



# WIND ENERGY DEVELOPMENT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

## FREQUENTLY ASKED QUESTIONS (FAQs)

### **What is wind energy?**

The terms "wind energy" or "wind power" describe the process by which the wind is used to generate mechanical power or electricity. Wind turbines convert the kinetic energy of the wind into mechanical power. This mechanical power can be used for specific tasks (such as grinding grain or pumping water) or a generator can convert this mechanical power into electricity to power homes, businesses, schools, and the like.

### **How is the energy in the wind captured?**

Wind turbines, like aircraft propeller blades, turn in the moving air and power an electric generator that supplies an electric current. Most large modern wind turbines are horizontal-axis turbines, like the traditional farm windmills used for pumping water. Wind turbines are often grouped together into a single wind power plant, also known as a wind farm, and generate bulk electrical power. Electricity from these turbines is fed into a utility grid and distributed to customers just as it is with conventional power plants.

### **How big are wind turbines?**

Wind turbines are available in a variety of sizes, and therefore power ratings. Typical commercial wind facilities are 1.5 MW. The largest machine has blades that span more than the length of a football field, stands 20 building stories high, and produces enough electricity to power 1,400 homes. A small home-sized wind machine has rotors between 8 and 25 feet in diameter, stands upwards of 30 feet, and can supply the power needs of an all-electric home or small business.

### **What are wind turbines made of?**

All electric-generating wind turbines, no matter their size, are comprised of a few basic components: a rotor (the part that actually rotates in the wind), an electrical generator, a speed-control system, and a tower.

### **Are there good wind resources in the United States?**

Wind energy is very abundant in many parts of the United States. Wind resources are characterized by wind-power density classes, ranging from class 1 (the lowest) to class 7 (the highest). Good wind resources (e.g., class 3 and above, which have an average annual wind speed of at least 13 miles per hour) are found in many locations (see United States Wind Energy Resource Map). There are 20 million acres of good wind on BLM-administered lands. Wind speed is a critical feature of wind resources, because the energy in wind is proportional to the cube of the wind speed. In other words, a stronger wind means a lot more power.

### **How many homes can be powered by a megawatt of wind-generated electricity?**

According to the American Wind Energy Association, 1 megawatt (MW) of wind-generated power can supply electricity to approximately 240 to 300 households per year.

**What are the advantages of wind-generated electricity?**

Numerous public opinion surveys have consistently shown that the public prefers wind and other renewable energy forms over conventional sources of generation. Wind energy is a free, renewable resource, so no matter how much is used today, there will still be the same supply in the future. Wind energy is also a source of clean, non-polluting, electricity. Unlike conventional power plants, wind plants emit no air pollutants or greenhouse gases. According to the U.S. Department of Energy, in 1990, California's wind power plants offset the emission of more than 2.5 billion pounds of carbon dioxide and 15 million pounds of other pollutants that would have otherwise been produced. It would take a forest of 90 million to 175 million trees to provide the same air quality.

**What are the economic obstacles to greater wind power usage?**

Even though the cost of wind power has decreased dramatically in the past 10 years, the technology requires a higher initial investment than fossil-fueled generators. Roughly 80% of the cost is the machinery, with the balance being for site preparation and installation. If wind generating systems are compared with fossil-fueled systems on a "life-cycle" cost basis (counting fuel and operating expenses for the life of the generator), however, wind costs are much more competitive with other generating technologies because there is no fuel to purchase and minimal operating expenses.

**Are there environmental problems facing wind power?**

Although wind power plants have relatively little impact on the environment compared to fossil fuel power plants, there is some concern over the wildlife habitat impacts, noise produced by the rotor blades, aesthetic (visual) impacts, and bird and bat mortality. Most of these problems have been resolved or greatly reduced through technological development or by properly siting wind plants.

**Are wind turbines hazardous to birds and bats?**

Bird and bat deaths are one of the most controversial biological issues related to wind turbines. The deaths of birds and bats at wind farm sites have raised concerns by fish and wildlife agencies and conservation groups. On the other hand, several large wind facilities have operated for years with only minor impacts on these animals.

To try to address this issue, the wind industry and government agencies have sponsored research into collisions, relevant bird and bat behavior, mitigation measures, and appropriate study design protocols. In addition, project developers are required to collect data through monitoring efforts at existing and proposed wind energy sites. Careful site selection is needed to minimize fatalities and in some cases additional research may be needed to address bird and bat impact issues.

