LEWIS ROCA

State Requirements For Decommissioning End-Stage Renewable Energy Projects

What Project Participants Need to Know

Renewable Energy End-Stage Planning Report

Updated 2024

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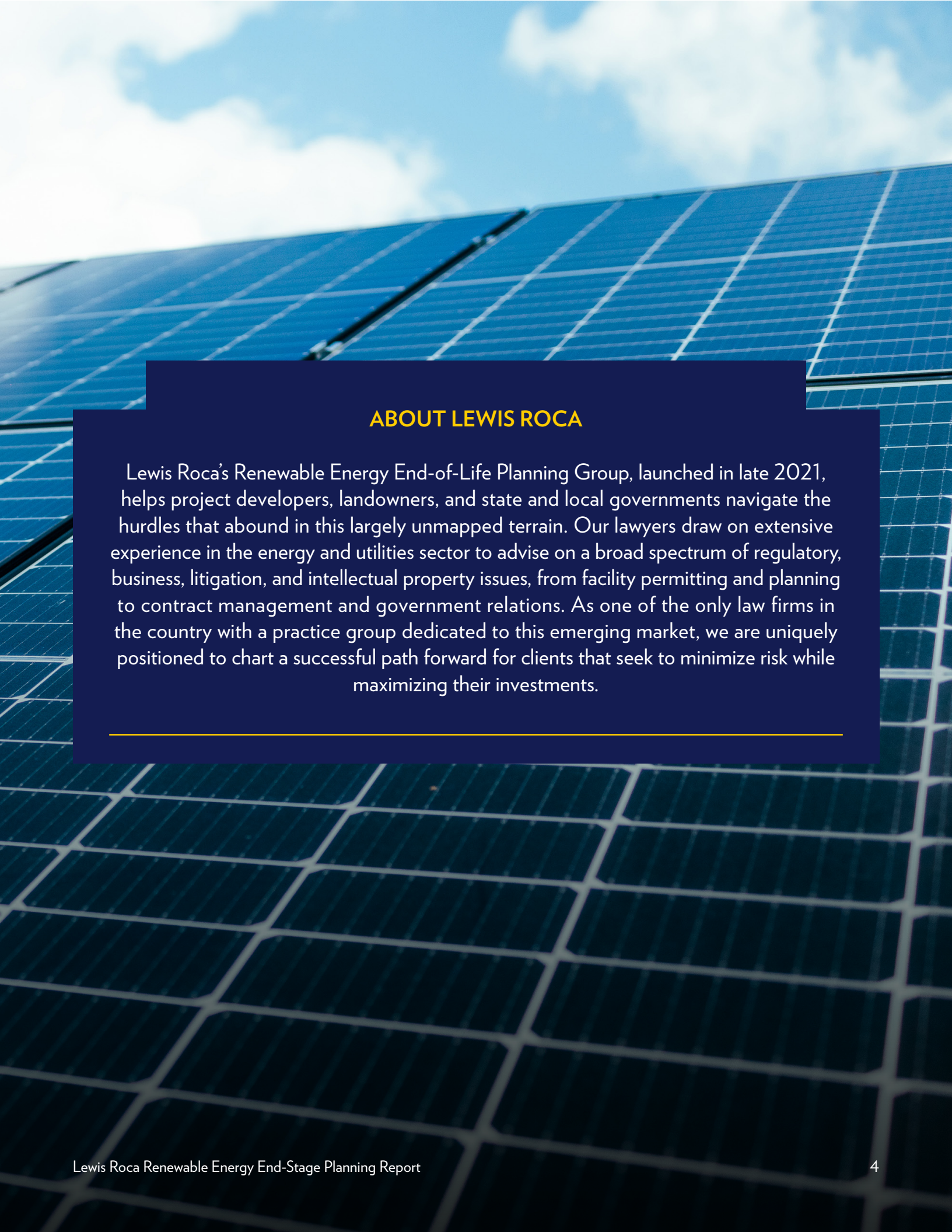
INTRODUCTION

The first utility scale wind and solar power projects in the United States were developed in the early 1980s. As early-generation renewable projects reach the end of their useful lives and as new projects are being developed, owners, developers, and other project participants must consider whether to decommission, repower, or redevelop their projects. When the decision is to decommission the project, there are an increasing number of state laws and regulations that will apply. As such, project participants must consider:

- → What are the existing regulatory requirements?
- → What permits, approvals, or exemptions are needed?[1]
- → What are the regulatory risks and how best to plan for them?
- → What regulatory and practical difficulties might arise in the absence of clear regulatory or industry guidance?

In recent years, state legislatures have begun to impose specific decommissioning requirements for existing and new renewable energy facilities, such as bonding requirements, to ensure the responsible decommissioning of these facilities. These requirements have the potential to affect participants at both ends of the project lifecycle.

This report provides an overview of each state's requirements. Although this information is primarily applicable to owners and developers of new and legacy assets, it also strives to illuminate opportunities for partnership across research, industry, and government. As one of the first legal analyses of its kind, the report provides renewable energy industry participants with the context needed to avoid costly missteps while also reaping all potential rewards of end-of-life planning.



ABOUT LEWIS ROCA

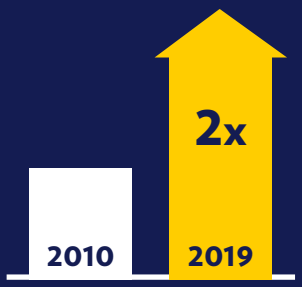
Lewis Roca's Renewable Energy End-of-Life Planning Group, launched in late 2021, helps project developers, landowners, and state and local governments navigate the hurdles that abound in this largely unmapped terrain. Our lawyers draw on extensive experience in the energy and utilities sector to advise on a broad spectrum of regulatory, business, litigation, and intellectual property issues, from facility permitting and planning to contract management and government relations. As one of the only law firms in the country with a practice group dedicated to this emerging market, we are uniquely positioned to chart a successful path forward for clients that seek to minimize risk while maximizing their investments.

RENEWABLE ENERGY STATS

Renewables Will Generate

of The World's Electricity by 2035

– McKinsey



Global Renewable Energy Power Capacity

– International Renewable Energy Agency

BACKGROUND

The past decade has seen a rapid acceleration in the development of renewable energy projects precipitated by several factors including: federal and state energy policies, favorable tax credits and incentives, declining costs of solar and wind energy systems, and rising public demand for green energy in response to global climate concerns. According to the International Renewable Energy Agency, global renewable energy power capacity more than doubled between 2010 and 2019,[2] while McKinsey predicts that renewables will generate 60 percent of the world's electricity by 2035.[3] The Infrastructure Investment and Jobs Act of 2021 and the Inflation Reduction Act of 2022 will provide billions of dollars in incentives for the development of renewable energy projects.

"No longer merely a game for small regional players, renewables are now the domain of federal governments and major corporations—a shift that is poised to reshape the geopolitical map as we know it."

With legislative momentum around clean power generation and net-zero emissions policies swiftly mounting, more and more wind and solar energy facilities are being built across the United States every year. As the technology used to power these facilities becomes more efficient, previous generations of technology begin to face a new problem: obsolescence. For example, the average capacity of a wind turbine in 2021 was 3 MW which is a 319 percent increase from 1998-1999. At the same time, the performance of older wind power projects declines with age as compared to newer projects. These technological developments, combined with the need to maximize the output from locations with high wind and solar energy potential, create additional incentives to decommission older projects and replace them with newer technologies.

Accordingly, cohesive public policy and industry practices are needed to address the eventual disposition of obsolete solar panels, wind turbines, and other clean energy generation technologies. To date, no single regulatory framework has been developed to serve as a North Star for renewable energy project end-of-life planning, leaving a patchwork of federal, state, and local policies and regulations to sift through—and leaving project owners and developers, as well as landowners and other interested parties, to fend for themselves.

In other industries such as oil and gas extraction, decommissioning has long been recognized as a critical part of responsible development. For example, the oil and gas industries have mature and extensive regulations and requirements that deal with financial assurances, well abandonment and reclamation. These regulations provide reliable guidance for oil and gas industry participants with respect to project end-of-life obligations. The same regulations, however, cannot simply be imported wholesale into an entirely different area of the energy industry. Nevertheless, in many respects state and local governments' experiences with the oil and gas industry are informing aspects of their approaches to renewable energy end-of-life and decommissioning regulations.

In this uncertain landscape, creative problem-solving is required to tackle the numerous challenges involved in retiring renewable energy projects —such as adapting to evolving regulatory requirements, managing large quantities of hazardous material contained in project components, acquiring land use approvals and real estate for storage of decommissioned equipment, and reconciling project end-of-life obligations with contracts that may not clearly address such issues.

With solar panels and wind turbines typically having a useful life of 20 to 30 years, renewable energy industry participants can expect similar issues to occur every few decades. Given the decades-long lifespan of most renewable energy projects, project owners, developers and other participants must plan now for how project end-of-life obligations and regulatory requirements will be addressed.

Those involved in the development of new projects cannot wait until their assets have deteriorated to begin preparing; instead, they must proactively plan for the full lifecycle at the project's outset in order to ensure compliance. Given the variety of requirements (whether statutory, regulatory, contractual or otherwise) and the potential for overlap and conflict between these requirements—and uncertainty around future regulations and costs, failure to carefully plan for decommissioning considerations could result in significant unanticipated consequences when planning for a new project or when a project reaches the end of its useful life.

"If approached with strategic forethought, however, the renewables market can also serve as a fruit-bearing land of opportunity."

KEY FINDINGS AND RECOMMENDATIONS

This white paper provides a high-level overview of state requirements related to the decommissioning of renewable energy projects.

As mentioned, each state's approach—in the form of both legislation and policy—varies significantly. Some states focus exclusively on financial assurance requirements to ensure that end-of-life obligations are funded, while others also mandate specific regulatory standards for decommissioning efforts. Some states require the submission of detailed decommissioning plans, some provide for government monitoring and approval of decommissioning efforts, and some focus heavily on land reclamation.

In Part A, we outline the current statutes and/or regulatory codes that concern decommissioning requirements for each party involved in constructing and operating a wind or solar energy facility, including landowners, lessees, municipalities and state governments. A thorough knowledge of all applicable requirements as well as careful coordination among all parties will help guarantee a project's successful decommissioning.

In Part B, we illuminate common decommissioning requirements found in state statutes and codes. Some of the most widely used state decommissioning requirements include: anticipated life of the project,[4] a description of the manner of decommissioning,[5] periodic updating of decommissioning costs,[6] financial capacity to fully fund decommissioning,[7] assurance of restoration of land[8] and compliance with local laws applicable to decommissioning.[9]

PART A

PARTY PROTECTIONS AND REQUIREMENTS

This section offers a broad overview of the regulatory landscape for each party involved in wind and solar energy facilities, including what they should anticipate when considering decommissioning.

