

U.S. Department of Energy's Wind Program Funding
in the United States:

Environmental Projects Report

Fiscal Years 2006 - 2014



Introduction

Wind and Water Power Technologies Office

The Wind and Water Power Technologies Office (WWPTO), within the U.S. Department of Energy's (DOE's) Office of Energy Efficiency and Renewable Energy (EERE), supports the development, deployment, and commercialization of wind and water power technologies. WWPTO works with a variety of stakeholders to identify and support research and development (R&D) efforts that improve technology performance, lower costs, and—ultimately—deploy technologies that efficiently capture the abundant wind and water energy resources in the United States. WWPTO is one office that contains two distinct focus programs: wind and water. The Wind Program and the Water Power Program operate as integrated, but separate entities within WWPTO.

The Wind Program is committed to developing and deploying a portfolio of innovative technologies for clean, domestic power generation to support an ever-growing industry.

The Wind Program provides R&D funding across six broad areas:

1. Offshore Wind Projects
2. Testing, Manufacturing, and Component Development Projects
3. Integration, Transmission, and Resource Assessment and Characterization Projects
4. Environmental Impacts Projects
5. Market Acceptance Projects
6. Workforce Development Projects.

The breakdown of Wind Program funding is presented in a series of reports that showcase the projects funded in each of the six abovementioned areas.

Types of Funding Sources

WWPTO's research and development (R&D) projects are financed through two primary sources of funding: Congressional Appropriations and Congressionally Directed Projects (CDPs). Congressional Appropriations determine the operating budgets for each EERE office. WWPTO-funded R&D projects are typically awarded to recipients as cooperative agreements through competitive Funding Opportunity Announcements (FOAs) that are dedicated to specific topic areas. CDPs are also funded by Congress, but are outside of the annual federal budget process. Frequently, there is a cost-share requirement for recipients of both competitive cooperative agreements resulting from FOAs and CDPs.

In addition to these two primary funding sources, WWPTO may be financed directly through specific legislation passed by Congress. In Fiscal Year 2009, for example, Congress passed the American Recovery and Reinvestment Act of 2009 (ARRA/Recovery Act). A portion of Recovery Act funding was dedicated to WWPTO's R&D projects.

WWPTO also funds research projects at DOE's national laboratories through the laboratories' annual operating plans. This funding is not detailed in this report. However, a national laboratory may be a lead or a partner on a competitively awarded project covered in this report. In these cases, the national laboratory is identified as the lead or partner in the appropriate project descriptions.

The Small Business Innovation Research (SBIR) program in DOE's Office of Science provides competitive awards-based funding for domestic small businesses engaging in R&D of innovative technology. SBIR has funded several projects with relevance to wind technology development; however, these projects are not covered in this report.



Photo from NREL



Photo from Iberdrola Renewables, Inc.

Environmental Research & Siting for Wind Projects

Wind power is a renewable, low-carbon footprint energy supply option. When properly sited, wind projects provide a net environmental benefit to the communities in which they operate and to the nation overall.

As with all energy supply options, wind energy can have adverse environmental impacts. Wind projects have the potential to reduce, fragment, or degrade habitat for wildlife, fish, and plants. Turbine blades and towers can pose a threat to flying wildlife like birds (for example, the sage-grouse) and bats. To understand how to avoid, minimize, and mitigate these impacts in a cost-effective manner, the Wind Program has been investing in peer-reviewed research for over 15 years, primarily through collaborative

partnerships with the wind industry and environmental organizations, such as the National Wind Coordinating Collaborative, the Grassland and Shrub-Steppe Species Collaborative, and the Bats and Wind Energy Cooperative. The Program also works with other federal agencies to develop guidelines that enable developers to meet the statutory, regulatory, and administrative requirements for protecting wildlife, national security, and public safety.

From 2006 to 2014, DOE's Wind Program announced awards totaling \$14,444,731 for 24 projects focused on environmental impacts and siting. Table 1 provides a brief description of each of these projects. There are two sources of funding for environmental projects covered in this report: competitive Funding Opportunity Announcements (funded by Congressional Appropriations) and Congressionally Directed Projects (CDPs). See "Types of Funding Sources" for more information.



