



Environmental Data and Governance Initiative Website Tracking Report

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Changes to DOE's Office of Energy Efficiency & Renewable Energy Wind Energy Technologies Office Web Pages

April 19, 2017

This report is co-released with:

- [Changes to DOE's Office of Energy Efficiency & Renewable Energy Vehicle Technologies Office Web Pages](#)
- [Changes to DOE's Office of Energy Efficiency & Renewable Energy Bioenergy Technologies Office Web Pages](#)

Writing and review of this report was conducted and overseen by the members of EDGI's Website Monitoring Committee: Maya Anjur-Dietrich, Andrew Bergman, Gretchen Gehrke, and Toly Rinberg, with contributions from Rebecca Lave.

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Changes to DOE's Office of Energy Efficiency & Renewable Energy Wind Energy Technologies Office Web Pages

DOE's Office of Energy Efficiency & Renewable Energy has made extensive changes to the Wind Energy Technologies Offices. There was a shift in stated office priorities and language referring dependence on fossil fuels was changed.

Description

Extensive changes and reorganizations occurred on pages in the Wind Energy Technologies Office (WETO) of the Department of Energy's Energy Efficiency and Renewable Energy (EERE) Office. This report focuses on a subset of the entire domain, analysing changes to the "About the Bioenergy Technologies Office: Growing America's Energy Future" page and two of its subpages, "Key Activities" and "Accomplishments and Successes". Of the listed changes, several fall into two main categories: (1) changes in emphasis on wind energy as replacements for fossil fuels and (2) shift in emphasis on US jobs and economic growth.

A similar analysis was applied and documented in EDGI Website Tracking reports to changes to EERE's [Vehicle Technologies Office](#) and [Bioenergy Technologies Office pages](#). Significant changes were also identified in EERE pages, across multiple domains, outside the scope of these three reports and may be worth further investigation.

The most notable changes to the WETO pages in this report are summarized here:

1. **Changes in emphasis on wind energy as a replacement for fossil fuels**
 - a. On the "Environmental Impacts" page, removed sentence "Wind power is an emission-free and water-free renewable energy source that is a key component to the Administration's renewable electricity generation goals." (Change 3.1a).
2. **Shift in emphasis on US jobs and economic growth**
 - a. Added "Wind energy currently supports [more than 100,000 U.S. jobs](#), and wind turbine technician is the nation's [fastest-growing occupation](#). According to [industry experts](#), the U.S. wind industry is expected to drive over \$85 billion in economic activity from 2017 to 2020, and wind-related employment is expected to reach 248,000 jobs in all 50 states by 2020." (Change 1.1h).
 - b. Changed "a leader in making wind energy technologies more competitive with traditional sources of energy and a larger part of our nation's renewable energy portfolio" to "a leading global market for wind energy due to its vast domestic resources, low cost, and highly skilled workforce" (Change 1.2d).
 - c. Changed subsection "Reducing the Cost of Renewable Energy" to "Enabling US Industry Growth and US Competitiveness" (Change 1.2b)
 - d. Removed subsection "Enabling the Renewable Energy Market" and added subsection "Strengthening Domestic Manufacturing and Providing Local Economic Value Across the United States" (Changes 1.2g, 1.2h)

Detailed Description of Changes

Note: Our version tracking software was not checking most of the following pages, meaning that version comparisons were sourced from the Internet Archive. This means that many of the comparisons do not have highlights, and, in contrast to previous report formats, we have quoted blocks of changed text rather than referencing shorter phrases. In addition, quoted links corresponding to pages sourced from the Internet Archive reference the Internet Archive versions of that page.

Page 1: ABOUT THE DOE WIND ENERGY TECHNOLOGIES OFFICE

- URL: <https://energy.gov/eere/wind/about-doe-wind-energy-technologies-office>
- Previous URL: <https://energy.gov/eere/wind/about-doe-wind-program>
- Side-by-side View: 12/17/16 to 4/16/2017
- Changes occurred between **Dec 17, 2016 2:37 PM ET** and **Apr 16, 2017 11:09 PM ET**

Note: This unusually wide range of times is due to the fact that this page was not being tracked by software that EDGI uses—past versions were accessed using the Internet Archive.