Landowners

Owning the real property on which a wind or solar energy facility currently operates or will be constructed presents unique issues related to project decommissioning. Specifically, if a landowner seeks the initial construction permit, the landowner may be required to enter into an agreement outlining the decommissioning plan.

Statutes and regulations generally provide assurances to landowners that project impacts on their property will be mitigated, and the land reclaimed at the end of the facility's useful life. Because solar and wind energy facilities provide a significant benefit to energy security, states are cognizant that reclamation assurances are an integral part of decommissioning to ensure future landowner cooperation with such projects.

Lessees

For facilities to be located on land that is not owned by the project developer, a decommissioning guaranty/security agreement between the developer and the landowner is frequently required as a part of the permitting process and may even be demanded by more sophisticated landowners during initial negotiations.[10] In some states, the statutes describe in detail what equipment must be removed, including turbines, substations, tower foundations and buried cables.[11] These states exemplify the importance of providing assurances to the landowner that the land will be properly reclaimed at the end of the useful life of the solar or wind energy facility.

Municipal/Local Governments

Municipalities and other local governments play unique roles in decommissioning. State statutes and/or regulations may grant local governments authority to develop their own decommissioning requirements and to enforce decommissioning assurances, whether financial or reclamation. In addition, persons seeking a permit to build a wind or solar energy facility may be required to give the municipality assurances, whether in the form of letters of credit or other decommissioning security.

State Government

States may also regulate the decommissioning process through a state agency. For example, when the facilities are no longer useful for operations, the lessee or owner must receive approval from the Louisiana Office of Mineral Resources before decommissioning the facility.[12] The following reports can be required when submitting for decommissioning approval: (1) final removal application for a facility before removing a facility; (2) post-removal report for a facility within 30 days after the facility is removed; (3) site clearance report for a facility within 30 days after the completion of site clearance verification.[13]

PART B

STATE APPROACHES TO DECOMMISSIONING REQUIREMENTS

Many states have developed statutes or regulations specifying decommissioning requirements for wind and solar energy projects.[14] Some of the most common decommissioning requirements include:

Determining Costs

Several states request information on the costs of decommissioning plans in applicants' initial project proposals. These costs can be associated with decommissioning labor and restoration of the land.

For wind turbines, costs may be related to the removal of turbines, substations, tower foundations, and buried cables. For solar facilities, these costs should generally be able to cover the removal of the solar panels, support structures, buried cables and other related equipment. Even after states approve decommissioning plans, some states require project developers to update their costs every five years.[15] Other states require decommissioning costs to be reevaluated at least once every two years to account for price fluctuations.[16]

Bonding Requirement

The most common decommissioning requirement is a demonstration of the developer's financial capability to decommission its wind or solar energy project. Many states accept performance bonds, letters of credit, corporate guarantees, cash escrows, or other securities to guarantee the removal of solar and wind projects. Several states' bonding provisions require proof of insurance for liability for damages resulting from decommissioning.

Other states allow project owners to demonstrate financial capability to decommission their facilities over a period of time. For example, while Tennessee requires a full decommissioning plan, it requires the grantee to obtain and deliver to the landowner financial assurance for

removal and restoration. These assurances must include no less than five percent of the decommissioning cost on the date of commercial operations, no less than 50 percent on the 10th anniversary of commercial operations, and no less than 100 percent on the 15th anniversary.[17] Texas has different financial assurance requirements for wind and solar energy projects. For wind, the agreement must provide that the grantee shall deliver financial assurances no later than the termination date of the wind facility or the 10th anniversary of the commercial operations date. For solar, the agreement must provide that the grantee shall deliver financial assurances no later than the termination date or the 20th anniversary of the commercial operations.[18]

States have consistently demonstrated an interest in ensuring project applicants have effective and responsible project decommissioning plans, reasonably estimate the costs associated with decommissioning, and have the financial capability to implement the decommissioning plan. As a result, bonding requirements for decommissioning solar and wind energy projects is one of the more consistent policies across the 50 states.

Land Restoration

Many states have also addressed the need to restore disturbed land. For example, California requires applicants to provide evidence of a "restoration security instrument," which should be sufficient to cover costs of re-grading, re-vegetation, and labor, with the requirement of fully restoring the land to its original condition.[19]

Other states require the restoration to be as close as possible to the land's original condition. For example, Hawai'i requires project owners to restore the disturbed land to "substantially the same physical condition [that] existed prior to the development..."[20] Even though Hawai'i does not require applicants to submit a decommissioning plan, it still requires wind and solar facility owners to ensure that projects are "compatible with agriculture uses and cause minimal adverse impact on agricultural land..."[21] Maine specifies that decommissioning plans need to provide information on how developers will restore farmlands, including regrading and revegetating disturbed land up to a minimum of 24 inches below grade.[22] New Jersey codified in its decommissioning requirements that restoration of the land also means any other "measures necessary to address ecological and visual impacts..."[23] Oklahoma describes proper decommissioning of a wind energy facility as the removal of wind turbines, towers, buildings, cabling, electrical components, foundations and any other associated facilities to a depth of 30 inches below grade.[24]

Other Substantive Requirements

Several states have other substantive requirements for commercial wind energy facilities, such as providing notice prior to decommissioning.

For example, Maine requests that applicants explain how "one or more of the proposed turbines and other components" would be dismantled.[25]

Washington has its own unique requirements. It has mandated that manufacturers contribute to improving recycling of solar photovoltaic (PV) panels. Washington implemented a take-back program for solar PV panels that requires manufacturers to finance the takeback and recycling of modules at no cost to the owner. This requirement applies to all solar PV panels sold in or into Washington.[26] The program is expected to be implemented on July 1, 2025, and will require PV manufacturers to prepare and submit a stewardship plan to the state by the "later of July 1, 2024, or within thirty days of its first sale of a photovoltaic module in or into the state." The manufacturer must describe how it will finance the take-back and recycling system, including the costs of collecting, managing, and recycling PV panels.

NEXT STEPS

As state and local governments continue to develop regulatory frameworks for decommissioning of renewable energy projects, this report provides project participants with an important first step on the road toward successful end-of-life planning. Landowners, developers, lessees and other industry partners should take the time to familiarize themselves with their state's decommissioning requirements, then consider retaining legal representation to advise on a proper course of action. Whether conquering challenges or seizing opportunities, the "6P Rule" is particularly applicable to renewable energy projects: "Proper prior planning prevents poor performance."

CURRENTNESS OF REPORT

Lewis Roca updated research on wind and solar energy project decommissioning in the summer of 2024. This report will undergo yearly review to provide additional information as state statutes and regulations regarding decommissioning are updated. Please consult with an attorney for the most current information.

The states included in this report are only those that had available information on statutes, pending legislation, or regulations that address the decommissioning of renewable energy projects.

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FOOTNOTES

[1] U.S. Dept. of Energy, Office of Energy Efficiency and Renewable Energy, *Wind Turbines: the Bogger, the Better*, August 16, 2022 (https://www.energy.gov/eere/articles/wind-turbines-bigger-better).

[2] U.S. Dept. of Energy, Wind Energy Technologies Office, *Technology Changes in U.S. Wind Industry Help Slow the Impacts of Aging on Wind Power Plants*, October 13, 2020 (https://www.energy.gov/eere/wind/articles/technology-changes-us-wind-industry-help-slow-impacts-aging-wind-power-plants).

[3] McKinsey & Company, *Renewable-energy development in a net-zero world*, October 28, 2022, https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/renewable-energy-development-in-a-net-zero-world

[4] See Minnesota and Connecticut among others.

[5] See Montana, North Dakota, and West Virginia among others.

[6] See Minnesota, Montana, Texas, and Vermont among others.

[7] See Connecticut, California, Maine, Maryland, Minnesota, New Hampshire, New Jersey, New York, North Carolina, North Dakota, South Dakota, Texas, Washington, Wisconsin, and Wyoming among others.

[8] See California, Connecticut, Hawaii, Illinois, Indiana, Maine, Minnesota, New Jersey, New York, North Carolina, North Dakota, Oklahoma, Rhode Island, Tennessee, Vermont, Virginia, Washington, West Virginia, and Wisconsin.

[9] See California, New York, Tennessee, and Virginia among others.

[10] See N.Y. Comp. Codes R. & Regs. tit. 16, § 1001.29(c).

[11] Tex. Util. Code Ann. §§ 301.0003, 302.0004.

[12] *See generally* La. Admin. Code tit. 43 § V-733.

[13] Id. (E).

[14] See the accompanying State Research portion.

[15] See Ohio, Texas, West Virginia.

[16] Code Me. R. tit. 06-096 Ch. 382, § 7.

[17] Tenn. Code Ann. § 66-9-207.

[18] Tex. Util. Code Ann. § 302.0005

[19] Cal. Code Regs. tit. 14, § 3111.

[20] HRS § 205-4.5(21)(C)(ii).

[21] HRS § 205-4.5(15). .

[22] Me. Rev. Stat. tit. 35-A, § 3494; Code Me. R. tit. 06-096 Ch. 382, § 7.

[23] N.J. Admin. Code § 7:50-5.36(a)(4).

[24] Okla. Stat. Ann. tit. 17, §§160.14(B)(1).

[25] Me. Rev. Stat. tit. 38, § 480-II(1); Code Me. R. tit. 06-096 Ch. 382, §§ 1, 7.

[26] Chapter 70A.510.010 RCW.