Table 1: FY 2006 – FY 2014 Environmental Project Descriptions

Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
ABB, Inc.	National Offshore Wind Energy Grid Interconnection Study	\$900,000	FY11: U.S. Offshore Wind: Removing Market Barriers FOA	North Carolina
Project Description				
ABB will determine likely offshore wind development sites and associated wind production profiles, perform an initial integration analysis and assess the applicability of traditional integration study methods, and evaluate various potential energy collection and delivery technologies.				
Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
AWS Truepower, LLC	National Offshore Wind Energy Resource and Design Condition Data Campaign	\$900,000	FY11: U.S. Offshore Wind: Removing Market Barriers FOA	New York
Project Description				
AWS Truepower is establishing a Web-based national met-ocean wind energy resource and design conditions data inventory. The project will establish data needs, identify existing sources of relevant data, and carry out a gaps analysis to establish long term requirements for new data to be gathered and disseminated through national public-private collaboration initiatives.				
Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
Bat Conservation International, Inc.	Win(d)-Win(d) Solutions for Wind Developers & Bats	\$118,800	FY09: 20% Wind by 2030 FOA	Texas
Project Description				
Bat Conservation International tested the effectiveness of acoustic deterring devices to reduce bat fatalities at operating facilities.				
Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
BioDiversity Research Institute	Modeling Wildlife Densities and Habitat Use Across Temporal and Spatial Scales on the Mid-Atlantic Continental Shelf	\$4,500,000	FY11: U.S. Offshore Wind: Removing Market Barriers FOA	New Jersey, Delaware, Maryland
Project Description				
BioDiversity Research Institute is collecting and analyzing data on bird, sea turtle, and marine mammal abundance and movement in the mid-Atlantic region to determine species risk to offshore wind plant interaction. The project is performing baseline surveys using a variety of technologies to develop predictive and risk assessment frameworks.				

Table 1: FY 2006 – FY 2014 Environmental Project Descriptions

Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
Board of Trustees of the University of Illinois	Are Flying Wildlife Attracted to (or do They Avoid) Wind Turbines?	\$180,835	FY11: Next Generation Drivetrain FOA	Illinois

Project Description

The University of Illinois provided information essential to a risk assessment framework for flying wildlife, namely determining if night-flying wildlife actively fly toward wind turbines (or away from them) from a distance, using natural post-construction observations with an instrumentation tracking radar.

Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
Bowling Green State University	Coastal Wind Ohio	\$2,531,900	FY06, FY08, FY09 CDPs	Ohio

Project Description

Bowling Green State University conducted research to remove impediments for deployment of wind turbines in Lake Erie. The primary research questions addressed the deployment design and environmental issues.

Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
Jones & Stokes Associates, Inc.	An Analytical Impact Assessment Framework for Wildlife to Inform the Siting and Permitting of Wind Energy Facilities	\$92,643	FY09: 20% Wind by 2030 FOA	Oregon

Project Description

Jones & Stokes Associates developed a scalable analytical framework for standardized assessment of long-term impacts of wind turbine operations on birds and bats.

Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
Kansas State University	Environmental Impacts of Wind Power Development of Population Biology of Greater Prairie Chickens	\$299,998	FY09: 20% Wind by 2030 FOA	Kansas

Project Description

Kansas State University developed specific recommendations for site selection and design of wind power facilities that will minimize the impacts of wind power development on sensitive species of prairie grouse. This project used post-construction monitoring to determine the potential impacts of a 201-megawatt wind power facility on the population biology of greater prairie chickens.

Table 1: FY 2006 – FY 2014 Environmental Project Descriptions

Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
Long Island Power Authority	Offshore Wind Project Study	\$500,000	FY10: CDP	New York

Project Description

Long Island Power Authority and the working group are studying, among other things, the economics and feasibility of an actual Long Island-New York City offshore wind farm. Information gathered from this project will be used to provide a better understanding of where wind development could be most suitable and help protect habitats important to the environment.

Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
Michigan State University	Bat and Avian Migration Along the Lake Michigan Coastline: A Pilot Study to Inform Wind Turbine Siting	\$99,951	FY09: 20% Wind by 2030 FOA	Michigan

Project Description

Michigan State University researched the question of whether bats follow the coast of the Lake Michigan during late summer migration. The project - which can be found at <http://mnfi.anr.msu.edu/reports/2011-19%20Bat%20Migration%20Along%20the%20Lake%20Michigan%20and%20Lake%20Huron%20Coastlines.pdf> - helps wind energy developers reduce negative impacts to these migratory wildlife by siting wind turbines in non-migratory areas.

Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
The Nature Conservancy	Energy by Design: Science-Based Wind Energy Siting to Avoid Environmental Impacts in the Continental United States	\$95,210	FY09: 20% Wind by 2030 FOA	Virginia, Wyoming

Project Description

The Nature Conservancy has ensured the long-term persistence of key species and habitats, while allowing for the energy production and transmission that is critical to our Nation's economy, security, and carbon emission reductions.

Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
Navigant Consulting, Inc.	U.S. Offshore Wind Market and Economic Analysis, Annual Market Assessment	\$514,999	FY11: U.S. Offshore Wind: Removing Market Barriers FOA	Illinois

Project Description

Navigant Consulting is issuing a comprehensive assessment of the U.S. offshore wind market over a three year period. The project provides stakeholders with updated information, data analysis and trends on technical, regulatory, financial, economic, and workforce development drivers influencing industry growth.

Table 1: FY 2006 – FY 2014 Environmental Project Descriptions

Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
Navigant Consulting, Inc.	U.S. Offshore Wind Manufacturing and Supply Chain Development	\$349,998	FY11: U.S. Offshore Wind: Removing Market Barriers FOA	Illinois

Project Description

Navigant Consulting examined factors and strategies influencing development of a U.S. supply chain for the offshore wind industry. Through industry surveys and stakeholder forums, the project identified potential gaps in the supply chain and opportunities for manufacturers and technical services companies to contribute to the domestic content of offshore project facilities.

Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
Oregon State University	A Synchronized Sensor Array For Remote Monitoring Of Avian And Bat Interactions With Offshore Renewable Energy Facilities	\$560,000	FY11: U.S. Offshore Wind: Removing Market Barriers FOA	Oregon

Project Description

Oregon State University is monitoring avian and bat interactions with offshore wind turbines using a fully integrated sensor array monitoring system with on-board custom designed data post-processing and statistical-based software.

Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
Pandion Systems, Inc.	A Habitat-Based Wind-Wildlife Risk Tool with Application to the Upper Great Plains Region: Collisions and Habitat Displacement	\$294,491	FY09: 20% Wind by 2030 FOA	North Dakota, South Dakota

Project Description

Pandion Systems developed a spatial tool that characterizes risk for bird and bat species that are potentially susceptible to collisions with wind turbines and habitat displacement from wind farms based on the species' habitat characteristics.

Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
Savannah River National Laboratory (operated by Savannah River Nuclear Solutions, LLC)	Advanced Technology for Improving the Design Basis of Offshore Wind Energy Systems	\$554,845	FY11: U.S. Offshore Wind: Removing Market Barriers FOA	South Carolina

Project Description

Savannah River National Laboratory is developing new techniques for characterizing steep and breaking waves and resulting structural loads on monopile foundations.

Table 1: FY 2006 – FY 2014 Environmental Project Descriptions

Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
Stantec Consulting Services, Inc.	Deepwater Offshore Bat and Avian Monitoring Program	\$599,501	FY11: U.S. Offshore Wind: Removing Market Barriers FOA	Maine

Project Description

To diminish potential impacts of offshore wind energy development on local bat populations in the Gulf of Maine, the Great Lakes, and the Mid-Atlantic coastal state regions, an environmental consulting and engineering firm, Stantec, is observing patterns in offshore bat activity and species composition. To date, Stantec has monitored acoustic bat activity at 36 sites distributed across the three regions. The firm has also deployed bat detectors on a variety of lighthouses, offshore towers, weather buoys, and three research vessels from the National Oceanic and Atmospheric Administration.

Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
Texas Tech University	Density and Occupancy Patterns of Grassland Birds in the Competitive Renewable Energy Zones of the Texas Panhandle	\$223,223	FY09: 20% Wind by 2030 FOA	Texas

Project Description

Texas Tech University identified, evaluated, and developed mitigation strategies to reduce potential negative impacts on grassland bird species at wind resource areas. By identifying important habitats to grassland birds, this project was able to provide wind energy developers with needed information for environmentally responsible siting decisions.

Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
Texas Tech University	Assessment of Lesser Prairie Chicken Population Distribution in Relation to Potential Wind Energy Developments	\$257,984	FY09: 20% Wind by 2030 FOA	Texas

Project Description

Texas Tech University surveyed approximately 30 percent of the lesser prairie-chicken range in the Texas Panhandle using helicopter aerial surveys that were developed at Texas Tech University. Spatial modeling will be used to determine the relationship between lesser prairie chicken lek density, habitat composition, and anthropogenic disturbance to predict the distribution of leks in the Panhandle.

Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
University of Michigan	Development of a GIS-based Decision Support Tool for Evaluating Wind Farm Sitings in Great Lakes Aquatic Habitats	\$100,000	FY09: 20% Wind by 2030 FOA	Michigan

Project Description

The University of Michigan developed a tool to support wind farm turbine siting. The GIS-based Decision Support Tool—which can be found at glgis.rog/ladst/—allows resource managers to compare areas of Great Lakes bottomland to determine their relative suitability for lakbed alteration projects. It allows users to visualize a large number of political, cultural, biological, and physical features simultaneously.

Table 1: FY 2006 – FY 2014 Environmental Project Descriptions

Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
University of Texas-Austin	Assessment of Offshore Wind Farm Effects on Sea Surface, Subsurface, and Airborne Electronic Systems	\$500,000	FY11: U.S. Offshore Wind: Removing Market Barriers FOA	Texas
Project Description				
The University of Texas-Austin assessed the potential of offshore wind farms to cause electromagnetic or acoustic interference of electronic detection, communication and navigation equipment operating in the marine environment. The project interacted closely with commercial and governmental stakeholders to identify concerns and recommending mitigation methods when required.				
Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
Versar, Inc.	Spatially-Explicit Bat Habitat Screening Tool for Turbine Siting	\$142,916	FY09: 20% Wind by 2030 FOA	Virginia
Project Description				
Versar conceptualized, developed, and implemented the initial design of a spatially explicit site screening tool focused on evaluating the potential for bat mortality from collisions with wind turbines. The tool provides developers with the capability to screen potential sites early in the development process to determine how turbines and turbine layouts might interact with local bat populations.				
Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
West Virginia University Research Corporation	Developing High-Resolution Spatial Data of Migration Corridors for Avian Species of Concern Regions of High Potential Wind Development	\$193,000	FY09: 20% Wind by 2030 FOA	West Virginia
Project Description				
West Virginia University (WVU) used a GPS similar to that found in a smartphone to track movements of golden eagles and increase understanding of the risks they face from wind energy development as they migrate through the Appalachian Mountains. Funded by a 2-year DOE Wind Program grant, WVU's findings characterized potential risk and suggested risk management strategies to protect migrating golden eagles and other soaring birds of prey. DOE laboratories also conducted studies on the impacts of wind energy development on the greater sage grouse in several of the Great Plains states.				
Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
Western EcoSystems Technology, Inc.	Greater Sage-Grouse Telemetry Study for the Simpson Ridge Wind Resource Area Carbon County, Wyoming	\$100,000	FY09: 20% Wind by 2030 FOA	Wyoming
Project Description				
Western EcoSystems Technology obtained reference data on demographic parameters—survival, nest success, and brood success—from three concurrent sage-grouse telemetry studies being conducted in the general area.				

continued >

Table 1: FY 2006 – FY 2014 Environmental Project Descriptions

Project Recipient	Project Title	DOE Funding Amount	Funding Source	Project Location
Western Michigan University	Genetic Approaches to Understanding the Population-Level Impact of Wind Energy Development on Migratory Bats	\$99,933	FY09: 20% Wind by 2030 FOA	Michigan

Project Description

Using existing tissue samples taken from wild-captured and turbine-killed individuals from across their range, Western Michigan University provided the best possible estimates of the eastern red bats. This project examined the influence of molecular markers and the number of individual bats sampled to detect demographic trends, and the patterns of male-biased mortality.

