

Activity Area Overview: Technology Research, Development, & Testing: Distributed Wind

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August 2-5, 2021



Introduction to Distributed Wind

Wind technologies (kW and MW scale) used as distributed energy resources (DERs) to supply local electricity needs and support grid operations

- Through 2020, cumulative U.S. distributed wind installed capacity is greater than 1 GW
- R&D investment could unlock a lot more - an estimated 48 GW of economic potential deployed profitably in 2030, and more than 85 GW in 2050
- Investing to diversify cost effective and reliable DER options for decarbonization



FY21 Peer Review – Activity Overview

Activity Summary:

- Advancing wind energy technology as a cost effective, reliable, and compatible distributed energy resource (DER)
- Key Activity Partners: National labs, original equipment manufacturers, national associations, universities, and nonprofit research organizations

Activity Objective(s) 2019-2020:

- Reduce hardware cost and increase performance
- Increase turbine testing to national performance and safety standards
- Reduce the wide range of actual versus estimated project performance
- Enable plug-and-play DER integration and grid support

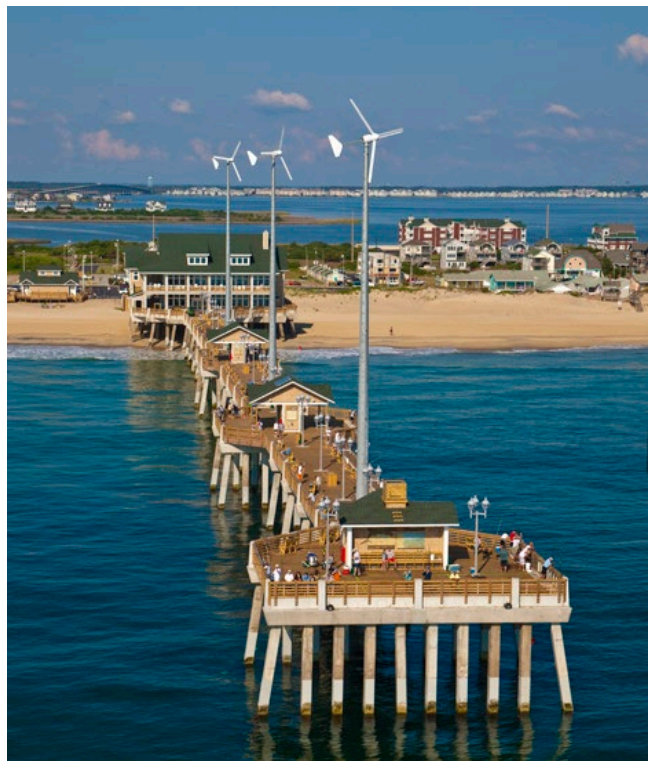
Overall Activity Objectives (life of Activity):

- Create enabling conditions for rapid distributed wind industry scaling in DER markets.

FY19 - FY20 Budget Under Review: \$20,977,643

Current budget (FY21): \$19,265,274

Number of projects under peer review: 6



Projects Under Review

Project Name	UID	Date & Time	Presenter
Distributed Wind R&D Analysis and Support	A02	Monday, 10:55-11:20 AM	Alice Orrell, PNNL
Distributed Wind Research, Development, and Testing	T36	Thursday, 2:20-2:45 PM	Ian Baring-Gould, NREL
Tools Assessing Performance (TAP)	T37	Thursday, 3:00-3:35 PM	Heidi Tinnesand, NREL with support from PNNL, ANL, & LANL
Microgrids Infrastructure Resilience and Advanced Controls Launch Pad (MIRACL)	T38	Thursday, 3:25-3:50 PM	James Reilly, NREL with support from PNNL, SNL, & INL
Defense and Disaster Deployable Turbines (D3T)	T39	Thursday, 4:05-4:30 PM	Brian Naughton, SNL with support from NREL & INL
Distributed Wind Strategic and Technical Engagement	T40	Thursday, 4:30-4:25 PM	Ian Baring-Gould, NREL with support from PNNL

