City of Santa Barbara

SOLAR ENERGY
REFERENCES & RESOURCES

The references and resources in this section provide additional information about topics related to solar energy and energy efficiency. The references and resources are meant to provide further information and may not be comprehensive. Manufacturers and contractors have not been reviewed or endorsed by the City of Santa Barbara and are listed only for information purposes. Suggested additions to the reference and resource lists can be submitted to the Planning Counter at 630 Garden Street.

REFERENCES

General Books

The Homeowner's Guide to Renewable Energy: Achieving Energy Independence from Wind, Solar, Biomass and Hydropower. By Dan Chiras. 2006.

Real Goods Solar Living Sourcebook. 12th Edition. Edited by John Schaeffer. 2004.

Solar House: A Guide for the Solar Designer. By Terry Galloway. Architectural Press. 2004.

Solar Energy System Books

Consumer Guide to Solar Energy. By Scott Sklar and Ken Sheinkopf. Bonus Books. 2002.

Designing with Solar Power: A Sourcebook for Building Integrated Photovoltaics. Edited by Deo Prasad and Mark Snow. Earthscan. 2005.

The Easy Guide to Solar Electric, Part 1 and Part 2. 2nd Edition. By Pieper Adi. 2001.

Photovoltaics: Design and Installation Manual. By Solar Energy International. 2004.

Planning and Installing Photovoltaic Systems: A Guide for Installers, Architects and Engineers. By the German Solar Energy Society. Earthscan. 2005.

Power with Nature: Solar and Wind Energy Demystified. By Rex A. Ewing. Pixyjack Press. 2003.

Practical Photovoltaics: Electricity for Solar Cells. By Richard J. Komp. Aatec Publications. 1995.

The Solar Electric House: Energy for the Environmentally Responsive, Energy-Independent Home. By Steven J. Strong with William G. Scheller. Sustainability Press. 1993.

Solar Electricity. Edited by Tomas Markvart. Wiley. 2000.

Solar Water Heating: A Comprehensive Guide to Solar Water and Space Heating. By Bob Ramlow with Benjamin Nusz. 2006.

Passive Solar Building Design Books

The Natural House: A Complete Guide to Healthy, Energy-Efficient, Environmental Homes. By Daniel D. Chiras. Chelsea Green Publishing Company. 2000.

The Passive Solar Design and Construction Handbook. By Steven Winter Associates and Michael J. Crosbie. Wiley. 1997.

Passive Solar Energy: The Homeowner's Guide to Natural Heating and Cooling. By Bruce Anderson and Malcolm Wells. 1994.

Passive Solar House: The Complete Guide to Heating and Cooling Your Home. By James Kachadorian. Chelsea Green Publishing Company. 2006.

The Passive Solar House: Using Solar Design to Heat and Cool Your Home. By James Kachadorian. Chelsea Green Publishing Company. 1997.

The Solar House: Passive Heating and Cooling. By Dan Chiras. Chelsea Green. 2002.

*The Sun-Inspired House: Ideas and House Plans Using the Sun to Brighten and Warm Your Ho*me. By Debra Rucker Coleman. 2005.

Sun, Wind and Light. By G.Z. Brown and Mark DeKay. Wiley. 2000.

Other Publications

"A Consumer's Guide: Get Your Power from the Sun."
www.nrel.gov/docs/fy04osti/35297.pdf

"A Consumer's Guide: Heat Your Water with the Sun." By the U.S. Department of Energy, Energy Efficiency and Renewable Energy.
www.nrel.gov/docs/fy04osti/34279.pdf

"Building-Integrated Photovoltaic Designs for Commercial and Institutional Structures: A Sourcebook for Architects." By Patrina Eiffert and Gregory J. Kiss.
www.nrel.gov/docs/fy00osti/25272.pdf

"Go Solar! 9 Steps to Getting Started with Solar." By the Community Environmental Council.
www.communityenvironmentalcouncil.org/Programs/EP/PDFs/9steps_gosolar.pdf

"Santa Barbara County Green Building Guidelines." By The Sustainability Project.
www.sustainabilityproject.org/DesktopDefault.aspx?pageid=88