Screenshot 1.1

Changes to the Introductory Paragraph

(1.1a) Changed page title “ABOUT THE DOE WIND PROGRAM” to “ABOUT THE DOE WIND ENERGY TECHNOLOGIES OFFICE.” Changed corresponding name in sidebar.

(1.1b) Changed WETO description “committed to developing and deploying a portfolio of innovative technologies for clean, domestic power generation to support an ever-growing industry.” to “invests in energy science research and development (R&D) activities that enable the innovations needed to advance U.S. wind systems, while continuing to address market and deployment barriers, including siting and environmental impacts. WETO is dedicated to driving down the cost of wind energy with more efficient, more reliable, and more predictable wind energy systems.”

(1.1c) Added “and other stakeholders” to make the sentence “WETO, in close cooperation with the wind industry and other stakeholders, released...”

(1.1d) Changed “wind power can be economically deployed to provide renewable power in all 50 states” to “wind energy can provide cost-effective electricity across the United States”

Changes to the “WHAT WE DO” Section

(1.1e) *Previous paragraph:*

“The Program’s activities are leading the nation’s efforts to accelerate the deployment of wind power technologies through improved performance, lower costs, and reduced market barriers. The Program works with [national laboratories](#), industry, universities, and other federal agencies to conduct research and development activities through competitively selected, directly funded, and cost-shared projects. Our efforts target both land-based and offshore wind power to fully support the clean energy economy.”

Current paragraph:

“WETO's research and development activities are aimed at improving performance, lowering costs, and reducing market barriers for U.S. wind energy. The Office works with [national laboratories](#), industry, universities, and other agencies to [conduct R&D activities through competitively selected, directly funded, and cost-shared projects](#). Our efforts target both land-based and offshore wind power at the utility scale as well as systems on the distribution side, and focus on novel research not being undertaken by the U.S. wind industry due to perceived cost, risk, or focus on near-term investment returns.”

Changes to the Introduction of the “WHY IT MATTERS” Section

(1.1f) Changed “help the nation reduce emissions of greenhouse gases and other air pollutants, diversify its energy supply, provide cost-competitive electricity to key regions across the country, and reduce water usage for power generation” to “helps the nation increase its competitiveness, diversify its energy supply, increase energy security and independence, reduce emissions of air pollutants, save water that would otherwise be used by thermal power generation, and provide cost-competitive electricity across the country”

(1.1g) Changed “creating long-term, sustainable skilled jobs” to “creating long-term skilled jobs”

(1.1h) Added paragraph “Wind energy currently supports [more than 100,000 U.S. jobs](#), and wind turbine technician is the nation’s [fastest-growing occupation](#). According to [industry experts](#), the U.S. wind industry is expected to drive over \$85 billion in economic activity from 2017 to 2020, and wind-related employment is expected to reach 248,000 jobs in all 50 states by 2020.”

Screenshot 1.2

(1.2a) Changed section headings:

- *Previous:* Reducing the Cost of Renewable Energy; Securing Clean, Domestic Energy; Enabling the Renewable Energy Market; Harnessing Energy Where Our Nation Needs It Most
- *Current:* Enabling US Industry Growth and US Competitiveness; Securing US Security and Independence; Strengthening Domestic Manufacturing and Providing Local Economic Value Across the United States; Harnessing Energy Where our Nation Needs it Most

Removed “Reducing the Cost of Renewable Energy” Subsection / Added “Enabling US Industry Growth and US Competitiveness” Subsection

Note: The description for these two sections is similar, however there are phrase changes as noted below.

