Distributed Wind Network Launch Webinar Q&A

The following questions were asked during the National Distributed Wind Network Launch Webinar held on March 14, 2024. Questions have been edited for clarity and organized in thematic groups.

Federal Funding Allocations

What percentage of federal renewable energy budget is intended to support distributed energy resources (DERs) versus large-scale projects?

Most government agencies don't break down their budgets into allocations for DERs versus large-scale projects, and when they do, the amount can vary by government agency and program. For example, the USDA's Rural Energy for America Program (REAP) budget is dedicated entirely to rural renewable energy systems (RES) and energy efficiency improvements (EEI). A significant portion, if not most or all, of projects in this program are distributed in nature.

Environmental Impacts and Research

Are there any comprehensive studies on the ecological effects of distributed wind projects? How do distributed wind turbines affect species of bats, birds, and bees?

Siting is important to minimize impacts to birds, bats, and other species of concern. Impacts to animals are primarily through collision and habitat disruption. Studies have concluded that these impacts are relatively low, especially for projects with a small number of turbines. There is also limited scientific research on the impacts of small wind turbines, which have different operating characteristics than large turbines, but impacts are generally considered to be minimal based on anecdotal experience.

There have been no studies on the impacts on pollinators related to wind technologies in distributed applications, though experiences of impacts have not been reported. Impacts that do occur are often species- and habitat- specific. Micro-siting (i.e., identifying the specific location for a turbine at a site of interest) is key to reducing impacts. Since most distributed wind projects are installed in areas that are already developed, such as on farms or at commercial or industrial sites, the likelihood of impacts to species of concern are typically considered low relative to large wind farms. Some locations, however, may not be suitable for development.

Development and Deployment Assistance

The Rural Area Distributed Wind Integration Network Development (RADWIND) project considered the Lake Region Electric Cooperative (LREC) project in Minnesota to be a distributed energy resource. Do the panelists also consider this project to be a DER?

Yes, the LREC project is a great example of how distributed wind can be deployed with other technologies like solar photovoltaics! This project is connected to the distribution grid in a front-of-meter application to provide electricity to LREC's members. PNNL includes this project along with other RADWIND case studies in the PNNL database of distributed wind projects.

Are there technical assistance (TA) programs available to support distributed wind development and deployment processes such as interconnection? Are there any sources of publicly available information on interconnection processes?

The Distributed Wind Resource Hub hosts several technical resources available to assist with the planning and deployment of distributed wind energy projects including information on DOE's Clean Energy to Communities Program.

In addition to DOE opportunities, the USDA's REAP Technical Assistance Grant (TAG) program makes funding available for TA providers (including state, Tribal or local governments; colleges and universities; electric cooperatives and utility companies; and nonprofit organizations) to support Agricultural Producers and Rural Small Businesses applying to REAP for renewable energy systems and energy efficiency improvements. The deadline to apply to REAP TAG has passed; however, agricultural producers and small business owners that are interested in receiving distributed wind TA through REAP may reach out to the TAG TA providers or their State Rural Development Energy Coordinator with questions.

For interconnection, specifically, DOE's Interconnection Innovation e-Xchange (i2X) offers office hours to discuss interconnection challenges with experts. NREL also published a technical report in 2019 covering an overview of DER interconnection with current practices and emerging solutions with a specific section on cost allocation, which may be able to provide insight into compensation structures.

Who can assist me, a small farm/agricultural producer, with applying to USDA's REAP RES/EEI grants?

Small farm owners, agricultural producers, and small business owners can contact the TAG TA providers or their USDA State Energy Coordinator with assistance for applying to REAP grants.

Is there a central place with fact-based information about wind energy to help dispel misinformation?

DOE's WINDExchange is a great source for reliable, fact-based information on both large scale and distributed wind, with sections addressing many of the common concerns associated with wind energy development. Be sure to check out the Distributed Wind Energy Resource Hub that's hosted on WINDExchange, too.

What are the latest advancements in distributed wind energy technologies in the United States?

There have been many advances in distributed wind technologies over the last decade, many leading to the large cost decreases the industry has seen even while improving turbine reliability. Expanded aeroelastic modeling during the turbine design process, including a design for wind turbine certification has increased reliability while optimizing turbine designs. Larger turbine rotors, improvements in power electronics, and optimization of turbine generators have all lead to higher energy capture, even from areas with lower wind speeds. Lastly, innovation and optimization of turbine foundations and installation techniques have led to reductions in installation costs and time.

