

How To *Go Solar* Using New Mexico's New Solar Energy Incentives¹



Published by the New Mexico Coalition for Clean Affordable Energy, a nonpartisan, nonprofit organization promoting renewable energy and energy efficiency in New Mexico. For more information about renewable energy policy and incentives, visit www.NMCCA.org. For more information about solar energy, including solar events and workshops, visit the New Mexico Solar Energy Association website at www.NMSEA.org.

¹ Please email comments, suggestions, or questions about this document to Ben Luce at BenLuce@NMCCA.org, using the email subject heading “Go Solar”. This is a work in progress, and we welcome your input.

Note: This document covers only photovoltaic and *active* solar heating systems (systems that utilize solar energy collecting *panels*). For information about *passive* solar energy, please see the Passive Solar Design Guidelines and other materials at www.NMSEA.org.

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Introduction

Welcome to the *How To Go Solar Using New Mexico's New Solar Energy Incentives* Guide. This guidebook is intended to provide New Mexico residents with a basic introduction to becoming involved with solar energy, following the passage of three new solar energy incentives: The Solar Market Development Act, by the State Legislature, which creates a personal income tax credit for homeowners, businesses, or agricultural entities that install solar electric or (active) solar heating systems; Approval by the Public Regulation Commission of a new photovoltaic power buyback program for customers of PNM, the utility serving the Albuquerque/Santa Fe area; and a new Federal Solar Tax Credit. We hope you will find this useful.

How to Go Solar:

Step 1: Move Carefully, Be Patient: Plan from the outset to take your time, research your options first, and make your choices carefully. Please keep in mind that although New Mexico's Solar Installation Industry is quite competent, it is still very small, and not fully equipped to meet the increasing demand for solar today due to rising gas costs, environmental concerns, concerns about dependence on foreign energy sources, and now the existence of new federal and state incentives. *It may therefore take several months to a year to obtain installation services. Please help New Mexico's solar industry grow into a robust and useful part of society by being a patient and informed customer.*

Also, don't buy a solar system right away without checking into the eligibility requirements and pre-requisites associated with the various new incentives. The new state solar credits, for example, require that systems be *pre-certified*, via an application process, by the New Mexico Energy, Minerals, and Natural Resources Department. The Department will be issuing guidelines and application forms soon (these will be available at <http://www.emnrd.state.nm.us/emnrd/ecmd/>, and via links from CCAE's website). This requirement is to prevent substandard equipment that led to the problems with solar tax credits in the 1980s. *We must ensure that those problems do not reoccur!* It's also not clear yet to what extent self-installed systems will be eligible.

Work with reputable installers only: Visit an installer's previous work before you commit. Talk with the system owners. Even better, take some time to participate in solar tours (such as those offered occasionally by the New Mexico Solar Energy Association) or other educational opportunities first, and get a feel for what's working, and who does good work.

Step 2: Energy Efficiency: Before you start looking into solar systems, first take a look at the energy efficiency of your home or business. Are your gas, propane, or electric bills outrageously high? If so, you might want to invest in *energy efficiency* first. Replace those conventional light bulbs with compact fluorescent lights (the new ones produce high quality light, and use about 25% of the power that conventional incandescent bulbs use). A high efficiency refrigerator, for example, will use less than 1.5 kilowatt-hours of power per day, whereas many older models use 5 or more. How about those windows? You might add weather stripping and caulking, or perhaps it's time to upgrade to thermal panes, or upgrade the insulation of the whole building. Perhaps the furnace needs upgrading to a higher efficiency model. Air leakage is a major loss of heat for many buildings – there are services that can measure leakage with “blower door tests”, and help patch things up. Of course you don't want the building to be too tight – having some leakage is important. But many older homes have 5 to 10 times the leakage rate that they should – a terrible loss of energy!

