

Choosing Wind or Solar

3 Steps to Help You Choose a Renewable Energy System That's Right for You

Under guidelines established by the Nevada Legislature, the following types of energy qualify as renewable: biomass, geothermal, hydropower, solar electric, solar thermal, and wind. If you're considering a renewable energy system for your home, you're probably considering a solar electric system, solar thermal (water or space heating) system, or a small wind electric system. To help determine if a wind or solar system is right for you, use the 3 steps below to assist in your decision making.

1 MEASURE THE RESOURCE & UNDERSTAND LIMITATIONS

It's important to measure the resource (wind or sunlight) to ensure your property has enough wind or direct sunlight to ensure your investment in a renewable energy system is worth the cost. Investigate government zoning, homeowner association restrictions, and permit limitations as well.

SOLAR ELECTRIC & THERMAL SYSTEMS: Nevada has an abundant supply of sunlight. However, sunny skies can't guarantee that the sun's energy will be able to reach every solar electric system at every site. Things to consider:

- For best performance, the system will need clear, direct and unobstructed access to south-facing sunlight for most or all of the day, every day. A big tree in your yard or a neighbor's yard, or a tall adjacent home, can create shading problems that can significantly reduce your system's potential to produce energy.
- Your roof or yard must be large enough to accommodate the solar modules.
- Solar thermal (water or space heating) systems usually cost more to purchase and install than conventional water or space heating systems.
- Solar thermal systems almost always require a backup system for cloudy days and times of increased demand.
- Check with local planning and building departments to find out about permitting requirements and/or restrictions.

WIND ENERGY SYSTEMS: Nevada is not a consistently windy state. There are actually very few locations in Nevada with enough wind to ensure that the cost of installing a wind turbine will be covered by the resulting energy savings. Things to consider:

- Measure the wind speed at your residence every day for one year to determine whether there is enough wind to cover or exceed the installation cost over the expected life of the turbine.
- Check with your local planning department for potential restrictions against installing a turbine on your property.

2 UNDERSTAND PAYBACK TIME

Before investing in a renewable energy system, understand payback time, or the length of time it will take for the system to generate the income to pay off the investment. The formula outlined below demonstrates how to estimate payback time for a 6-kilowatt, AC-rated solar electric system, but it can be used to estimate payback time for other types of renewable energy systems as well.

First, here are definitions for important terminology.

Watts: A unit of power used to measure the rate of energy demand.

Kilowatt (KW): One kilowatt equals 1,000 watts. A 6-kilowatt solar electric system generates 6,000 kilowatt-hours of electricity annually.

Kilowatt-Hour (kWh): Measurement of the amount of electricity used. A 60-watt light bulb left on for 24 hours will use 1.44 kWh of electricity (multiply watts (60) by number of hours used (24) and divide by 1,000). At \$0.13 per kWh, a 60-watt bulb left on for 24 hours would cost \$0.19.

AC-Rated: Renewable energy systems are measured based on the amount of AC or DC watts they produce. These systems generally produce DC watts and use an inverter to convert

the DC watts to AC watts, which is the type of watts used to power homes. An AC-rated system means its AC output has been determined based on its DC production after conversion to AC power.

A. Determine how much energy the system could potentially produce, in kilowatt-hours (kWh), in a year.

Multiply the number of hours in a year (8,760) by the kilowatts your proposed system will generate (6), by the percentage of time your system will likely produce energy. Realistically, your solar electric system will likely produce electricity 24% of the time rather than 100% of the time due to inclement weather, cloudy skies and darkness at night.

Example: 8,760 hours x 6 kilowatts x .24 = 12,614 kWh per year

1. Measure the resource & understand limitations

2. Understand payback time

3. Take advantage of incentive, tax credit & other programs



The Public Utilities Commission of Nevada ("PUCN") oversees the administration of renewable energy incentive programs in Nevada. In order to ensure the programs result in the installation of quality systems, the PUCN has provided this information to help you select a renewable energy system that is right for you.

