

Activity Area Overview Presentation: Stakeholder Engagement and Workforce

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FY21 Peer Review – Engagement Activities Overview

Activity Summary:

Challenge:

Without credible sources of information, more initiated projects will be unsuccessful. As the easy-to-deploy sites are developed, project costs at sites facing more deployment barriers will increase.

Activities:

- **United States Wind Turbine Database and Location Impacts R&D (Academia, Task 28, Industry)** - Key project partners: RSG, Vermont Energy Resource Associates (VERA); University of Connecticut; Amherst College; U.S. Geological Survey (USGS); and, American Clean Power (ACP) Association (formerly the American Wind Energy Association)
 - Examines potential location impacts of wind projects to provide tools and information to siting/permitting stakeholders.
 - Research include: Military and weather radar, community attitudes, sounds and shadow flicker, perception and annoyance, or other location impacts i.e. economical, school finances
 - Maintain and update the US Wind Turbine Database (USWTDB)
- **WINDEXchange Stakeholder Engagement and Outreach (NREL, IEA Task 28, Industry, NGOs/Community Groups/Local/States)**
 - A national program focuses on mitigating barriers associated with wind energy siting and planning to address concerns that intersect with community values, risk assessment, and planning processes.
 - Developing communication products.
 - Convening and facilitating stakeholder engagement.

FY19 - FY20 Budget Under Review:
\$4,566,639

Current budget (FY21):
FY21 Total Funding Level: \$2,340,794 Actual
Planned Spend: \$1,699,203

Number of projects under peer review: 2

Activity Objective(s) 2019-2020:

- ❖ Provide or facilitate the provision of broad-based, unbiased and scientifically defensible information about historical or potential U.S. wind development locational impacts on radar operations, the surrounding landscape, human populations, and economies.
- ❖ Convening stakeholders, information synthesis, and dissemination.
- ❖ Create an expanded network of experts and stakeholders to inform research and outreach.
- ❖ Develop communications and information resources to support community-based decisions.

Overall Activity Objectives (life of Activity):

Enable well-informed decisions about wind energy deployment.



Photo Credit: Canva

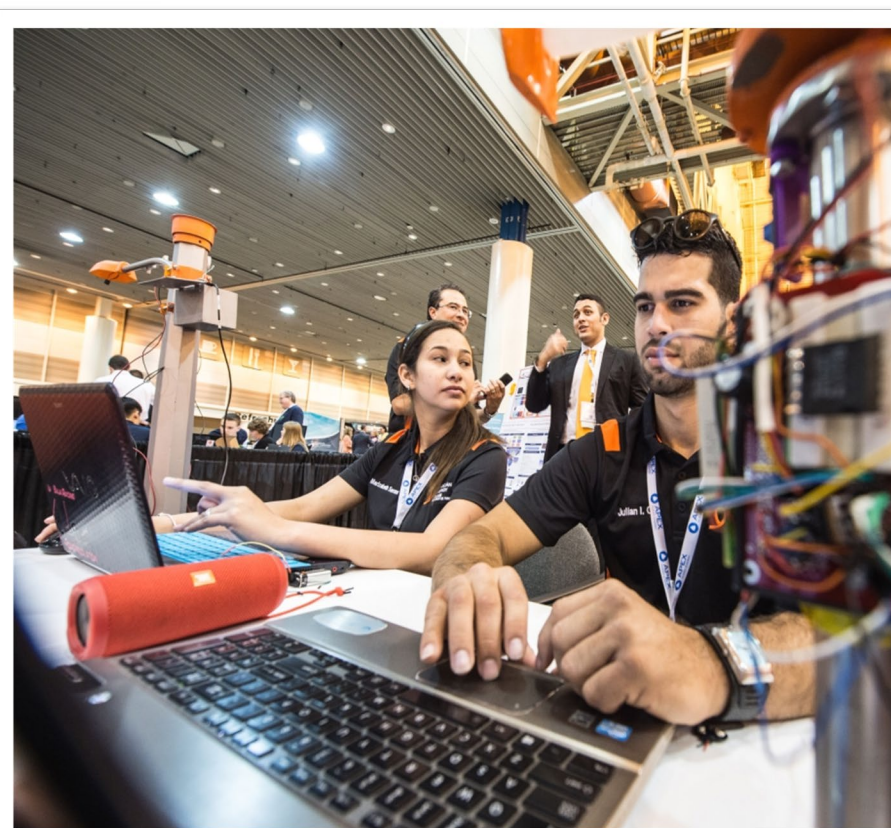
Projects Under Review

ESW&G -	
E19 - United States Wind Turbine Database and Location Impacts R&D (1:30-1:55 PM Wednesday)	Ben Hoen Lawrence Berkeley National Labs
E20 - WINDEXchange Stakeholder Engagement and Outreach (1:55-2:20 PM Wednesday)	Mary Hallisey National Renewable Energy Lab
E21 - Collegiate Wind Competition (2:35-3 PM Wednesday)	Ian Baring-Gould National Renewable Energy Lab
E22 - Wind for Schools (3-3:25 PM Wednesday)	Elise DeGeorge National Renewable Energy Lab

Community Impacts Research and Outreach - Workforce Development

Motivation: Addressing community impacts and ensuring a robust domestic workforce are critical to preserve or expand access to quality wind resources.