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STATE BY STATE REQUIREMENTS

Energy Types Mentioned

WIND

SOLAR

U.S. Energy Information Administration: https://www.fool.com/research/renewable-energy-by-state/
Wind energy potential/wind energy installed: https://windexchange.energy.gov/maps-data/321
Solar energy installed: https://www.seia.org/states-map

ALABAMA

U.S. EIA RANKING
42ND

SOLAR ENERGY INSTALLED: 823 MW
WIND ENERGY INSTALLED: 0 MW
WIND ENERGY POTENTIAL: 143K MW

Between 2013 and 2015, the state legislature passed laws regulating wind energy conversion systems in DeKalb County, Cherokee County, Etowah County, and Baldwin County. The legislation applicable to Cherokee County, DeKalb County, and Etowah County requires financial assurance in an amount equal to the costs of reclamation and removal of abandoned or unused wind energy conversion systems.[1]

CALIFORNIA

U.S. EIA RANKING
11TH

SOLAR ENERGY INSTALLED: 48,482 MW
WIND ENERGY INSTALLED: 6,194 MW
WIND ENERGY POTENTIAL: 303K MW

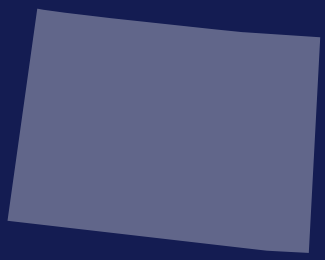
A California city or county may require that a solar-use easement (under the Williamson Act or a farmland security zone contract) have a decommissioning plan and financial assurances to fund restoration of the solar-use easement to the land's original condition.[2] Assurances can take the form of a performance bond, letter of credit, corporate guarantee, or other security.[3] An owner of land eligible for a solar-use easement must also submit a proposed soil management, site restoration plan, as well as a description of regrading and removal of structures and equipment.[4] Owners must also post a "restoration security instrument" in an amount sufficient to cover all restoration costs, including regrading, revegetation, labor, and more.[5] Additionally, operating permits for renewable energy facilities on "disturbed mined lands" require a decommissioning plan and a financial assurance mechanism.[6]

In addition to requiring a decommissioning plan, cities or counties sometimes require the California Energy Commission (CEC) to approve the plan.[7] For example, decommissioning of the Solar Energy Generating System (SEGS) IX in San Bernadino County, California required the CEC's approval before the land was repurposed as a condition of its certification.[8] For that project's decommissioning plan, the Compliance Project Manager needed to: identify and discuss decommissioning activities and schedule for the site, transmission line corridor and relevant facilities constructed; identify applicable laws, ordinances, regulations, and standards; explain how the planned decommissioning satisfied relevant law; identify and explain alternatives; and discuss why the proposed plan is preferred.[9]

COLORADO

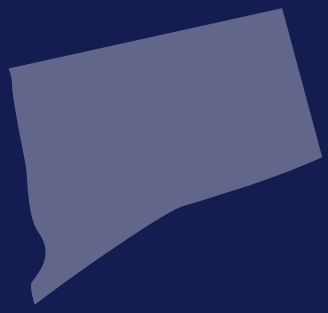
U.S. EIA RANKING
9TH

SOLAR ENERGY INSTALLED: **4,168 MW**
WIND ENERGY INSTALLED: **4,844 MW**
WIND ENERGY POTENTIAL: **395K MW**



Colorado currently has no regulatory scheme for decommissioning end-stage renewable energy projects. However, as is the case in many states around the country, decommissioning is often regulated at the local level.[10] For example, in Yuma County, Colorado, applicants for a Major Land Use Permit must submit financial security for decommissioning and request an inspection upon completion of decommissioning to have their security deposits returned.[11] Additionally, Colorado law, effective until July 1, 2026, requires the Colorado energy office to submit a report to the general assembly on or before September 30, 2025, evaluating the impact of renewable energy projects and commercial energy transmission facilities on wildlife resources; the use of wildlife mitigation, decommissioning, and community benefit agreements; and the range of fees imposed by local government.[12]

CONNECTICUT



U.S. EIA RANKING
47TH

SOLAR ENERGY INSTALLED: 1,558 MW
WIND ENERGY INSTALLED: 5 MW
WIND ENERGY POTENTIAL: 2K MW

Applications for wind facilities must include a decommissioning plan for the proposed site of the facility.[13] The plan must include the projected useful life of the turbines, identification of the circumstances that would trigger decommissioning before that time, a description of the method for restoring the site to its original condition, a cost estimate, and financial assurances that sufficient funds are available for decommissioning.[14] A financial assurance may include a performance bond, surety bond, letter of credit, or other form of assurance, as detailed in Conn. Agencies Regs. 16-50j-94(i)(6). The Connecticut Department of Energy and Environmental Protection (DEEP) and the Connecticut Department of Agriculture (DoAg) recommend the co-use of agricultural land for agricultural production and electric generation from solar panels that minimizes changes to existing vegetation management while incorporating solar energy production.[15] However, the departments recommend avoiding the use of prime farmlands for solar energy production.[16] To address concerns about using prime farmland for solar energy production, the legislature passed a law requiring that an applicant for a "certificate of environmental compatibility and public need" who wants to construct a solar facility to be located on prime farmland or forestland must furnish a bond to cover all costs associated with the decommissioning of the facility and restoration of the farmland.[17] The process must include soil inspection to ensure that the farmland is restored and suitable for farming.[18]

GEORGIA

U.S. EIA RANKING
27TH

SOLAR ENERGY INSTALLED: 5,936 MW
WIND ENERGY INSTALLED: 0 MW
WIND ENERGY POTENTIAL: 94K MW

Georgia law requires a solar power facility agreement to provide that the grantee is responsible for removing their solar power facilities from the landowner's property.[19] The statute requires that the grantee (1) safely clear, clean, and remove all grantee-owned solar energy devices, equipment, personal property, and improvements from the property; (2) clean, clear, and remove each solar energy device foundation and cables installed underground to a depth of at least three feet; (3) ensure that each hole in the ground created by removal is filled with soil of the same type as most soil found on the property; (4) clean, clear, and remove roads constructed by the grantee; and (5) remove all rocks more than 12 inches in diameter excavated during removal.[20] Grantees are also required to record evidence of financial assurance to secure the removal of the solar power facilities.[22]

HAWAI'I

U.S. EIA RANKING
18TH

SOLAR ENERGY INSTALLED: 1,925 MW
WIND ENERGY INSTALLED: 233 MW
WIND ENERGY POTENTIAL: N/A

Hawai'i categorizes two types of solar energy facilities based on which Special Use Permit the individual seeks from the county planning commission[22] – (1) facilities that do not occupy more than 10 percent of the acreage of a parcel or 20 acres of land, but cannot include productivity rating class A and (2) facilities on lands with soil classified by the land study bureau's detailed land classification as overall (master) productivity rating B or C.[23] At this time, solar decommissioning is statutorily required only for the second category and only considers facilities built upon agricultural or rural land.

For facilities in the second category, Hawai'i requires "[p]roof of financial security to decommission the facility," to the satisfaction of "the appropriate county planning commission prior to … commercial generation."[24] Solar facilities must be decommissioned at the owner's expense within 12 months of the conclusion of the operation or useful life.[25] Further, the permittee must restore the disturbed earth to substantially the same physical condition as existed prior to the development of the solar energy facility. Despite these requirements, Hawai'i does not require an actual decommissioning plan prior to construction.

Hawai'i also has unique regulations related to universal and solar waste handlers. The regulation states, "[a] large quantity handler of universal waste must manage solar panels in a way that prevents releases of any universal waste or component of a universal waste to the environment … [and] stored in a manner that prevents breakage and release of any constituent of a solar panel to the environment under reasonably foreseeable conditions."[26] A universal waste handler may "conduct the removal of the ancillary components in the manner that is prescribed in the operating manual for the solar photovoltaic system, or in a manner that would otherwise reasonably be employed during the normal operation and maintenance of the solar photovoltaic system."[27]

Hawaiian law states that wind energy facilities and the appurtenances associated with the production and transmission of wind energy are "compatible with agriculture uses and cause minimal adverse impact on agricultural land."[28] Hawai'i has not prescribed requirements for decommissioning of wind energy facilities.

ILLINOIS

U.S. EIA RANKING
22ND

SOLAR ENERGY INSTALLED: **2,948 MW**
WIND ENERGY INSTALLED: **7,665 MW**
WIND ENERGY POTENTIAL: **191K MW**

A commercial solar energy facility owner[29] and commercial wind energy facility [30] that is located on landowner property must enter into an agricultural impact mitigation agreement with the Department of Agriculture outlining construction and deconstruction standards and policies designed to preserve the integrity of any agricultural land that is impacted by the commercial wind energy facility.[31] For wind facilities, the agreement with the department must include deconstruction plans, financial assurance (including upon abandonment), as well as other requirements, such as repair of damaged soil conservation practices.[32] Despite the binding requirements of the agreement (which must be entered into prior to the public hearing on a siting decision of a county), it is not clear that a wind owner needs to submit an actual deconstruction plan to the county prior to construction.[33]

To avoid abandonment, deconstruction must be completed within 18 months after the facility reaches the end of its useful life. The facility is presumed to reach the end of its useful life if (1) no electricity is generated for a continuous period of 12 months and (2) the commercial wind energy facility owner fails to pay the landowner amounts owed in accordance with the underlying agreement for a period of six consecutive months to pay the landowner amounts owed in accordance with the underlying agreement.[34] "Abandonment of a commercial solar energy facility" means when deconstruction has not been completed within 12 months after the commercial solar energy facility reaches the end of its useful life.[35] A commercial solar energy facility is presumed to have reached the end of its useful life if the commercial solar energy facility owner fails, for a period of six consecutive months.[36]

No less than 45 days prior to commencement of actual construction, a commercial solar energy facility owner must submit a standard agricultural impact mitigation agreement to the Department and a deconstruction plan to the county in which the commercial solar facility is to be located.[37] On January 27, 2023, the Illinois General Assembly passed Public Act 102-1123. The state Department of Agriculture's standard agricultural impact mitigation agreement now preempts any county law that demands higher standards for decommissioning solar or wind farms.[38] This preemption creates a ceiling for decommissioning standards: no county can expect higher standards than the state.[39] In part, this legislation "[limits] a county's ability to regulate commercial wind [and solar] energy . . . ."[40] No Illinois county may "require standards for . . . decommissioning or deconstruction of a commercial wind [or solar] energy facility . . . that are more restrictive than those included in the Department of Agriculture's standard wind farm agricultural impact mitigation agreement. The amount of any decommissioning payment is limited to the cost identified in the decommissioning or deconstruction plan, as required by those agricultural impact mitigation agreements, minus the salvage value of the project."[41]

INDIANA

U.S. EIA RANKING
23RD

SOLAR ENERGY INSTALLED: 1,905 MW
WIND ENERGY INSTALLED: 3,368 MW
WIND ENERGY POTENTIAL: 118K MW

Ind. Code § 8-1-41-16 governs decommissioning of wind power facilities. The project owner of a wind power device may not install or locate a wind power device in a unit[42] unless the project owner submits to the permitting authority a decommissioning and site restoration plan and posts a surety bond or an equivalent means of security acceptable to the permit authority. The project owner must post a bond or security equal to 25 percent of the total estimated decommissioning costs by the start of the commercial operation; 50 percent by the 15th anniversary of the start date; and 100 percent by the 20th anniversary.[43] The cost of decommissioning will be calculated by a third-party licensed or registered engineer, or by another person with suitable experience in the decommissioning of wind power devices, as agreed upon by the project owner and the permit authority.[44]

Ind. Code § 8-1-42-18 governs decommissioning for solar energy facilities. The project owner of a Commercial Solar Energy System may not install or locate a wind power device in a unit unless the project owner submits to the permit authority a decommissioning and site restoration plan. They must also post a surety bond or an equivalent means of security acceptable to the permit authority. The project owner must post a bond or security equal in the same amounts and on the same schedule as is required for wind energy facilities. The project owner must provide a notice of intent to decommission at least 60 days before discontinuation. Decommissioning must be completed no later than one year after the proposed date.[45]

After the discontinuation of a commercial solar operation and as part of the decommissioning process, all structures, foundations, roads, gravel areas, and cables associated with the project must be removed to a depth of at least 36 inches below grade and the ground must be restored to a condition reasonably similar to its condition before the start of construction activities in connection with the solar system project.[46]