"Solar Energy in Santa Barbara County: The Next Steps for Removing Barriers." By The Santa Barbara County Million Solar Roofs Partnership.
www.communityenvironmentalcouncil.org/Programs/EP/PDFs/MSR%20Solar%20Barriers%20FINAL.pdf

"Solar Water and Pool Heating Manual." By the Florida Solar Energy Center.
www.fsec.ucf.edu/solar/install/solarmanual.htm

Local and State Regulations and Guidelines

City of Santa Barbara

The following documents can be viewed online at www.santabarbaraca.gov or at the Community Development Department's Planning and Zoning Information Counter, 630 Garden Street:

General Plan, Conservation Element, Last updated July 1994

Municipal Code
Environmental Policy and Construction Ordinance, Title 22
Zoning Ordinance, Title 28

Solar Access Ordinance Planning and Zoning Counter Handout

Design Guidelines

- Architectural Board of Review Guidelines
- Chapala Street Design Guidelines
- El Pueblo Viejo District Guidelines
- Lower Riviera Special Design District Guidelines
- Outdoor Lighting Design Guidelines
- Sign Review Guidelines
- Single Family Residence Design Guidelines
- Urban Design Guidelines

California

California Solar Rights Laws
http://calseia.org/news/general/solar-rights.html
Also see "State Legislation Text" at the end of this document.

RESOURCES

Video

"An Introduction to Residential Solar Electricity with Johnny Weiss." Renewable Energy with the Experts. 1997.

Solar and Renewable Energy Information

California Energy Commission Consumer Energy Center
(800) 555-7794 (toll-free in California) or (916) 654-4058 (outside California) or (916) 654-4287
www.consumerenergycenter.org/renewables/ Email address: renewable@energy.state.ca.us

California Solar Center
www.californiasolarcenter.org

Center for Renewable Energy and Sustainable Technology
(202) 293-2898
www.crest.org

Energy and Environmental Building Association
(952) 881-1098
www.eeba.org

U.S. Department of Energy, Energy Efficiency and Renewable Energy
(800) 342-5363
www.eere.energy.gov/

U.S. Department of Energy, National Renewable Energy Laboratory
(303) 275-3000
www.nrel.gov/

Energy Efficiency and Green Building

Alliance to Save Energy
(202) 857-0666
www.ase.org

Center for Energy Efficiency and Renewable Technologies
(916) 442-7785
www.ceert.org

Solar Energy and Energy Efficiency Software

Clean Power Estimator
www.consumerenergycenter.org/renewables/estimator/index.html
Free online tool for estimating solar energy system size, price and cost savings.

Building Software Tools Directory
www.eere.energy.gov/buildings/tools_directory/
Hundreds of online software tools for evaluating energy efficiency, renewable energy, and sustainability in buildings. Some are free.

My Solar Estimator
www.findsolar.com/
Free online tool for estimating solar energy system size, price and cost savings.

Rebates and Incentives

California Emerging Renewables Program
(800) 555-7794
www.consumerenergycenter.org/erprebate/
Coordinates solar energy system rebates in 2006

California Solar Incentive Program
www.cpuc.ca.gov/static/energy/solar/index.htm
Will coordinate rebates from 2007 to 2017

Southern California Edison Net Energy Metering Program
(626) 302-9680
LauraDiane.Rudison@SCE.com
www.sce.com/RebatesandSavings/GeneratingYourOwnPower/NetEnergyMeteringFAQs/
Under this program, SCE customers can receive kilowatt-hour credits for surplus electricity produced by a solar energy system and transferred to the SCE grid

Federal Incentives for Renewables and Efficiency,
DSIRE (Database of State Incentives for Renewable Energy)
www.dsireusa.org/library/includes/genericfederal.cfm?currentpageid=1&search=federal&state=US&RE=1&EE=1
Describes federal incentives for using renewable energy

Energy Efficiency Rebates and Programs
(800) 655-4555
www.sce.com/RebatesandSavings/
Describes rebates from SCE for completing energy-efficiency projects

Local Renewable Energy Advocates

Community Environmental Council
(805) 963-0583
www.communityenvironmentalcouncil.org/

The Sustainability Project
(805) 966-3355
www.sustainabilityproject.org

BuiltGreen Santa Barbara Program
(805) 884-1100
www.builtgreensb.org

Other Renewable Energy Advocates

American Solar Energy Society
(303) 443-3130
www.ases.org/

California Solar Energy Industries Association
(949) 709-8043
http://calseia.org/

Solar Energy System Manufacturers

Several manufacturers produce photovoltaic modules that are eligible for a rebate from the State of California. See the California Energy Commission's list of eligible renewable energy equipment at www.consumerenergycenter.org/erprebate/equipment.html or contact the Commission at 1-800-555-7794.