The screenshot shows the WINDExchange website, a resource hub for wind energy. The header includes the logo for the Office of Energy Efficiency & Renewable Energy and navigation links for 'About WINDExchange' and 'Search Site'. A main menu lists categories: Market Sectors, Project Development, Technical Assistance, Education & Workforce Development, Maps & Data, Policies & Incentives, Publications, and News & Events. The main content area features a 'Wind information by state' dropdown menu and a map of the United States. Below this, there are sections for 'Utility-Scale Wind' (Land-Based and Offshore) and 'Distributed Wind' (Community and Residential). A 'Maps & Data' section offers various resource maps, while 'Project Development' provides tools for site selection, economic costs, wildlife impacts, and community impacts. 'Technical Assistance' offers models and guides for project development. The footer contains sections for 'News', 'Events', and 'Publications' with recent updates.



How We Organize Our Work: Activity Areas

Community Impacts Research & Engagement - Workforce Development

- **Addressing community impacts and develop skilled workforce**
 - WINDEXchange **Manager: Maggie Yancey**
 - Social Science Research **Co-Managed by Maggie Yancey & Patrick Gilman**
 - Collegiate Wind Competition
 - Wind for Schools **Manager: Amber Frumkin**
 - Workforce analysis **Manager: Amber Frumkin**

Environmental Research

- **Develop solutions to wildlife challenges**
 - Land-based and offshore wind environmental research

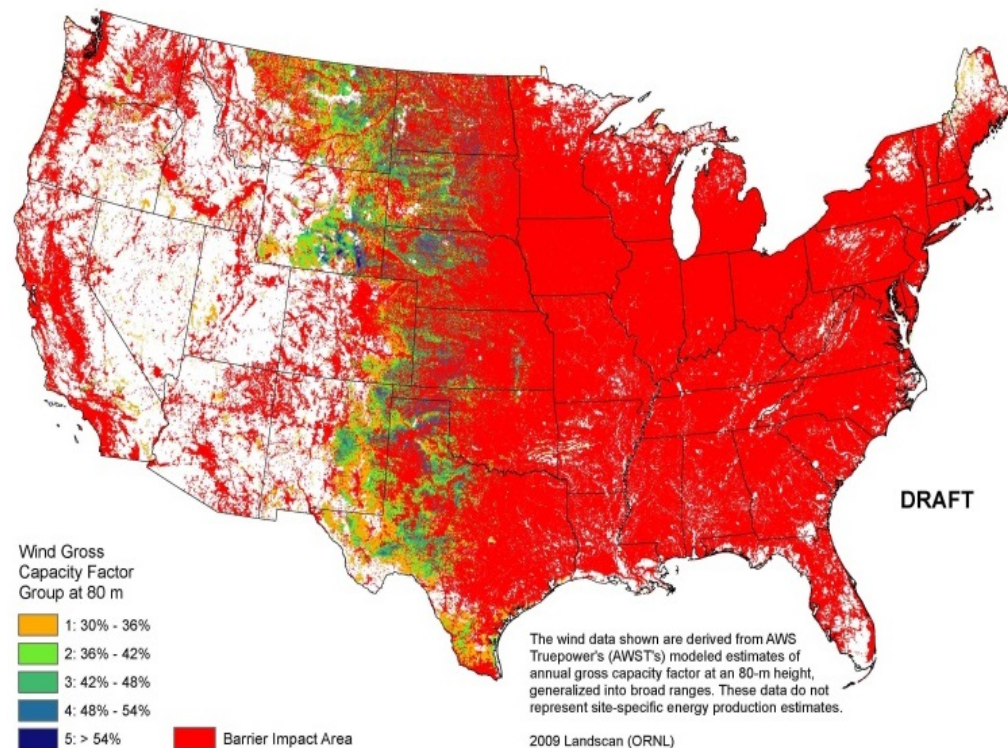
Grid Integration

- **Enable high levels of wind penetration**
 - Transmission adequacy and utilization
 - Provision of grid services
 - Grid reliability and resilience
 - Wind cybersecurity

