



E³A: 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

Installation

Pre-installation considerations

Before installing a solar electric system, check local building codes, subdivision covenants and zoning ordinances or regulations. Contact your local electrical or building inspector to determine any requirements they might have for a solar electric system installation. The National Electric Code (NEC) Article 690 provides requirements for designing and installing a safe, reliable and code-compliant solar electric system. Using NEC criteria will ensure compliance with local code. Contact your utility company for information on regulations on connecting to their network.

Review the covenants and contact the homeowner's association board or the management company if you live in an area with a homeowner's association. You might need to educate local building code officials and representatives if you are the first in your area to install a renewable energy system. Contact your utility company to ask if it requires a specific Underwriters Laboratories (UL)-certified inverter. The UL has developed a series of inverter safety requirements, which can be found in UL 1741.

You may need to also consider historic district guidelines and restrictions and future shading. For example, will any trees on your property or nearby property grow and shade the system panels? Communicate with neighbors about your plans and determine if they might plant trees or make additions to a home that might shade your panels. Some government jurisdictions have solar access zoning regulations that prevent blocking the sun required for operation of any solar energy system.

Who will install your system?

Proper installation of your solar electric system will ensure maximum electrical output. Hire a qualified company or contractor because proper installation takes into account a variety of complicated factors, from safety to electrical work. Some manufacturers will extend a system's warranty if installation is handled by one of their trained contractors. Some utility rebates will only be offered if a system is installed by a trained and certified professional. Protect yourself and your home by hiring a qualified professional. Ask questions about experience, licensing, certifications and their customer service record.

Experience

Does the company or individual contractor have experience installing and providing maintenance for the type of system you want installed? Do they offer a warranty on their installation work? Do they provide system commissioning? Ask to speak with other customers, and if possible, take time to see those systems and ask the owners about their experience with the system and the level of customer service received.

Licenses

Missouri does not require a solar contractor to be licensed, but you should check local requirements. A licensed electrician must connect a grid-tied system to the utility grid.

Insurance

Confirm that the installing company or individual contractor has liability and workman's compensation insurance, and find out if they have taken any safety training courses.

Certifications

Many installers take specialized training and exams to receive certifications. The North American Board of Certified Energy Practitioners (NABCEP) is one group that tests and certifies solar electric and other renewable energy system professionals. Its website lists NABCEP-certified professionals in each state at www.nabcep.org.

Trade organizations

Ask the company or installer if they are members of a trade organization such as the Solar Energy Industries Association. Are they a member of the Better Business Bureau?

System monitoring

Many companies now offer a system monitoring service that allows remote monitoring of the system through a web-based computer program.

Installers

The Missouri Department of Economic Development offers the Missouri Renewable Resources Directory, which lists businesses related to renewable energy in Missouri, at <http://energy.mo.gov/energy/pubs/pub1292.pdf>.

Comparing bids

Compare bids from more than one company. Bids should specify the system type, size, electricity output and maintenance requirements in addition to cost.

- Ask the installer if they install packaged systems and if the system or the individual components are UL-certified.
- Because different PV panels generate different amounts of electricity, ask for the maximum generating capacity (measured in DC watts or kilowatts) under a set of Standard Test Conditions (STC) or under PVUSA Test Conditions (PTC). Or, ask the electricity output of the system at the inverter.
- Ask for an estimate of the amount of electricity the system will produce on an annual basis in units of kilowatt-hours (kWh) that will reach your electrical load.
- Ask how the panels will be attached to the roof and what type of mounting system will be used.
- Ask about whole system or individual component warranties. Some rebates require a minimum system warranty, but installers might offer longer warranties.

- Request that the bid include the following costs: installation, initial setup and commissioning, all hardware, required National Electric Code (NEC) signage, permits, sales tax and warranties.
- Some companies will also research and complete the paperwork for available federal, state, local and utility incentives. Ask if they include incentive deductions in their cost estimates, and be aware some incentives take effect after the system is installed and that you will typically need to pay the full, initial cost upfront.

Do-it-yourself installation

If you decide to install your own system, you should educate yourself and take time to attend classes, workshops or trainings organized by qualified instructors.

Whether you hire a contractor or install the system yourself, make sure it is done correctly and safely.

Additional information

The Department of Energy has a useful collection of resources on energy-saving practices at <http://energy.gov/energysaver/energy-saver>.

References

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