Many manufacturers produce rectangular crystalline silicon modules, which account for the majority of the photovoltaic module market. The following manufacturers produce less common photovoltaic modules such as building-integrated photovoltaic modules and custom-shaped modules that, as of 2006, are eligible for rebates from the State of California.

Building-Integrated Photovoltaic Module Manufacturers

Atlantis Energy Systems
(916) 438-2930
www.atlantisenergy.org/

First Solar
(602) 414-9300
www.firstsolar.com

Kaneka
(800) 526-3522
www.kaneka.com

Kyocera
(800) 223-9580
www.kyocerasolar.com/

Mitsubishi
(714) 229-3814
www.mitsubishielectric.com/products/solar.html

Sanyo
2055 Sanyo Ave.
San Diego, CA 92154
solar@sec.sanyo.com
www.sanyo.com/industrial/solar/

Schott
(916) 625-9033
www.schott.com

Solar Integrated
(323) 231-0411
www.solarintegrated.com

Spire
(800) 510-4815
www.spirecorp.com

Unisolar
(800) 843-3892
www.uni-solar.com

Custom-Shaped Photovoltaic Module Manufacturers

Sharp
(800) 237-4277
http://sharpusa.com/solar

SPG Solar
(800) 815-5562
www.spgsolar.com

Building-Integrated Solar Thermal System Manufacturers

American Solar
(703) 346-6053
www.americansolar.com

Dawn Solar
(800) 803-1476
www.dawnsolar.com

Local Solar Energy System Contractors

For a list of local solar energy system contractors, please see page 2 of Appendix C.

Local Utilities

Southern California Edison
(800) 655-4555
www.sce.com

Southern California Gas Company
(800) 427-2200
www.socalgas.com

Self Generation Incentive Program Contact Information (for projects in 2006)

Southern California Edison Company
Mailing Address: Program Manager
Self Generation Incentive Program
c/o Southern California Edison
2131 Walnut Grove Ave., 3rd floor, MS B10
Rosemead, CA 91770
Email address: selfgen@pge.com

Southern California Gas Company
Mailing Address: Self-Generation Incentive
Program Administrator
Southern California Gas Company
555 West Fifth Street, GT22H4
Los Angeles, CA 90013
Fax: (213) 244-8222
Telephone: 866-DG-REBATE
Email address: selfgeneration@socalgas.com

State Legislation Text

Government Code 65850.5

(a) The implementation of consistent statewide standards to achieve the timely and cost-effective installation of solar energy systems is not a municipal affair, as that term is used in Section 5 of Article XI of the California Constitution, but is instead a matter of statewide concern. It is the intent of the Legislature that local agencies not adopt ordinances that create unreasonable barriers to the installation of solar energy systems, including, but not limited to, design review for aesthetic purposes, and not unreasonably restrict the ability of homeowners and agricultural and business concerns to install solar energy systems. It is the policy of the state to promote and encourage the use of solar energy systems and to limit obstacles to their use. It is the intent of the Legislature that local agencies comply not only with the language of this section, but also the legislative intent to encourage the installation of solar energy systems by removing obstacles to, and minimizing costs of, permitting for such systems.

(b) A city or county shall administratively approve applications to install solar energy systems through the issuance of a building permit or similar nondiscretionary permit. Review of the application to install a solar energy system shall be limited to the building official's review of whether it meets all health and safety requirements of local, state, and federal law. The requirements of local law shall be limited to those standards and regulations necessary to ensure that the solar energy system will not have a specific, adverse impact upon the public health or safety. However, if the building official of the city or county has a good faith belief that the solar energy system could have a specific, adverse impact upon the public health and safety, the city or county may require the applicant to apply for a use permit.