Regulatory and Siting

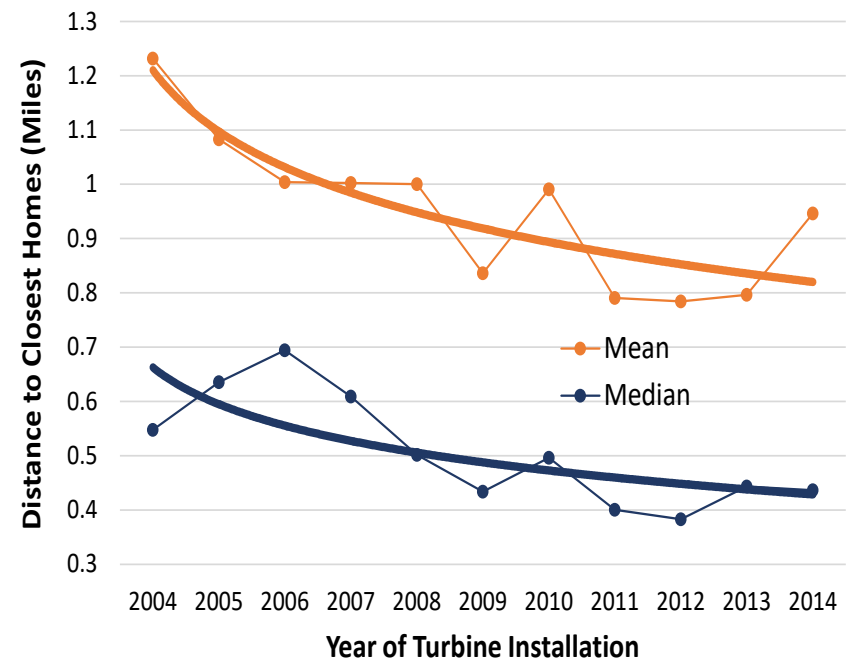
- **Accelerate the deployment of land-based, distributed and offshore wind technology**
 - Eliminate wind turbine radar interference with civilian and defense radar systems

What's the Problem?



Land area within 2500 feet of a residence – 1500 feet is a typical setback distance but setbacks range up to nearly 4000 feet

Mean and Median Distance to Nearest Home By Installation Year



Source: LBNL Baseline Public Acceptance Data; Note: Turbines > 364 ft & 1.5 MW

- **Siting all this renewable energy means contending with environmental impacts, other land uses, and the potential for local opposition.**
 - Princeton NZA Study: 90-400K mi² required for wind development in 2050 net-zero economy scenarios – the size of WY, CA, and TX combined
- **Increased siting restrictions impact potential deployment and the ability to achieve deep decarbonization.**
 - As wind technology deployment becomes more widespread, opposition is magnified by fear of potential impacts.

Citations: [Land use and turbine technology influences on wind potential in the United States](#), Lopez et al 2021
[December 2020 Princeton Study](#), Mai et al 2021

Stakeholder Engagement - (2019 - 2020)

Strategic Area	Selected Accomplishments
<p>Land Based Wind</p>	<p>Social Science</p> <ul style="list-style-type: none"> • LBL: Completed the publishing of seminal research papers totally 6 on the national survey of 1,705 wind project neighbors resulting in over 300 citations by other published papers • LBL: USBTDB almost 5 million views • LBL: Work to be submitted for publication include seminal work to inform future project emissions turbine scaling, shadow flicker, and sound perception i.e. examined over 30 shadow flicker regulations • LBL: Amplified a paper’s findings on School Revenue and Student Outcomes in High Wind Energy Districts demonstrating large significant relationships with increasing revenue and expenditures via multiple (3+) newsletters and webinars. <p>Engagement</p> <ul style="list-style-type: none"> • NREL: Conducted key customer research on understanding economic tools to inform future development of JEDI and released the online Economic Development Guide. Held key information meetings with industry and community representatives to inform product development on Economic Guidebook and Siting Guidebook. • NREL: Published WINDEXchange newsletters #207-#215 in FY19 and FY20, ending with 34,901 subscribers
<p>Offshore Wind</p>	<p>Engagement</p> <ul style="list-style-type: none"> • NREL: Over 100K views of the Offshore Wind Floating Webinar and developed new slideshow content - <i><u>Block Island and Beyond: Offshore Wind in the United States</u></i> <p>Data Collection and Information Sharing</p> <ul style="list-style-type: none"> • NREL: Released WINDEXchange resource maps and updated state profile information to 50+ states and territories that include megawatts under construction in each state, links to the U.S. Wind Turbine Database maps, RPS information, cities with 100% renewable energy commitments, and more.
<p>Cross-Cutting</p>	<p>Social Science</p> <ul style="list-style-type: none"> • LBL: Supported programmatic social science development <p>Information Dissemination</p> <ul style="list-style-type: none"> • LBL/ NREL: Continued to expand DOE research internationally leading to the development of the successfully adopted plan for a new 4-year term for Task 28. • NREL: Completed the development and implementation of a priority challenge-centered engagement national strategy.