As of July 1, 2023, the Indiana Department of Environmental Management is tasked with conducting a study concerning the decommissioning and disposal of solar panels and wind energy equipment in the state.[47]

KENTUCKY

U.S. EIA RANKING
50TH

SOLAR ENERGY INSTALLED: 191 MW
WIND ENERGY INSTALLED: 0 MW
WIND ENERGY POTENTIAL: 151K MW

House Bill 4, now Chapter 140 of the Kentucky Revised Statutes, creates a legal framework dictating the requirements for solar farm decommissioning. The bill passed the Kentucky Legislature but was vetoed by Governor Beshear on March 24, 2023,[48] because it "takes away the authority of the Siting Board to enforce decommissioning and bonding requirements." Ultimately, the General Assembly overrode this veto on March 29, 2023.[50]

Chapter 140 requires "solar companies . . . to file a decommissioning plan with the [Kentucky Public Service Commission] that includes securing a bond to cover the costs of the cleanup at the end of the facility's life."[51] The legislation also empowers the Kentucky Energy and Environment Cabinet rather than the Siting Board to ensure companies' compliance with their decommissioning plans.[52] Additionally, solar developers must remove underground wiring and conductors up to three feet into the ground unless the developer and landowner agree to a different depth.[53] The legislation does not preempt county law; instead, it empowers local ordinances to require more than Chapter 140, but "the vast majority of counties and cities currently don't have solar-specific laws on the books yet."[54]

LOUISIANA

U.S. EIA RANKING
45TH

SOLAR ENERGY INSTALLED: 617 MW
WIND ENERGY INSTALLED: 0 MW
WIND ENERGY POTENTIAL: 57K MW

La. Stat. Ann. § 30:1154 requires the secretary of the Department of Energy and Natural Resources to adopt regulations for solar power generation facilities.[55] The regulations must be designed to encourage the development and use of solar energy and to provide information to the public about solar devices and solar generation facilities. The statute states that regulations may require permit applications to include a bond or other acceptable financial security to ensure proper site closure. The total amount required for the bond or other financial security will consider the assets, debts, and compliance history of the applicant, the condition and capacity of the facilities, and the estimated cost of site closure. The decommissioning plan must account for both the closure of the site as well as closure in the event of a disaster. The plan must be updated every five years.[56]

La. Admin. Code tit. 43 § V-733 governs decommissioning for wind energy operations.[57] Lessees and owners gain decommissioning obligations when they install a facility, create an obstruction to other users of the state lands and water bottoms, are or become a lessee or the owner of operating rights of a lease on which there is a facility or an obstruction, or re-enter a facility or an obstruction that was previously abandoned.[58] When the facilities are no longer useful for operations, the lessee or owner must obtain approval from the Office of Mineral Resources before decommissioning the facility.[59] The following reports must be submitted in conjunction with the decommissioning: (1) a final removal application for a facility before removing a facility; (2) a post-removal report for a facility within 30 days after removal of a facility; and (3) a site clearance report for a facility within 30 days after the completion of site clearance verification.[60] The facility must be removed within one year unless special approval is given.

MAINE

U.S. EIA RANKING
7TH

SOLAR ENERGY INSTALLED: 1,108 MW
WIND ENERGY INSTALLED: 1,031 MW
WIND ENERGY POTENTIAL: 70K MW

Under Me. Rev. Stat. tit. 35-A, § 3494, a solar developer (of a facility with ground-mounted panels occupying three or more acres) must submit a decommissioning plan to the environmental permitting entity for approval. For any portion of the development located on land classified as farmland within the five years preceding construction, the plan must also provide for the restoration of the farmland. Additionally, any plan must provide for the grading and revegetation of any disturbed earth. Lastly, the plan must include a "demonstration of current and future financial capacity" (financial assurances) to fully fund decommissioning.[61] Financial assurances may be in the form of a performance bond, surety bond, or irrevocable letter of credit.[62] Financial assurances must be updated 15 years after approval of the plan and then every five years after that.[63]

Similarly, for wind energy developments of at least 100 kW in total generating capacity,[64] pursuant to an application for a permit for construction, or for developments proposed to be located within an "expedited permitting area pursuant to the Maine Wind Energy Act,"[65] an applicant must provide a decommissioning plan to the state Department of Environmental Protection describing how "one or more of the proposed turbines and other components" will be dismantled.[66] Additionally, subsurface components up to a minimum of 24 inches below grade must be removed and disturbed areas must be revegetated.[67] Before decommissioning, the licensee must submit a plan for the continued beneficial use of any components of the development proposed to be left on-site.[68] The regulation further outlines what circumstances trigger decommissioning, namely if the wind energy development does not generate electricity for a continuous 12-month period, and the requirements for financial assurance (performance bond, surety bond, irrevocable letter of credit, or other form of financial assurance) for the total cost of decommissioning.[69] The licensee must re-evaluate decommissioning costs at least once every two years to account for price fluctuations.[70]

MARYLAND

U.S. EIA RANKING
36TH

SOLAR ENERGY INSTALLED: 2,183 MW
WIND ENERGY INSTALLED: 121 MW
WIND ENERGY POTENTIAL: 7K MW

The decommissioning regulations in Maryland apply to major and minor solar energy generating systems in intensely developed areas, limited development areas, and resource conservation areas.[71] The regulations state local jurisdictions must require a decommissioning plan if one is not otherwise required as a result of obtaining a Certificate from the Public Service Commission.[72] Individual counties can require decommissioning plans and financial assurances.[73]

MASSACHUSETTS

U.S. EIA RANKING
20TH

SOLAR ENERGY INSTALLED: 5,233 MW
WIND ENERGY INSTALLED: 120 MW
WIND ENERGY POTENTIAL: 5K MW

Massachusetts permits local governments to manage decommissioning and has provided a model local ordinance for their consideration.[74] The model zoning and accompanying guidance were prepared to assist Massachusetts cities and towns in establishing reasonable standards to facilitate the development of solar energy systems. The model provides that an owner or operator of a ground-mounted solar energy system that has reached the end of its useful life or has been abandoned must remove the installation no more than 150 days after the date of discontinued operations.[75] Decommissioning must include the physical removal of all solar energy systems, structures, equipment, security barriers and transmission lines from the site, the disposal of all solid and hazardous waste according to law, and the stabilization or revegetation of the site to minimize erosion.[76] Abandonment is considered to have happened when a site fails to operate for more than one year without prior written consent.[77]

MICHIGAN

U.S. EIA RANKING
26TH

SOLAR ENERGY INSTALLED: 1,457 MW
WIND ENERGY INSTALLED: 3,768 MW
WIND ENERGY POTENTIAL: 81K MW

Michigan has recently adopted a new policy concerning the decommissioning of solar farms located on lands enrolled in the Farmland Development Rights Program.[78] A bond or irrevocable letter of credit as a surety tool must be obtained and maintained in an amount sufficient to decommission the solar array and return the property to agricultural purposes for that property under the relevant Farmland Development Rights Agreements.[79] The financial surety must be in place for the entire deferment period.[80] The amount of the financial surety must be calculated by a licensed engineer and approved by the Michigan Department of Agriculture and Rural Development ("MDARD") and must be payable to the State of Michigan.[81] MDARD expects this will be the solar company's responsibility under the Commercial Solar Agreement.[82]

Beginning in November 2024, an electric provider or independent power producer seeking a wind, storage, or solar certification for construction of an energy facility must submit an application to the Michigan Public Service Commission containing a decommissioning plan that ensures participating properties are returned to a useful condition, similar to what existed before construction of the facility.[83] An energy facility includes any solar energy facility with the capability to produce an output of 50 megawatts or more and any wind energy facility with the capacity to produce an output of 100 megawatts or more.[84] The decommissioning plan should also include financial assurance not less than the estimated cost of decommissioning.[85] Michigan law also allows a solar facility under a development rights agreement if a bond is maintained as financial assurance of decommissioning the facility and returning the land to agricultural use.[86] The bond must be adjusted as necessary every three years to ensure that financial assurance is sufficient.[87]

MINNESOTA

U.S. EIA RANKING
13TH

SOLAR ENERGY INSTALLED: 2,811 MW
WIND ENERGY INSTALLED: 4,184 MW
WIND ENERGY POTENTIAL: 183K MW

Minn. R. 7854.0500 requires large wind energy conversion systems with a capacity of 5,000 KW or more to submit a decommissioning and restoration plan as part of an application with the Minnesota Public Utilities Commission for a site license.[88] The plan must include the anticipated life of the project, the estimated decommissioning costs "in current dollars," the method and schedule for updating the costs of decommissioning and restoration, the method of ensuring the funds will be available for decommissioning and restoration (in other words, financial assurances), and the anticipated manner in which the project will be decommissioned and the site restored.[89] Minn. Stat. Ann. § 216C.377 establishes a grant program for solar facilities on public buildings.[90] Any local government submitting an application must include the total cost of the solar facility's life cycle, including removal and disposal after decommissioning.[91]

MONTANA

U.S. EIA RANKING
19TH

SOLAR ENERGY INSTALLED: 298 MW
WIND ENERGY INSTALLED: 1,798 MW
WIND ENERGY POTENTIAL: 679K MW

An owner of a wind (25+ MW) or solar (2 MW+ capacity) energy facility must submit a decommissioning plan to the Montana Department of Environmental Quality.[92] Mont. Admin. R. 17.86.105 specifies the contents of the plan including, but not limited to, a cost estimate of decommissioning, a description of the manner of decommissioning, and a decommissioning schedule.[93] Additionally, Mont. Admin. R. 17.86.102 contains detailed notification and timing requirements for decommissioning. For example, within 12 months of purchasing a facility, an owner must submit an "updated decommissioning plan" including an "updated cost estimate."[94] Mont. Admin. R. 17.86.107 and Mont. Code Ann. § 75-26-304 also require an owner to submit a bond. For facilities that commenced commercial operation after January 1, 2007, the operator must submit a decommissioning bond by the conclusion of the 15th year of operation.[95] There are several exceptions to posting a bond.[96]

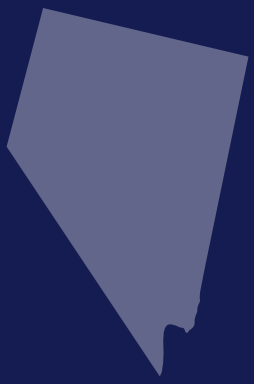
NEBRASKA

U.S. EIA RANKING
12TH

SOLAR ENERGY INSTALLED: 203 MW
WIND ENERGY INSTALLED: 3,519 MW
WIND ENERGY POTENTIAL: 465K MW

At this time, Nebraska has little guidance on renewable energy decommissioning. It does not require financial assurances or a decommissioning plan. Rather, it delegates these obligations to local governments.[97] Nevertheless, an owner of a solar energy facility or wind energy facility subject to an easement must submit to the office of the register of deeds of the county in which the real property subject to the instrument is located a description of "any decommissioning security or local requirements related to decommissioning."[98] A decommissioning security is a security instrument that is posted or given by a wind developer to a municipality or other governmental entity to ensure sufficient funding is available for the removal of the system.[99]