While structures such as smokestacks, lighthouses, tall buildings, and radio and television towers have also been associated with bird and bat kills, bird and bat mortality is a serious concern for the wind industry.

**Are wind turbines noisy?**

Most turbine noise is masked by the sound of the wind itself, and the turbines run only when the wind blows. Noise from wind turbines has diminished as the technology has improved. Early-model turbines are generally noisier than most new and larger models. As wind turbines have become more efficient, more of the wind is converted into rotational torque and less into acoustic noise. Under most conditions, modern turbines are quiet.

**Do wind turbines pose a safety hazard?**

Unlike most other generation technologies, wind turbines do not use combustion to generate electricity, and hence don't produce air emissions. The only potentially toxic or hazardous materials are relatively small amounts of lubricating oils and hydraulic and insulating fluids. Therefore, contamination of surface or ground water or soils is highly unlikely. The primary health and safety considerations are related to blade movement and the presence of industrial equipment in areas potentially accessible to the public. Like all electrical generating facilities, wind generators produce electric and magnetic fields.

**Are there other drawbacks to the use of wind energy?**

The major challenge to using wind as a source of power is that it is intermittent and does not always blow when electricity is needed. Wind cannot be stored (although wind-generated electricity can be, if batteries are used) and not all winds can be harnessed to meet the timing of electricity demands. Further, good wind sites are often located in remote locations far from areas of electric power demand (such as cities). Finally, wind resource development may compete with other uses for the land, and those alternative uses may be more highly valued than electricity generation.

**Is wind energy good for the economy?**

Wind energy avoids the external or societal costs associated with conventional resources, namely, the trade deficit from importing foreign oil and other fuels, the health and environmental costs of pollution, and the cost of depleted resources. Wind energy is a domestic, reliable resource that provides more jobs per dollar invested than any other energy technology - more than five times that from coal or nuclear power, according to the U.S. Department of Energy. In 1994, wind-turbine and component manufacturers contributed directly to the economies of 44 states, creating thousands of jobs for Americans.

**Is the cost of wind power competitive with conventional power plants?**

According to the U.S. Department of Energy, new, utility-scale wind projects are being built all around the United States today, with energy costs ranging from 3.9 cents per kilowatt-hour (at very windy sites in Texas) to 5 cents or more (in the Pacific Northwest). These costs are competitive with the direct operating costs of many conventional forms of electricity generation now - and prices are expected to drop even further over the next 10 years. Since wind is an intermittent electricity generator, and does not provide power on an "as needed" basis, it has to compare favorably with the costs saved on fuel from fossil generators.

**Where can I learn more about wind energy?**

There are many web sites with information on wind power, wind power technology, and wind energy development issues, including environmental concerns. Visit the Wind Energy Links page for a list of web sites with wind energy information.

**What is an EIS?**

"EIS" is the abbreviation for environmental impact statement, a document prepared to describe the effects of proposed activities on the environment. "Environment," in this case, is defined as the natural and physical environment and the relationship of people with that environment. This means that the "environment" considered in an EIS includes land, water, air, structures, living organisms, environmental values at the site, and social, cultural, and economic factors.

An "impact" is a change or consequence that results from an activity. Impacts can be positive or negative, or both. An EIS describes impacts, as well as ways to "mitigate" impacts. To "mitigate" means to lessen or remove negative impacts.

Therefore, an EIS, is a document that describes the impacts on the environment as a result of a proposed action. It also describes impacts of alternatives, as well as plans to mitigate the impacts.

**What is a Programmatic EIS?**

A Programmatic EIS evaluates the environmental impacts of broad agency actions such as the setting of national policies or the development of programs. Because BLM's efforts to evaluate additional wind energy development on public lands include the establishment of a Wind Energy Development Program, a Programmatic EIS is appropriate.

**Why is an EIS needed for wind energy development in the Western states?**

The Wind Energy Development Programmatic EIS is needed to maintain compliance with federal laws and regulations that require the federal government to evaluate the effects of its actions on the environment and to consider alternative courses of action. The National Environmental Policy Act of 1969 (NEPA) specifies when an environmental impact statement must be prepared. NEPA requires that an EIS be prepared for major federal actions with the potential for a significant impact on the quality of the human environment. The BLM has determined that amending land use plans and the establishment of a Wind Energy Development Program would be major federal actions as defined by the NEPA, and, thus, the BLM has prepared an EIS.

