

Issue Brief:



Wind Decommissioning – Policies in the West

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1 SUMMARY

The West has seen and will continue to see a proliferation of wind energy development. States and provinces want to ensure that future generations are protected from the potential of abandoned wind farms when facilities reach their useful 20-30+ year lifespan. Because it is unknown what the political and economic climate will be when wind facility is slated to retire, decommissioning – the process used to retire an electric generation facility safely and reclaim the site – should be considered upfront. Many states and provinces in the West have varying rules and regulations surrounding the decommissioning of wind facilities. Some states require financial assurances, whereas others rely on local jurisdictions such as the county or municipality to administer their own rules. Best practices were identified by surveying Western states that have guidelines that include decommissioning for landowners to reference when negotiating deals with wind developers. Some states defer to local jurisdictions. Still, well-crafted decommissioning guidelines could help both landowners and wind developers make projects consistent with the public interest, providing clarity to the industry while safeguarding landowners and customers.

2 PREFACE

2.1 ABOUT THE WESTERN INTERSTATE ENERGY BOARD

The Western Interstate Energy Board (WIEB) is an organization of 11 western states and two western Canadian provinces whose purpose is to provide the instruments and framework for cooperative efforts to “enhance the economy of the West and contribute to the well-being of the region’s people.” WIEB seeks to achieve this purpose by promoting energy policy that is developed cooperatively among member states and provinces and with the federal government.

2.2 ABOUT THIS ISSUE BRIEF

The WIEB Board approved a proposal from the state of New Mexico, requesting that WIEB review existing wind turbine decommissioning procedures, practices, and requirements within western states and provinces, identify best practices, from a regional perspective, and provide recommendations to ensure adequate protections are in place to harmonize policy and make the energy transition easier on Westerners. Many states and provinces in the West are pursuing public policy initiatives that will continue to increase wind development throughout the West. States like New Mexico, want to ensure policies are in place to protect future generations. This issue brief is a review of surveyed western states and provinces to identify the scope of legislation and policy within the states and provinces associated with wind turbine end-of-life decommissioning. Noting that re-powering is an alternative to decommissioning, this issue brief focuses on reclaiming the site after its useful life. It identifies themes and recommendations that states and provinces can consider in establishing better policies that will ensure the protection of citizens, landowners, and developers alike.

3 INTRODUCTION

The Western United States has 306 wind plant facilities (including around 17,000 individual wind turbines) with a combined capacity of 21,900 megawatts across the 11 western states of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. The median operational startup date of these facilities is 2009, with the most facilities coming online in 2012. The oldest facility began operation in 1975.¹ Figure 1 shows the capacity additions year-over-year and total operational capacity in the 11 westernmost states dating back to 1975.

The median age of wind facilities in the Western U.S. is only approximately ten years old and the estimated useful life of wind facilities now ranges from 20 to 40 years.² States, provinces, and local jurisdictions are considering what policies should be in place to assure adequate protection for future generations from the potential of abandoned wind energy infrastructure. Within the West, by 2030, nearly half of the wind plants currently built (9,500 MW) will reach an operational life of at least 20 years. Therefore, it is prudent to consider what happens at the end of a plant’s useful life.