(1.2b) Changed subsection heading from “Reducing the Cost of Renewable Energy” to “Enabling US Industry Growth and US Competitiveness”

(1.2c) Replaced “secure cost-competitive sources of renewable energy through the development and deployment of innovative wind power technologies” with “secure cost-competitive, unsubsidized wind energy and U.S. competitiveness in the global wind market through energy science R&D activities that enable technology innovation and market barrier mitigation”

(1.2d) Replaced “a leader in making wind energy technologies more competitive with traditional sources of energy and a larger part of our nation's renewable energy portfolio” with “a leading global market for wind energy due to its vast domestic resources, low cost, and highly skilled workforce”

Removed “Securing Clean, Domestic Energy” Subsection

(1.2e) Removed “The Wind Program is contributing to the nation's role as a leader in renewable energy technology development by promoting domestic manufacturing of wind power technologies. Wind energy is a clean, domestic power source that requires little to no water and creates no air pollution when compared to more traditional energy sources. The Program works to ensure that wind energy technologies are environmentally responsible by analyzing the environmental impacts of wind energy, observing species' interactions with wind turbines, and researching opportunities to mitigate or eliminate any impacts where they may exist.”

Added “Securing US Security and Independence” Subsection

(1.2f) Added “U.S. wind energy provides energy security and energy independence at local, state, and national levels through more choices for stable, reliable, and cost-effective domestic energy. Because the electricity from wind farms is sold at a fixed price over a long period of time (e.g. 20+ years) and its fuel is free and inexhaustible, wind energy mitigates the price uncertainty that fuel costs add to traditional sources of energy. By leveraging their

land-based, offshore, and distributed wind resources, states can hedge against fuel price volatility and improve grid infrastructure security.”

Removed “Enabling the Renewable Energy Market” Subsection

(1.2g) Removed “By working with industry, federal and international partners, and national laboratories, the Wind Program seeks to understand and address market barriers such as environmental impacts, project siting and permitting processes, and wind's potential effects on our nation's air space and waterways. These efforts will help wind power continue on its trajectory to being a competitive, cost-effective part of our nation's renewable energy portfolio.”

Added “Strengthening Domestic Manufacturing and Providing Local Economic Value Across the United States” Subsection

(1.2h) Added “WETO is contributing to the nation's role as a leader in renewable energy technology development by promoting domestic manufacturing of wind power technologies. The U.S. has the opportunity to expand infrastructure, grow domestic manufacturing, create skilled jobs, and revitalize rural America. U.S. wind reduces energy costs to consumers, reduces health care costs through cleaner air, and increases income through local tax revenues and land lease payments.”

Changes to “Harnessing Energy Where Our Nation Needs It Most” Section

(1.2i) Changed “contributes to the delivery of clean, renewable energy throughout the nation” to “contributes to the delivery of reliable, cost-effective energy throughout the nation”

https://energy.gov/eere/wind/about-doe-wind-program Go

SEP 17 2015 DEC 17 2016 JAN 2017

REDUCING THE COST OF RENEWABLE ENERGY

The Wind Program is committed to helping the nation secure cost-competitive sources of renewable energy through the development and deployment of innovative wind power technologies. By investing in improvements to wind plant design, technology development, and operation as well as developing tools to identify the highest quality wind resources, the Wind Program serves as a leader in making wind energy technologies more competitive with traditional sources of energy and a larger part of our nation's renewable energy portfolio.

SECURING CLEAN, DOMESTIC ENERGY

The Wind Program is contributing to the nation's role as a leader in renewable energy technology development by promoting domestic manufacturing of wind power technologies. Wind energy is a clean, domestic power source that requires little to no water and creates no air pollution when compared to more traditional energy sources. The Program works to ensure that wind energy technologies are environmentally responsible by analyzing the environmental impacts of wind energy, observing species' interactions with wind turbines, and researching opportunities to mitigate or eliminate any impacts where they may exist.

ENABLING THE RENEWABLE ENERGY MARKET

By working with industry, federal and international partners, and national laboratories, the Wind Program seeks to understand and address market barriers such as environmental impacts, project siting and permitting processes, and wind's potential effects on our nation's air space and waterways. These efforts will help wind power continue on its trajectory to being a competitive, cost-effective part of our nation's renewable energy portfolio.