**What is the scope of your analysis in the Programmatic EIS?**

The scope of the Final Programmatic EIS includes an assessment of the positive and negative environmental, social, and economic impacts of wind energy development; discussion of relevant mitigation measures to address these impacts; and identification of appropriate, programmatic policies and best management practices (BMPs) to be included in BLM's proposed Wind Energy Development Program. The scope includes all BLM-administered lands in the western United States, excluding Alaska. Potential land use plan amendments have also been assessed, but the scope does not evaluate site-specific issues associated with individual wind energy development projects.

**What alternatives did you consider?**

The Final Programmatic EIS evaluates three alternatives: the proposed action, the no action alternative, and the limited wind energy development alternative.

- The *proposed action* would implement a program that would establish policies and best management practices (BMPs) to address the administration of wind energy development activities and identify minimum requirements for mitigation measures. The programmatic policies and BMPs would be applicable to all windy energy development projects on BLM-administered land, but does not include project-specific analyses. Also, 52 BLM land use plans would be amended to address wind energy development.
- Under the *no action alternative*, the BLM would continue administering wind energy development right-of-way authorizations in accordance with the terms and conditions of the Interim Wind Energy Development Policy. Analysis and review of wind energy development would be conducted on a project-by-project basis, as would any individual land use plan amendments. There would be no overarching, comprehensive analysis.
- Under the *limited wind energy development alternative*, additional wind energy development on BLM administered land would occur only in areas where it currently exists or is under review or approved for development at the time the Record of Decision for the Programmatic EIS is published. No additional BLM-administered land would be made available for development.

**What are land use plans?**

Land use plans are planning and management documents that define how resources will be managed within a specific planning area and establish restrictions on activities to be undertaken in that planning area. They are developed by BLM in accordance with applicable regulations and in conjunction with interested stakeholders.

The land use planning process is the key tool used by the BLM to protect resources and designate uses on Federal lands managed by the BLM. These plans help ensure that the public lands are managed in accordance with applicable laws and regulations under the principles of multiple use and sustained yield; recognizing the Nation's need for domestic sources of minerals, food, timber, and fiber while protecting the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water, and archaeological values.

**How would land use plans be amended to address wind energy development as a result of this Programmatic EIS?**

As a part of the Wind Energy Development Programmatic EIS, BLM developed a maximum potential development scenario to define the magnitude of future wind energy development activities on BLM-administered lands and to identify which land use plans would be amended. Examples of amendments to land use plans include the:

- adoption of policies and best management practices (e.g., wildlife management guidelines) applicable to wind energy development projects, and
- exclusion of lands from wind energy development.

**Why are some land use plans recommended for amendment and others are not in the Final Programmatic EIS?**

Some plans within the 11-state study were excluded from amendment under the Final Programmatic EIS for a variety of reasons, including (1) if developable wind resources are not present in the planning area, (2) if the plan was previously amended or revised to adequately address wind energy development, (3) if the plan currently is being amended or revised in a separate NEPA review and that amendment or revision will address wind energy development, or (4) if some other reason exists to exclude the plan from amendment under the Final Programmatic EIS. (A more detailed list of proposed changes is provided in Appendix C of the Final Programmatic EIS.)

**What impacts are addressed in the Wind Energy Development Final Programmatic EIS?**

The Final Programmatic EIS pays special attention to the resources listed below, which involve important issues associated with wind energy development:

- wildlife and wildlife habitat, including avian impacts,
- visual environment, and
- social and economic considerations.

The Final Programmatic EIS also addresses the indirect and cumulative impacts associated with wind energy development on a wide range of other resource issues.

The Final Programmatic EIS describes:

- wind energy technologies,
- activities undertaken for site monitoring and evaluation,
- activities undertaken for full commercial development,
- the distribution of wind energy resources on a regional scale, and
- best management practices to minimize potential impacts.

The Final Programmatic EIS also describes the impact associated with current technologies, monitoring, and mitigation measures and constraints relevant to wind energy development, and it includes a statement of the purpose and need for the proposed action.