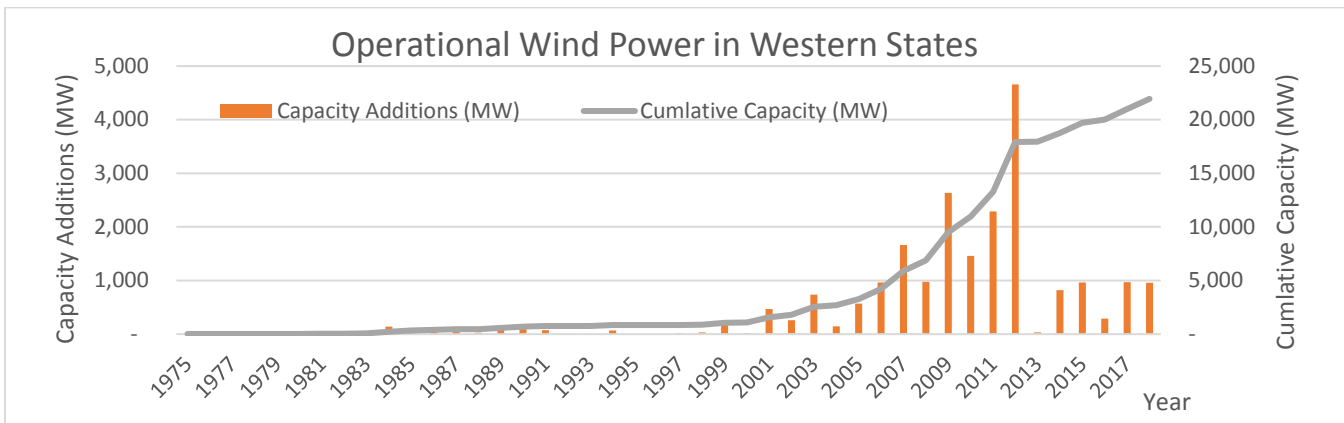


Figure 1 - Operational Wind Power Facilities in the Western U.S. - EIA-860

4 BACKGROUND AND CONTEXT

4.1 ACCOUNTING FOR WIND FACILITY END-OF-LIFE

Wind energy on a large scale is still a relatively young industry; therefore, there have not been many instances of wind farms reaching their useful end-of-life. However, there are instances where project operators removed old equipment at a site and replaced it with new equipment, allowing the site to continue producing renewable energy without the need for decommissioning. In parts of the United States, there are cases where wind facilities were abandoned for some time before being decommissioned or repowered. California and Hawaii experienced situations where wind facilities built in the early 1980s changed ownership multiple times throughout the life of the wind farm. It led to confusion about what would occur when the facilities were taken out of service at the end of their useful lives. During the late 2000s, facilities were abandoned, but have since been decommissioned or repowered. Given that most wind facilities are located in areas with very good and accessible wind resources and the technology has

¹ Data from EIA form 860

² LBNL report, Benchmarking Anticipated Wind Project Lifetimes, found that wind developers are increasing project-life assumptions from the 20 years assumed back in the early to 2000s to more than 30 years assumed today, reducing the levelized cost of energy from wind facilities. <https://emp.lbl.gov/publications/benchmarking-anticipated-wind-project>

advanced significantly, it is far more common to see wind facilities be upgraded and repowered with new technology to extend the life of the wind farm another 20 to 30 years.

4.2 WHAT IS DECOMMISSIONING

Decommissioning is a process used to retire an electric generation facility safely. It includes all phases from the deactivation of the energy facility, dismantling components, and site remediation to return the site to a condition as close to the pre-construction state as possible. Wind facility decommissioning can be complicated. A single site includes the wind turbines, collection lines, and access roads that typically provide joint user access to the site, with agriculture often using the same land area. Wind projects usually do not affect livestock grazing. Some states and local jurisdictions have promulgated regulations to mandate specific requirements for decommissioning, although there is no standard rule or process about what needs to be done. Generally, wind facility decommissioning includes the removal of the wind turbines, the removal of above and below grade structures such as concrete pads to at least three feet below the surface, re-vegetation, seeding, and topsoil replacement. Typically, decommissioning is completed within 12 months after the termination of the project.

4.3 WIND DECOMMISSIONING COSTS

The cost to decommission a wind facility can vary based on-site location, turbine type, and the salvage value of high-value components. Given the small number of decommissioned wind facilities in the U.S., there are not a lot of actual examples of the real cost to decommission a wind facility. Some states, like South Dakota, have begun to require developers to provide cost estimates in decommissioning plans of wind facilities during the application process with the public utility commission. Based on wind decommissioning plans submitted to the South Dakota Public Utilities Commission, the estimated costs to decommission a wind turbine facility can range between \$90,000 to over \$300,000 per wind turbine, but the associated salvage of high-cost components can help recover between 70-80 percent of the decommissioning costs; with the salvage component, the estimated average net decommissioning cost is about \$40,000 per turbine.³

Assuming the net cost to decommission a 3.0-megawatt (MW) turbine will be \$40,000 after the expected salvage of the high-value components, and after a life of 30 years where it produced at an average capacity factor of 30 percent, the per megawatt-hour (MWh) rate to ensure funds are available for decommissioning is approximately \$0.17/MWh or \$1,333 per year over the life of the turbine. Assuming an average customer uses 900-kilowatt hours per month, an average customer would pay \$0.19 per month (\$2.25/year) to decommission, if 100 percent of their energy was supplied by wind and it included decommissioning costs in rates. This estimate is likely high given that many factors can influence this rate, including turbine size, capacity factor, lifespan, salvage value, and other decommissioning costs. This estimate is used to demonstrate the potential magnitude decommissioning can have on customers.