(c) A city or county may not deny an application for a use permit to install a solar energy system unless it makes written findings based upon substantial evidence in the record that the proposed installation would have a specific, adverse impact upon the public health or safety, and there is no feasible method to satisfactorily mitigate or avoid the specific, adverse impact. The findings shall include the basis for the rejection of potential feasible alternatives of preventing the adverse impact.

(d) The decision of the building official pursuant to subdivisions (b) and (c) may be appealed to the planning commission of the city or county.(e) Any conditions imposed on an application to install a solar energy system shall be designed to mitigate the specific, adverse impact upon the public health and safety at the lowest cost possible.

(f) (1) A solar energy system shall meet applicable health and safety standards and requirements imposed by state and local permitting authorities. (2) A solar energy system for heating water shall be certified by the Solar Rating Certification Corporation (SRCC) or other nationally recognized certification agency. SRCC is a nonprofit third party supported by the United States Department of Energy. The certification shall be for the entire solar energy system and installation. (3) A solar energy system for producing electricity shall meet all applicable safety and performance standards established by the National Electrical Code, the Institute of Electrical and Electronics Engineers, and accredited testing laboratories such as Underwriters Laboratories and, where applicable, rules of the Public Utilities Commission regarding safety and reliability.

(g) The following definitions apply to this section: (1) "A feasible method to satisfactorily mitigate or avoid the specific, adverse impact" includes, but is not limited to, any cost-effective method, condition, or mitigation imposed by a city or county on another similarly situated application in a prior successful application for a permit. A city or county shall use its best efforts to ensure that the selected method, condition, or mitigation meets the conditions of subparagraphs (A) and (B) of paragraph (1) of subdivision (d) of Section 714 of the Civil Code. (2) "Solar energy system" has the same meaning set forth in paragraphs (1) and (2) of subdivision (a) of Section 801.5 of the Civil Code. (3) A "specific, adverse impact" means a significant, quantifiable, direct, and unavoidable impact, based on objective, identified, and written public health or safety standards, policies, or conditions as they existed on the date the application was deemed complete.65851. For such purposes the legislative body may divide a county, a city, or portions thereof, into zones of the number, shape and area it deems best suited to carry out the purpose of this chapter. 65852. All such regulations shall be uniform for each class or kind of building or use of land throughout each zone, but the regulation in one type of zone may differ from those in other types of zones. 66475.3. For divisions of land for which a tentative map is required pursuant to Section 66426, the legislative body of a city or county may by ordinance require, as a condition of the approval of a tentative map, the dedication of easements for the purpose of assuring that each parcel or unit in the subdivision for which approval is sought shall have the right to receive sunlight across adjacent parcels or units in the subdivision for which approval is sought for any solar energy system, provided that such ordinance contains all of the following:

(1) Specifies the standards for determining the exact dimensions and locations of such easements.

(2) Specifies any restrictions on vegetation, buildings and other objects which would obstruct the passage of sunlight through the easement.

(3) Specifies the terms or conditions, if any, under which an easement may be revised or terminated.

(4) Specifies that in establishing such easements consideration shall be given to feasibility, contour, configuration of the parcel to be divided, and cost, and that such easements shall not result in reducing allowable densities or the percentage of a lot which may be occupied by a building or a structure under applicable planning and zoning in force at the time such tentative map is filed.

(5) Specifies that the ordinance is not applicable to condominium projects which consist of the subdivision of airspace in an existing building where no new structures are added. For the purposes of this section, "solar energy systems" shall be defined as set forth in Section 801.5 of the Civil Code.

For purposes of this section, "feasibility" shall have the same meaning as set forth in Section 66473.1 for the term "feasible".