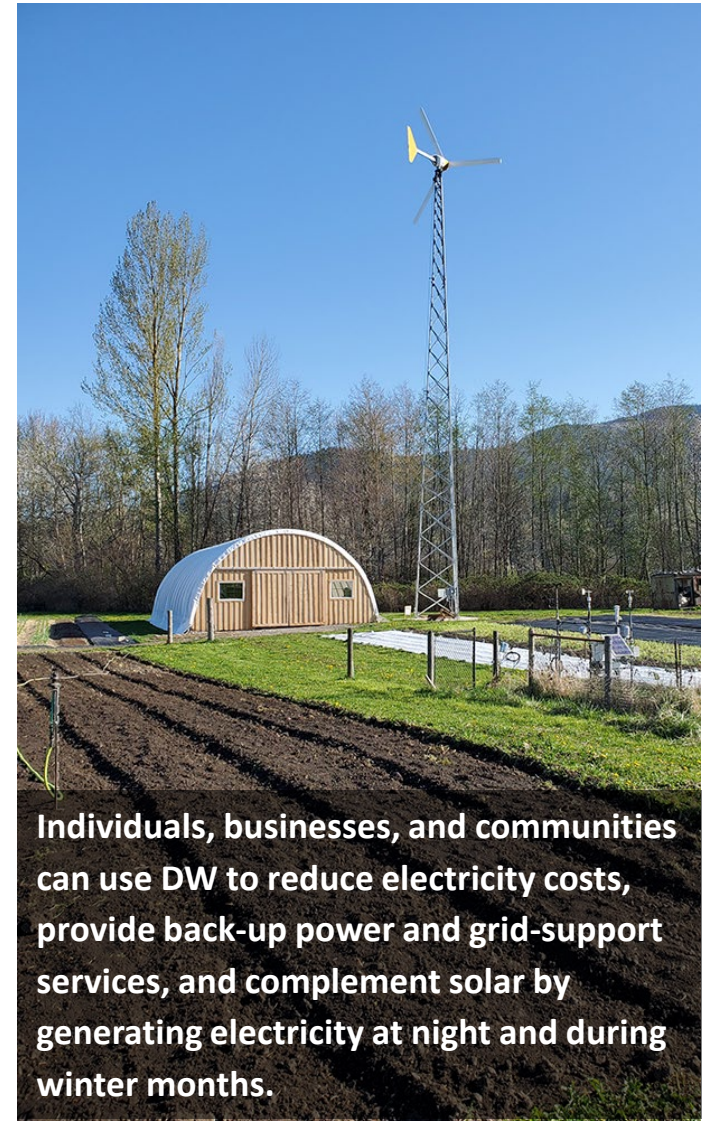
Activity Impact

Distributed wind has significant potential to help achieve the nation's energy and climate goals. But meeting this potential will not be achieved without DOE investment in:

- 1) Significant cost reduction
- 2) Accurate, low-cost performance prediction
- 3) Improved system and grid integration
- 4) Reduced project development barriers