- B. **Estimate how much money you will save annually on your electric bills.** Multiply the number of kilowatt-hours your system will likely produce annually by your electric rate to determine how much your solar system could save you annually on your electric bills. As of January 2014, the electric rate in Clark County was \$0.13 per kilowatt-hour.

Example: 12,614 kWh x \$.13 = \$1,640 annual savings

- C. **Calculate payback period.** Three pieces of information are required:

1. **Cost of the System:** In 2013, the average cost of a solar electric system in Nevada was approximately \$5 per watt. Since there are 1,000 watts in a kilowatt, a 6-kilowatt system would cost about \$30,000 (6,000 x \$5).
2. **Incentive & Tax Credit Amount:** An incentive and tax credit may lower the purchase price of a solar electric system by \$10,000 to \$15,000. Using current criteria, \$12,000 is a typical combined incentive/tax credit amount for a 6-kilowatt system. (See Step 3 for more incentive and tax credit information.)
3. **Annual Savings Amount:** A 6-kilowatt system will generate approximately \$1,640 in annual savings on electric bills, as per Step 2B above.

Add together any incentives and tax credits you will receive. Subtract that amount from the purchase price. Divide the purchase price by the system's estimated annual savings.

Example: \$30,000 - \$12,000 = \$18,000
\$18,000 ÷ \$1,640 = 11 year payback time

3 TAKE ADVANTAGE OF INCENTIVE, TAX CREDIT & OTHER PROGRAMS

Incentives and tax credits can reduce a renewable energy system's initial cost, while certain programs allow the system to generate income by earning credits with a cash value based on the system's production.

NOTE: The Nevada Legislature passed Assembly Bill 428 in 2013, which made changes to the rules governing incentive programs, net metering and the PEC Trading Program. The PUCN is currently in the rulemaking process to implement changes required by AB 428. As of March 2014, the information offered in this section is accurate. For more information on PUCN rulemaking proceedings pertaining to AB 428, please contact the PUCN.

TAX CREDIT: The federal government is offering a 30% residential renewable energy personal tax credit through Dec. 31, 2016. Multiply 30% by the system's purchase cost to figure out the incentive amount. *Consult your tax advisor for more information on renewable energy tax incentives.*

Example: .30 x \$30,000 = \$9,000 tax incentive



PV Watts Energy Calculator

The National Renewable Energy Laboratory created this free, online calculator to help estimate the potential energy production and cost savings of a proposed solar electric Photovoltaic (PV) installation.

pvwatts.nrel.gov

INCENTIVES: The Nevada Legislature requires gas and electric utilities to offer incentives to consumers who install renewable energy systems. The Legislature has set current incentive programs to expire on Dec. 31, 2020, or earlier if funds set aside for the incentives run out. In 2014, the average incentive paid in Nevada per watt will be \$0.50 for a solar electric system. Multiply \$0.50 by the number of watts the system will produce (6 kilowatts, as per the hypothetical solar electric system proposed in Step 2) to calculate the incentive amount. *Contact your gas or electric utility for information about incentive programs.*

Example: \$0.50 x 6,000 = \$3,000 rebate

NET METERING: Net metering allows you to use energy generated by your renewable energy system to offset your monthly power bill. If your renewable energy system produces more energy in a billing period than you use, you will earn credits that are recorded on your electric bill. The credits will be automatically applied in the next billing period in which you consume more energy than you produce. *Contact your electric utility for more information on net metering.*

PEC TRADING PROGRAM: A portfolio energy credit, or PEC, represents one kilowatt-hour of electricity generated by a utility scale solar electric renewable energy system. PECs are issued by the PUCN and may be sold to participating electric utilities, electric service providers or other entities. The value of a PEC is market-driven. A residential solar electric system owner could potentially earn a few hundred dollars each year by selling PECs. *For more information, call the PUCN and ask to speak with the PEC administrator.*

NOTE: If you receive an incentive from a utility for a renewable energy system, you are ineligible to participate in the PEC Trading Program.

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