HARNESSING ENERGY WHERE OUR NATION NEEDS IT MOST

Wind energy presents a unique opportunity to harness energy in areas where our country's populations need it most. This includes offshore wind's potential to provide power to population centers near coastlines, and land-based wind's ability to deliver electricity to rural communities with few other local sources of power. By working to deploy wind power in new areas on land and at sea and ensuring the stable, secure integration of this power to our nation's electrical grid, the Wind Program contributes to the delivery of clean, renewable energy throughout the nation.

NATIONAL LABORATORIES

The Wind Program funds research and development activities at the following national laboratories:

- Argonne National Laboratory
- Idaho National Laboratory
- Lawrence Berkeley National Laboratory
- Lawrence Livermore National Laboratory
- National Renewable Energy Laboratory
- Oak Ridge National Laboratory
- Pacific Northwest National Laboratory

Partner with our National Labs



NEWS

DECEMBER 13, 2016
EERE Success Story—Department of Energy Harnesses the Power of Wind

The U.S. Department of Energy's (DOE's) Wind Energy Technologies Office addresses a number of pressing energy needs, from improving technology performance to advancing wind turbines' design and size to facilitating grid integration of renewable energy. Since wind energy research began in the United States in the 1970s, DOE has brought together industry, academia, and key research institutions to help overcome wind energy deployment challenges related to cost, design, materials, efficiency, and environmental stewardship.

NOVEMBER 30, 2016
3 Ways Energy Department Research Will Help Eagles Coastal with Wind Energy Deployment

NOVEMBER 21, 2016
New Report Shows Potential Growth of Distributed Wind Energy for On-Site Power

More news

https://energy.gov/eere/wind/about-doe-wind-energy-technologies-office Go

MAR 17 2017 APR 17 2017 MAY 2017

Wind energy currently supports more than 100,000 U.S. jobs, and wind turbine technician is the nation's fastest-growing occupation. According to industry experts, the U.S. wind industry is expected to drive over \$85 billion in economic activity from 2017 to 2020, and wind-related employment is expected to reach 248,000 jobs in all 50 states by 2020.

ENABLING U.S. INDUSTRY GROWTH AND U.S. COMPETITIVENESS

WETO is committed to helping the nation secure cost-competitive, unsubsidized wind energy and U.S. competitiveness in the global wind market through energy science R&D activities that enable technology innovation and market barrier mitigation. WETO invests in improvements to wind plant design, technology development and operation, as well as developing tools to identify the highest quality wind resources. The United States can remain a leading global market for wind energy due to its vast domestic resources, low cost, and highly skilled workforce.

SECURING U.S. SECURITY AND INDEPENDENCE

U.S. wind energy provides energy security and energy independence at local, state, and national levels through more choices for stable, reliable, and cost-effective domestic energy. Because the electricity from wind farms is sold at a fixed price over a long period of time (e.g. 20+ years) and its fuel is free and inexhaustible, wind energy mitigates the price uncertainty that fuel costs add to traditional sources of energy. By leveraging their land-based, offshore, and distributed wind resources, states can hedge against fuel price volatility and improve grid infrastructure security.

STRENGTHENING DOMESTIC MANUFACTURING AND PROVIDING LOCAL ECONOMIC VALUE ACROSS THE UNITED STATES

WETO is contributing to the nation's role as a leader in renewable energy technology development by promoting domestic manufacturing of wind power technologies. The U.S. has the opportunity to expand infrastructure, grow domestic manufacturing, create skilled jobs, and revitalize rural America. U.S. wind reduces energy costs to consumers, reduces health care costs through cleaner air, and increases income through local tax revenues and land lease payments.

