



Wind-Powered Electric Systems for Homes, Farms, and Ranches: Resources

A Publication of ATTRA - National Sustainable Agriculture Information Service • 1-800-346-9140 • www.attra.ncat.org

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This publication provides a description of information available on wind resources, wind energy financing, wind power on the Web, and other wind energy basics to help you decide whether and how to start turning wind power into electricity. It may be easier than you think to get started on your own wind energy project.

Small Wind Electric Systems: A U.S. Consumers' Guide

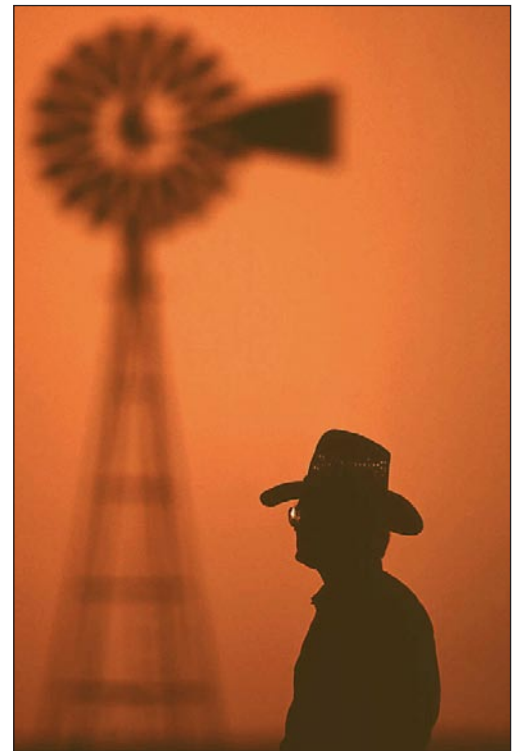
A 27-page booklet published in March 2005 by the National Renewable Energy Laboratory.

www.nrel.gov/docs/fy05osti/37633.pdf

Also available are 34 state-focused booklets such as *Small Wind Electric Systems: A Montana Consumer's Guide*, *A New Mexico Consumer's Guide*, etc. Check under "publications" to see whether your state is listed at www.eere.energy.gov/windandhydro/windpoweringamerica/.

Generally, an acre or less is required to site wind turbines large enough to generate a significant portion of the electricity needed by the average U.S. home. Given that approximately 21 million U.S. homes are built on one-acre and larger sites, and 24 percent of the U.S. population lives in rural areas, wind power is a real possibility for many Americans. This booklet will help you answer some of the following basic questions.

- Is there enough wind where you live?
- Are tall wind towers allowed in your neighborhood or rural area?
- Do you have enough space?
- How much electricity do you need or want to produce?
- Do you want to connect to the utility grid or be grid-independent?
- Can you afford a wind energy system?
- What does it take to install and maintain a system?



The Community Wind Financing Handbook

A 25-page booklet published by the Environmental Law and Policy Center available at www.elpc.org/energy.

- Describes various models for community wind power ownership.
- Examines sources of equity and debt financing and the steps necessary to secure this financing.
- Identifies federal grant and loan programs and state incentives for wind power development.
- Reviews the federal tax incentives supporting wind power projects, the impact

ATTRA - National Sustainable Agriculture Information Service is managed by the National Center for Appropriate Technology (NCAT) and is funded under a grant from the United States Department of Agriculture's Rural Business-Cooperative Service. Visit the NCAT Web site (www.ncat.org/agri.html) for more information on our sustainable agriculture projects.



of these incentives on project economics, and limitations on using these incentives.

- Examines power purchase agreements and the value of green tags to community wind power projects.
- Contains a list of operating community wind projects in the United States and a list of project consultants and financing resources.

Wind Energy Basics: A Guide to Small and Micro Wind Systems

(Real Goods Solar Living Book) A 222-page paperback, by Paul Gipe, published in 1999 by Chelsea Green Publishing Co, ISBN: 1890132071. Get your copy through your local bookstore or by contacting

Real Goods Company
800-919-2400
www.realgoods.com

An informative, easy-to-understand guide to small and micro wind systems for energy generation. *Wind Energy Basics* includes detailed information on planning, purchasing, siting, and installing a wind system, and it explains the integration of wind power with solar electric power (photovoltaics) for more cost-effective and reliable off-the-grid applications. It also explains “net metering” and utility interconnection possibilities, describing how homeowners and businesses in many states can now sell back or get credit for their excess electricity.

Understanding Your Wind Resource

A 12-page booklet published by the American Wind Energy Association in 1994. Get your copy by writing or calling

AWEA
1101 14th Street, NW, 12th Floor
Washington, DC 20005
202-383-2500

A good starting point for understanding and measuring wind speed, air density, and wind characteristics.

