# Solar Electric System User Guide

# Contacts & introduction

## Table of contents




## Office contact information

**Bay Area**
(510) 652-4730
info@gridalternatives.org

**Bay Area - North Coast**
(707) 202-6421
ncoffice@gridalternatives.org

**Central Coast**
(805) 351-3344
infocc@gridalternatives.org

**Central Valley**
(559) 261-GRID (4743)
infofresno@gridalternatives.org

**Colorado**
(303) 968-1326
colorado@gridalternatives.org

**Greater Los Angeles**
(310) 735-9761
infogla@gridalternatives.org

**Inland Empire**
(951) 272-GRID (4743)
infoie@gridalternatives.org

**Mid-Atlantic**
(202) 602-0190
infodc@gridalternatives.org

**New York Tri-State**
(212) 549-3977
nyoffice@gridalternatives.org

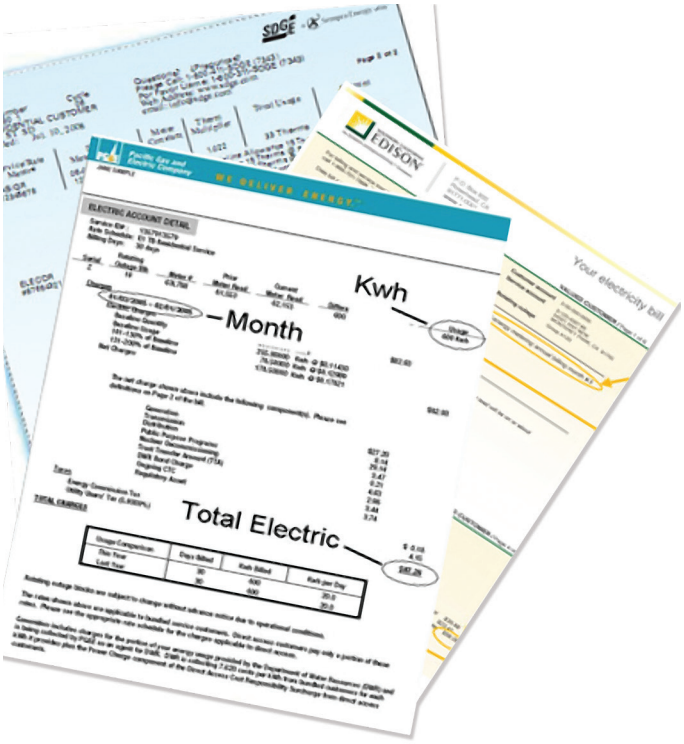
**North Valley**
(530) 217-6115
infonv@gridalternatives.org

**San Diego**
(619) 239-GRID (4743)
infosd@gridalternatives.org

## Attachments:

*Net Metering Bill Information (from utility)*
*Economic Analysis*
*GRID Alternatives Labor Warranty*
*Inverter Warranty*
*Solar Panel Warranty*
*Inverter Manual*
*System Plans*
*Building Dept. Permit Copy*

# Your electric bill




Your system is tied to the electric grid, allowing you to use electricity from both your system and the grid, depending on the time of day and how much electricity you are using. You will be billed by your utility company through a process called net energy metering, or NEM. NEM means that your electric company will credit your account for the electricity produced by your system that you do not use on-site. These credits will lower the amount you owe for the electricity you take from the grid.

## How net energy metering works

At any time of day, your system may produce more or less electricity than you need for your home. When the system is producing more than needed, the extra energy automatically goes through your electric meter into the utility grid, running the meter backwards to credit your account.

At other times of the day, your electric usage may be higher than what your system produces and will take extra energy from the utility. Switching between the system's power and the utility grid is instantaneous. You will never notice any interruption in the flow of power.

Under a net energy metering agreement, your utility will continue to read your meter monthly and you will receive a monthly statement indicating the net amount of electricity you consumed or exported to the utility grid during that billing period. You may have the option of paying the utility for your net consumption monthly, or settling your account every 12 months. Contact your utility for billing options.

**Your utility will continue to read your meter monthly and you will receive a monthly statement.**

# Turning your system on

Your system should already be turned ON, but you are able to turn your solar system OFF or ON if needed.

## Turning the system ON

All switches must be in the ON position to operate the system. The order in which they are turned ON is not important. After all of the system switches have been turned ON, the inverter will power on and may take up to 5 minutes to finish starting up.

When the startup is complete, the screen on the inverter will show the status of the system and a solid green light will display. For microinverters, the monitor will show the number of microinverters that are currently producing power.


## Turning the system OFF

If any one of the switches are in the OFF position, your system will not operate. Your system will not generate electricity at night, or anytime when the sun is not shining, but should produce electricity again when the sun is out.

**CAUTION:** Even when one or more system switches is OFF, there may still be high voltage electricity in the system. Never try to service any part of the system including the wiring, fuses or breakers.

