



# E<sup>3</sup>A: Solar Electricity for the Home, Farm or Ranch

## Steps in the Solar Electricity Series

Building and Site Assessment

Conservation and Efficiency

System Options

System Components

System Sizing

Costs

Installation

**Operation and Maintenance**

Electricity Use Worksheet

## Operation and maintenance

Solar electric systems are low maintenance with no moving parts, but like any electronic equipment, they routinely require periodic attention for maximizing performance. System performance can now be monitored in a variety of ways.

### Maintenance

The *Installation* guide suggests sources for finding qualified companies and contractors. These professionals might also conduct system inspections and perform maintenance tasks, so ask your system installer what is required or recommended and be sure to read the owner's manual. Your installer might provide a yearly maintenance checklist specific to your system. Hiring a licensed and certified contractor is recommended, but this list of expected maintenance activities if you plan on doing the work yourself.

### Solar panel array

- **Panel shading:** Check for shading during the day at mid-morning, noon and mid-afternoon on an annual basis. Check for leaves or other debris covering the panels, as shading can greatly reduce electricity generation. Regular rain and snow will clean panels adequately.
- **Glass and seals:** Underwriters Laboratories-approved panels are sturdy and weatherproof-tested to handle hailstorms. After hailstorms or high-wind storms with airborne debris, check panels. If the tempered glass cracks or seals are not in good condition, moisture in the panel can cause corrosion and failure.
- **Support and mounting structures:** Check nuts and bolts attaching panels to support structures for tightness.
- **Wiring connections:** Wiring connections should be tight and free from rust and corrosion. Wires should be secured to keep them from blowing in the wind, which is a ground fault hazard.

### Roof penetrations

- Flashing and sealant around roof penetrations should be in good condition.

### Batteries

- Batteries require the most maintenance of any solar electric system component.
- Flooded, or unsealed and watered, batteries require periodic electrolyte level checks to determine whether distilled water needs to be added. Battery charges must also be equalized.
- Connections and terminal posts need to be checked and cleaned if corroded.
- Keep batteries stored at manufacturer's suggested temperature to prolong their life.

If components of your system are damaged or not working, the manufacturer or your installer might cover repair or replacement under warranty. If not, a standard homeowner's insurance policy might cover hail damage.

### System monitoring

It is important to know your system is operating efficiently and producing the intended amount of electricity. Monitoring devices allow system owners to view production at any time and to view historical production for comparison over time. For example, inverters are equipped with a display that shows current and lifetime power production.

Web-based monitoring and data-logging systems allow you to access information from an Internet-enabled computer. Information available can include equipment performance, how much electricity was sent to the utility grid, how much money was saved, and the amount of greenhouse gases not emitted.

## References

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- National Renewable Energy Laboratory (produced) for U.S. Department of Energy. (2009, January). *Own Your Power! A Consumer Guide to Solar Electricity for the Home*. DOE/GO-102009-2656.
- U.S. Dept. of Energy. (2011, Feb.). *Installing and Maintaining a Small Solar Electric System*. Retrieved February 16, 2011, from [http://www.energysavers.gov/your\\_home/electricity/index.cfm/mytopic=10820](http://www.energysavers.gov/your_home/electricity/index.cfm/mytopic=10820)

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