.**

- First and foremost, evacuate the building.
- Wear SCBA (Self-Contained Breathing Apparatus) and full protective clothing.

- Once the PV system is identified, look for warning labels on electrical disconnects. Lock-out and tag-out all electrical disconnects, isolating the PV system at the inverter.
- Turn off the main electrical service as soon as practical. When the main electrical panel is shut off, be aware there is still DC power from the rooftop to the inverter box.
- Disconnecting power to a building will not de-energize the solar panel system. The disconnection of an electrical service to a building should only be performed by SCE&G employees or other authorized personnel. A firefighter should never attempt to disconnect electrical service by removing the electric meter.
- Consider all PV equipment and wires to be energized. Do not touch or cut into or through PV modules, conduit or equipment.
- Do not open the combiner box (usually only on large commercial units). All energized wires from the solar panels are fed into the combiner box then combined with two large high-current wires. These boxes are normally locked.
- In roof operations, consider how the weight of the PV system may compromise a weakened roof structure. Solar panels may not allow access to the roof over the fire. Consider cross ventilation.
- Do not walk on or break PV modules. This can cause the simultaneous release of all the energy in the system.
- Foam or salvage cover cannot block sunlight from the solar panels. Foam will slide off the array. A salvage cover will significantly reduce sunlight, but electricity can still be generated through the salvage cover.
- Be aware that moonlight, street lights and flood lights, as well as scene lighting, may be bright enough for the PV system to generate electricity.