

FACT SHEET: DECOMMISSIONING WIND ENERGY SYSTEMS

Every day, rural communities benefit from wind energy. Wind development provides new income for landowners, new tax revenue to fund schools and services, and creates local career and job opportunities. County officials are responsible for enacting siting or zoning standards that help ensure wind development is supported by local residents. Many seek to address the issue of decommissioning.

Decommissioning and repowering

As projects reach the end of their operational lifespan—often estimated at 20 to 25 years—owners may seek to cease generation at a facility and decommission a system.¹ While relatively few systems are decommissioned each year, many communities are concerned about the possibility of projects being abandoned.

States and counties may choose to put into place specific requirements for decommissioning. Agreements between landowners and developers/owners may also include expectations or requirements for decommissioning.

- › Requirements frequently set a timeline for removal of a project once it is no longer producing electricity. This timeframe should be considerably longer than minor disruptions to energy production, such as a system taken offline while repairs are being made.
- › Due to the cost of removal, officials may require financial assurance of some kind from project owners. These amounts are meant to cover the cost of decommissioning systems, and create a guarantee that funds will be available for the removal of projects no longer in operation.
 - › Different financial instruments may be considered for decommissioning requirements. These may include a letter of credit, various types of bonds, or other agreements between project owners and local governments.
 - › Although the cost of decommissioning will vary depending on several factors and the salvage value of project materials, on average, the cost of decommissioning per megawatt for a wind farm is \$51,000.²

The process of decommissioning requires several steps, including:

- › Preparing for cranes and other equipment required for the removal of systems. This includes ensuring roads are in a condition that will allow for heavy equipment traffic and that stable pads are in place for cranes.
- › Turbines are dismantled and parts are removed. The blades, nacelle, or housing for components related to the generation of electricity, and the tower are all fully removed from the site. Cables that are part of the collection system, as well as transformers, are also removed.
- › Removal of turbine foundations so any remaining portion is below a certain level—often below tillable ground so land can be returned to an agricultural use.
- › Repairing and restoring land and roadways to their previous condition after removal of the parts and equipment.





Recommendations

Local officials should consider including a requirement for decommissioning plans in their ordinances. These plans should outline the methods developers will use to decommission projects, remove materials, and restore sites, as well as local infrastructure like roads. Prior to drafting any requirements, officials should determine if there are existing standards for decommissioning of wind energy systems at the state level, and if there are any additional issues related to decommissioning that should be addressed through an ordinance.

While counties may choose to require financial guarantees for decommissioning and removal in an ordinance, the amount must reflect the actual cost associated with these activities. Rather than relying on average cost estimates, officials should work with developers to determine the real projected cost of decommissioning for a project in their area and use that to set amounts for financial assurances.

Although about 90 percent of turbine parts can be sold, repurposed, or recycled, blades are often disposed of and sent to landfills. Wind turbine blades pose a challenge to many landfills as their size and composition require specific equipment for processing and disposal.⁴

An alternative to decommissioning is repowering. This process can extend the operational life of a project by updating or replacing equipment. Repowering may also increase the efficiency and capacity of a project. There are primarily two options for repowering projects:

- Full repowering: This involves a total replacement of turbines and related equipment. This process requires the removal of existing systems and the construction of new turbines often at the same location.
- Partial repowering: This consists of the replacement of select parts or equipment. Typically the tower and foundation of a turbine remain, while the rotor—hub and blades—or generation components are replaced with newer systems.³

- Counties may choose to limit the number of blades a local landfill may accept, or ban turbine blades from local landfills entirely. A county shouldn't place additional requirements on disposal, however, as any requirement in an ordinance should be primarily focused on removal or disposal within a county's jurisdiction.
- Developers should seek out facilities or organizations that may be able to recycle or repurpose blades to reduce the amount of materials sent to landfills after decommissioning or repowering.

Sources

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- 2 Raimi, Daniel. "Decommissioning U.S. Power Plants: Decisions, Costs, and Key Issues." Resources for the Future, October 2017, ourenergypolicy.org/wp-content/uploads/2017/10/RFF-Rpt-Decommissioning-Power-Plants.pdf. Accessed March 2020.
- 3 Lantz, Eric, et al, "Wind Power Project Repowering: Financial Feasibility, Decision Drivers, and Supply Chain Effects." National Renewable Energy Laboratory, [nrel.gov/docs/fy14osti/60535.pdf](https://www.nrel.gov/docs/fy14osti/60535.pdf). Accessed March 2020.
- 4 Stella, Christina. "Unfurling The Waste Problem Caused By Wind Energy." National Public Radio, Sept. 10, 2019, [npr.org/2019/09/10/759376113/unfurling-the-waste-problem-caused-by-wind-energy](https://www.npr.org/2019/09/10/759376113/unfurling-the-waste-problem-caused-by-wind-energy). Accessed March 2020.

