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WIND–

Over the years this process has become an increasingly regulated aspect of wind energy development throughout the country, and North Dakota is no exception.

Many individuals took their concerns directly to local lawmakers after seeing how some of those earliest wind projects ended up, and in 2008 North Dakota lawmakers enacted several laws and safeguards related to decommissioning. The code, Chapter 69-09-09, has been updated twice since, in both 2017 and 2020.

Specifically, Century Code stipulates that a wind project developer in North Dakota must have a "decommissioning plan" in place before construction of their project can begin. That plan must also be approved by the North Dakota Public Service Commission (PSC) – the state agency responsible for monitoring wind energy in North Dakota.

N.D. Century Code also declares that the owners of a wind project are responsible for all decommissioning efforts and any associated costs, thereby shielding local property owners and taxpayers from the burden of decommissioning.

However, Larry Danduran, the District 14 GOP Chairman and a vocal critic of the Flickertail Wind project, said he believes local governments should do more to protect landowners from decommissioning liability.

"It's common knowledge that industrial wind projects change hands many times as each company exhausts their tax credits and subsidies. As they change hands the liability should also change hands," said Danduran. "... I believe that the best way to ensure that Eddy and Wells County residents are protected from assuming the liability and cost of decommissioning is that the counties approve an ordinance that specifically addresses this foreseeable problem.

"My suggestion to the zoning boards and county commissioners is to take a broad, in-depth and long-term look at the ramifications of the PRC project," he added.

Financial assurance and decommissioning requirements

The State of North Dakota requires certain assurances from owners that decommissioning will eventually take place – they aren't allowed to simply draw up a plan for decommissioning in two or three decades and start operating turbines.

Before a wind energy project becomes operational, N.D. Century Code requires its owners to provide sufficient financial assurance to the PSC that proves they can afford to decommission the project they're about to operate.

"Financial assurance may be in the form of a performance bond either as ... cash escrow held by a federal insured financial institution, a surety bond, irrevocable letter of credit, guarantee, parent guarantee, or another form of financial assurance that is acceptable to the commission to cover the anticipated costs of decommissioning," states N.D. Century Code 69-09-09-08.

Century Code also requires a wind energy developer to provide financial assurance for decommissioning a project before construction begins, on the off-chance that they abandon the project before construction is complete.

As for the process of decommissioning itself, N.D. Century Code stipulates that all towers, turbine generators, transformers, fencing, overhead cables, inverters, transformers, substations and other equipment must be dismantled and removed.

Additionally, all underground cables to a depth of 24 inches must be removed, as well as all foundations, buildings and ancillary equipment to a depth of 4 feet.

Notably, for turbine's the size Flickertail Wind is expected to have – around 700 feet tall – the foundation and some wiring would be below a depth of 4 feet, and could therefore be left underground long after the project is decommissioned.

According to the U.S. Department of Energy, many communities have made the choice to allow some below-ground infrastructure to remain after decommissioning in order to avoid certain environmental impacts that can occur after complete removal, such as noise and ground disturbances.

"Additional environmental concerns related to full foundation removal may include compromised site stability, erosion, or unwanted pathways for surface and subsurface water due to inappropriate backfilling of the site," states the Department of Energy's website.

However, the department goes on to mention that leaving some underground infrastructure in place can have consequences of its own, such as impairing drainage or creating new pathways for water.

Site restoration and time frame

Once the required steps have been taken to remove the project infrastructure, site restoration must take place.

This means bringing the land used for a wind farm back to its original condition, which would include reclamation of the approximate topography and re-spreading topsoil over disturbed areas to match what existed prior to construction.

Grading, reseeding and restoring topsoil of areas disturbed by the facility are all required by N.D. Century Code, unless a landowner requests otherwise.

"The commission may waive a decommissioning requirement upon receipt of a request signed by the applicable landowner and finding good cause that the requirement be waived," states N.D. Century Code 69-09-09-05.

The entire decommissioning process is required to begin within 12 months after a wind farm is declared abandoned or determined to be at the end of its useful life by the PSC. And the process must be completed within 24 months unless the PSC approves a plan that would see the facility return to being operational.

The Transcript sent a number of questions to PRC Wind, LLC regarding their decommissioning plans for Flickertail Wind, and received the following response from Senior Project Developer Tim Ross.

"For more than four decades wind energy has been refined and modernized. And that includes decommissioning, a key issue that was resolved decades ago," stated Ross.

"Because this project began as a partnership with local landowners, we've been focused on decommissioning from the very start. There will be a final plan along with bonding as required by the State of North Dakota to ensure it happens in a timely manner at no cost to landowners. We will follow all best practices for removing equipment, material and structures, and state laws meant to protect the landowners as well as the community. As the wind industry has matured over the past 40 years, today's turbines are built with sustainability in mind – up to 90% of a modern wind turbine's mass is recyclable. It is always part of our plan and documentation and this is no exception."

Recycling

The recycling of wind turbines is another common topic of conversation when it comes to decommissioning.

According to the U.S. Department of Energy, the metal components that make up most of a wind turbine's mass are easily recyclable. More specifically, between 85% and 90% of a wind turbine's mass – excluding foundation and underground wiring – is made up of easily-recycled materials.

However, composite components like blades and rotor covers are much more difficult to recycle.

In fact, until recently viable options for recycling the composite components of turbines didn't exist, and the options that exist now are significantly more expensive than disposal.