**Your system will automatically shut down during a blackout, but should restart after it ends. Make sure to check your system.**

# Reading your inverter

**Green: System is operating.**

**No light (at night or when cloudy): System is on standby.**

**No light (during full daylight): System is off. Turn all switches to ON.**

**Red or Yellow: There is a system error. Write down the error message on the display screen and call GRID Alternatives.**

Your inverter has indicator lights to help you check that the system is working. A green light displayed during daylight means that your system is working normally. Check for the green light at least once a week. This will help you catch any problems with your system before your electric bill is affected.

It's a good idea to check the inverter more often in the summer when your system will be producing the most electricity.

**NOTE:** Review the owner manual your inverter came with for information about reading your specific display.

## Common messages on your inverter screen:

**Inverter Offline** - This is normal at night when the system is not generating electricity.

**Insufficient Solar Energy** - This is normal when there is not enough sunlight for the system to produce electricity.

**Ground Fault** - If you see this message, contact GRID Alternatives.

Systems with microinverters do not have indicator lights. Instead, they have a monitoring device that shows the number and power being produced by each microinverter. Ensure that all the microinverters installed are shown on the device.


**GRID Alternatives office contact information can be found on the first page of this booklet. Call GRID Alternatives immediately if you see a yellow or red light on your inverter or it displays a ground fault message.**

# System maintenance

Your PV system needs very little maintenance since there are no moving parts; however dirt and dust on the panels can interfere with sunlight absorption and reduce your power output.

## Cleaning the solar panels

We recommend that you wash your solar panels at least once a year. If you live in a dusty area (for example, near a freeway or a construction site) it may help to wash the panels more often, especially before summer when the system produces the most electricity.

To clean your panels, hose them down with water. You can spray them from the ground if you have enough water pressure. You can also use a hose nozzle to help increase water pressure. For caked dirt or bird droppings, use regular soap and wipe the panels with a window sponge on a telescoping pole. Do not use chemicals or sponges that may cause scratches on the solar panels.

**CAUTION:** Do not wash your panels on a hot day. This may damage the panels. Washing your solar panels will make your roof wet and slippery. Hose the panels from the ground instead of standing on the roof. Never walk on the panels because this can damage them.

## Shade is a solar panel's biggest enemy!

If you are installing an antenna or satellite dish, make sure it does not shade any part of your solar panels because this can lower the system's electricity production. Also watch for shade that may be caused by new buildings or new trees near your home. Be sure to trim trees, plants or shrubs around your home that may shade any part of your solar panels.

# Solar PV parts

## Solar panels

Collect energy from the sun and convert it into usable energy for your home. Photovoltaic (PV) cells in solar panels typically contain no corrosive chemicals, do not pollute, require little maintenance, and operate silently.

## Inverter

Changes direct current (DC) electricity generated from a PV panel into alternating current (AC) electricity that can be used by appliances and the electricity grid. Because PV panels produce electricity in DC, an inverter is required to make the electricity usable. You may have a string inverter on your wall or microinverters, which are smaller and placed under the solar panels.

## Disconnect

These switches disconnect power between the solar panels on the roof and the inverter or between the inverter and the utility grid. You may have larger switches with handles, a switch on your inverter, or just a breaker in your service panel.

## Conduit and wire

Conduit is the metal piping that protects the system's wiring.

# Energy efficiency

## Energy wise habits

- Turn off lights and computers when not in use.
- Use a power strip for televisions, DVD players, VCRs, and chargers, and turn off power to the strip when not in use. All together, these small items can use as much power as your refrigerator.
- Recycle burned-out CFL bulbs, fluorescent tubes, televisions, computer monitors, and all other electronic waste.
- Unplug and recycle any inefficient old refrigerators and freezers.
- Use appliances efficiently. Use your dishwasher and clothes washer for full loads only. Use the cold water setting on your clothes washer when possible.
- Turn down the water heater to 120 degrees.
- Use your drapes properly. In the summer, close your drapes during the day.
- Clean or replace furnace air filters monthly.

## Energy saving tips

- Replace incandescent bulbs with compact fluorescent lamps (CFLs) or light-emitting diodes (LEDs) and save up to 75 percent on lighting costs.
- Replace all nightlights and holiday lights with LEDs.
- Choose ENERGY STAR® appliances, computers, and televisions.
- Insulate the first 5 feet of pipes from the hot water heater.
- Install low-flow showerheads and faucet aerators.
- Add or repair weather stripping on all doors and windows.
- Use caulk and spray foam to fill all visible air gaps.
- Replace heating equipment more than 15 years old with new ENERGY STAR® qualified models.
- Have your air conditioning unit serviced to cut 15% of cooling costs.

## Additional online resources and information about solar power:

**Go Solar California**
www.gosolarcalifornia.gov

**American Solar Energy Society (ASES)**
www.ases.org

**Solar Energy International (SEI)**
www.solarenergy.org

**Solar Living Institute**
www.solarliving.org

GRID ALTERNATIVES

**gridalternatives.org**
**facebook.com/GRIDAlternatives**
**twitter.com/GRID**