NEVADA



U.S. EIA RANKING
10TH

SOLAR ENERGY INSTALLED: 7,325 MW
WIND ENERGY INSTALLED: 152 MW
WIND ENERGY POTENTIAL: 468K MW

Nevada statutes do not address decommissioning of renewable energy facilities. A bill introduced in March 2023 was intended to provide decommissioning requirements for solar energy facilities; however, the bill failed after it was introduced.[100] The Nevada State Infrastructure Bank provides loans and other financial assistance to borrowers for the decommissioning of renewable energy infrastructure.[101] Some Nevada local governments address the decommissioning of renewable energy facilities. For example, Lander County has an ordinance requiring the applicant/developer to submit a decommissioning plan for a wind farm.[102] Nevada does have the State Infrastructure Bank, which is meant to provide loans and other financial assistance to borrowers for the decommissioning, among other relevant activities, of renewable energy infrastructure.[103]

Although Nevada law does not specifically address decommissioning of renewable energy facilities, it does consider decommissioning activities by regulated utilities. Any asset classified as a surplus by an electric utility must file a surplus asset retirement plan with the Public Utilities Commission of Nevada within 120 days after the asset has been classified as a surplus.[104] A "surplus" is any asset that is out-of-service and no longer needed, suitable, or reasonably intended to be used to generate electricity.[105] The asset retirement plan must include a plan for decommissioning the site, which further includes the closure of any remaining operational activities, any required environmental remediation, and the removal and disposal of any physical assets deemed unsuitable for redevelopment and remediation.[106] This applies to all public utilities which supply electricity in the state of Nevada.[107]

NEW HAMPSHIRE

U.S. EIA RANKING
32ND

SOLAR ENERGY INSTALLED: 284 MW
WIND ENERGY INSTALLED: 214 MW
WIND ENERGY POTENTIAL: 13K MW

Owners of wind and solar facilities with a nameplate capacity greater than 30 MW must apply for a certificate with the site evaluation committee that contains terms and conditions that authorize the applicant to proceed with the proposed site and facility.[108] Applications must include a description "in reasonable detail" of the owner's decommissioning plan and financial assurances for that plan.[109] Each application must contain sufficient information to satisfy the application requirements of each state agency having jurisdiction and must include each agency's completed application forms, which must be filed contemporaneously with the state agency having jurisdiction.[110] The plan will be reviewed preliminarily by a committee that will decide whether to accept the application within 60 days of filing.[111] Although the statute does not specify what is required in the decommissioning plan, available examples of previous project decommissioning plans include: (1) be responsible for all decommissioning costs. A Financial Assurance Mechanism (FAM) in the form of an irrevocable standby letter of credit, performance bond, surety bond, or unconditional payment guaranty executed by a parent company will be established prior to construction; (2) obtain any additional permits required for the decommissioning, removal and legal disposal of project components prior to commencement of decommissioning activities; (3) complete decommissioning, including component removal and disposal, grading and re-vegetation in accordance with permits and in compliance with all applicable rules and regulations then in effect governing the disposal thereof; and (4) remove all hazardous materials and transport them to be disposed of by licensed contractors at an appropriate facility in accordance with rules and regulations governing the disposal of such materials.[112]

For wind facilities specifically, each application must include a decommissioning plan prepared by an independent, qualified person with demonstrated knowledge and experience.[113] The decommissioning plan must include: (1) a description of sufficient and secure funding to implement the plan; (2) a provision of financial assurance; (3) acknowledgment that all turbines shall be disassembled and transported off-site; (4) acknowledgment that all transformers shall be transported off-site; (5) acknowledgment that the overhead power collection conductors and the power poles shall be removed from the site; (6) acknowledgment that all underground infrastructure at depths less than four feet below grade shall be removed from the site and all underground infrastructure at depths greater than four feet below finished grade shall be abandoned in place; and (7) acknowledgment that areas where subsurface components are removed shall be appropriately remedied.[114]

In 2021, New Hampshire also considered the recycling of solar panels. House Bill 1459 would have required the New Hampshire Department of Environmental Services to develop guidance for a program to recycle solar panels.[115] Though this bill shows New Hampshire's forward thinking on disposing of solar panels after the panels have reached the end of their useful lives, the bill ultimately failed in the New Hampshire Senate.[116]

NEW JERSEY

U.S. EIA RANKING
40TH

SOLAR ENERGY INSTALLED: 5,362 MW
WIND ENERGY INSTALLED: 9 MW
WIND ENERGY POTENTIAL: 945 MW

An owner of a solar facility on commercial farmland that seeks the benefits of the Right to Farm Act must submit a "conservation plan" to the "soil conservation district" in the state. The conservation plan must address decommissioning of the facility and restoration of the land (pursuant to the New Jersey Field Office Technical Guide (FOTG) in order to maximize the agricultural productivity of the soil).[117] The conservation plan must be approved by the soil conservation district which will require that all solar energy generation facilities be removed from the commercial farm and that the land be restored in accordance with the conservation plan prepared pursuant to NJ-FOTG in order to achieve as much agricultural productivity of the soil as practicable.[118] Solar energy generation facilities may not be constructed or installed on prime farmlands to the maximum extent physically and financially practicable.[119] Further, a solar energy generation facility will be deemed abandoned if there is no energy production for 18 consecutive months.[120]

Additionally, an owner of a solar facility located in a Pinelands Management Area must submit a decommissioning plan "within 12 months of the cessation of its utilization."[121] Decommissioning must include removal of all structures (including subsurface wires), restoration of the land (per the revegetation and landscaping requirements in N.J. Admin. Code § 7:50-6.24), and "[a]ny other measures necessary to address ecological and visual impacts."[122]

NEW MEXICO

U.S. EIA RANKING
5TH

SOLAR ENERGY INSTALLED: 2,576 MW
WIND ENERGY INSTALLED: 4,024 MW
WIND ENERGY POTENTIAL: 653K MW

New Mexico statutes and regulations concerning decommissioning of renewable energy facilities are relatively sparse. One statute allows the recovery of decommissioning costs if the facility is discontinued by the commission.[123]

NEW YORK

U.S. EIA RANKING
33RD

SOLAR ENERGY INSTALLED: 5,834 MW
WIND ENERGY INSTALLED: 2,627 MW
WIND ENERGY POTENTIAL: 92K MW

As part of the permit process, a person seeking a building permit for a major renewable energy facility must include a Final Decommissioning and Site Restoration Plan in their compliance filings.[124] The plan must include proof that letters of credit have been obtained in the appropriate amount.[125] The letter of credit will establish a right for each municipality to draw on the letters dedicated to its portion of the facility. Each letter must be given to the Office of Renewable Energy Siting after one year of facility operation and updated every fifth year.[126] Further, applicants must provide a summary of the substantive provisions of local law applicable to the decommissioning of the proposed facility during a consultation with the local agency.[127]

All major electric generation facilities (including wind) must include a statement and decommissioning plan. The statement must address: (1) safety and the removal of hazardous conditions; (2) environmental impacts; (3) aesthetics; (4) salvage and recycling; (5) potential future uses for the site; and (6) the useful life of the facility.[128]

A decommissioning plan must detail funding for decommissioning and site restoration.[129] For facilities to be located on lands that are not owned by the applicant, a decommissioning and guaranty/security agreement between the applicant and the landowner must be included.[130]

A current bill in the 2023-2024 session of the New York legislature concerns the decommissioning of renewable energy facilities and would amend the current law to require offices to include a provision about decommissioning major renewable energy facilities sited on prime soils and farmlands.[131] The applicant would need to submit decommissioning plans and bonds as well as show evidence that the structures and materials of the facility will be removed upon decommissioning and that the soils will be capable of agricultural production.[132]

NORTH CAROLINA

U.S. EIA RANKING
25TH

SOLAR ENERGY INSTALLED: 9,574 MW
WIND ENERGY INSTALLED: 208 MW
WIND ENERGY POTENTIAL: 78K MW

An applicant for a wind energy facility permit of 1 MW or more (when combined with other facilities within a one-half mile of one another) must establish financial assurance sufficient for decommissioning the facility and restoring the property to its condition prior to the commencement of activities on the site.[133] An applicant may satisfy this requirement by use of insurance, financial tests, trusts, surety bonds, or "any other financial device."[134] The plan must include an estimate of the cost to decommission the wind facility, an estimate of the anticipated life of the project, an estimate of the cost, a description of the manner of decommissioning, and a description of the expected condition of the site after removal.[135]

New solar facilities with a 2 MW capacity or greater must file a decommissioning plan with the Department of Environmental Quality that is prepared by a qualified engineer and includes a step-by-step plan, a cost estimate, and financial assurance.[136] The decommissioning procedure requires the removal of all project components from the site, the proper disposal of hazardous and non-hazardous wastes, and reusing and recycling where practicable.[137] Additionally, decommissioning includes restoring the property to its previous condition or an alternative condition agreed upon by the landowner and the facility owner.[138] In addition, landowners and local governments may provide more stringent requirements.[139]

NORTH DAKOTA

U.S. EIA RANKING
8TH

SOLAR ENERGY INSTALLED: 2 MW
WIND ENERGY INSTALLED: 3,665 MW
WIND ENERGY POTENTIAL: 296K MW

As a condition of approval for a "certificate of operation," solar[140] and wind facility[141] owners must submit a decommissioning plan and proof of financial assurance to the North Dakota Public Service Commission prior to the operation of the facility.[142] A wind or solar facility owner is responsible for decommissioning and all associated costs.[143] Decommissioning must begin within 12 months of abandonment or the end of the facility's useful life and be completed within 24 months.[144] N.D. Admin. Code 69-09-09-05 and 69-09-10-05 outline the requirements for decommissioning, including dismantling the facility, removing foundations, and restoring the site to its approximate original topography. Additionally, a decommissioning plan must include a description of the anticipated manner of decommissioning, expected effects on natural resource development, and a cost estimate for the facility (to be updated 10 years after the initial approval and then every five years after that).[145] New and existing facilities (after 10 years of operation) must also provide financial assurances for decommissioning.[146] Financial assurance (five percent of the estimated cost) may take the form of a performance bond or another instrument, such as cash escrow held by a financial institution, a surety bond, or a guarantee.[147]

OHIO

U.S. EIA RANKING
41ST

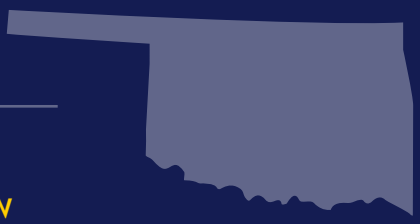
SOLAR ENERGY INSTALLED: 2,822 MW
WIND ENERGY INSTALLED: 1,111 MW
WIND ENERGY POTENTIAL: 119K MW

The application for an economically significant wind farm or a major utility facility consisting of wind-powered electric generation must include a decommissioning plan to be submitted to the power siting board.[148] This plan must be submitted to the board and the applicable county engineer at least 30 days prior to the preconstruction conference.[149] The plan must include: (1) a description of future planned use; (2) a description of the engineering techniques and major equipment to be used in decommissioning and reclamation; a surface water drainage plan and any proposed impacts that would occur to surface and groundwater resources and wetlands; and a plan for backfilling, soil stabilization, compacting and grading; and (3) a detailed timetable for each major step in the decommissioning process.[150] This plan must be resubmitted every five years.