There are many other measures for saving energy: Low-flow showerheads, water heater tank wraps, etc. PNM is now offering rebates for a variety of gas efficiency measures (see www.pnm.com). Check with your local utility provider for other programs. *Energy efficiency pays, and you should only invest in solar after you have already achieved a high level of efficiency.*

Step 3: Next Check for Restrictions on Solar Equipment: Now that you are reasonably sure you want a solar system, first find out if there are any restrictions on solar energy systems specific to *your* home or business, such as homeowner association covenants, historical district restrictions, etc. Don't invest in *anything* until you're sure you won't have to remove the system later. If you want to have grid-tied (net-metered) photovoltaics (solar electricity), check with your local utility provider or electric co-op first to make sure they offer it. Investor-owned utilities, such as PNM, SPS, and El Paso Electric, and New Mexico's many rural electric co-ops, are all required by a Public Regulatory Commission rule to offer net-metering. Some co-ops may not acknowledge this at first – be persistent or call the PRC if there is a question. Some, but not all *municipal* utilities also offer net-metering, such as Los Alamos. Check first!

Addition information about net-metering can be found on the website of the New Mexico Solar Energy Association, at www.NMSEA.org.

Step 4: Protect Your Solar Rights: New Mexico has a Solar Rights Law that enables you to register and protect your solar rights, to prevent structures being built next door that will shade your system. *You must, however, register your rights before your neighbor applies for a building permit, and you must inform your neighbors.* Also, local building codes trump the New Mexico Solar Rights Law if those codes contain their own solar rights provisions. Check with your local zoning Commission first.

More information about protecting your solar rights is available at:
<http://www.emnrd.state.nm.us/emnrd/ecmd/Laws/documents/YourSolarRight.pdf>

Step 5: Get a Basic Idea About What Type(s) of System You Want: Decide *roughly* what type, and what size (what cost range) of solar system you want before you do further research. Regardless of whether there are tax incentives or other incentives, you will likely still have to pay the full system cost upfront, so the unsubsidized cost is still an important variable.

The most common types of systems, their purpose, and their rough price ranges are:

System Type	Purpose	Price Range (sans incentives)
Solar Hot Water System	Provide domestic hot water	\$4000-\$8000
Large Solar Hot Water System	Air Heating (best with radiant floors)	\$10-\$20/square foot
(Direct) Solar Hot Air System	Air Heating	\$7-\$10/square foot
Grid-Tied Photovoltaic System	Solar Electricity (without batteries)	\$9-10K/kilowatt (two kilowatts is typical)
Off-grid Photovoltaic System	Solar Electricity (with batteries)	\$10-12K/kilowatt (two kilowatts is typical)

Note that there is a wide range of prices quoted above for solar hot water and heating systems. This is because labor tends to be a large fraction of the price, configuration is very site dependent, there is a wide range of options (stainless steel lined tanks vs. regular, etc), and there is very little competition in this market presently. Photovoltaic costs are easier to characterize, but even PV costs can be substantially different depending on whether a system is mounted on a tracker, in a physically challenging site, etc.

Which of these options is best for you depends on why you're interested in solar, how much you can spend, and what kind of site you have, etc.

Solar hot water systems for domestic hot water heating are a relatively simple, cost effective measure that almost anyone with a well exposed roof area can take advantage of.

Large Solar Hot Water Systems for Air Heating are a more serious undertaking, and need a significant amount of space, but work very well with radiant floor (hydronic) heating systems, because the floor acts as a heat storage mechanism, storing up solar heat during the day and radiating it at night. A radiant floor is not necessary: Such systems can also utilize large hot water storage tanks to store solar heat, and use another means, such as radiant wooden floor, or a water-to-air heat exchanger to distribute the heat. The storage tanks can add significant additional cost, however.

Direct Solar Hot Air Systems use panels that resemble solar hot water panels, but heat air directly with sunlight. These can be quite cost effective, but tend to work best for homes that are fairly well insulated and that have a significant amount of "thermal mass" (masonry floors and/or walls that can absorb the solar heat effectively during the day, and release it at night).

Grid-Tied, or “Net-Metered” Photovoltaic Systems are simple (low maintenance) way to generate solar electricity and thereby reduce emissions from conventional power plants and advance solar, for those that already have *conventional* electricity service. Besides the obvious environmental and practical benefits on not using batteries, these systems are also attractive because all of the solar power gets used (if you don’t use it, it gets put back on the grid, so someone else does). Moreover, it increases local power generation on the grid, which is philosophically attractive, and benefits ratepayers generally (because the decreased load on the grid helps extend the life of transformers and other components, and avoids upgrades to the system).