Landfilling of composite turbine components has led to images of so-called "wind turbine graveyards," where blades and other parts can be seen either piled up in a field or buried underground.

According to the U.S. Department of Energy, not more than 50,000 tons of decommissioned turbine blades are estimated to have been managed at U.S. landfills in 2018, equivalent to 0.017% of the municipal solid waste and construction and demolition waste managed by landfills in 2018.

However, that number is expected to grow, and likely has already since 2018.

"By 2050, it is projected that wind turbine blade waste could range from about 200,000 to 370,000 tons per year, depending on the operational lifetime of these components (15–25 years)," states the department's website.

The department further states that the average rate of retirements is expected to be 3,000 to 9,000 blades per year from 2021-2026, before increasing to 10-20,000 per year by 2040.

And despite not making up a significant percentage of the total tonnage handled by U.S. landfills each year, turbine blades can have a visually out-sized impact on the space needed to store them due to their size.

The amount of space needed for decommissioned blades depends on how the blade is segmented and whether it's crushed, shredded or otherwise processed before disposal.

Meanwhile, there are some emerging recycling options for turbine blades that wind farm owners could take advantage of now and in the future.

These options include mechanical recycling, a process by which blades are ground or shred into materials that can be repurposed; thermal decomposition recycling, a process that uses heat to recover glass fibers; and repurposing, a process by which a decommissioned component is repurposed to be a competent of new products, such as pedestrian bridges.

For now, however, these methods are much more expensive than landfilling, and the capacity does not exist for these methods to process every turbine blade at the rate they're being retired.

Currently, it's unclear how turbines from Flickertail Wind will eventually be recycled or disposed of.

"As new end-of-service processing methods mature and secondary supply chains are developed, opportunities for wind turbine blade recycling and repurposing are expected to become more widely available," states the U.S. Dept. of Energy.

"Additionally, as recycling costs decrease, these alternatives will become economically competitive with landfilling, resulting in a higher percentage of turbine blades having secondary lives as materials that can be used in the manufacturing of new products."

State restricts disposal of blades in landfills

In 2023, the N.D. legislature passed HB 1090, which prohibits the placement of wind turbine blades in any landfill without a proper waste management plan approved by the Department of Environmental Quality.

Last year, UND Professor of Mechanical Engineering Surojit Gupta was awarded a $3.7 million grant for a three-year research project to study the feasibility of recycling wind turbine blades. The study is funded by $3 million from the U.S. Department of Energy, and the remainder provided by the N.D. Industrial Commission and other local sources.

UND announced the award on their website July 9, 2024 with an article written by Joe Banish titled, "How to recycle wind turbine blades."

"Currently, the major problem is that everything is going underground in landfills," said Gupta. "Recently, the North Dakota Legislature has passed legislation that restricts blades being dumped in landfills in North Dakota. Similar legislation is getting in place all over the country. There are places in Texas and Iowa where they have sites filled with blades."

The article states that a "comprehensive recycling matrix composed of various propriety degradation processes and gasification will be used to recycle turbine blades holistically, converting fibers into material suitable for uses such as construction and resin into different composite systems."

Noise and shadow flicker

In the next installment of the Transcript's investigation into the potential impacts Flickertail Wind could have on Eddy County and its residents, the focus will turn to quality-of-life concerns, beginning with noise and shadow flicker.

For readers interested, the sources referenced in this article will be linked in the online edition at newrockfordtranscript.com.

The North Dakota Game and Fish Department announces the following summary of regulations and changes for the 2025-2026 Deer Hunting Proclamation.

Apply online at gf.nd.gov. The deadline for submitting applications is June 4, 2025.

SEASON	OPENS	CLOSES	AREAS	RESTRICTIONS
DEER BOW	August 29 12:00 noon (CT)	January 4	Statewide	Residents - Any deer is legal. No unit restrictions. Nonresidents - Restricted to species of deer described on license. No unit restrictions. Orange clothing required of all bow hunters during regular gun season.
DEER GUN	November 7 12:00 noon (CT) 16 1/2 Day Season	November 23	All units	Restricted to type of deer and unit described on license. Type of deer includes species and whether antlerless or antlered (at least one visible antler). Note exception for white-tailed deer hunters in units 4B, 4C, 4D and 4E. Orange clothing required.
MUZZLELOADER	November 28 12:00 noon (CT)	December 14	Statewide	Restricted to white-tailed deer only and type of deer described on license. No unit restrictions. Orange clothing required.
YOUTH DEER	September 19 12:00 noon (CT)	September 28	Statewide	11-, 12- and 13-year-olds – Any antlerless deer is legal.* 14- and 15-year-olds – Any deer is legal.* Orange clothing required. **Hunting units 4A-4F, 3B1 and 3B2 a special license is required to hunt mule deer. These licenses are valid only in the unit specified on the license.*
SPECIAL DEER-BOW HERD REDUCTION	August 29 12:00 noon (CT)	January 31	See Proclamation	Restricted to any-antlerless deer as described on license.

SUMMARY OF CHANGES FROM LAST YEAR

- The 2025 North Dakota deer hunting season is set with 42,300 licenses available, 7,800 less than last year.
- A total of 806 muzzleloader licenses will be available in 2025, 150 less than last year.

A complete 2025 deer hunting proclamation is available from the North Dakota Game & Fish Department, 100 North Bismarck Expressway, Bismarck, ND 58501-5095, (701) 328-6300 or online at gf.nd.gov.