At least seven days prior to the preconstruction conference, the applicant must retain an independent, registered professional engineer, licensed to practice engineering in the state of Ohio to estimate the total cost of decommissioning in current dollars, without regard to salvage value of the equipment.[151] The estimate will be converted to a per-turbine basis calculated as the total cost of decommissioning all facilities divided by the number of turbines in the most recent facility engineering drawings.[152] This estimate must be conducted every five years.[153] For decommissioning, the applicant, facility owner, and/or facility operator must post and maintain a performance bond in an amount equal to the per-turbine decommissioning costs multiplied by the sum of the number of turbines constructed and under construction.[154]

During decommissioning, all recyclable materials, salvaged and non-salvaged, must be recycled to the greatest extent practicable. All other non-recyclable waste materials must be disposed of in accordance with state and federal law.[155]

OKLAHOMA



U.S. EIA RANKING
6TH

SOLAR ENERGY INSTALLED: 189 MW
WIND ENERGY INSTALLED: 11,790 MW
WIND ENERGY POTENTIAL: 359K MW

Oklahoma law explains that the prudent development of wind energy resources requires "balancing the needs of wind energy developers with those of the landowners who provide access to the wind energy resource, including assurances that wind turbines and wind energy facilities will be properly decommissioned, that they will have access to adequate information to verify the accuracy of their payments, and that they will be adequately protected against hazards and accidents that may arise from the wind turbines or wind energy facilities."[156] Also, to protect the public against health hazards, "standards for the safe decommissioning of wind energy facilities should be established and assurance of adequate financial resources should be given so that the wind energy systems can be properly decommissioned at the end of their useful life."[157]

Accordingly, the owner of a wind energy facility is responsible for the proper decommissioning of the facility upon abandonment or at the end of the useful life of the commercial wind energy equipment in the wind energy facility.[158] Oklahoma provides specific requirements for commercial wind facility (500 kW+) decommissioning.[159] Proper decommissioning of a wind energy facility shall include: the removal of wind turbines, towers, buildings, cabling, electrical components, foundations, and any other associated facilities to a depth of 30 inches below grade; and disturbed earth being graded and reseeded or otherwise restored to substantially the same physical condition as existed prior to the construction of the wind energy facility by the owner, excluding roads, unless the landowner specifically requests in writing that the roads or other land surface areas be restored.[160]

The owner of a commercial wind energy facility must also submit evidence of financial security to cover anticipated decommissioning costs to the Oklahoma Corporation Commission.[161] Further, for a wind energy facility achieving commercial generation prior to December 31, 2016, the evidence of financial security must be accompanied by an estimate of the total cost of decommissioning minus the salvage value of the equipment, prepared by a professional engineer licensed in this state.[162] For a wind energy facility or portion thereof that achieves commercial generation on or after December 31, 2016, the evidence of financial security must be submitted by the fifth year of operation of the facility.[163] The statute provides additional details as to how a wind owner must estimate the cost of decommissioning.[164]

OREGON

U.S. EIA RANKING
17TH

SOLAR ENERGY INSTALLED: 1,815 MW
WIND ENERGY INSTALLED: 2,843 MW
WIND ENERGY POTENTIAL: 297K MW

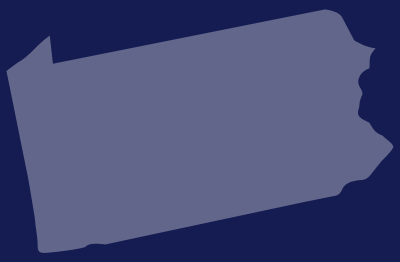
In Oregon, qualifying solar facilities must provide a decommissioning plan in their application for a land use permit that includes a plan and the necessary financial assurances to restore the site to a useful, nonhazardous condition.[165] A qualifying solar facility uses (1) more than 160 acres but not more than 240 acres located on high-value farmland; (2) more than 1,280 acres but not more than 2,560 acres located on land that is predominantly cultivated; or (3) more than 1,920 acres but not more than 3,840 acres located on any other land.[166]

Offshore wind facilities must provide financial assurance to the Oregon Department of Energy that demonstrates the facility has the required financial assistance to cover: (1) the costs of closure and post-closure maintenance of the facility or device, excluding the removal of anchors, cables or any other equipment that lies at least one meter beneath submerged lands in the territorial sea; and (2) any corrective action, required by the Department or any other local, state or federal government agency with jurisdiction over the site, to be taken at the site of the ocean renewable energy monitoring equipment or ocean renewable energy facility.[167]

PENNSYLVANIA

U.S. EIA RANKING
46TH

SOLAR ENERGY INSTALLED: 2,168 MW
WIND ENERGY INSTALLED: 1,475 MW
WIND ENERGY POTENTIAL: 109K MW



On January 31, 2023, Senate Bill No. 211 was introduced in the Pennsylvania Senate Environmental Resources and Energy Committee.[168] SB 211 establishes decommissioning and financial requirements for solar power generation projects in the state.[169] Under the bill, solar energy facility agreements executed after the effective date of July 1, 2024, must provide that owners of solar energy facilities on leased property are responsible for decommissioning the facility no later than 18 months after the facility has ceased producing electricity. Such grantees would be required to provide a decommissioning plan, submit proof of financial assurance to the county recorder of deeds, and provide notice to the surface property owner of the solar energy facility agreement.[170] The amount of financial assurance required must be equal to the estimated cost to decommission the facility, as updated every five years by a third-party professional engineer.[171] The bill passed through the Senate on March 8, 2023, and was referred to the House Environmental Resources and Energy Committee on April 25, 2023. No further action has been taken on the bill since this date.[172]

RHODE ISLAND

U.S. EIA RANKING
28TH

SOLAR ENERGY INSTALLED: 1,029 MW
WIND ENERGY INSTALLED: 49 MW
WIND ENERGY POTENTIAL: 192 MW

Applications to the state siting board for "major energy facilities" (facilities designed for operating at a gross capacity of 40 MW or more) must include "a complete life-cycle management plan" including "plans for the decommissioning of the facility at the end of its useful life."[173] However, "major energy facilities" does not specifically address wind or solar facilities.[174]

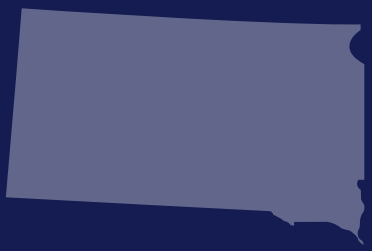
Decommissioning plans for solar facilities must include: the physical removal of all solar photovoltaic installations, structures, equipment, security barriers and transmission lines from the site; disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations; and stabilization or revegetation of the site as necessary to minimize erosion.[175] The owner or operator of the solar energy facility must notify the Quonset Development Corporation (QDC) by certified mail of the proposed date of discontinued operations and plans for removal.[176] The owner or operator will have 180 days to uninstall the facility from the time the facility is considered at the end of its useful life or abandoned.[177] Solar energy facilities will be considered abandoned when they fail to operate for more than one year without the written consent of the QDC.[178] The code states it is in place to provide adequate financial assurance for the eventual decommissioning of such installations; however, the code does not specify what financial assurances must be made.[179]

Senate Bill S0499 was introduced to the Senate Environment and Agriculture Committee on March 7, 2023.[180] Under the bill, no solar energy permits would be issued unless the permit applicant has committed in writing and submitted evidence demonstrating that sufficient resources will be available and set aside to pay for the decommissioning and recycling of the photovoltaic panels at the end of their useful life.[181] Additionally, the bill requires that blades from a decommissioned or repowered wind energy conversion system be disposed of or recycled within the state.[182]

SOUTH DAKOTA

U.S. EIA RANKING
2ND

SOLAR ENERGY INSTALLED: 268 MW
WIND ENERGY INSTALLED: 3,462 MW
WIND ENERGY POTENTIAL: 418K MW



Wind and solar energy facility applications must include a decommissioning plan, including cost estimates, an estimate of the "site condition" after decommissioning, and the amount of land irretrievably committed to energy conversion.[183] The South Dakota Public Utilities Commission may also require a bond, insurance, or other financial guarantee (dependent on the size of the facility and the financial condition of the applicant).[184]

All rights and titles in any financial security required by the commission for the decommissioning of wind turbines or solar energy facilities must be controlled by the commission, in accordance with the terms of the financial security agreement or instrument, until the commission by order releases the security.[185] The commission may require, accept, hold, or enter into any agreement or instrument for the provision of financial security, including any funds reserved or held by any person to decommission and remove the wind turbines or solar energy facilities in order to satisfy or guarantee the obligation of an owner of wind turbines or solar energy facilities permitted under this chapter.[186]

TENNESSEE

U.S. EIA RANKING
49TH

SOLAR ENERGY INSTALLED: 895 MW
WIND ENERGY INSTALLED: 29 MW
WIND ENERGY POTENTIAL: 116K MW

All solar power facility agreements between landowners and grantees operating a facility more than 5 MW in size must include a decommissioning plan for the removal of the facility and removal from the power grid.[187] The agreement must require the grantee to obtain and deliver to the landowner financial assurance for removal and restoration.[188] The financial assurance must include no less than five percent of the decommissioning cost on the date of commercial operations, no less than 50 percent on the 10th anniversary, and no less than 100 percent on the 15th anniversary.[189] Forms of acceptable financial assurances include a surety bond, collateral bond, irrevocable letter of credit, parent guaranty, cash, cashier's check, certificate of deposit, or bank joint custody receipt.[190]

Local governments may adopt regulations for the conditions and criteria of wind energy facilities.[191] The local legislation must provide that the permit applicant include financial security for the decommissioning of the facility.[192] The financial security must be established for 100 percent of the decommissioning costs.[193] Decommissioning can be triggered if a facility does not generate electricity for 180 continuous days.[194] The decommissioning must be completed within 12 months.[195]

