



## **SOLAR ENERGY IN SANTA BARBARA COUNTY**

### ***WHY SOLAR ENERGY?***

#### **Santa Barbara County's sunny climate is ideal for solar energy applications.**

Most households have the potential to supply much of their own electricity and hot water using solar energy systems.

Even with the marine influence, coastal areas receive 85 to 90 percent of the annual amount of solar energy the inland areas receive.

#### **Solar is no longer an experiment.**

Present day systems are reliable, efficient, and require little maintenance.

Hundreds of thousands of families world-wide generate their own solar electricity, and millions heat water with dependable solar technology.

#### **Solar is clean and green!**

Solar is one of the cleanest energy options available. By installing solar energy systems you can significantly reduce your consumption of fossil fuels and reduce your carbon footprint.

Personal solar energy systems reduce the need to build additional centralized power plants and utility infrastructure. This is part of the reasoning behind government programs that promote solar energy.

#### **Solar is easy.**

Experienced installers and informational resources can guide you to the right solar energy system. Installation can be quick and effortless.

#### **Solar is affordable.**

California's renewable energy rebate programs make solar energy more competitive with conventional energy sources. Incentive programs and "net metering" agreements contribute to significant savings on utility bills.

Solar locks in low energy costs for 20 to 30 years, and reduces your dependence on unpredictable energy market prices.



## TYPES OF SOLAR ENERGY SYSTEMS

Solar energy systems for domestic applications are typically either **thermal energy (hot water) systems** that use solar energy to heat water for use in swimming pools or houses, or **photovoltaic systems** that use photovoltaic (PV) cells to convert solar energy to electricity.



Thermal energy systems can be either active or passive. *Active* systems use a pump to circulate water from a storage tank to the roof-mounted solar collector. *Passive* systems store hot water inside the solar collector or nearby tank so that a pump is not needed. Active systems generally cost more and require more maintenance than passive systems, but they are more efficient.

Thermal energy systems can provide 40 to 70 percent of domestic water heating needs. These systems can be integrated into an existing gas or electricity powered tank or tankless hot water system and can generally pay for itself through utility bill savings within the 20-year life of the system. Energy cost savings can pay for a solar pool heater in two to four years. After that, pool heating is free up to eight months of the year. Thermal energy systems can last 15 to 20 years for pool heating and 20 to 30 years for domestic hot water heating.

Photovoltaic solar systems allow you to generate a stable, reliable supply of electricity which can be uninterrupted if a battery backup system is used. Arrays of photovoltaic cells can be placed on top of roofs or mounted on a support system located on the ground. Some photovoltaic cells are now being built into construction materials, for example, roof tiles, so that they are virtually invisible. Photovoltaic systems typically last 20 to 30 years.

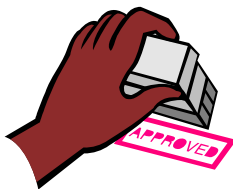
## DESIGN CONSIDERATIONS



To determine the size and type of solar systems that will fit your requirements, and the best locations for the system, you should consult with professionals who are experienced in designing building solar systems (see *Additional Resources* below). Solar systems need to be located in an unshaded location facing South, East or West, with the panels angled between five and 30 degrees. You should also consider the system's visibility to the neighborhood and visual integration with existing buildings. Consider a high performance location with low public visibility, installing "building-integrated photovoltaic systems (see below) or using framing and mounting techniques that maximize a system's visual integration.

Solar installations can be very attractive or disappear altogether. Solar collectors heating a pool can be concealed on the roof of a nearby structure such as a pool house or trellis, or built into a pool deck so that the collector tubes cool the deck while heating the pool. Solar panels for domestic hot water can blend into the design of the structure, appearing like a skylight or some other architectural feature.

Arrays of photovoltaic cells can be mounted on top of roofs or mounted on a support system located on the ground. Building-integrated photovoltaic systems integrate photovoltaic material directly into the building's materials such as the roof shingles or tiles, or glazing (skylights, windows). Building-integrated photovoltaic systems can be particularly visually attractive because they are integrated with the building design. Thin-film photovoltaic materials are flexible and durable and can be applied to many different surfaces; however their energy production is much lower and thus more expensive.



## PERMIT REQUIREMENTS

In compliance with California Government Code Section 65850.5, solar energy systems do not require design review by the County of Santa Barbara. Systems mounted on the roof of a structure are exempt for zoning permits. Ground-mounted systems that are not located in the Coastal Zone are also exempt from zoning permits, and only require the approval of a ministerial Coastal Development Permit if located in the Coastal Zone.

Building permits, including electrical and plumbing permits depending on the type of system, are required. Domestic hot water systems need to be certified by the Solar Rating and Certification Corporation, the national ratings laboratory for all hot water systems.

## ECONOMIC CONSIDERATIONS



You will often hear the word "payback period" in relation to solar power. A simple payback is the length of time it takes to pay for the system through energy bill savings. This may be calculated by using the following formula:

Simple Payback = System cost / (monthly utility bill savings x 12)

For example, if the system costs \$20,000, and it saves \$200 off the electricity bill each month, the payback period would be:

Simple Payback = \$20,000 / (\$200 x 12) = 8.3 years.

This is an oversimplified calculation and does not include financing or maintenance costs or potential changes in electricity rates or other important considerations. A more complete calculation can be performed at [www.consumerenergycenter.org/renewables/estimator](http://www.consumerenergycenter.org/renewables/estimator).

Whether or not you realize an immediate dollar savings, solar energy systems are a great investment because they save money, benefit the environment, and reduce your dependency on escalating public utility rates. In Santa Barbara a solar water heater costing \$7,000 to \$9,000 can save 2,000 to 3,000 kilowatts of electricity or 10 to 15 million BTUs of natural gas per year.

