



# The Solar House: Passive Heating and Cooling

By Daniel D. Chiras

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**The Solar House: Passive Heating and Cooling** By Daniel D. Chiras

Passive solar heating and passive cooling—approaches known as natural conditioning—provide comfort throughout the year by reducing, or eliminating, the need for fossil fuel. Yet while heat from sunlight and ventilation from breezes is free for the taking, few modern architects or builders really understand the principles involved.

Now Dan Chiras, author of the popular book *The Natural House*, brings those principles up to date for a new generation of solar enthusiasts.

The techniques required to heat and cool a building passively have been used for thousands of years. Early societies such as the Native American Anasazis and the ancient Greeks perfected designs that effectively exploited these natural processes. The Greeks considered anyone who didn't use passive solar to heat a home to be a barbarian!

In the United States, passive solar architecture experienced a major resurgence of interest in the 1970s in response to crippling oil embargoes. With grand enthusiasm but with scant knowledge (and sometimes little common sense), architects and builders created a wide variety of solar homes. Some worked pretty well, but looked more like laboratories than houses. Others performed poorly, overheating in the summer because of excessive or misplaced windows and skylights, and growing chilly in the colder months because of insufficient thermal mass and insulation and poor siting.

In *The Solar House*, Dan Chiras sets the record straight on the vast potential for passive heating and cooling. Acknowledging the good intentions of misguided solar designers in the past, he highlights certain egregious—and entirely avoidable—errors. More importantly, Chiras explains in methodical detail how today's home builders can succeed with solar designs.

Now that energy efficiency measures including higher levels of insulation and multi-layered glazing have become standard, it is easier than ever before to create a comfortable and affordable passive solar house that will provide year-round comfort in any climate.

Moreover, since modern building materials and airtight construction methods sometimes result in air-quality and even toxicity problems, Chiras explains state-of-the-art ventilation and filtering techniques that complement the ancient solar strategies of thermal mass and daylighting. Chiras also explains the new diagnostic aids available in printed worksheet or software formats, allowing readers to generate their own design schemes.

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### **The Solar House: Passive Heating and Cooling By Daniel D. Chiras Bibliography**

- Rank: #104610 in eBooks
- Published on: 2002-10-01
- Released on: 2008-12-22
- Format: Kindle eBook

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## Editorial Review

### Review

"An excellent guide for embracing ecologically-friendly living."--*Midwest Book Review*

### About the Author

Dan Chiras paid his last electric bill in June of 1996. It is not that he has disavowed the use of electricity and modern conveniences, but rather that he has turned to the sun and wind to meet his family's needs.

In 1995, Dan, a former full-time college professor with years of experience in sustainable development, built a state-of-the-art rammed earth tire and straw bale home in Evergreen, Colorado. He installed solar electric panels on the roof; a year or so later he installed a small wind generator. Since that time, he has met nearly all of his electrical needs for his home and office from these clean, renewable sources.

Dan also heats his home in the foothills of the Rocky Mountains 8000-feet above sea level with energy from the sun thanks to passive solar design. For backup heat on those cold winter nights, he burns a cord of wood a year, gathered free from his community. His annual gas bill, mostly for showers and cooking, runs about \$120 a year - about \$2 to \$3 per month for natural gas and \$10 per month to read the meter!

Dan has spent much of the past 30 years studying sustainability and applying what he has learned in solar energy, natural building, and green building to his residences, and most of the last ten years sharing the practical knowledge he has gained through writing, lectures, slide shows, and workshops.

Dan has published 21 books to date including several college and high school textbooks: *Environmental Science: Creating a Sustainable Future*, *Natural Resource Conservation*, *Human Biology*, and *Biology: The Web of Life*. His high school environmental science text, *Environmental Science*, was selected as the official book of the U.S. Academic Decathlon's 1991 competition.

In the early 1990s, Dan published two trade books on environmental issues and sustainability for a general audience: *Beyond the Fray: Reshaping America's Response* and *Lessons from Nature: Learning to Live Sustainably on the Earth*.

Since 1995, Dan has focused most of his attention on residential green building. He has written extensively on the subject. His books include: *The Natural House: A Complete Guide to Healthy, Energy Efficient, Environmental Homes*; *The Natural Plaster Book*; *The Solar House: Passive Heating and Cooling*; *Superbia! 31 Ways to Create Sustainable Suburbs*; and *The New Ecological Home*.

His newest book, *EcoKids: Raising Kids Who Care for the Earth* will be published in the Spring of 2005 by New Society Publishers.

Dan also writes extensively for magazines, journals, newsletters, and newspapers. He has published nearly 250 articles on environmental issues, sustainability, natural building, natural plaster, green building, and passive solar heating and cooling. His articles appear regularly in *Home Power*, *Mother Earth News*, *Natural Home*, and *The Last Straw*.

Dan also writes frequently for *World Book Encyclopedia* (Science Year) and *Encyclopedia Americana*. He authored a 12-page article on the environment for *Encyclopedia Americana*. Dan has written environmental pollution section for *World Book Encyclopedia's* annual publication, *Science Year*, since 1993. In 1997, he wrote an extensive piece for *World Book* on population growth and its many implications. Dan also wrote the ecology and air pollution sections for *Encyclopedia Americana*.

In addition to his writing, Dan has served as an adjunct professor at the University of Colorado in Denver and the University of Colorado at Denver. He has been a visiting professor at the University of Washington, where he taught a course on environmental science. He currently is a Melon Visiting Professor at Colorado College where he teaches courses on renewable energy, ecological design, and sustainable development.

Through his writing and teaching in the 1980s and early 1990s, Dan played a leading role in promoting critical thinking, an understanding of the root causes of environmental issues, systemic solutions to environmental problems, sustainable development. He pioneered a systems approach to sustainable development and has played a lead role in articulating the principles, policies, and practices of sustainable development which seeks ways that business and society can prosper within a healthy environment. He is currently focusing most of his research and writing on sustainable building and sustainable communities.

Dan's free time is spent mountain biking, canoeing, playing music, and gardening.

For more information visit [danchiras.com](http://danchiras.com).

## **Users Review**

### **From reader reviews:**

#### **Jose Laney:**

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#### **Mohammad Darling:**

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**Benjamin Martinez:**

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**Rosemary Robinson:**

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