The Tennessee Advisory Commission on Intergovernmental Relations (TACIR) performed a study of the overall effects of utility-scale solar energy development in the state.[196] The study included: federal regulatory requirements regarding decommissioning and managing end-of-life photovoltaic modules, energy storage system batteries, and other equipment used in utility-scale solar energy development; statutory and regulatory requirements in other states regarding decommissioning and managing end-of-life photovoltaic modules, energy storage system batteries, and other equipment used in utility-scale solar energy development; and financial assurances and responsibilities of owners and operators in the event of natural disasters, pollution from solar energy system failures, decommissioning of a solar energy system, as well as the end-of-life management of photovoltaic modules, energy storage system batteries, and other equipment used in utility-scale solar development.[197] As a result of the study, TACIR recommended that: (1) the Tennessee Department of Environment and Conservation (TDEC) Office of Energy Programs continue to expand and maintain its existing website with additional guidance and resources on utility-scale solar for local governments, landowners, developers, and the public; (2) the TDEC Office of Energy Programs continue to expand and maintain its webpage that provides guidance and resources on residential solar for the public; and (3) the state consider raising the penalty for violations of the Consumer Protection Act if the good or service involved has a value greater than a monetary threshold set by the state.[198] The recommendations were reported to members of the Energy, Agriculture and Natural Resources Committee of the Senate and members of the Agriculture and Natural Resources Committee of the House of Representatives for consideration.[199]

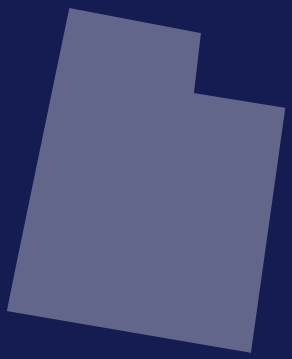
TEXAS

U.S. EIA RANKING
14TH

SOLAR ENERGY INSTALLED: 32,142 MW
WIND ENERGY INSTALLED: 37,172 MW
WIND ENERGY POTENTIAL: 1.3M MW

A wind or solar power facility agreement must provide that the grantee is responsible for removing the facilities from the landowner's property.[200] The statutes describe in detail what must be removed and addressed, including turbines, substations, tower foundations, and buried cables.[201] Additionally, Tex. Util. Codes Ann. §§ 301.0004 and 302.0005 require financial assurances for wind and solar facilities (within 10 years of the end of the agreement for wind and within 20 years of the end of the agreement for solar). Acceptable forms of financial assurance include a parent company guaranty (with a minimum investment grade credit rating), a letter of credit, a bond, or other assurances "acceptable to the landowner." The grantee must also provide a cost estimate for the solar or wind decommissioning, updated every five years.[202] The statutes also state that a solar or wind agreement that purports to exempt a grantee from liability related to decommissioning is void.[203]

UTAH



U.S. EIA RANKING
21ST

SOLAR ENERGY INSTALLED: 3,110 MW
WIND ENERGY INSTALLED: 391 MW
WIND ENERGY POTENTIAL: 278K MW

Although Utah has requirements pertaining to the decommissioning of electric generation facilities, these statutes are constrained to coal facilities right now.[204]

VERMONT

U.S. EIA RANKING
4TH

SOLAR ENERGY INSTALLED: 430 MW
WIND ENERGY INSTALLED: 149 MW
WIND ENERGY POTENTIAL: 22K MW

For entities and facilities subject to the jurisdiction of the Vermont Public Utilities Commission, Vt. Stat. Ann. tit. 30, § 248(a)(5) directs the Vermont PUC to adopt rules addressing decommissioning and to ensure that all facilities are removed once they are no longer in service.[205] Pursuant to this statutory mandate, the Vermont PUC requires that all facilities subject to PUC jurisdiction be removed once they are no longer in service. Requirements apply to both utility-owned and non-utility facilities.[206] For non-utility facilities under 500 kW of capacity, the regulation states that the facilities must be removed once they are no longer in service and the site must be restored to its condition prior to installation, as a condition of a Certification of Public Good. For facilities over 500 kW, in addition to the above, facility owners must submit a decommissioning cost estimate (including detailed elements, such as costs associated with labor, restoration, and reclamation of any primary agricultural soils), an "irrevocable standby letter of credit" or alternative form of financial security, a report describing any adjustments or changes to the decommissioning fund (every three years), and any other requirements related to the decommissioning fund.

VIRGINIA

U.S. EIA RANKING
29TH

SOLAR ENERGY INSTALLED: 5,418 MW
WIND ENERGY INSTALLED: 0 MW
WIND ENERGY POTENTIAL: 89K MW

All local ordinances must include provisions that establish reasonable requirements to address wind and solar energy generation facility decommissioning.[207] Virginia defines "Decommission" as "the removal and proper disposal of solar energy equipment, facilities, or devices on real property that has been determined by the locality to be subject to § 15.2-2232 and therefore subject to this section."[208] "Decommission" includes the reasonable restoration of the real property upon which such solar equipment, facilities, or devices are located, including (i) soil stabilization and (ii) revegetation of the ground cover of the real property disturbed by the installation of such equipment, facilities, or devices.[209]

As part of the local legislative approval process or as a condition of the approval of a site plan, the locality must require the owner, lessee, or developer of real property to enter into a written agreement to decommission the solar energy equipment, facility, or devices.[210] If the party that enters into such a written agreement defaults on its decommissioning obligation, the locality has the right to enter the real property without approval of the owner and engage in decommissioning. In addition, the owner, lessee, or developer must obtain certified funds, cash escrows, bonds, letters of credit, or parent guarantees based on the estimate of a professional engineer for financial reassurance of the solar decommissioning.[211]

WASHINGTON

U.S. EIA RANKING
30TH

SOLAR ENERGY INSTALLED: 711 MW
WIND ENERGY INSTALLED: 3,069 MW
WIND ENERGY POTENTIAL: 174K MW

Prior to the construction of any Energy Facilities (solar and wind included), the developer must obtain a Site Certificate.[212] At least 90 days prior to the beginning of site preparation, the certificate holder must provide an initial site restoration plan.[213]

This site plan must parallel a decommissioning plan.[214] The site plan must be prepared in sufficient detail to:

"[I]dentify, evaluate, and resolve all major environmental and public health and safety issues presently anticipated. It shall describe the process used to evaluate the options and select measures that will be taken to restore or preserve the site or otherwise protect all segments of the public against risks or danger resulting from the site. The plan shall include a discussion of economic factors regarding the costs and benefits of various restoration options versus the relative public risk and shall address provisions for funding or bonding arrangements to meet the site restoration or management costs. The provision of financial assurances shall include evidence of pollution liability insurance coverage in an amount justified for the project, and a site closure bond, sinking fund, or other financial instrument or security in an amount justified in the plan."[215]

Additionally, the Site Certification application must include a summary of the impacts on each element of the natural or built environment and the means to minimize or mitigate the impacts during decommissioning.[216]

Washington also has a takeback program for solar photovoltaic panels that requires manufacturers to finance the takeback and recycling of modules at no cost to the owner.[217] This requirement applies to all PV modules sold in or into Washington.

WEST VIRGINIA

U.S. EIA RANKING
39TH

SOLAR ENERGY INSTALLED: 165 MW
WIND ENERGY INSTALLED: 758 MW
WIND ENERGY POTENTIAL: 69K MW

Solar and wind generation facilities with nameplate capacity above 1 MW must submit a decommissioning plan to the West Virginia Department of Environmental Protection (DEP) within one year of beginning commercial operation.[218] The West Virginia Public Service Commission will condition all siting certificates on full compliance with this section, as determined by the DEP. W. Va. Code Ann. § 22-32-4(n). "Decommissioning" is defined in the statute.[219] Decommissioning plans must include a commitment to remove all aboveground solar panels and towers, diagrams of all structural and electrical components, and all disturbances associated with the facility. Additionally, plans must also include an estimate of the cost of decommissioning the facility. Facilities must provide financial assurance in the form of a bond.[220]

For facility owners subject to this section, the plan must include a description of the scope of the decommissioning work, cost estimates, and "salvage estimates."[221] A wind or solar generation facility that commenced commercial operation on or before July 1, 2021, was required to submit the decommissioning bond to DEP on or before July 1, 2022.[222] For all wind and solar facilities commencing operation after July 1, 2021, the facility operators must submit a decommissioning bond to the DEP within one year of the facility producing electricity for consumer or industrial use.[223] Owners may also apply for a bond amount reduction once every five years.[224]

However, "exempt" owners, e.g. facilities operated by a public utility that can "successfully demonstrate… an acceptable showing of financial integrity," can submit "a copy of a properly executed and legally binding decommissioning agreement… ."[225] Both exempt and non-exempt facilities must submit a decommissioning agreement which, at a minimum, must address the term and scope of the agreement, including: access and easement rights for decommissioning activities; a bond or fund for decommissioning; the requirement to review the agreement every five years; the DEP's right to review and approve the plan; industry standards or citations to be the same to be met for decommissioning wind or solar facilities, including a statement of restoration, the process for making claims under the decommissioning fund, required notices, the assignment of rights and obligations under the agreement, and force majeure provisions.[226]

Alternatively, facilities may reach an "alternative decommissioning agreement" with landowners and local governing bodies.[227] These alternative agreements may concern alternative plans for restoring the property as well as alternative plans for the reclamation of surface lands. Additionally, alternative decommissioning agreements may be a more general agreement, such as a contract or other writing, that includes specific provisions on decommissioning.[228] Regardless, alternative decommissioning agreements must be provided to the DEP for review and approval.[229]

WISCONSIN

U.S. EIA RANKING
35TH

SOLAR ENERGY INSTALLED: 2,326 MW
WIND ENERGY INSTALLED: 829 MW
WIND ENERGY POTENTIAL: 114K MW

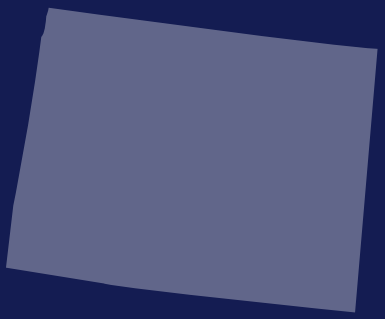
An owner of a wind energy system must decommission the system at the end of its useful life.[230] The system is deemed at the end of its useful life if it generates no electricity for a continuous 360-day period.[231] "Decommissioning" means removing wind turbines, buildings, cables, electrical components, roads, and any other facilities associated with a wind energy system that are located at the site of the wind energy system and then restoring the site of the wind energy system.[231] Upon certain conditions and application, a political subdivision may grant an extension of the time period for returning the wind energy system to service by one or more additional 180-day periods.[233] When decommissioning is required, the owner must begin decommissioning within 360 days after the wind energy system has reached the end of its useful life, and the owner must complete decommissioning and removal of the wind energy system within 540 days.[234]

The owner of a system with a capacity of 1 MW or larger must maintain proof of their ability to fund the costs to decommission the system.[235] An owner may provide financial assurances through a bond, deposit, escrow account, irrevocable letter of credit, or some combination of these financial assurances that will ensure the availability of funds necessary for decommissioning.[236] An owner may be required to assure financials up to the actual or necessary amount to decommission.[237]

WYOMING

U.S. EIA RANKING
16TH

SOLAR ENERGY INSTALLED: 124 MW
WIND ENERGY INSTALLED: 2,508 MW
WIND ENERGY POTENTIAL: 472K MW



Wyoming has a hybrid state/local policy for solar and wind decommissioning. The decommissioning policy applies only to owners of solar and wind facilities with capacities greater than 500 kW.[238] Prior to construction, owners must submit a decommissioning plan to the county board of commissioners with jurisdiction.[239] The plan will indicate the planned life of the facility and the means by which the facility and its site will be decommissioned and reclaimed.[240]

For industrial facilities, as defined under §§ 35-12-102(a)(vii)(E), (G), or facilities referred to the industrial siting council under § 35-12-102(a)(vii)(F), the plan must comply with requirements "adopted by the industrial siting council" under § 35-13-105(d), which preempt local rules. The industrial siting council has promogulated decommissioning rules only for wind power facilities. The regulations cover decommissioning plan requirements (e.g., plan for backfilling affected lands, regrading, revegetation, and disposing of turbine blades)[241] and financial assurance requirements (which may be a surety bond, certificate of deposit, or other forms of corporate guarantee).[242] The regulations require decommissioning to begin within 12 months after the end of the useful life of the wind power facility. The plan must also include financial assurance that ensures all facilities will be properly reclaimed and decommissioned.[243] The decommissioning plan must be updated and resubmitted every five years.[244]

FOOTNOTES

[1] Ala. Code § 45-28-260.04

[2] Cal. Code Regs. tit. 14 §§ 3102, 3109, 3111.

