

Farmers' Guide to Wind Energy

Key Wind Energy Terms

Any farmer considering investing in a wind energy project will need to be familiar with a few key energy terms. *These are not precise legal definitions.* Rather, this information is provided to give farmers a sense of how these terms are typically used within the electric industry.

Anemometer: A device that measures wind speeds.

Avoided Cost: The price that a utility must pay for electricity obtained from a Qualifying Facility under the Public Utility Regulatory Policies Act. It is based on the cost the utility would have had to pay for an equivalent amount of electricity if it had not purchased that power from a Qualifying Facility.

Commercial-Scale Wind Project: Definitions vary, but for the purposes of this guide, wind projects larger than 100 kW are commercial-scale.

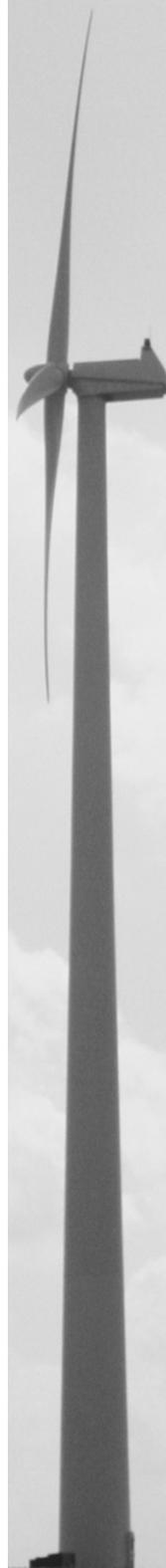
Community Wind: An approach to wind energy development that emphasizes local ownership, involvement, and benefits.

Distributed Generation: Electricity that is generated close to where it is used. Includes generation for on-site use. Contrasts with traditional, centralized large power plants that serve distant consumers.

Distribution Lines: Low-voltage power lines used to distribute electricity over relatively short distances from a power generation facility or substation to consumers.

Electric Grid: A system of transmission and distribution lines connecting synchronized power providers and consumers. Interconnects and facilitates the distribution of electricity to consumers.

Electric Utility: An entity that owns and/or operates facilities for the generation, transmission, distribution, or sale of electric energy to the public. Usually operates with some form of legal monopoly over the electric services in the geographic area.



Federal Energy Regulatory Commission (FERC): An independent regulatory agency within the U.S. Department of Energy having jurisdiction over, among other things, interstate electricity sales and wholesale electricity rates.

Independent Power Producer: An entity which generates electricity, but is not an electric utility.

Independent System Operator (ISO): An entity organized by the electric industry to control and administer non-discriminatory access to electric transmission in a region or across several electric systems, independent from the owners of the transmission facilities.

Interconnection: The physical and electrical interface between a power generator (like a wind turbine) and electric distribution or transmission lines.

Kilowatt Hour (kWh): The basic unit of measurement upon which the price of electricity is based. In other words, customers pay per kWh of electricity used. One kWh is equal to 1 kilowatt (1,000 watts) of power used for 1 hour. A 1,000 watt lightbulb burned for 1 hour would use 1 kWh. Likewise, ten 100 watt lightbulbs burned for 1 hour would use 1 kWh of electricity.

Megawatt (MW): A unit of electrical power equal to 1 million watts or 1,000 kilowatts.

Meteorological Tower Agreement (“MET” tower agreement): A contract through which a landowner agrees to allow a wind developer to install wind testing equipment (a “meteorological tower”) on his or her land.

Nameplate Capacity or Rated Power: The amount of electricity a generator is expected to produce when operating at maximum performance. If a wind turbine has a rated power or nameplate capacity of 1,000 kW, then that wind turbine is expected to produce 1,000 kW of energy per hour of operation, when running at its maximum performance (that is, during high winds). In actual operation, investors expect a turbine to produce only 25 to 35 percent of its nameplate capacity.

Net Excess Generation: The amount of electricity produced by a wind turbine constructed to meet on-site energy needs that exceeds the farm’s or household’s immediate demands. Usually calculated on a monthly basis.

Net Metering: A method of measuring, on a single electric meter, the amount of electricity consumed from the electric grid *and* the amount of electricity produced on-site and put onto the grid. Allows an electric consumer to accumulate credit for net excess generation that flows back onto the grid.

Parallel Generation: Electricity generated on the customer's side of the electric meter. Sometimes called cogeneration.

Power Purchase Agreement (PPA): A contract through which a power purchaser (like a utility) agrees to buy electricity from a power generation facility (like a wind project).

Production Tax Credit (PTC): A government incentive for wind energy development that reduces income tax liability based on the amount of renewable energy generation. Offered by the federal government and several states. The federal PTC, currently worth 1.9 cents per kWh, is an important stimulus to wind development in the United States.

Public Utilities Commission (PUC) or Public Service Commission (PSC): A state's energy regulatory agency, typically having jurisdiction over, among other things, retail electricity sales to customers and on-site power generation projects.

Public Utility Regulatory Policies Act (PURPA): A federal statute that, among other things, ensures a market for the electricity produced by small renewable energy generators (called Qualifying Facilities).

Qualifying Facility: A renewable energy generator, as defined by the Public Utility Regulatory Policies Act, with a nameplate capacity of no more than 80 MW.

Regional Transmission Organization (RTO): An entity very similar to an Independent System Operator (ISO), except that an RTO is also required to meet certain criteria regarding the geographical scope of its coverage. Some transmission providers are both ISOs and RTOs simultaneously.

Renewable Energy Credit (REC) (also called a Green Tag): The environmental attributes of electricity generated from renewable sources, like wind, that are tracked or sold separately from the electricity itself. For example, a wind turbine owner might sell electricity to an electric utility, and might sell the associated green tags to a business seeking to market itself as environmentally responsible.