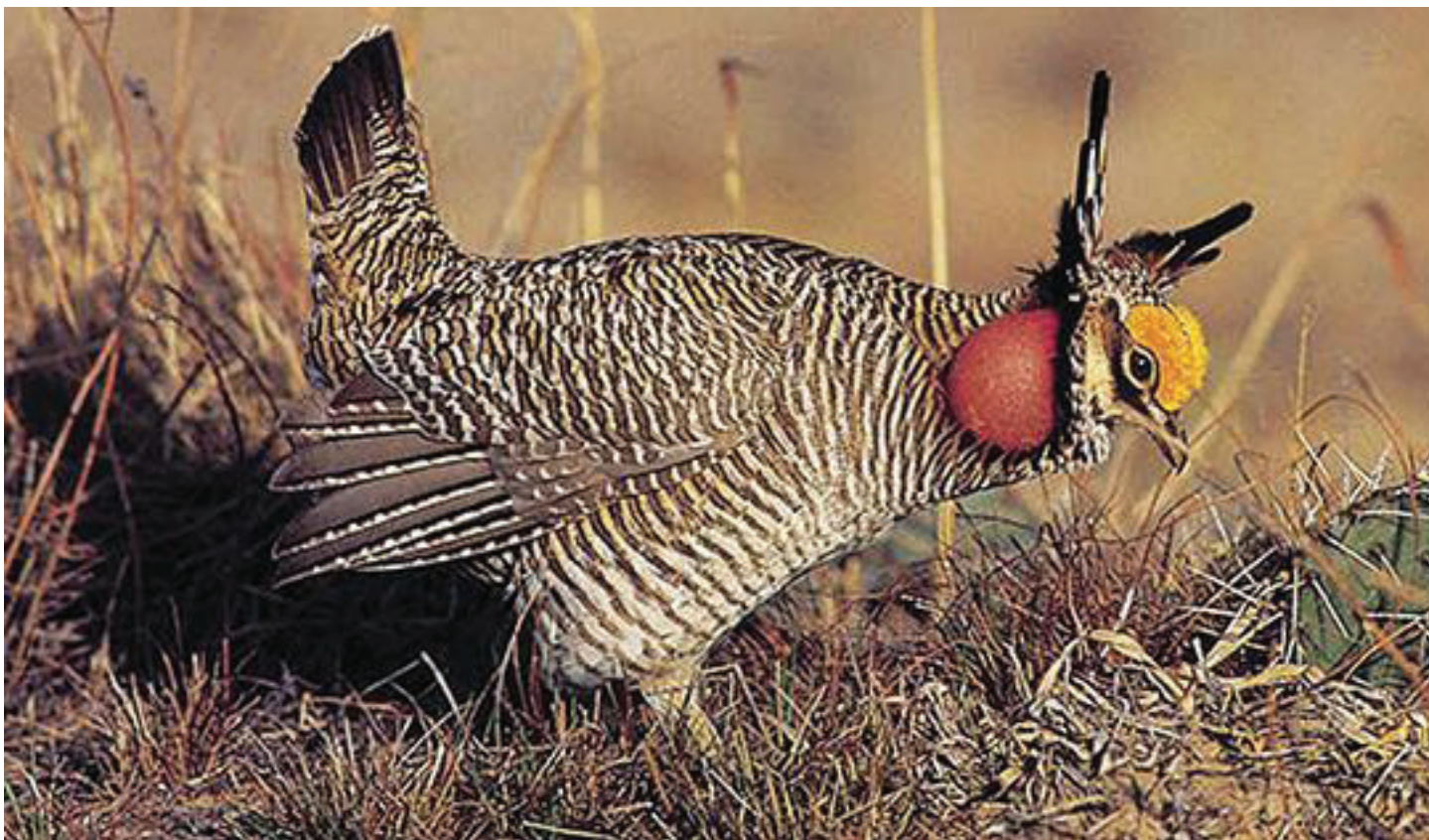


Photo from Courtesy of the Kansas Department of Wildlife, Parks and Tourism

A Kansas State University study suggests female prairie chickens actually live longer in the presence of a wind farm, perhaps because the turbines scare off predators.

Environmental Funding Distribution

DOE funded 24 environmental projects through the Wind Program from Fiscal Year (FY) 2006 to FY 2014. These projects are categorized in the following sections by topic area, geographic region and division, state, recipient type, and funding source.

Funding by Topic Area

The Wind Program's environmental efforts between FY 2006 and FY 2014 fall under three topic areas: Environmental Risk Reduction, Environmental Impact, and Impact on Electronic Equipment in the Marine Environment. Projects in these topic areas support the continued growth of the U.S. wind industry by providing a net environmental benefit to the communities in which they operate and to the nation overall.

Nearly half of the Wind Program's environmental funding went to environmental risk reduction

projects, while environmental impact projects accounted for another 46% of total funding. Table 2 provides details on the environmental projects within the three topic areas listed above.



Table 2: FY 2006 - FY 2014 Environmental Funding Distribution by Topic Area

Topic Area	Total Funding	Percent of Total
Environmental Risk Reduction	\$6,759,002	47%
Environmental Impact	\$6,630,884	46%
Impact on Electronic Equipment in the Marine Environment	\$1,054,854	7%
Total	\$14,444,731	



Funding by Geographic Region & Division

Environmental project funding was awarded in each of the nation's four geographic regions, with the Northeast region receiving the largest share of funding due to FOA funding for environmental risk reduction and resource characterization and design conditions in Maine and New York. The remaining funding was distributed to the West, Midwest, and South, with the West receiving a smaller amount.