Heating a pool with a conventional heater is expensive with monthly energy costs of \$100 to \$300 or more. A solar pool heater consisting of seven to 10 four foot by 10 foot solar panels can keep a mid-sized pool at 75 to 85 degrees for eight or more months of the year in Santa Barbara. A typical installation costs \$3,500 to \$4,500. An 8-panel system can capture up to 400,000 BTU of solar energy per day, which would cost five dollars a day using natural gas. This system can pay for itself in two to four years, and after that the pool heat is free. Use of a pool cover substantially reduces heat loss, allowing you to install fewer solar panels and minimize the system size and cost.

Rebates, tax credits and other incentives reduce the price of a solar energy system. The California Energy Commission New Solar Homes Partnership focuses on solar photovoltaic systems for new home construction. Information on this program is available at [www.gosolarcalifornia.ca.gov/nsbp](http://www.gosolarcalifornia.ca.gov/nsbp). The California Public Utilities Commission provides incentives for all other residential and non-residential customers under the California Solar Initiative ([www.gosolarcalifornia.ca.gov/csi/index.html](http://www.gosolarcalifornia.ca.gov/csi/index.html)). Both of these programs currently only fund solar photovoltaic systems. Also, if you finance the system with a home improvement loan or as part of a mortgage refinance, your monthly energy bill savings can largely offset the increase in the loan payment, and the interest on the loan is tax deductible.

California's net metering law requires utilities to allow customers with solar photovoltaic systems rated at 10 kilowatts or less who generate small amounts of electricity in excess of the electricity consumed to feed that excess power back into the electric grid for credit towards their bill. The system must include the correct type of power inverter, and the utility company will need to provide a suitable electric meter for net metering customers. Under this arrangement, when your grid-connected system generates more electricity than you are using, your meter will run backwards, but you cannot be credited for more electricity than you use.

## **FREQUENTLY ASKED QUESTIONS**



### ***Will adding solar energy systems delay my construction?***

No. Solar energy systems are readily available and can be installed quickly and easily. If a building permit is required, the permit process for energy-efficient projects may be expedited through the Innovative Building Review Program (IBRP). Call 805.568.2040 for more information.

### ***Do solar systems require a lot of upkeep?***

That may have been true in the 1970's and 80's, but modern systems are more reliable and better designed than older systems. Most can last 20 to 30 years.

### ***Where can I obtain information on construction requirements for solar?***

Working with experienced solar installers and suppliers may be the easiest way, but also refer to the *Additional Resources* listed below.

## **10 STEPS TO GETTING STARTED<sup>1</sup>**

1. **Learn about solar technologies.** For general information about the different solar technologies, check out the Energy Efficiency and Renewable Energy website of the U.S. Department of Energy at [www.eere.energy.gov/solar](http://www.eere.energy.gov/solar).



<sup>1</sup> Information provided by the Community Environmental Council \* (805) 963-0583 \* [www.FossilFreeBy33.org](http://www.FossilFreeBy33.org)

2. **Get an energy audit before going solar.** Before you start planning the size of your solar installation, complete an online audit at [www.sce.com](http://www.sce.com) (if you live in South County) or [www.pge.com](http://www.pge.com) (if you live in North County). Use your customer number on your electric bill to request a history of your electric usage. This usage history will be needed by your solar contractor to size your system correctly.
3. **Assess the most efficient location for panels.** Figure on needing 100 square feet of panels per kilowatt (kW). A typical home installation is 2.5 or 3 kW AC, so you would need about 300 square feet of unshaded roof or ground space for panels that will be angled between 5 and 30 degrees.
4. **Consider the aesthetics.** While a state mandate prevents architectural boards and homeowners associations from restricting solar panel installations based solely on aesthetics, we strongly encourage you to consider your system's visibility to neighbors and its visual integration.
5. **Talk to a contractor who specializes in solar.** Installers will assess your location and suggest the size and type of system that is best for you.
6. **Reserve your incentives.** You or your installer will work with the solar program administrator to reserve your incentive funds or rebate. After the program administrator receives your completed application, it will reserve funds based on the size of your solar project as well as the design parameters such as shading, direction, etc. These funds will be reserved for periods of time indicated in each program, by which time you must provide adequate proof of progress towards installing your system and demonstration that you are moving forward with the project.
7. **Get your permits and install the solar system.** Photovoltaic systems and hot water systems require a building permit, which are typically handled by your contractor. Systems that are mounted on the ground may require a Land Use Permit.
8. **Claim your state rebate.** After the building permit has been signed off, claim your reserved rebate. Getting your check can take some time but many installers will handle this application process for you and float the rebate, automatically deducting the rebate from your final bill.
9. **Complete interconnection with the utility.** Once you've received signoff on the building permit, the utility interconnection process can be finalized. Within five to ten business days after the utility company receives a completed application prepared by your installer, you get permission to operate your solar system.
10. **Apply for your tax credits.** Tax incentives change from year to year. Under current tax code, when you file your federal income tax return you will receive a tax credit for a percentage 30 percent of your out-of-pocket, after-rebate costs for the solar system. Check with your accountant or the current tax laws for this credit.

## **ADDITIONAL RESOURCES**

There are many resources available to help you decide on the most appropriate and cost-effective system. Visit some of the many informative solar web sites. The list below is a good starting point, with links to other excellent sites. Also, contact local experts, including solar installers, architects and contractors knowledgeable about solar energy systems. Look in the yellow pages under solar.

[www.sbcontractors.org](http://www.sbcontractors.org)

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

[www.California.researchSOLAR.com](http://www.California.researchSOLAR.com)

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