FY21 Peer Review – Workforce Activities Overview

Activity Summary:

- **Challenge:** *The U.S. wind industry continues to grow and employ Americans through education and workforce development programs across the country. **The American wind energy industry currently supports more than 100,000 jobs**, including vital positions such as turbine technicians, researchers, scientists, engineers, trade workers, educators, transportation workers, and workers focused on business and sales.*
- **Activities:**
 - **Collegiate Wind Competition (NREL) American Clean Power Association; KidWind:** **Introduces students to the primary disciplines within the wind energy industry**, including engineering, project management, business, and stakeholder engagement. **Prepares students from multiple disciplines to enter the wind energy workforce** by providing real-world technology and project development experience.
 - **Wind for Schools (NREL) Distributed Wind Energy Association; Repowering Schools, NEED, WACs):** **Introduces wind energy education** and careers to teachers and K-12 and post-secondary students, supporting the industry’s need for a skilled and qualified workforce. **Equips college students** with hands-on wind energy applications and education to provide the growing U.S. wind industry with a competitive workforce.
 - **Provide workforce analysis (NREL):** To better understand current wind workforce trends and what challenges can be addressed to ensure a readied, domestic workforce.

FY19 - FY20 Budget Under Review:
\$6,103,209

Current budget
FY21 Total Funding Level: \$4,434,810
Actual Planned Spend (FY21): \$1,785,396

Number of projects under peer review: 2

Activity Objective(s) 2019-2020:

- ❖ Identify Domestic Wind Energy Education Training and Workforce Needs
- ❖ Bridge Gaps among Industry, Workforce, and Educational Institutions
- ❖ Increase Wind Energy Exposure and Engagement at Educational Institutions
- ❖ Update a wind workforce strategy for WETO
- ❖ Host collegiate wind competition through effective engagement and fostering skill development.

Overall Activity Objectives (life of Activity):

Ensure the availability of a robust workforce



Photo Credit: Canva

Workforce - (2019 - 2020)

Strategic Area	Selected Accomplishments
<p>Land Based Wind</p>	<p>Wind for Schools</p> <ul style="list-style-type: none"> • NREL (Wind for Schools/RePowering Schools (REpS)) • Implemented State based wind workforce industry consortia in 9 of 12 WfS states • Implementation of REpS through the creation of a new non-profit entity that provides avenues for transition of WAC and support educational programs nationwide, allowing engagement from new states and educational entities as financial contribution to existing university programs decreases. • Maintain active and healthy WAC in historically states by transitioning transition to REpS. • Continued partnership with KidWind provides additional opportunities for students from K-12 and Higher Education to share experiential learning. <p>Collegiate Wind Competition</p> <ul style="list-style-type: none"> • NREL: Facilitated quarterly industry advisory board meetings to increase competition impact and inform future activities. • NREL: Created an alumni group to inspire students to enter the wind industry and networks • NREL: All 12 2018 teams returned for the last biannual interim competition held at NREL • NREL: 2020 hosted the first virtual but also the first ANNUAL competition with 12 universities including 3 new and 9 returning schools. <p>Workforce Analysis</p> <ul style="list-style-type: none"> • NREL : • Publication of updated report of wind workforce needs (2019) • Conducted first detailed analysis of university students relating to wind energy (2019) • Published assessment of wind energy workforce needs for wind plant O&M (2020) • Implemented the first national assessment of offshore wind workforce needs (2019-2020)
<p>Offshore Wind</p>	<p>Workforce Analysis</p> <ul style="list-style-type: none"> • NREL : • Implemented the first national assessment of offshore wind workforce needs (2019-2020) • Facilitated workforce session at BNOW and CleanPower (2019 and 2020)
<p>Cross-Cutting</p>	<p>Wind for Schools</p> <ul style="list-style-type: none"> • NREL: Partnership and support with National Energy Education Development provides connection to land-based and offshore wind curriculum

Selected Program Upcoming Activities (FY21 and Beyond)

Stakeholder Engagement

- **Land-Based Wind:** Amplify Siting and Economic resources including Wind Project Recycling Information
- **Offshore Wind:** Notable Engagement Partnerships with NOAA National Sea Grant
- **Cross-cut:** Future information resources
- Continue to receive feedback and implement social science strategy

Workforce Development

- **Offshore Wind:**
 - Develop offshore workforce roadmap and network
 - Collegiate Wind Competition offshore component
- **Land-Based Wind:**
 - Fostering industry and alumni engagement
 - Workforce gaps analysis report
- **Cross-cut:** Support and expand diversity and inclusivity and industry engagement

Community Impacts Research & Outreach - Workforce Development: Key Projects Over Time