Off-grid Photovoltaic Systems are an attractive way to live away from the power grid without sacrificing the amenities of electrical power, and avoiding the need to run a noisy, highly polluting generator.

System Sizing and Cost:

For more detailed information about how large systems need to be to produce a certain amount of electrical power, or heat a particular floor area, and how much they cost, see the easy to use rules of thumb for these calculations in CCAE’s Info on System Sizing and Cost, available at:

http://www.nmcca.org/Incentives_Laws/index.htm.

Step 6: Now that you’ve decided *roughly* what type, what size, and what cost range of solar system you want, look more closely at what incentives are available. The basic incentives available in New Mexico, at the time of this writing, are:

- **Federal Solar Tax Credit:** 30% of installed system cost, up to a maximum credit of \$2000 per system for residences (no cap for commercial). Only available for systems purchased and installed in 2006 and 2007. Direct Solar Hot *Air* (for residences), and hot tub/swimming pool collectors are not eligible. For both homeowners and businesses, an excellent guide for navigating the fine details of the federal credits is the Guide to Federal Tax Incentives for Solar Energy, which can be obtained free of charge at www.seia.org. This covers, for example, to what extent hybrid systems are eligible (i.e. combining solar with conventional heat sources), and many other important details. Solar hot water heaters, for example, *must* be certified by the Solar Rating Certification Corporation (www.solar-rating.org) to be eligible for the federal credits.
- **New Mexico Solar Tax Credit:** 30% of installed system cost, then *less any applicable federal tax credits*, up to \$9000 per system (for all taxpayers, businesses or residences). Credits will be available for systems purchased after January 1, 2006, through 2015. Eligible systems include grid-tied commercial PV systems, off-grid and grid-tied residential PV systems, and (active) solar hot water or hot air systems. Hot tub/swimming pool collectors are not eligible (but direct solar hot air systems *are* eligible, unlike the federal). Agricultural PV water pumping systems are also eligible. **To be eligible, systems must be certified first by the New Mexico Energy, Minerals, and Natural Resources Department.** The Department will be issuing guidelines and application forms soon (these will be available at

<http://www.emnrd.state.nm.us/emnrd/ecmd/>. It is not clear yet whether, and to what extent, the new state solar credits will apply to self-installed systems.

Note on the Combination of the Federal and State Solar Credits: Because any applicable federal credits are subtracted from the state credits, the state and federal credits work to provide a 30% tax credit *combined*, up to maximum amounts that are larger and for a longer time period than was offered by the federal tax credits alone. In this way, New Mexico fully leverages the federal credits, and keeps incentives in place long enough to truly help our solar industry develop.

- **Net-Metering Incentive:** A grid-tied PV system can recoup 45% or more of its initial cost (relative to today's cost of PV) in avoided electricity bills alone over 25 years. This is really a very significant, and often under-appreciated incentive.
- **PNM PV Power Buyback Program:** In addition to net-metering, customers of PNM who own net-metered PV systems can also sell the "renewable energy credits" of their PV power to PNM for 13 cents per kilowatt-hour through 2018. PNM will then apply these credits towards meeting their obligations under New Mexico's Renewable Energy Standard, which requires utilities such as PNM to provide 10% of the power from renewable sources by 2011. These sales to PNM are *in addition* to the net-metering benefits (i.e. the benefits of spinning your meter backwards), and apply to *each and every* kilowatt-hour of PV power generated, whether the customer utilizes those kilowatt-hours or feeds them back into the grid (the customer must install a separate "credits" meter that measures the full output of the PV system to be eligible). Those who begin selling credits to PNM in 2006 will recoup approximately 25% of their system cost (relative to today's PV prices) by 2018 (when the program is currently scheduled to be re-evaluated, and possibly terminate). See www.pnm.com for more details on this program.

Note that, for customers of PNM that utilize all three incentives above, the total combined incentives will approximately equal the total cost of the system over 25 years, making PV a break even proposition, at least for PNM customers, for the first time in New Mexico:

Total Incentive: Tax Credits (30%) + Net-Metering (45%) + PNM Buyback (25%) = 100%!

For more detailed information on incentives, see CCAE's incentives summary, available at http://www.nmccae.org/Incentives_Laws/index.htm.