HARNESSING ENERGY WHERE OUR NATION NEEDS IT MOST

Wind energy presents a unique opportunity to harness energy in areas where our country's populations need it most. This includes offshore wind's potential to provide power to population centers near coastlines, and land-based wind's ability to deliver electricity to rural communities and islands with few other local sources of power. By working to deploy wind power in new areas on land and at sea and ensuring the stable, secure integration of this power to our nation's electrical grid, WETO contributes to the delivery of reliable, cost-effective energy throughout the nation.

NATIONAL LABORATORIES

In addition to its partnerships with industry and academia, the Wind Energy Technologies Office funds research and development activities at the following national laboratories:

NEWS

APRIL 11, 2017
EERE Success Story—Distributed Wind Competitiveness Improvement Project (CIP) Partner Delivers Next-Generation Wind Turbine for On-Site Power

Distributed wind is used at or near where it is generated, and has gained a strong footing in the marketplace among commercial, industrial, and utility customers. In total, U.S. wind turbines in distributed applications have eclipsed an installed capacity of more than 934 megawatts — from more than 76,000 turbines across all 50 states, the District of Columbia, Puerto Rico and the U.S. Virgin Islands.

APRIL 11, 2017
Energy Department Announces 2018 Collegiate Wind Competition Participants

MARCH 14, 2017
Milestones on the Road to the Wind Vision

More news

Internet Archive: [previous version from Dec 17, 2016](#) and [current version from Apr 17, 2017](#)

Page 2: KEY ACTIVITIES IN WIND ENERGY

- URL: <https://energy.gov/eere/wind/key-activities-wind-energy>
- Side-by-side View: 12/17/16 to 4/8/2017
- Changes occurred between **Dec 17, 2016 2:37 PM ET** and **Apr 17, 2017 4:11 PM ET**

Note: This unusually wide range of times is due to the fact that this page was not being tracked by software that EDGI uses—past versions were accessed using the Internet Archive.

Screenshot 2.1

Changes to the Introductory Paragraph

(2.1a) Changed “In order to reduce the cost of wind power technologies and accelerate the deployment of wind power, the Wind Program conducts the following key activities” to “The Energy Department’s Wind Energy Technologies Office (WETO) [invests](#) in applied energy science [research and development \(R&D\) activities](#) that enable industry technological innovation and deployment. While some of these investments are targeted at a specific sector, many of them are relevant across all wind applications: land-based utility-scale, [offshore](#), and [distributed](#) wind. These activities are [conducted in partnership with the academic community, national laboratories, and industry](#), and are aimed at improving performance, lowering costs, and reducing market barriers for U.S. wind energy.”

Changes to Key Activities Sections

Note that content in these sections has been significantly modified and restructured, however many of the same topics are covered in the previous and current version of the page. Removal of section does not necessarily imply that content was removed as it could appear in sections that were added.

(2.1b) Removed section “Research and Development”, containing points:

- Lower the cost of wind energy through [R&D activities](#) focused on innovative wind turbine components, systems, materials, and manufacturing
- [Partner with the academic community, research institutions, and industry](#) to improve wind turbine and wind plant design, operation, and reliability
- Facilitate the development of wind turbine systems in both land-based and [offshore environments](#)
- Explore cost reduction opportunities across all types of wind power systems
- Develop and validate open-source design tools for evaluating new concepts and educating the next generation of [wind turbine designers](#)

(2.1c) Removed section “Wind Turbine Testing and Certification”, containing points:

- Partner with industry, universities, and national laboratories to develop aerodynamic, structural and electrical [test centers](#) for wind farms, wind turbines, rotor blades, and drivetrains
- Enable industry to meet performance and safety standards by establishing frameworks for [small wind turbine certification](#)
- Participate in the development of national and international wind energy standards

(2.1d) Removed section “Market Acceleration and Deployment”, containing points:

- Partner with environmental groups and agencies to understand the [impacts of wind energy on bird, bat, and insect species and their habitats](#)
- Assist in the development of guidelines for proper [wind plant siting and permitting](#)
- Investigate and mitigate potential impacts of wind energy on society, including auditory, visual, radar, and competitive-use impacts
- Provide independent cost of energy analyses, economic assessments, and market information [publications](#)
- Use the [WINDExchange](#) platform to help communities weigh the benefits and costs of wind energy, understand the deployment process, and make wind development decisions supported by fact-based, relevant, and actionable information