Introduction to Small Wind Systems: Basic Operating Principles

A 24-page booklet published by the American Wind Energy Association in 1993. Get a copy by writing or calling

AWEA
1101 14th Street, NW, 12th Floor
Washington, DC 20005
202-383-2500

Covers the basics of wind power development, including wind system siting, hardware fundamentals, and understanding manufacturers’ descriptions of their machines.

More In-depth Resources

The Wind Resource Assessment Handbook

A 79-page booklet created in 1997 for the National Renewable Energy Laboratory, the Wind Resource Assessment offers information on organization and procedures if you are considering a formally structured wind measurement program. You can find the Handbook online at www.nrel.gov/docs/legosti/fy97/22223.pdf.

Wind Energy Explained: Theory, Design and Application

This 590-page book, by J.F. Manwell and J.C. McGowan, was published in 2002. It is a longer, more technical resource, available at <http://Wiley.com>.

Provides an overview of wind energy technology, charting the development of the first modern wind turbines.

- Discusses the characteristics of the wind resource and the atmospheric boundary layer.
- Outlines the aerodynamic principles and mechanics of the wind turbine, before going on to consider the electrical aspects of energy conversion and generation.

This Southwest Wind-power Whisper 175 wind turbine on the Lion Spring Farm in Dover, Massachusetts, supplies electricity for the house and barn. Photo by Bob Michelson, courtesy DOE/NREL.



- Examines key issues of wind turbine design and wind system control.
- Offers guidance on turbine siting and integration issues and analyzes the economic benefits of wind energy generation.
- Considers the environmental impact of single turbines and wind farms and the design of wind systems for minimal visual impact.
- Provides a comprehensive set of tutorial problems based on the contents on each chapter.

Good Places on the Web to Learn More About Wind Power

www.awea.org

This American Wind Energy Association Web site has a lot of useful information—for example, a Small Wind Systems section that includes frequently asked questions, industry standards, home energy systems, and “ask an expert.” There’s also a utility-scale section, if you’re interested in learning more about wind farm companies and technologies. Links to AWEA publications such as the *Wind Energy Information Guide 2004* and the *Small Wind Permitting Handbook* are especially helpful. The Guide lists 15 pages of contact information and Web site addresses for people wishing to learn more about wind power. The Handbook provides the legal and financial steps necessary to install a small-scale wind turbine.

www.windpower.org/en/core.htm

One of the best places to go to find nearly everything from basic information (e.g., where wind energy comes from) to more complex topics (e.g., wind shade calculators). Denmark, the host of this Web site, is the world’s leader in wind power development.

www.montanagreenpower.com

A very good gateway to more than 20 other Web sites that can help you learn more about turning wind into electrical power. The National Center for Appropriate Technology (NCAT) developed and maintains this site.

www.eere.energy.gov

Run by the U.S. Department of Energy, this Web site provides a “Wind” link that lists several good publications and resources. The link also supplies basic information on current wind energy news and technology and the DOE’s “Wind Powering America” program.

<http://windustry.com>

An all-encompassing site that covers everything from “Wind Basics” to “Wind Project Calculators.” This Web site is well organized, with links to both small and large-scale wind energy systems.

<http://bergey.com>

Bergey Windpower is one of several domestic wind turbine manufacturers. We’ve listed them here because their Web site includes links to helpful decision-making tools like the “90 Second Expert,” “Technical Stuff,” and “Solution Channels.” These links provide practical, economically feasible recommendations to people considering their renewable energy options.

For more information on renewable energy and conservation, call the National Center for Appropriate Technology (NCAT) at **1-800-275-6228**.

For more detailed information on sustainable farming systems, call NCAT’s ATTRA project at 1-800-346-9140. Or visit our Web sites, www.ncat.org and www.attra.ncat.org.

Siting Large Scale Wind Power on Your Land

Electricity from the Wind: What Landowners Should Know

[www.eere.energy.gov/windandhydro/windpoweringamerica/docs/what_](http://www.eere.energy.gov/windandhydro/windpoweringamerica/docs/what_landowners_should_know.doc)

[landowners_should_know.doc](http://www.eere.energy.gov/windandhydro/windpoweringamerica/docs/what_landowners_should_know.doc)

Good Web-based publication that outlines lease agreements, easements, and other factors to take into account when considering large wind turbines on your farm or ranch.

Harvesting the Wind

[www.seic.okstate.edu/owpi/Stakehld/](http://www.seic.okstate.edu/owpi/Stakehld/landownr/OK_Harvesting_Wind.pdf)

[landownr/OK_Harvesting_Wind.pdf](http://www.seic.okstate.edu/owpi/Stakehld/landownr/OK_Harvesting_Wind.pdf)

The publication at this Web site answers more basic questions about large wind turbines and locating them on your land.

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This publication is available on the Web at:
www.attra.ncat.org/attra-pub/wind.html
or

www.attra.ncat.org/attra-pub/PDF/wind.pdf

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Version 120705