



Steps in the Solar Electricity Series

STEP 8

1. Building and Site Assessment
2. Conservation and Efficiency
3. System Options
4. System Components
5. System Sizing
6. Costs
7. Installation

8. Operation and Maintenance

9. Electricity Use Worksheet

For more energy information, go to <http://energy.tennessee.edu>.

Operation and Maintenance

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

Maintenance

The Installation factsheet suggests sources for finding qualified companies and contractors. These professionals may also conduct system inspections and perform maintenance tasks. Ask your system installer what is required or recommended and be sure to read the owner's manual. Companies may provide a yearly maintenance checklist specific to your system. It is recommended you hire a licensed and/or certified contractor, but if you plan on doing the work yourself, here is a list of what maintenance may include:

Panels/Array

- **Panel shading:** Visually check for shading during the day (mid-morning, noon and mid-afternoon) on an annual basis. Any amount of shading can greatly reduce electricity generation. Check for leaves or other debris. Regular rain and snow will clean panels adequately in most cases.
- **Glass and seals:** UL-approved panels are sturdy and weatherproof-tested to handle hailstorms. After hailstorms or high-wind storms with airborne debris, be sure to check panels for damage. If the tempered glass cracks or seals are not in good condition, moisture can enter and cause corrosion and panel failure.
- **Support/mounting structures:** Check all nuts and bolts attaching panels to any support structures for tightness.
- **Wiring connections:** All wiring connections should be tight and free from rust/corrosion. Wires should be secured/zip-tied (fastened) to prevent blowing in the wind (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 (unsealed, watered) batteries** require periodic electrolyte level checks to see if distilled water needs to be added. Battery charges must also be equalized.
- **Connections and terminal posts** need to be checked and cleaned if corroded.
- **Wear proper eye protection** and disconnect the battery bank from the PV system and loads before removing battery cables to prevent sparks and battery explosions due to hydrogen gas. Use only distilled water when refilling batteries, because minerals in tap water will significantly reduce battery life.
- **Keeping batteries stored** at the manufacturer's suggested temperature prolongs their life.

If components of your system are not working or get damaged, see if repair or replacement is covered under warranty by the manufacturer or your installer. If not, a standard homeowner's insurance policy may cover damage from hail, etc.

System Monitoring

It is important to know your system is operating efficiently and producing the amount of electricity intended. 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/data-logging systems allow you to access information from your own computer or anywhere internet access is available. The information can include equipment performance, how much electricity was sent to the utility grid, how much money was saved, and the amount of greenhouse gas emissions offset.

References

- Brown, Michael. (2010, October/November). Keeping Tabs on Your PV System. Home Power, 139, 84-94.
- 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.

Notes

Original work created by Montana State University Extension and the University of Wyoming. Adapted for use in Tennessee by Elizabeth Gall, Department of Biosystems Engineering and Soil Science.

R01-5120-101-028-14 SP 758-I 14-0204 04/14 100

Programs in agriculture and natural resources, 4-H youth development, family and consumer sciences, and resource development. University of Tennessee Institute of Agriculture, U.S. Department of Agriculture and county governments cooperating. UT Extension provides equal opportunities in programs and employment.

Insurance

As with any upgrade or change made to your home, you should meet with your insurance company to discuss the changes. Many companies today will provide insurance for solar power systems and can oftentimes roll it into your homeowner's policy. Some insurers see solar power systems as adding value to your home and may thereby see it as an increase in the value of your policy, while others may provide a discount. Before purchasing and installing a solar power system, it is recommended that you meet with your current insurance company or shop around to see what the options are. Also consult with your insurance company about whether there are any installation issues to consider during the process of putting the panels and equipment on your roof.