(2.1e) Removed section “Wind Resource Assessment and Grid Integration”, containing points:

- [Assess domestic wind energy resource](#) for both land-based and offshore wind energy systems
- Improve the global understanding of wind farm design conditions and complex aerodynamics
- [Understand critical wind integration challenges](#) related to electricity supply and demand, wind forecasting, and wind speed variability
- Develop solutions and best practices for wind energy grid integration.

(2.1f) Added section “Wind Resource Characterization and Plant Optimization”, containing points:

- The [Atmosphere to Electrons \(A2e\) initiative](#) will play a major role in optimizing wind plant systems that produce more power and need less maintenance, leading to the wind plant of the future—a collection of intelligent and innovative machines operating in a highly coordinated way.
- [Measure and characterize domestic wind energy resources](#) for both land-based and offshore wind energy systems
- Improve the understanding of wind farm design conditions and [complex aerodynamics](#)
- Leverage the high-performance computing (HPC) abilities at the national laboratories to model the complexity of the atmosphere and wind plant flow physics, and enable industry to take the next steps in developing both evolutionary and transformational technologies
- Improve the reliability of wind plant systems that address the complex dynamics of winds created by turbulent weather, variable terrain, and rotor wakes
- Develop and validate open-source design tools for evaluating new concepts and enabling industry innovation in next-generation wind turbine designs.

(2.1g) Added section “Wind Component and System Research, Development, and Testing”, containing points:

- Partner with industry, universities, and national laboratories on aerodynamic, structural and electrical [test centers](#) for wind plants, wind turbines, rotor blades, and drivetrains

- Investigate new drivetrain configurations that weigh less and have higher efficiency than current designs and are installed on taller towers that can access the stronger wind resources at greater heights
 - Conduct research needed to address U.S.-specific [offshore wind](#) challenges such as deep water, weak soils, and hurricanes
 - Enable industry to meet performance and safety standards by establishing frameworks for [small wind turbine certification](#)
 - Participate in the development of national and international wind energy standards.
- (2.1h) Added section “Market Barrier Mitigation”, containing points:
- Conduct research aimed at understanding and mitigating the [impacts of wind energy on bird, bat, marine, and insect species and their habitats](#)
 - Investigate and mitigate potential impacts of wind energy on society, including auditory, visual, radar, and competitive-use impacts
 - [Understand critical wind integration challenges](#) related to electricity supply and demand, wind forecasting, wind speed variability, and cyber security
 - Develop solutions and best practices for wind energy grid integration
 - Provide independent cost of energy analyses, economic assessments, and market information [publications](#)
 - Use the [WINDExchange](#) platform to help communities weigh the benefits and costs of wind energy, understand the deployment process, and make wind development decisions supported by fact-based, relevant, and actionable information.

11 captures
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KEY ACTIVITIES IN WIND ENERGY

In order to reduce the cost of wind power technologies and accelerate the deployment of wind power, the Wind Program conducts the following key activities:

RESEARCH AND DEVELOPMENT

- Lower the cost of wind energy through R&D activities focused on innovative wind turbine components, systems, materials, and manufacturing
- Partner with the academic community, research institutions, and industry to improve wind turbine and wind plant design, operation, and reliability
- Facilitate the development of wind turbine systems in both land-based and offshore environments
- Explore cost reduction opportunities across all types of wind power systems
- Develop and validate open-source design tools for evaluating new concepts and educating the next generation of wind turbine designers

WIND TURBINE TESTING AND CERTIFICATION

- Partner with industry, universities, and national laboratories to develop aerodynamic, structural and electrical test centers for wind farms, wind turbines, rotor blades, and drivetrains
- Enable industry to meet performance and safety standards by establishing frameworks for small wind turbine certification
- Participate in the development of national and international wind energy standards