Public Resources Code 25980

This chapter shall be known and may be cited as the Solar Shade Control Act. It is the policy of the state to promote all feasible means of energy conservation and all feasible uses of alternative energy supply sources. In particular, the state encourages the planting and maintenance of trees and shrubs to create shading, moderate outdoor temperatures, and provide various economic and aesthetic benefits. However, there are certain situations in which the need for widespread use of alternative energy devices, such as solar collectors, requires specific and limited controls on trees and shrubs.25981. As used in this chapter, "solar collector" means a fixed device, structure, or part of a device or structure, which is used primarily to transform solar energy into thermal, chemical, or electrical energy. The solar collector shall be used as part of a system which makes use of solar energy for any or all of the following purposes: (1) water heating, (2) space heating or cooling, and (3) power generation. 25982. After January 1, 1979, no person owning, or in control of a property shall allow a tree or shrub to be placed, or, if placed, to grow on such property, subsequent to the installation of a solar collector on the property of another so as to cast a shadow greater than 10 percent of the collector absorption area upon that solar collector surface on the property of another at any one time between the hours of 10 a.m. and 2 p.m., local standard time; provided, that this section shall not apply to specific trees and shrubs which at the time of installation of a solar collector or during the remainder of that annual solar cycle cast a shadow upon that solar collector. For the purposes of this chapter, the location of a solar collector is required to comply with the local building and setback regulations, and to be set back not less than five feet from the property line, and no less than 10 feet above the ground. A collector may be less than 10 feet in height, only if in addition to the five feet setback, the collector is set back three times the amount lowered. 25983. Every person who maintains any tree or shrub or permits any tree or shrub to be maintained in violation of Section 25982 upon property owned by such person and every person leasing the property of another who maintains any tree or shrub or permits any tree or shrub to be maintained in violation of Section 25982 after reasonable notice in writing from a district attorney or city attorney or prosecuting attorney, to remove or alter the tree or shrub so that there is no longer a violation of

Section 25982, has been served upon such person, is guilty of a public nuisance as defined in Sections 370 and 371 of the Penal Code and in Section 3480 of the Civil Code. For the purposes of this chapter, a violation is hereby deemed an infraction. The complainant shall establish to the satisfaction of the prosecutor that the violation has occurred prior to the prosecutor's duty to issue the abatement notice. For the purpose of this section, "reasonable notice" means 30 days from receipt of such notice. Upon expiration of the 30-day period, the complainant shall file an affidavit with the prosecutor alleging that the nuisance has not been abated if the complainant wishes to proceed with the action. The existence of such violation for each and every day after the service of such notice shall be deemed a separate and distinct offense, and it is hereby made the duty of the district attorney, or the city attorney of any city the charter of which imposes the duty upon the city attorney to prosecute state infractions, to prosecute all persons guilty of violating this section by continuous prosecutions until the violation is corrected. Each and every violation of this section shall be punishable by a fine not to exceed one thousand dollars ($1,000). 25984. Nothing in this chapter shall apply to trees planted, grown, or harvested on timberland as defined in Section 4526 or on land devoted to the production of commercial agricultural crops. Nothing in this chapter shall apply to the replacement of a tree or shrub which had been growing prior to the installation of a solar collector and which, subsequent to the installation of such solar collector, dies. 25985. Any city, or for unincorporated areas, any county, may adopt, by majority vote of the governing body, an ordinance exempting their jurisdiction from the provisions of this chapter. The adoption of such an ordinance shall not be subject to the provisions of the California Environmental Quality Act (commencing with Section 21000). 25986. Any person who plans a passive or natural solar heating system or cooling system or heating and cooling system which would impact on an adjacent active solar system may seek equitable relief in a court of competent jurisdiction to exempt such system from the provisions of this chapter. The court may grant such an exemption based on a finding that the passive or natural system would provide a demonstrably greater net energy savings than the active system which would be impacted.

The California Solar Initiative, by the Public Utilities Commission

From the "Frequently Asked Questions" Website:
www.cpuc.ca.gov/static/energy/060123_csifaqs.htm

1. What is the California Solar Initiative?

The California Solar Initiative (CSI) provides up to **$2.9 billion in incentives** between 2007 and 2017, divided as follows:

The California Public Utilities Commission (PUC) will oversee a $2.5 billion program for commercial and existing residential customers, funded through revenues and collected from gas and electric utility distribution rates.

The California Energy Commission (CEC) plans to develop a $350 million program to target new residential building construction, utilizing funds already allocated to the CEC to foster renewable projects between 2007 and 2011.

2. Who is eligible for incentives?

All electric and gas customers of **PG&E, SCE, SDG&E,** and **Southern California Gas Company** are eligible to apply for incentives.