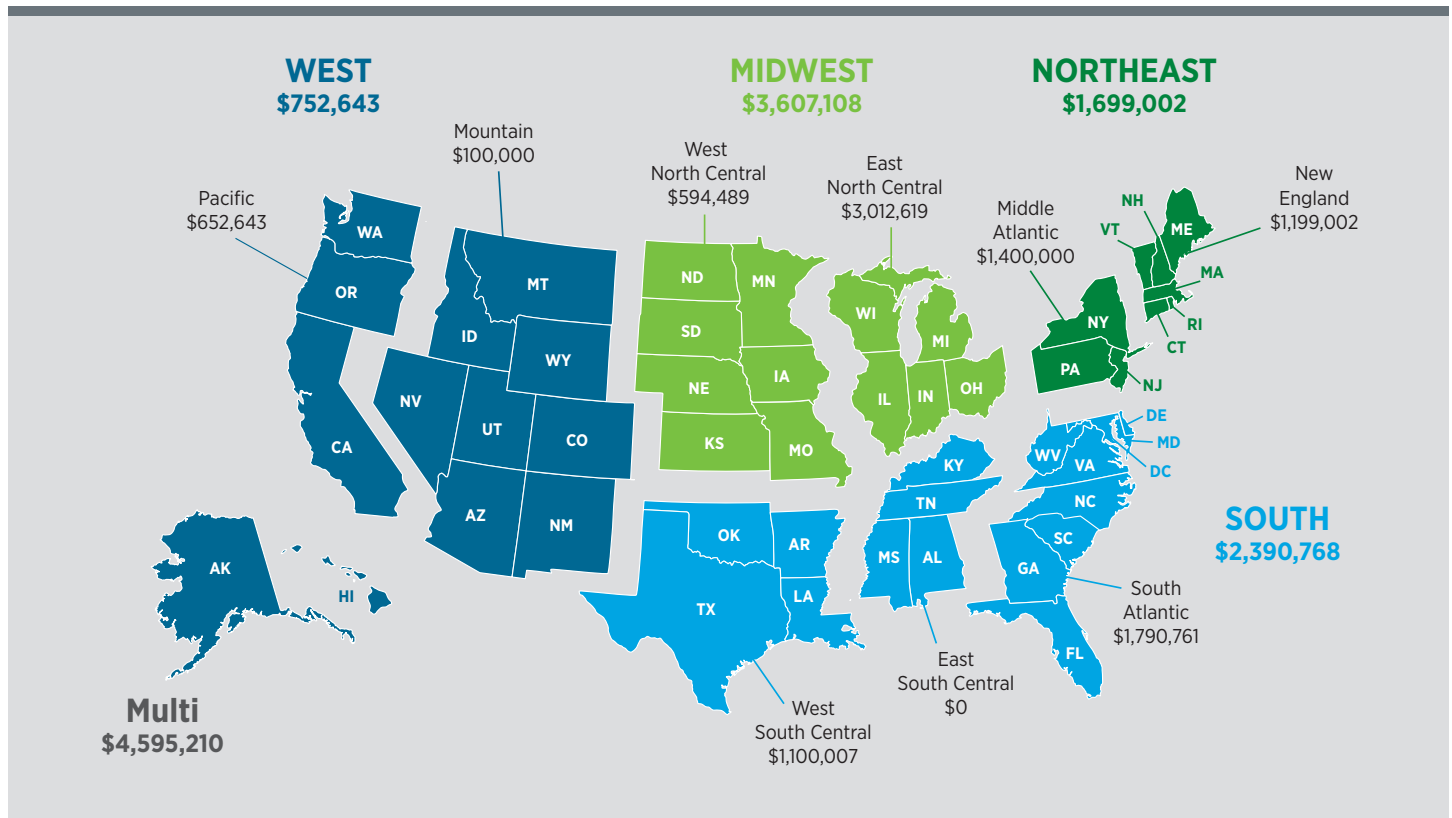
Table 3 provides details on how the Wind Program's funding was distributed within regions and divisions. The geographic regions and divisions used to present the distribution of the Wind Program's funding are based on the U.S. Census Regions and Divisions.¹

Exhibit 1 provides a map that shows how the Wind Program's funding for these projects was distributed throughout the United States.