MARKET ACCELERATION AND DEPLOYMENT

- Partner with environmental groups and agencies to understand the impacts of wind energy on bird, bat, and insect species and their habitats
- Assist in the development of guidelines for proper wind plant siting and permitting
- Investigate and mitigate potential impacts of wind energy on society, including auditory, visual, radar, and competitive-use impacts
- Provide independent cost of energy analyses, economic assessments, and market information publications
- Use the WINDExchange platform to help communities weigh the benefits and costs of wind energy, understand the deployment process, and make wind development decisions supported by fact-based, relevant, and actionable information

WIND RESOURCE ASSESSMENT AND GRID INTEGRATION

- Assess domestic wind energy resources for both land-based and offshore wind energy systems
- Improve the global understanding of wind farm design conditions and complex aerodynamics
- Understand critical wind integration challenges related to electricity supply and demand, wind forecasting, and wind speed variability
- Develop solutions and best practices for wind energy grid integration

MARKET BARRIER MITIGATION

- Conduct research aimed at understanding and mitigating the impacts of wind energy on bird, bat, marine, and insect species and their habitats
- Investigate and mitigate potential impacts of wind energy on society, including auditory, visual, radar, and competitive-use impacts
- Understand critical wind integration challenges related to electricity supply and demand, wind forecasting, wind speed variability, and cyber security
- Develop solutions and best practices for wind energy grid integration
- Provide independent cost of energy analyses, economic assessments, and market information publications
- Use the WINDExchange platform to help communities weigh the benefits and costs of wind energy, understand the deployment process, and make wind development decisions supported by fact-based, relevant, and actionable information.

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11 captures
10 Aug 2016 - 8 Nov 2017

Home » About the Office » Key Activities in Wind Energy

KEY ACTIVITIES IN WIND ENERGY

The Energy Department's Wind Energy Technologies Office (WETO) invests in applied energy science research and development (R&D) activities that enable industry technological innovation and deployment. While some of these investments are targeted at a specific sector, many of them are relevant across all wind applications: land-based utility-scale, offshore, and distributed wind. These activities are conducted in partnership with the academic community, national laboratories, and industry, and are aimed at improving performance, lowering costs, and reducing market barriers for U.S. wind energy.

WIND RESOURCE CHARACTERIZATION AND PLANT OPTIMIZATION

The Atmosphere to Electrons (A2e) initiative will play a major role in optimizing wind plant systems that produce more power and need less maintenance, leading to the wind plant of the future—a collection of intelligent and innovative machines operating in a highly coordinated way.

- Measure and characterize domestic wind energy resources for both land-based and offshore wind energy systems
- Improve the understanding of wind farm design conditions and complex aerodynamics
- Leverage the high-performance computing (HPC) abilities at the national laboratories to model the complexity of the atmosphere and wind plant flow physics, and enable industry to take the next steps in developing both evolutionary and transformational technologies
- Improve the reliability of wind plant systems that address the complex dynamics of winds created by turbulent weather, variable terrain, and rotor wakes
- Develop and validate open-source design tools for evaluating new concepts and enabling industry innovation in next-generation wind turbine designs.

WIND COMPONENT AND SYSTEM RESEARCH, DEVELOPMENT, AND TESTING

- Partner with industry, universities, and national laboratories on aerodynamic, structural and electrical test centers for wind plants, wind turbines, rotor blades, and drivetrains
- Investigate new drivetrain configurations that weigh less and have higher efficiency than current designs and are installed on taller towers that can access the stronger wind resources at greater heights
- Conduct research needed to address U.S.-specific offshore wind challenges such as deep water, weak soils, and hurricanes
- Enable industry to meet performance and safety standards by establishing frameworks for small wind turbine certification
- Participate in the development of national and international wind energy standards.

