

HOW MUCH DO YOU KNOW ABOUT DISTRIBUTED WIND ENERGY?

Wind energy technologies used in distributed applications—often referred to as distributed wind—provide energy to a variety of customers and are a growing part of the nation’s energy infrastructure. Test out your distributed wind knowledge, and check your answers on the back!

1. True or False: Distributed wind energy projects only use small wind turbines.
2. True or False: Distributed wind energy connects at the distribution level of the electric grid.
3. What is the difference between distributed wind energy projects and utility-scale wind farms?

4. Are distributed wind energy projects economically viable?
5. True or False: Distributed wind energy technologies can be installed with other technologies, such as solar photovoltaics.
6. Why do many financial incentives for small wind turbines require certified turbines?
7. Do distributed wind turbines occupy much space?
8. Can you install a wind turbine on top of a building?
9. Do distributed wind energy installations affect local land value?

Credit: One Energy Enterprises LLC | Ohio

Answers

1. False! Distributed wind energy projects are not limited to a specific turbine size or capacity. However, distributed wind projects are comparatively smaller than utility-scale wind farms. In other words, small wind turbines are almost always deployed in distributed wind applications, but distributed wind energy projects do not always include small wind turbines. For example, distributed wind projects may use large turbines to provide power to commercial or industrial customers like manufacturing facilities.
2. True! Distributed wind energy includes any turbine or group of turbines connected at the distribution level of the electric grid or used in off-grid applications. Distributed wind energy projects serve local energy needs, either by directly meeting on-site energy demand or supporting the local distribution grid (Orrell et al., 2023).
3. Utility-scale wind farms use many wind turbines to generate bulk-scale electricity for the electric grid at a transmission level. In contrast, distributed wind energy projects often consist of only one or a few wind turbines that directly power on-site energy needs or support local electricity loads on the distribution grid (Orrell et al., 2023).
4. They can be! The economic viability of a distributed wind energy project largely depends on its location. Distributed wind projects are more economically viable when located at sites with good wind resource quality and high electricity rates (Orrell et al., 2023). In this environment, distributed wind projects can ease economic burdens by offsetting high electricity rates and stabilizing long-term electricity costs (Orrell et al., 2023). In 2022, research indicated that there was potential to deploy nearly 1,400 GW of distributed wind energy profitably (McCabe et al., 2022).
5. True! Distributed wind turbines can be installed on their own or coupled with other distributed energy resources, such as solar photovoltaics or battery storage, to create a hybrid system. Hybrid systems often provide additional benefits such as resilience, grid reliability, grid support services, and cost improvements (Anderson et al., 2023; Parker et al., 2023; Orrell et al., 2023).
6. Certified turbines undergo rigorous testing to verify that the system meets performance, durability, and quality requirements. When financial incentives require turbine certification, they are working to not only support technology deployment but also promote the use of proven technologies to improve performance outcomes and customer satisfaction. [See a list of certified small turbines](#) that can be used in distributed wind applications.



Credit: American WindPower | Oklahoma

7. While sufficient land is needed to avoid significant obstacles and meet local zoning and permitting requirements, the wind turbine's actual footprint is small. This lends itself to multi-functional land use that can provide co-benefits at the site of distributed wind turbines, such as using the surrounding land for agriculture (O'Neil et al., 2022).
8. In theory, yes, but it is not recommended. Wind turbines currently do not perform well when installed on buildings. The expected performance of wind turbines installed on buildings is typically overestimated, creating a significant mismatch between the actual performance of the installed wind turbine and the pre-installation estimates (Fields et al., 2016).
9. To date, research about wind turbines' impact on the value of local land has not explicitly addressed distributed wind turbines. However, existing assessments that address utility-scale wind farms indicate that wind turbines do not have a statistically significant effect on property values in the long term (Brunner et al., 2024). The impact of distributed wind is likely even less due to the relatively smaller scale of distributed wind energy projects.

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