Table 3: FY 2006 – FY 2014 Environmental Funding by Geographic Region & Division

Region	Region Total Funding	Division	Division Total Funding
West	\$753,643	Mountain	\$100,000
		Pacific	\$652,643
South	\$2,390,768	South Atlantic	\$1,790,761
		West South Central	\$1,100,007
		East South Central	\$0
Northeast	\$1,699,002	Middle Atlantic	\$1,400,000
		New England	\$1,199,002
Midwest	\$3,607,108	East North Central	\$3,012,619
		West North Central	\$594,489
		Multi	\$4,595,210
		Total	\$14,444,731

Exhibit 1: FY 2006 – FY 2014 Environmental Funding by Geographic Region & Division



Funding by State

Wind Program funding for the 24 environmental projects was broadly distributed to organizations in 16 states, with 3 projects listed as multistate. Table 4 outlines funding by state.

The states with the largest individual share of funding were Ohio and New York, receiving a combined total of more than \$3.9 million (or more than 25% of the total funding), while the three multistate projects received roughly 34% of the funding for this portfolio.

Table 4: FY 2006 - FY 2014 Environmental Funding Distribution by State

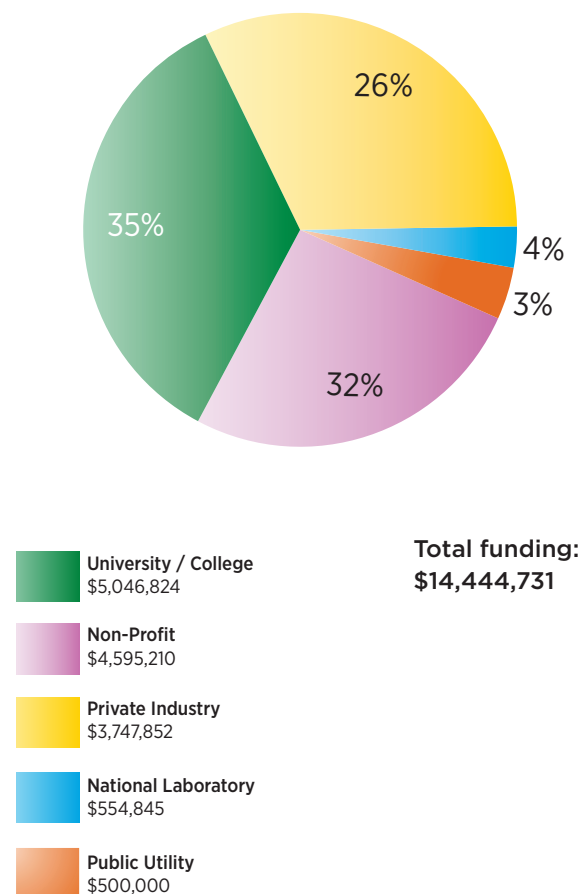
State	Total Funding
California	\$696,825
Colorado	\$1,604,000
Delaware	\$540,000
Illinois	\$180,835
Kansas	\$299,998
Maine	\$1,199,002
Michigan	\$299,884
New York	\$1,400,000
North Carolina	\$900,000
Ohio	\$2,531,900
Oregon	\$652,643
South Carolina	\$554,845
Texas	\$1,100,007
Virginia	\$142,916
West Virginia	\$193,000
Wyoming	\$100,000
Multi	\$4,595,210
Total	\$14,444,731

Funding by Recipient Type

DOE funds a variety of recipient types, including private industry, nonprofit organizations, universities and community colleges, investor-owned utilities and public utilities, local and state governments, as well as DOE national laboratories, federal agencies, and interstate government agencies.

From FY 2006 to FY 2014, universities or colleges accounted for more than one third of the total environmental funding. The remaining funds were distributed to non-profit private industry, public utilities, and national laboratories. Exhibit 2 provides these details by recipient type.

Exhibit 2: FY 2006 - FY 2014 Environmental Funding Distribution by Recipient Type



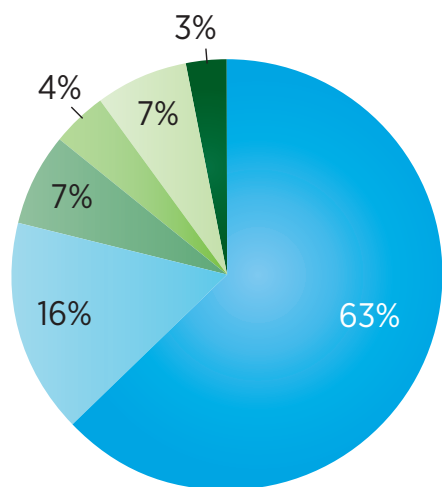
Project funds awarded to universities and colleges in the Program's environmental portfolio, represent 35%—or more than \$5 million—of total funding.