Check out the Competitiveness Improvement Project (CIP), sponsored by DOE and managed by NREL, for examples of projects that distributed wind manufactures have undertaken to lower the life cycle costs of their product. CIP awards cost-shared subcontracts and technical support to manufacturers of small and medium-sized wind turbines. These awards help manufacturers of wind turbines less than 1 MW in capacity to:

- Optimize their designs
- Develop advanced manufacturing processes
- Perform turbine and component testing and certification
- Accelerate pathways for commercialization

Where can I find a repository of distributed wind installers?

Please note that the list and recommendations made here are provided for consumers' reference but does not represent an endorsement of any installer or organization.

OpenEI hosts a list of Distributed Wind Installers. OpenEI is a wiki-site, so individual contributors can add installers to this list as well. Please note that many installers work in other states in addition to their home states and may be able to help you wherever you are.

Many installers are members of the Distributed Wind Energy Association (DWEA), and you can also reach out to your original equipment manufacturer (OEM) to learn more about their dealer-installer networks.

What are the broader applications for small wind turbines vs medium-sized wind turbines?

Small wind turbines, less than 100 kW, applications often include homes, farms, businesses, and remote applications (such as water pumping, telecommunication sites, and ice-making). Medium-sized wind turbines, between 100 and 1 MW, applications include village and community-scale power as well as small commercial, industrial, institutional, and governmental applications. Note: turbine size is determined by kW capacity of the turbine generator, not the height of the turbine or the size of the rotor. In the end, the size of the turbine that would be applicable to a specific consumer will depend on their energy consumption, their location and the other available energy sources (e.g., solar photovoltaics), local interconnection rules and local policy, such as net-metering. The goal will be to select the turbine size that fits with a consumer's needs, regardless of the specific application.

What benefits can distributed wind technologies bring to hybrid systems and microgrids?

Combining DERs (such as wind + solar or wind + battery or wind + solar + battery) can deliver a range of benefits while enhancing resilience, including:

- Increased energy output compared to single technology development because of the different daily and seasonal production profiles of renewable energy sources
- Lower cost of energy because of a reduced need for storage or back-up power in locations with good daily and seasonal differences between solar photovoltaic and wind turbines production
- Improved (or different) grid support capabilities provided by different generation technologies
- Increased power reliability and resilience to withstand instability, unanticipated losses, and uncontrolled events, including service disruptions, because of the use of multiple generation technologies
- Depending on resource availability, the potential for higher renewable contribution of loads through the optimization of system inputs, including available land, interconnection capacity, and permitting requirements

- Maximization of system value, including social, political, and economic benefits (e.g., meeting environmental and decarbonization goals, job creation, etc.) while expanding generation diversity, which may impact local or community acceptance

Do the IRA tax credit and USDA REAP require wind turbines to be certified?

Certified small and medium wind turbines are required to receive the federal Business Energy Investment Tax Credit (ITC), the Residential Renewable Energy Tax Credit, and the Production Tax Credit (PTC). Per the Internal Revenue Service (IRS) small wind turbines must meet either the American Wind Energy Association (AWEA) Small Wind Turbine Performance and Safety Standard 9.1-2009, the International Electrotechnical Commission (IEC) 61400-1, 61400-11, and 61400-12 standards, or ANSI/ACP 101-1-2021, the Small Wind Turbine Standard, to be eligible. Certification must be conducted by an appropriately accredited organization, such as the Small Wind Certification Council, https://smallwindcertification.org/.

Funding available through USDA REAP requires the use of a domestic or foreign system that has been certified by a recognized industry organization whose certification standards are acceptable to the Agency. By rule, a Renewable Energy System is considered to have demonstrated commercial availability if it has been certified by a recognized industry organization whose certification standards are acceptable to the Agency. Examples of recognized industry organization whose certification standards are acceptable to the Agency include, but are not limited to:

Small Wind Certification Council

http://smallwindcertification.org/

Solar Rating and Certification Corporation

http://www.solar-rating.org/

Florida Solar Energy Center

http://energyresearch.ucf.edu/

American Wind Energy Association

http://www.awea.org/

Intertek Small Wind Certification Program

http://www.intertek.com/wind/small/ directory/