3. Are municipal utility consumers eligible for the rebate?

If a municipal electricity customer takes gas service from PG&E, SoCal Gas, or SDG&E, that customer will be eligible for solar rebates.

4. How much are the incentives?

Effective January 1, 2006, the program paid **$2.80 per watt** for photovoltaics, as of March 21, 2006, that was reduced to $2.50. Incentives will be reduced by an average of approximately 10 percent annually, declining to zero in 2017.

By January 2007, the PUC intends to explore ways to develop a **pay-for-performance incentive structure** to reward high-performing solar projects.

5. How do I apply for incentives?

During 2006, customers interested in solar incentives offered should contact the following:

- Residential and small business customers (PV under 30 kW) should contact the California Energy Commission
  800-555-7794 (toll-free in California)
  916-654-4058 (outside California)
  renewable@energy.state.ca.us
- Systems 30 kW or larger, contact your local electric or gas utility, except in San Diego, where customers should contact the San Diego Regional Energy Office.

6. What types of solar technologies are eligible?

- In 2006, customer-side **photovoltaics up to 5 MW** capacity are eligible, although incentives are paid only for the first MW.
- Beginning 2007**, photovoltaics (PV) and solar thermal electric projects** will receive per watt **incentives for up to 5 MW**.
- Incentive levels for **solar thermal electric projects**, including solar heating and cooling will be determined in 2006.
- The Commission authorized a **pilot solar water heater** (SWH) incentive program for customers of San Diego Gas and Electric Company. If successful, the PUC could offer SWH incentives statewide.

7. Are there special incentives for low-income housing?

Ten percent of program funds are allocated for low-income and affordable housing. The PUC intends to explore whether to offer additional incentives or low-cost financing.

8. Does my building need to meet specific energy efficiency requirements?

- **New structures**: new construction is already required to meet certain energy efficiency standards, which will be familiar to your contractor or developer.

- **Existing structures**: In 2006, existing structures are **not required to meet any specific energy efficiency standards.** The PUC and CEC will develop energy efficiency requirements this year, which will be in place by January 2007

9. What are CARE and FERA? How do I find out if I qualify?

Low-income customers that are enrolled in the CARE program receive a 20 percent discount on their electric and natural gas bills and other rate exemptions.

Families whose household income slightly exceeds the low-income energy program allowances will qualify to receive Family Energy Rate Assistance (FERA) discounts, which bills some of their electricity usage at a lower rate.

Customers should contact their local utility for more information.

10. How does the rebate program work once I contact the program administrator?

Experienced solar installers typically contact the program administrator on the customer's behalf to apply for the rebate and arrange for the project to be interconnected to the utility system. The installer may also apply for local permits, if applicable. Some cities charge user or permit fees, which vary among cities.

Step 1 The program administrator will provide you or your installer with a rebate application form. After the program administrator receives your completed application, it will reserve rebate funds based on the size of your solar project. These funds will be reserved for approximately 60-90 days, by which time you must provide adequate proof of progress towards installing your system. Your system does not have to be installed within this period, but the utility will require you to provide documentation to prove you are serious about moving forward with the project.

Step 2 When your system is installed, you or your installer will contact the utility for permission to connect your system to the utility grid.

Step 3 Once your system is approved, you will provide proof of payment to the program administrator, and receive your rebate.

11. If I install solar, how will it impact my utility bill? Can you give an example of how my power expenses will reduce over time if I install solar?

When the sun is shining, your solar system generates electricity, which means, you will purchase less electricity from the local utility. Over the course of one year, your utility will track the amount of electricity your system has fed into the grid, and use this credit to offset the costs of power purchased from the utility when your system does not generate electricity, i.e. cloudy days or at night. At the end of the year, the utility will true up how much electricity it provided to you, and compare it to how much your system fed back to the utility grid. If you produced more than you consumed, your bill will be zero. If you used more electricity than you generated, you will only pay the difference. This process is called net metering. This works for solar systems 1 MW or less in size.

12. Why can't the utility pay me if I generate more electricity than I can use during this one-year period?

California's net metering law doesn't require the utilities to do so. See Public Utilities Code 2827.