Step 7: Locating a Reputable Installer: First you need to find installers who serve your area, and then figure out which of these is *reputable*. As was stressed at the beginning of this guide, working with reputable installers is crucial: Visit an installer's previous work before you commit if you can. Talk with the system owners. Even better, take some time to participate in solar tours (such as those offered occasionally by the New Mexico Solar Energy Association) or other educational opportunities, and get a feel for what's working, and who does good work.

Excellent Sources for Locating Solar Companies and Installers are:

- **The Solar Professionals Directory**; Published by the New Mexico Solar Energy Association. The Directory can be accessed for free online at www.NMSEA.org, or purchased by mail by sending a check for \$5 and a written request to: The New Mexico Solar Energy Association, 1009 Bradbury Se, #35, Albuquerque, NM 871067.
- **The Website www.findsolar.com.**
- **The Yellow Pages.**

Doing it yourself: While this appeals to the self-reliant spirit of the American people, and while we are grateful to all the do-it-yourself folks out there who have kept solar alive and kicking, we *do not* recommend self-installation for several reasons: Unless you really know what you're doing, self-installation can be dangerous and/or costly. Secondly, self-installation does not help the industry grow. While it may ostensibly cost less to self-install, hiring a qualified installer helps the industry develop, and the experience gained with your system will add to the collective knowledge of the professionals out there. Finally, it is not clear yet whether, and to what extent, the new state solar credits will apply to self-installed systems.

Installer Certification: Note that there now exists a national certification & training program for installers, called the North American Board of Certified Energy Practitioners, or "NABCEP" (see www.nabcep.org). NABCEP is already training and certifying PV installers, and will soon be issuing certification & training materials for solar thermal. There are already several NABCEP certified installers in New Mexico. *Encourage installers to become properly trained and certified if they aren't already. Look for installers who are.*

Beware of installers who suggest that systems not be inspected.

Report Problems: Report problems with installers to the Renewable Energy Industries Association of New Mexico (www.REIA-NM.org) and/or your local chamber of commerce or better business bureau. Remember, unscrupulous or incompetent installers or companies are not helpful to the development of solar.

General Information:

Technical Information by the New Mexico Solar Energy Association:

- Passive Solar Guidelines: www.NMSEA.org (Click on FAQs section).
- Education info: www.NMSEA.org/Curriculum/Listing.htm
- Net-Metering: www.NMSEA.org/Grid_Interconnection/Interconnection.htm

Locating Renewable Energy Services/Businesses:

- Solar Business Directory: www.NMSEA.org (then see menu-bar on left side)
- Renewable Energy Industries Association of New Mexico: www.REIA-NM.org
- A new website: www.findsolar.com, which allows customers to learn about PV dealers, read customer reviews, and estimate system size and costs.
- The website www.nabcep.org, which lists nationally certified PV (and soon thermal) installers who have successfully proven field experience and who have passed a rigorous certification test.

Workshops and Energy Fairs offered by the New Mexico Solar Energy Association:

- **Solar Fiesta!** Two days of comprehensive workshops and exhibits held by the NMSEA in late September in Albuquerque. A great way to get to know the solar energy community as well.
- **Solar Village:** Exhibits held in conjunction with the Taos Solar Music Festival.
- **SynergyFest:** Solar Music Fair held each spring in Las Vegas, New Mexico.
- **Albuquerque Chapter of the NMSEA (see NMSEA website).**
- **School Visits:** Contact the NMSEA at info@NMSEA.org.

Chapters of the New Mexico Solar Energy Association: (Contact the Association at info@NMSEA.org for contact information)

- Santa Fe Chapter (“Santa Fe Circle”), Alamogordo Chapter, Las Vegas Chapter (“Heavenly Bodies Club”), Taos Chapter (closely linked with “Sustain Taos!”), Los Alamos Chapter (“Los Alamos Sustainable Energy Network” or “LASE Network”): <http://www.lasenergy.net/>, Albuquerque Chapter

Other New Mexico Clean Energy Organizations:

- Rebuild New Mexico: <http://www.rebuildnewmexico.org/>
- UNM Students for Clean Energy: <http://www.unm.edu/~cleannrg/>
- Regional Development Corporation: <http://www.rdcnm.org/pRenewableEnergy.aspx>