**How were your best management practices developed?**

The programmatic best management practices (BMPs) were derived from mitigation measures identified in the Final Programmatic EIS as applicable to all wind energy development projects in order to protect and enhance natural and cultural resources. These BMPs would be adopted as required elements of project-specific Plans of Development (PODs) and/or as right-of-way (ROW) authorization stipulations.

**What is a POD?**

A POD is a Plan of Development for an individual wind energy development project. Entities seeking to develop a wind power project on BLM-administered lands will develop a project-specific POD that incorporates all proposed best management practices (BMPs) and, as appropriate, the requirements of other, existing and relevant BLM mitigation and guidance. It will include a site plan showing the locations of turbines, roads, power lines, other infrastructure, and other areas of short- and long-term disturbance.

**Who will develop site-specific and species-specific resource mitigation measures for projects since these are not addressed in the Final Programmatic EIS?**

Site-specific and species-specific issues will be addressed during individual project reviews. The BLM and operators will need to develop project-specific Plans of Development (PODs) and must contact appropriate agencies, property owners, and other stakeholders to identify potentially sensitive land uses and issues, rules that govern wind energy development locally, and land use concerns specific to the region. Additional mitigation measures would be applied in the form of stipulations in the right-of-way (ROW) authorization.

**How did you determine how much wind energy could be developed on BLM-administered lands over the next 20 years?**

A Maximum Potential Development Scenario (MPDS) was developed for BLM-administered land in 11 western states. The MPDS identifies the spatial distribution of the maximum possible extent of future wind energy development activities that may occur on BLM-administered land over the next twenty years. A variety of factors beyond BLM's control will likely limit wind energy development below this level, but the MPDS represents an upper bound of potential development. The MPDS identifies where the potential development could occur based on land status and location of wind resources. Another model, the Wind Deployment System (WinDS) was used to project the amount of wind power that might be generated in the areas over the next twenty years in the 11-state study area. (A detailed description of the methodologies used is located in Appendix B of the Final Programmatic EIS.)

**Why is there so much difference between potential and economically feasible wind energy development?**

A maximum potential development scenario (MPDS) was modeled to determine the amount of potentially developable land, and an additional model, the Wind Deployment System (WinDS), was used to predict the amount of land that is economically developable. The differences in the amount of developable land is that the WinDS model takes into account various factors such as access to and cost of transmission capacity, the intermittency of wind power, wind technology development, and potential barriers to wind resource development. Since the MPDS model does not include these factors, its results for developable land are much greater than the results predicted using the WinDs model.

**What was the basis for excluding lands from your analysis?**

Lands excluded from analysis were lands that would be excluded from development, such as those on which wind energy development is incompatible with specific resource values. These areas include designated areas that are part of the National Landscape Conservation System (NLCS) (e.g. Wilderness Areas, Wilderness Study Areas, National Monuments, National Conservation Areas, Wild and Scenic Rivers, and National Historic and Scenic Trails) and Areas of Critical Environmental Concern (ACECs). Additional land may be excluded from wind energy development on the basis of finding of resource impacts that conflict with existing and planned multiple-use activities. (Wind energy development is permitted in one National Conservation Area, the California Desert Conservation Area, in accordance with the provisions of the California Desert Conservation Area Plan of 1980, as amended.)

**How will the BLM process wind energy development applications following expiration of the Interim Wind Energy Development Policy on September 30, 2004?**

The BLM will continue to process wind energy development applications in accordance with the terms and conditions of the Interim Wind Energy Development Policy until issuance of the Record of Decision for the Final Programmatic EIS. Upon final approval of the BLM's proposed Wind Energy Development Program, the Interim Wind Energy Development Policy would be replaced by a new policy that incorporates the programmatic policies and BMPs evaluated in the Programmatic EIS. Elements of the interim policy addressing applications, authorizations, competitive interests, and due diligence will not be changed by the proposed program requirements.

**How will the public be involved with the wind energy development projects on BLM-administered lands after the Programmatic EIS is completed?**

The public can become involved directly with individual wind energy development projects as they undergo site-specific environmental analyses.

**How can I obtain a copy of the Final Wind Energy Development Programmatic EIS?**

The Final Programmatic EIS is available on the Internet at <http://windeis.anl.gov> in a downloadable and searchable format. The Web site provides an online order form and other information regarding obtaining a copy of the Final Programmatic EIS.