

U.S. Department of Energy - Energy Efficiency and Renewable Energy Wind Program

Frequently Asked Questions about Wind Energy

This page lists frequently asked questions about wind energy.

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What is wind energy?

Wind energy (or wind power) refers to the process by which wind turbines convert the movement of wind into electricity. Winds are caused by the uneven heating of the atmosphere by the sun, the irregularities of the earth's surface, and rotation of the earth. Humans use this wind flow for many purposes: sailing boats, pumping water, and also generating electricity. Wind turbines convert the kinetic energy of the moving wind into electricity.

For more information, visit our "[How Wind Turbines Work](#)" page.

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How do wind turbines work?

A wind turbine works like a fan, but in reverse: instead of using electricity to make wind, like a fan, wind turbines use wind to make electricity. The wind turns the turbine's blades, which spin a shaft connected to a generator to make electricity. Take a look [inside a wind turbine](#) to see the various parts, or view the [wind turbine animation](#) to see how a wind turbine works.

For more information, visit our "[How Wind Turbines Work](#)" page.

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I would like to put up a wind turbine at my house or property. How do I get started?

The basic steps for installing a small wind turbine on your property are:

1. Determine whether the wind resource in your area makes a small wind system economical;
2. Determine your household electricity needs by looking at monthly or yearly electricity usage
3. Find out whether local zoning ordinances will allow wind turbine installations
4. Purchase and install a wind turbine sized to the needs of your household.

For more information, please visit our [Frequently Asked Questions on Small Wind](#)

[Systems](#) or the small wind section of the [Stakeholder Engagement and Outreach](#) Web site.

The American Wind Energy Association has an [online "toolbox" of resources](#) on installing a small wind energy system on your property.

Publications: [Small Wind Electric Systems: A U.S. Consumer's Guide](#).

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What is the wind resource like in my area?

The Wind Program provides validated, [high-resolution state wind maps](#) that show average wind energy at a 50 meter tower height across each state. These maps provide a good overview of a state's wind resources. However, wind resources can vary significantly due to local site characteristics such as trees, hills, and buildings, so you should get a professional evaluation of your specific site before purchasing and installing a wind energy system.

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What grants or incentives are available to defray the cost of a small wind electric system?

As of March 2009, the federal government offers an investment tax credit for the purchase and installation of qualifying small wind electric systems, worth 30% of the value of the system. For details, please see the [Residential Renewable Energy Tax Credit](#) page in the Database of State Incentives for Renewables and Efficiency (DSIRE) Web site. The federal government also offers a [Renewable Electricity Production Tax Credit](#) and [Business Energy Investment Tax Credit](#) for larger, utility-scale wind power installations.

Additional incentives may be available at the state level; [visit the DSIRE database](#) for more information. Small wind systems installed for agricultural applications may be eligible for federal funding through the U.S. Department of Agriculture; visit Stakeholder Engagement and Outreach's [Agricultural Community page](#) for details.

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What funding opportunities are currently available from DOE?

The Wind Program focuses primarily on technological development to improve the reliability and affordability of wind energy, as well as addressing barriers to wind energy deployment. The program does not fund the purchase or installation of wind energy systems by individuals or companies. For information on grants and incentives for installing or operating wind energy systems, please see the response to "[What grants and incentives are available to defray the costs of small wind electric systems?](#)" above. For information on grants to develop inventions, see "[Where can I get a grant to develop my wind power invention?](#)" below.

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Where can I get a grant to develop my wind power invention?

The Wind Program prefers to award funding for research and development activities, including research into and development of new inventions, through a competitive solicitation process. Proposals for research, development, and demonstration of new inventions should be submitted to the program in response to a competitive solicitation in order to be considered for funding. Solicitations will be posted on the program's [financial opportunities page](#). DOE also awards competitively-sourced funding for research and development through its [Small Business Innovation Research \(SBIR\)](#) program. Wind energy projects may qualify for loan guarantees from DOE; for more information, please visit the Web site of the [DOE Loan Guarantee Program](#).

If you are interested in applying for funding, but your project does not fit within the scope of the posted solicitations, please submit your proposal to [DOE's Unsolicited Proposal Office](#).

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How can I find a job in the wind industry?

The American Wind Energy Association (AWEA), the trade association for the wind industry, has a Web site on [careers in the wind industry](#) that includes job postings from its members and other companies working in the industry. EERE also maintains a list of Web sites that post [jobs in the renewable energy sector](#).

For those interested in continuing education for careers in the wind industry, Stakeholder Engagement and Outreach maintains a [list of universities and community colleges](#) that offer wind energy training courses.

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How can students learn about wind energy?

The Wind Program sponsors the [Wind for Schools project](#) as a way to educate students and build student interest in wind energy. The Wind for Schools project helps schools purchase and install wind turbines, and also helps schools develop teaching curricula to educate their students about wind energy.

The following Web sites have additional student-focused information on wind energy, including hands-on activities and lesson plans:

- [EERE K-12 Energy Lesson Plans](#)
- [Texas State Energy Conservation Office: Renewable Energy Lesson Plans](#)

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What is the federal government doing to advance wind power?

The Wind Program sponsors research and development activities to enable greater use of abundant, domestic wind and water resources for electric power generation that will help stabilize energy costs, enhance energy security, and improve our environment. These activities are conducted through competitively selected, cost-shared research and development projects with industry and are performed in partnership with federal, state, industry, and other stakeholder groups.

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Do wind turbines kill birds and bats?

Birds and bats are occasionally killed in collisions with wind turbines. Like any form of development, wind projects can also negatively impact wildlife by altering habitat. Over the past two decades, the impact of wind development on birds has been greatly reduced by improvements in turbine design and particularly through improved project and turbine siting. The Wind Program works to reduce the risks of wind development to wildlife by participating in collaborative research and outreach efforts with industry, such as the [National Wind Coordinating Collaborative](#) and the [Bats and Wind Energy Cooperative](#). The wind industry, in partnership with environmental organizations, is also taking action to reduce wildlife impacts through the efforts of the [American Wind Wildlife Institute](#).

Publications: [Wind Turbine Interactions with Birds, Bats, and their Habitats](#).

For more information, visit our "[Environmental Impacts and Siting](#)" page.

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How are commercial wind farms developed and how can I get a wind farm on my property?

Commercial wind farms are built by wind energy developers using private sources of financing. Before installing turbines, the developer will assess the wind resource at a particular site by collecting meteorological data, determining access to transmission lines, and considering environmental and community impacts. If sufficient wind resources are found, the developer will secure land leases from property owners, obtain the necessary permits and financing, and purchase and install wind turbines. The completed facility is often sold to an independent operator (called an independent power producer) who generates electricity to sell to the local utility, although some utilities own and operate wind farms directly.

For more information on the wind farm development process, please visit the Web site of the [American Wind Energy Association](#) (AWEA).

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