³ Based on decommissioning plans submitted to the SD PUC for wind projects: Crowned Ridge II, Buffalo Ridge, Dakota Range, Dakota Range III, Prevailing Winds, Sweetland Wind, Tatanka Ridge, Deuel Harvest

5 SUMMARY OF RULES & REGULATIONS FOR WIND DECOMMISSIONING

The rules, regulations, and policies enacted in the western states and provinces associated with wind plant decommissioning vary widely. Some states and provinces have enacted state and province-wide requirements (MT, OR, WY, SD, TX, AB). Typically, rules are captured either in public utility commission permitting processes over which the commission has been given jurisdiction (SD, WY) or by other state or provincial agencies responsible for overseeing the siting of energy projects within the state or province (MT, OR, AB). Almost all states that have state-wide rules regarding the decommissioning of wind facilities require some financial assurance such as bonds or escrow accounts to ensure that funds will be available to cover costs at the facilities' end of life (MT, OR, WY, NE, SD, TX).

Many other states have not passed any state-wide requirements specific to the decommissioning of wind facilities (AZ, ID, NV, NM, UT, WA). Nevada does require regulated electric utilities to provide plans for decommissioning generation assets, which contain more than 50 contiguous acres. These states either rely on the rules and regulations associated with environmental remediation (AZ) or leave these types of laws related to wind decommissioning to local jurisdictions at the county or municipal level either for all projects (CA, ID, NE) or smaller projects (WY, SD). Some states defer to local jurisdiction when it comes to siting rules and decommissioning of energy projects but enact "backstop" statutes (NE, SD) or guidelines (CA) that can be used in those circumstances where local jurisdiction does not have rules in place.

Some states and provinces have created rules and requirements for decommissioning for wind development on state and province-owned land (ID, NM, BC). The terms and conditions, typically spelled out in standard lease agreements that the state and provincial land offices use to lease the property to an energy developer, require some financial assurance, such as a bond, to ensure decommissioning funds are available.

State/Province	State and Province-wide Requirements	Requirements at Local Level	Requirements on State and Provincial Land	Backstop Regulations
Alberta	√	-	-	-
Arizona	-	?	?	-
British Columbia	-	?	√	-
California	-	√	?	√*
Colorado	-	√	-	-
Idaho	-	√	√	-
Montana	√	?	?	-
Nevada	-	-	-	-
New Mexico	-	√	√	
Oregon	√	-	-	-
Utah	-	?	?	-
Washington	-	?	?	-
Wyoming	√	√	-	-
Nebraska**	-	√	?	√
South Dakota**	√	√	?	√
Texas**	√	?	?	-
* Not in official rules; Guideline				
** Non-WIEB Members States				

Table 1 - Survey of Decommissioning Policies in the Western States

6 THEMES AND POLICY OPTIONS

6.1 THEMES

6.1.1 Decommissioning Plans:

Many states, provinces, and local jurisdictions that have rules in place for the decommissioning of wind farms require a decommissioning plan to be submitted during the permitting processes. This approach asks developers to consider what will be done when the facility reaches the end of its useful life. A decommissioning plan can consist of the description of the facility, including an accounting of all equipment the developer plans to install at the facility. A high-level schedule of related tasks is identified and a more detailed description of preparation activities, plans for removal of facilities, and restoration and reclamation of the surrounding land and environment. Then the developer estimates the costs associated with these activities, understanding that the expenses will occur 20-30+ years in the future; therefore, it is understood that they are rough estimates.⁴

6.1.2 Financial Surety:

Most states that have created regulatory requirements for wind decommissioning require a financial surety in the form of a bond or funds to be added into an escrow account. A financial assurance, in combination with a decommissioning plan, ensures that wind developers are considering the ramifications that may occur down the road when the facility has reached its useful life. The amount required to be posted varies. Montana requires a bond to be posted within the first 15 years that cover the decommissioning cost outlined in a facility's decommissioning plan.⁵ The South Dakota PUC has recently required escrow accounts to be established and funded at ~\$5,000 per turbine per year and revisit the funding level after year ten based on estimated decommissioning costs at that time. Wyoming requires financial assurances "sufficient" to assure complete decommissioning and site reclamation.