MARKET BARRIER MITIGATION

- Conduct research aimed at understanding and mitigating the impacts of wind energy on bird, bat, marine, and insect species and their habitats
- Investigate and mitigate potential impacts of wind energy on society, including auditory, visual, radar, and competitive-use impacts
- Understand critical wind integration challenges related to electricity supply and demand, wind forecasting, wind speed variability, and cyber security
- Develop solutions and best practices for wind energy grid integration
- Provide independent cost of energy analyses, economic assessments, and market information publications
- Use the WINDExchange platform to help communities weigh the benefits and costs of wind energy, understand the deployment process, and make wind development decisions supported by fact-based, relevant, and actionable information.

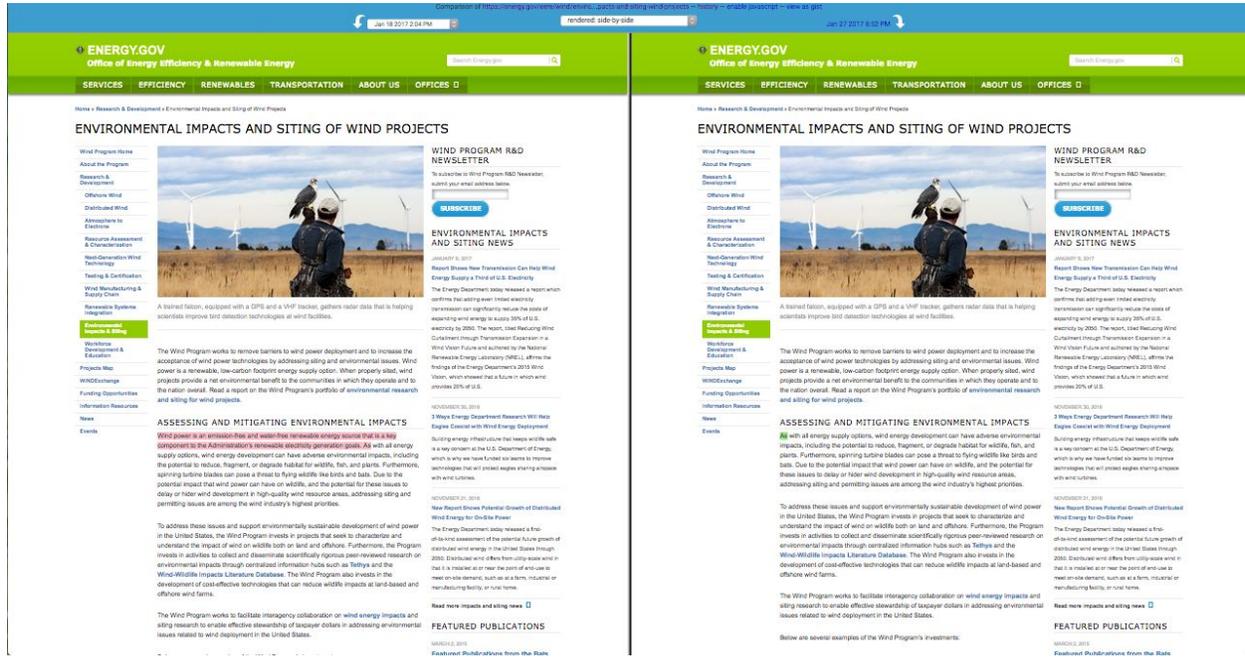
Internet Archive: [previous version from Dec 17, 2016](#) and [current version from Apr 8, 2017](#)

Page 3: ENVIRONMENTAL IMPACTS AND SITING OF WIND PROJECTS

- URL: <https://energy.gov/eere/wind/environmental-impacts-and-siting-wind-projects>
- Side-by-side View: 1/18/2017 to 1/27/2017
- Changes occurred between Jan 26, 2017 8:46 PM ET and Jan 27, 2017 8:52 PM ET

Screenshot 3.1

(3.1a) Removed “Wind power is an emission-free and water-free renewable energy source that is a key component to the Administration’s renewable electricity generation goals.”



Internet Archive: [previous version from Jan 26, 2017](#) and [current version from Feb 5, 2017](#)