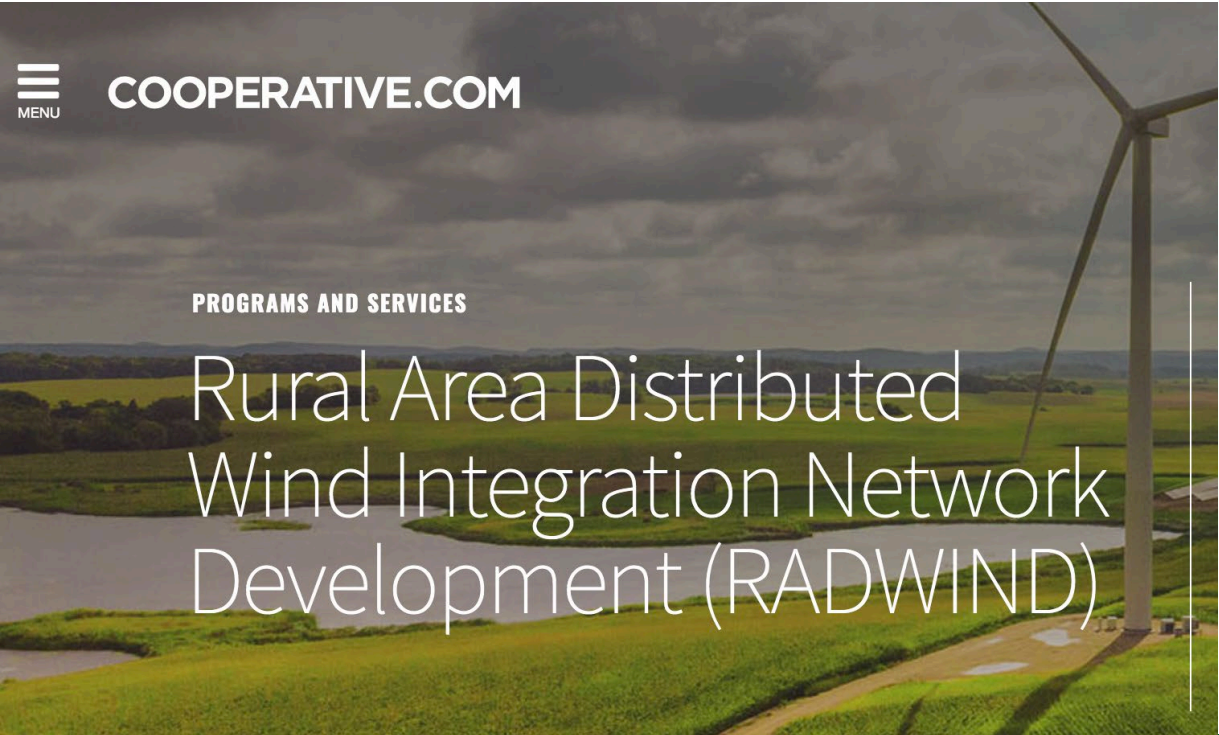
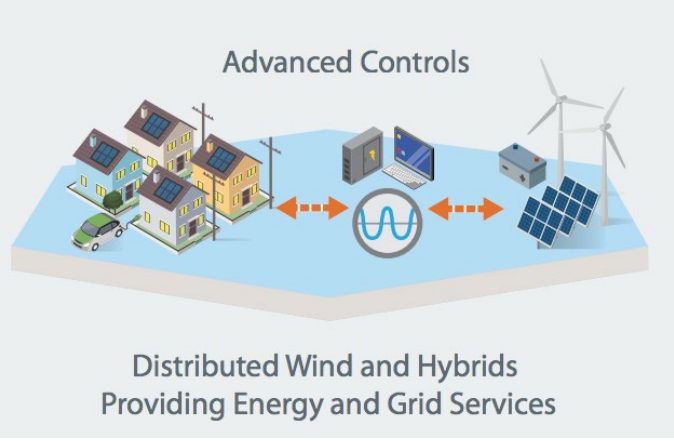
Activity Goal:

Reduce costs to 7.2¢/kWh in 2025, and to 5.0¢/kWh in 2030, from 10.5¢/kWh in 2020 (100-kW system).



Activity Accomplishments & Progress

- Planned and stood up a new multi-faceted, multi-year Distributed Wind Research Program across 7 national labs
- Established the research capacity to advance wind technology as highly controllable, more predictable, cost effective, and compatible DER



Wind Innovations for Rural Economic Development (WIRED) funding opportunity awards \$6M across 4 projects:

1. NRECA – Utility networks & business models
2. EPRI & GE – Wind + storage grid support
3. Iowa State – Wind + solar + storage grid support
4. Bergey Windpower – Utility business models

Future Work (FY21 and Beyond)

Future work will build upon technology R&D efforts conducted in FY19 & 20 and expand programmatic focus to deployment acceleration.

- Scenario analysis evaluating DW's potential roles in decarbonizing the grid by 2035
- Desktop performance assessment tool validation and decision support tool integration
- Grid support and hybrid system integration validation and demonstration
- EERE crosscutting deployment acceleration and technical assistance programs