6.1.3 Backstop Regulations:

Many states defer to local municipalities and counties with how they choose to regulate local energy projects. Sometimes, local jurisdictions may not have rules in place or may not have the bandwidth to establish comprehensive regulations that consider all potential costs associated with energy projects and long-term infrastructure. In Nebraska, the Nebraska Power Review Board is empowered to set backstop decommissioning requirements (including bonding) in the case where a local jurisdiction does not have regulations for decommissioning renewable facilities installed by private entities. This approach allows local authorities to set their own rules and regulations. The developer must certify to the Power Review Board that the developer is complying with the local rules. In South Dakota, a county could create county-specific requirements, but to date, all counties leave the determination of decommissioning with the South Dakota Public Utilities Commission. This approach has another benefit in that it sets a baseline set of regulations that local jurisdictions can adapt and modify to accommodate differences within their area.

6.1.4 Guidelines:

In many cases, decommissioning and other requirements are negotiated in lease agreements with the private landowners who are working with developers to install turbines on their land. Many developers include standard decommissioning requirements in private leases and will adhere to state or local

⁴ South Dakota requires wind decommissioning plans during the permitting process and costs are revisited 10 years into operation and then every 5 years after that point. Decommissioning plan for Crowned Ridge Wind II Energy Facility: <https://puc.sd.gov/commission/dockets/electric/2019/EL19-027/Appendixn.pdf>

⁵ Montana exempts wind facilities from bonding with the MT DEQ if they have already bonded with another agency.

requirements if available, and it is helpful for all parties to understand the requirements. Alberta's Farmer's Advocate Office, in response to increased renewable energy development in the province, created a guideline to help landowners negotiate wind and solar leases. In Alberta, contracts are negotiated bilaterally between the landowner and the renewable energy developer. One negotiating consideration identified in the guideline is support on how to reclaim the site after its useful life.⁶ The Alberta Farmers' Advocate Office describes the situation at a high-level but then encourages landowners to ask questions to collect more information about how developers plan to reclaim a site.

6.2 POLICY OPTIONS

6.2.1 Develop Guidelines for Landowners and Industry:

States and provinces should develop resources for all parties to reference when negotiating leases for wind projects on private land. One component of the guidance should be to include tools for landowners and developers to use to ensure that all affected parties are planning for wind site decommissioning.

6.2.2 Create Backstop Rules:

If a state or province decides not to promulgate rules that apply throughout the state or province, and instead leaves the decommissioning decision to local authorities, then it should consider establishing backstop rules that only take effect when there are no rules in place at the local level. Backstop rules should include decommissioning requirements.

6.2.3 Require Decommissioning Plans:

Decommissioning plans are a useful exercise for developers to conduct and for state and provincial officials to review. It establishes accountability with the wind facility owner and ensures that the state and developers understand what will occur at a facility's end-of-life. Backstop rules or state and provincial regulations should require project owners to submit decommissioning plans in the permitting process and revisit the plan at least every five years after the first ten years of operation.

6.2.4 Request Financial Assurances:

A financial surety is a component of the decommissioning process that ensures funds are available to deal with costs associated with facility end-of-life. Most states that have enacted decommissioning rules require financial assurance. Backstop rules or other regulations should consider requiring wind facility owners to post a decommissioning bond within the first 20 years of a plant's life and require facility owners to revisit, every five years after that, the amount of funds necessary to decommission the facility.

7 CONCLUSIONS

Wind energy will continue to be an essential part of the generation mix in the West. Although, on average, it is still a relatively young resource, considering how to deal with the energy facilities after their useful life ensures that future generations do not have to deal with the decisions made today. Many states, provinces, local, and other jurisdictions have their own rules and regulations for dealing with wind plant decommissioning. There are best practices that can be shared amongst states to harmonize policy and make the energy transition easier for Westerners.

⁶ Alberta Farmers' Advocate Office. Renewable Energy in Alberta.

[https://www1.agric.gov.ab.ca/\\$Department/deptdocs.nsf/all/agdex16246/\\$FILE/negotiating-renewable-energy-leases-v2-jun-17.pdf](https://www1.agric.gov.ab.ca/$Department/deptdocs.nsf/all/agdex16246/$FILE/negotiating-renewable-energy-leases-v2-jun-17.pdf)