Funding Sources

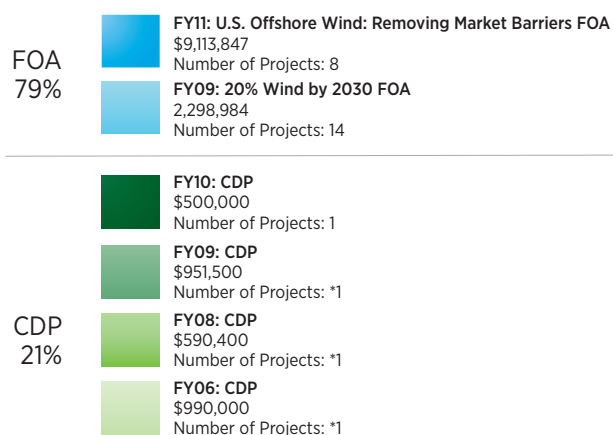
Exhibit 3 below provides details on the sources of funding for the Wind Program’s 24 environmental projects awarded from FY 2006 to FY 2014.

Between FY 2006 to FY 2014, the Wind Program issued numerous competitive FOAs; two of these FOAs are represented in this report, receiving approximately \$11 million of the total funding for 22 projects. An additional \$3 million was awarded to two projects through CDP funds.

Exhibit 3: FY 2006 - FY 2014 Environmental Projects



Total funding: \$14,444,731 | Total number of projects: 24



*The number of distinct environmental CDP projects is three; some projects were funded as CDPs in multiple years (see Table 1)."

Accomplishments

The Wind Program provided more than \$14 million in funding for 24 environmental projects from FY 2006 to FY 2014, with numerous projects operating over multiple years. The Wind Program has already realized significant return on the federal investment to date and anticipates significant key accomplishments in the years to come.

A few of the Program’s project accomplishments include the following:

- In 2013, the **University of Texas-Austin** assessed the potential of offshore wind farm effects on sea-surface, subsurface, and airborne electric systems. The university surveyed electronic systems, engaged key stakeholders in industry and government to identify their possible concerns, and conducted first-principle simulations on the interactions of electromagnetic signals. The stakeholder survey confirmed that mitigation processes are in place to address interference of land-based wind farms on critical land-based radar systems in weather, air traffic control, and long-range surveillance. To date, no comprehensive study of the potential for electromagnetic interference has taken place in the United States for offshore wind farms. All of this project’s findings were released in a final report, which can be accessed at wind.energy.gov/pdfs/assessment_offshore_wind_effects_on_electronic_systems.pdf.
- In 2012, **Kansas State University (KSU)** investigated the impacts of wind power development on the demography, movements, and population genetics of greater prairie chickens at three sites in north central and eastern Kansas for a seven-year time period. KSU addressed seven potential impacts of wind power development on prairie chickens: lek attendance, mating behavior, use of breeding habitat, fecundity rates, natal dispersal, survival rates, and population numbers. Results from the investigation show that greater prairie chickens were not strongly affected by wind power development in Kansas. All of this project’s findings were released in a final report, which can be accessed at wind.energy.gov/pdfs/wind_power_prairie_chickens.pdf.
- **Stantec Consulting Services** actively collected data from numerous bat echolocation detector systems deployed in 2012 at locations in the Gulf of Maine, Mid-Atlantic coastal areas, and the Great Lakes. This project seeks to help offshore wind developers and regulators understand potential effects of offshore wind farms on bats by assessing how widespread bat occurrence is offshore. By the end of the project, the team aims to obtain regional and multi-year data on seasonal offshore bird and bat activities and to refine equipment, methods, and logistics to aid in the development of a remote offshore bird and bat migration data collection and monitoring system.

- In 2012, the **BioDiversity Research Institute** conducted the first of three years of high-definition aerial and boat-based surveys of the Mid-Atlantic. Data from this project will be used to model wildlife densities and movements across temporal and spatial scales on the Mid-Atlantic continental shelf which will inform responsible and expedited siting of offshore wind projects in this region in conjunction with the “Smart from the Start” Wind Energy Areas designated by the Bureau of Ocean Energy Management.

For more information, including updates and results from national laboratory research not detailed in this report, see energy.gov/eere/wind/environmental-impacts-and-siting-wind-projects.

End Notes

¹ Energy Information Administration, U.S. Census Regions and Divisions. June 14, 2000. http://www.eia.gov/emeu/recs/census_map.html



Photo from F.K. Sandercock, Kansas State University

A seven-year study from a Kansas State University research team has found that wind power development has little effect on greater prairie chickens.

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