



## ENERGY SOLUTIONS FACT SHEET

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## Solar Electric Systems

The energy from the sun can be used to generate electricity in our homes. That possibility is now within closer economic reach for Colorado homeowners who want an “electric generating station” on their roof or in their yard. As a result of the November 2004 passage of Amendment 37, some utilities offer substantial rebates for solar electric, or photovoltaic (PV) systems.

There are two basic types of solar electricity systems: Off-grid systems are installed when there is no available connection to a utility power grid and Grid-connected systems are installed when a utility grid connection is possible.

### Electricity Savings

The energy savings depend upon the size and performance of the PV system. A typi-

cal grid-connected PV system will provide \$200 or \$300 worth of electricity per year. This can be a large portion of the electricity use in a very efficient home. The smart approach is to install energy efficiency measures as the new PV system is being purchased so you can enjoy the savings from efficiency and solar.

### Components

Grid tied systems use 2 main pieces of equipment:

1. *The electricity is generated by a solar panel that converts light particles (photons) into electricity. The PV panels represent perhaps 80% of the total costs. The panels often come with a 20 year performance warranty.*

### More Information about our Sponsor

Simple Solar Systems is a Colorado-based provider of intelligently designed solar systems and energy efficient solutions serving people, business, and the planet.

We provide our clients with sustainable energy solutions developed through a collaborative team based approach, partnerships with key industry visionaries, a commitment to on going energy based education and extraordinary customer service.



303-541-9852

[www.simplesolar.com](http://www.simplesolar.com)

A Proud Sponsor of the Xcel and CESC  
Energy Makeover Contest

- Since no two homes are identical in their site specifications and electric usage, at Simple Solar we provide detailed, site-specific custom designs and installations for every project.
- Whether your primary motivation is lowering your electric bills, reducing your carbon footprint, making a sound capital investment in your home, or being on the forefront of our nation's transition to cleaner energy sources, we can help!

Providing Energy Solutions to Homeowners



2. *Direct grid-tie inverters convert the direct current power produced by the PV to alternating current used in the home and sent to the grid through net metering. The inverter represents about 10% of the total cost, and typically comes with a 5 year warranty.*

An off-grid system has a third essential piece of equipment, batteries.

There are a few key criteria to evaluate in determining if your home is suitable for PV:

**Orientation.** Your roof or other unshaded area needs to face south. It is not necessary for the panels to be mounted facing exactly south, they may deviate by up to 30° with minimal energy yield loss.

**Tilt angle.** In the winter the sun will not reach the same angle as in summer. Ideally solar panels should be placed somewhat more horizontal in the summer. But this is far from optimal for the winter sun. However these panels will then not be placed optimally for the winter sun. To achieve the best year round performance solar panels should be installed at a fixed angle, between the optimum angle for summer and for winter. A solar contractor can help you determine the optimum tilt angle.

### Questions to Ask

It is important to carefully scrutinize installers before signing on the dotted line. The good news is that a PV installation is essentially “plug and play” with a minimum of maintenance. There are no moving parts to fail, and the solid state equipment comes with long warranties.

Installers should be certified by Colorado Solar Energy Industry Association (COSEIA). Make sure equipment is certified by Solar Rating and Certification Corporation (SRCC) and by the North American Board of Certified Energy Practitioners (NABCEP).

### Costs

Your system’s price will depend on a number of factors, including whether the home is under construction or whether the PV is integrated into the roof or mounted on top of an existing roof. The price also varies depending on the PV system rating, manufacturer, retailer, and installer.

The size of your system may be the most significant factor in any equation measuring your costs against your benefits. Small, single PV-panel systems with built-in inverters that produce about 75 watts may cost around \$900 installed, or \$12 per watt. At the

high end, a 5-kilowatt system that will completely offset the energy needs of many conventional homes may cost \$35,000 to \$40,000 installed, or \$7 to \$8 per watt. These prices, of course, are just rough estimates, and your costs will depend on your system’s configuration, your equipment options, and other factors.

### Tax Incentives and Rebates

#### Xcel Solar Rewards Program.

Residential Systems (smaller than 10.0kW) qualify for a 50-60% utility rebate (\$4.50 per DC watt) if they are Xcel electricity customers

#### Federal Tax Credit

There is 30% federal income tax credit that is capped at \$2,000.

More information can be found at [smartenergyliving.org](http://smartenergyliving.org)



## Providing Energy Solutions to Homeowners

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