Small-Scale Wind Project: Definitions vary, but for the purposes of this guide, wind projects of 100 kW and smaller are small-scale.

Tariff: The terms and conditions, including prices, under which utility services are provided. Typically a lengthy document filed by a utility and approved by a state or federal regulatory agency. Some tariffs cover utilities' retail sales to consumers, while other tariffs cover utilities' wholesale purchases from independent power producers.

Transmission: The transfer of electrical power from one place to another at high voltages.

Transmission lines: High-voltage power lines used to move electricity over relatively long distances from a power generation facility to a substation or other distribution point.

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Additional Resources

American Wind Energy Association Web site, www.awea.org.

The national trade association for the U.S. wind industry maintains this Web site for the public. Highlights include industry news, policy issues, a series of expert advice pieces for small wind development, and a database of U.S. wind projects.

Energy Law and Transactions (David J. Muchow and William A. Mogel, eds., Matthew Bender 2006) (1990).

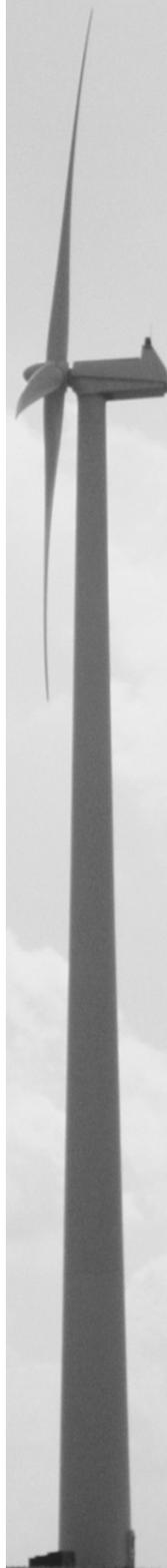
This is a seven-volume legal treatise and reference series on the business and legal aspects of all types of energy transactions. It is updated with regular supplements. Although very expensive to purchase, it may be available in a local law library.

Energy Trust of Oregon, *Community Wind: An Oregon Guidebook* (2005), www.energytrust.org/RR/wind/community/oregon_wind_guidebook.pdf.

This guidebook investigates the opportunities, tools, challenges, and necessary steps for the development of community wind projects of up to 10 MW.

Iowa Department of Natural Resources, *A Guide to Interconnection: Merging Onto the Electric Transmission Highway* (2004), www.iowadnr.com/energy/renewable/files/interconnectionguide.pdf.

This handbook provides an introduction to the technical and legal aspects of interconnecting renewable energy facilities to the electric distribution and transmission system.



Iowa Department of Natural Resources, *Iowa Wind Energy Checklist* (2003), www.iowadnr.com/energy/wind/files/checklist.pdf.

This is a step-by-step wind development guide for cities, schools, municipal utilities, rural electric cooperatives, businesses, and landowners.

Izaak Walton League, *Landowner's Guide to Wind Energy in the Upper Midwest* (2001).

This guide discusses how landowners can evaluate their land for wind energy, the economics of wind projects, and issues to consider when approached by a wind developer. Copies may be ordered from the Midwest office of the Izaak Walton League of America by calling (651) 649-1446 or e-mailing midwestoffice@iwla.org.

National Wind Coordinating Committee & National Conference of State Legislatures, *State Siting and Permitting of Wind Energy Facilities* (April 2006), www.nationalwind.org/publications/siting/Siting_Factsheets.pdf.

These fact sheets set out state-specific siting guidelines for wind projects.

National Wind Coordinating Committee, *Permitting of Wind Energy Facilities: A Handbook* (2002), www.nationalwind.org/publications/siting/permitting2002.pdf.

This handbook covers siting and permitting issues of concern to project developers and government agencies at all levels.

New York State Energy Research and Development Authority, *Wind Energy Tool Kit*, www.powernaturally.org/Programs/Wind/toolkit.asp.

This resource compiles several documents related to wind energy development, including a legal guidebook for landowners, reports on lease agreements and wind project site selection, and a sample annotated lease agreement.

**Stoel Rives, LLP, *The Law of Wind: A Guide to Business and Legal Issues*,
[http://www.stoel.com/webfiles/LawOfWind WEB 05 07.pdf](http://www.stoel.com/webfiles/LawOfWind_WEB_05_07.pdf).**

This guide was produced by a large law firm with expertise in wind development and covers property interests, regulatory issues, permitting, taxes, negotiations, contracting, and other legal issues of importance to the wind industry. The Web address is to a somewhat expanded version posted on June 19, 2007, which was unavailable while the *Farmers' Guide to Wind Energy* was being written. Citations to *The Law of Wind* within the *Farmers' Guide* itself refer to an earlier version.

**Joseph P. Tomain and Richard D. Cudahy, *Energy Law in a Nutshell*
(West 2004).**

This is a legal primer on the field of energy law. Local law libraries may have a copy on their shelves. Any bookstore should be able to order a copy.

**U.S. Department of Energy's *Wind Powering America* Web site,
www.eere.energy.gov/windandhydro/windpoweringamerica/.**

"Wind Powering America" is a Department of Energy initiative committed to dramatically increasing the use of wind energy in the United States. Highlights of the initiative's Web site include state-by-state wind data, links to wind resource maps, and a special section with resources for the agricultural sector.

Windustry Web site, www.windustry.org.

Windustry is a non-profit organization working to increase wind development in rural areas. Its Web site includes extensive practical information for developing a wind project from the local landowner and community perspective, including a special section on small wind development, a resource library, and wind project case studies.