[3] Cal. Code Regs. tit. 14 § 3109(b)(3).

[4] *See generally* Cal. Code Regs. tit. 14 § 3108.

[5] Cal. Code Regs. tit. 14, § 3111.

[6] Cal. Pub. Res. Code § 2777.3.

[7] Facility Decommissioning Plan, https://efiling.energy.ca.gov/GetDocument.aspx?tn=231367&DocumentContentId=63164 (§ 1.2).

[8] *Id.*

[9] *Id.*

[10] For additional information about local decommissioning requirements for solar energy in Colorado, see https://www.nrel.gov/docs/fy24osti/88556.pdf.

[11] *Id.*

[12] Colo. Rev. Stat. Ann. § 29-20-404(4)(a)(II)

[13] Conn. Agencies Regs. 16-50j-94.

[14] *Id.*(i)(1)-(6).

[15] Department of Energy and Environmental Protection & Department of Agriculture, DRAFT Guidance for Siting Solar on Agricultural Land, (August 2023), https://portal.ct.gov/-/media/deep/permits_and_licenses/client-concierge/draft-guidance-for-siting-solar-on-agricultural-land.pdf.

[16] *Id.*

[17] Conn. Gen. Stat. Ann. § 16-50k

[18] *Id.*

[19] Ga. Code Ann. § 46-3-69

[20] *Id.*

[21] Ga. Code Ann. § 46-3-69.1

[22] H.R.S. §205-6.

[23] H.R.S. § 205-4.5(21).

[24] *Id.*(21)(B).

[25] *Id.* (21)(C)(i).

[26] Haw. Code R. 11-273.1-5(4)(g)(1).

[27] *Id.*(4(g)(3)(iii).

[28] H.R.S. § 205-4.5(15).

[29] A private commercial enterprise that owns a commercial solar energy facility. A commercial solar energy facility owner is not nor shall it be deemed to be a public utility as defined in the Public Utilities Act. 505 ILCS 147/10.

[30] Equal or greater than 500 kilowatts in total nameplate generating capacity. "Commercial wind energy facility" does not include a wind energy conversion facility: (1) that has submitted a complete permit application to a county or municipality and for which the hearing on the completed application has commenced on the date provided in the public hearing notice, which must be before the effective date of this Act; (2) for which a permit to construct has been issued before the effective date of this Act; or (3) that was constructed before the effective date of this Act. 505 ILCS 147/10.

[31] 505 ILCS 147/15

[32] For a full list of items to include in the agreement, please refer to 505 ILCS 147/15(b).

[33] See 505. ILCS 147/15(c).

[34] 505 ILCS 147/10.

[35] *Id.*

[36] *Id.*

[37] 505 ILCS 147/15 (c-5).

[38] Dan Gearino & Aydali Campa, Illinois Put a Stop to Local Governments' Ability to Kill Solar and Wind Projects. Will Other Midwestern States Follow?, INSIDE CLIMATE NEWS, Feb. 27, 2023, https://insideclimatenews.org/news/27022023/illinois-solar-local-government/.

[39] *See id.*

[40] Bill Status of HB4412, Illinois General Assembly, https://www.ilga.gov/legislation/BillStatus.asp?DocNum=4412&GAID=16&DocTypeID=HB&SessionID=110&GA=102.

[41] Ill. P.A. 102-1123, § 30(j), eff. Jan. 27, 2023.

[42] Unit is defined in Ind. Code Ann. § 8-1-41-6.

[43] Ind. Code Ann. § 8-1-41-16(a)(1)-(3).

[44] *Id.* (a)

[45] *Id.* (c)

[46] *Id.* (c)(1)-(2).

[47] *Id.*

[48] House Bill 4, Kentucky General Assembly, https:// apps.legislature.ky.gov/record/23rs/hb4.html.

[49] Liam Niemeyer, Beshear vetoes solar decommissioning bill, saying it weakens local control, KY. LANTERN, Mar. 24, 2023, https://kentuckylantern.com/2023/03/24/beshear-vetoes-solar-decommissioning-bill-saying-it-weakens-local- control/.

[50] *House Bill 4, supra*.

[51] Niemeyer, supra, note 41.

[52] KRS § 278.702, eff. June 29, 2023.

[53] KRS § 278.706(m), eff. June 29, 2023.

[54] Niemeyer, supra, note 41.

[55] SOLAR ENERGY, 2022 La. Sess. Law Serv. Act 555 (H.B. 655).

[56] *Id.*

[57] "Obstruction" is defined in La. Admin. Code tit. 43 § V-733(A).

[58] La. Admin. Code tit. 43 § V-733(B)-(C).

[59] *Id.* (E).

[60] *Id.*

[61] Me. Rev. Stat. tit. 35-A, § 3494.

[62] *Id.* § 3495.

[63] *Id.*

[64] Me. Rev. Stat. tit. 38, § 480-II.

[65] Code Me. R. tit. 06-096 Ch. 382, § 1.

[66] Me. Rev. Stat. tit. 38, § 480-II(1); Code Me. R. tit. 06-096 Ch. 382, §§ 1, 7.

[67] Code Me. R. tit. 06-096 Ch. 382, § 7.

[68] *Id.*

[69] *Id.* (B)-(C).

[70] *Id.* (C).

[71] Md. Code Regs. 27.01.14.04 (A).

[72] *Id.* (I).

[73] See, e.g., St. Mary's County Solar Task Force – Final Report, https://www.stmarysmd.com/docs/ Final_Report_of_the_St._Mary_s_County_Solar_Task_Force.pdf ("The plan should describe how the site will be restored to its original state prior to the construction of the community solar project within one year after the community solar project ceases operation or is deemed abandoned. The plan should be subject to County approval …The Task Force recommends that a utility-scale solar developer provide proof to the County that the developer has complied with the decommissioning requirements, including proof of a bond or other financial security, set forth by the PSC."). Maryland sets forth the requirements for decommissioning of offshore wind power facilities. See Md. Code Regs. 20.61.06.02.

[74] See Model Zoning for the Regulation of Solar Energy Systems, available from the Massachusetts Executive Office of Energy and Environmental Affairs, https://www.mass.gov/doc/model-solar-zoning-0/download.

[75] *Id.* at 1.3.3.1.

[76] *Id.*

[77] *Id.* 1.3.3.2.

[78] Mich. Dep't of Agric. and Rural Dev., Policy for Allowing Commercial Solar Panel Development on PA 116 Lands, Nov. 14, 2022, https://www.michigan.gov/mdard/-/media/Project/Websites/mdard/documents/environment/farmland/mdard_policy_on_solar_ panel_and_pa116_land.pdf.

[79] *Id.*

[80] *Id.*

[81] *Id.*

[82] *Id.*

[83] Mich. Comp. Laws Ann. § 460.1225

[84] Mich. Comp. Laws Ann. § 460.1222

[85] Mich. Comp. Laws Ann. § 460.1225

[86] Mich. Comp. Laws Ann. § 324.36104e

[87] *Id.*

[88] Minn. R. 7854.0500(13); Minn. R. § 7854.0100(7).

[89] Minn. R. 7854.0500(13).

[90] Minn. Stat. Ann. § 216C.377

[91] *Id.*

[92] Mont. Admin. R. 17.86.101(7), 102(4) (definition of facility); Mont. Code Ann. § 75-26-301.

[93] Mont. Admin. R. 17.86.105.

[94] Mont. Admin. R. 17.86.102(4).

[95] Mont. Code Ann. § 75-26-304(6)(b).

[96] *Id.* (7)-(8).

[97] Taylor L. Curtis, et.al., *A Survey of Federal and State-Level Solar System Decommissioning Policies in the United States*, National Renewable Energy Laboratory i, vii (2012), page vii, https://www.nrel.gov/docs/fy22osti/79650.pdf.

[98] Neb. Rev. Stat. Ann. §§ 66-909, -909.04 (definition of "agreement" includes an easement).

[99] Neb. Rev. Stat. Ann. § 66-902.01.

[100] 2023 Bill Text NV S.B. 421.

[101] Nev. Rev. Stat. Ann. § 408.55069.

[102] Lander County, Nevada Code of Ordinances Sec. 15.28.170 (A).

[103] Nev. Rev. Stat. Ann. § 408.55069.

[104] Nev. Rev. Stat. Ann. § 704.734.

[105] Nev. Rev. Stat. Ann. § 704.7337.

[106] *Id.*

[107] Nev. Rev. Stat. Ann. § 704.7333.

[108] N.H. Rev. Stat. Ann. § 162-H:2(II).

[109] N.H. Rev. Stat. Ann. § 162-H:7(V)(g).

[110] *Id.* § (IV).

[111] *Id.* § (VI)(g).

[112] See Application of Chinook Solar, LLC Decommissioning Plan, https:// www.nhsec.nh.gov/projects/2019-02/application/2019-02_2019-10-14_appendix_16c_decommissioning_plan.pdf.

[113] N.H. Code Admin. R. Site 301.08(a)(7).

[114] *Id.* § (a)(8).

[115] 2021 Bill Text NH H.B. 1459.

[116] *Id.*

[117] N.J. Admin. Code § 2:76-2A. 12(b), (m).

[118] *Id.* § (m)(2).

[119] *Id.*

[120] *Id.* § (m).

[121] N.J. Admin. Code § 7:50-5.36(a)(4).

[122] *Id.* In addition to solar energy generation facilities, an entity seeking to construct an offshore wind facility must submit an application to the board of public utilities that includes a decommissioning plan with provisions for financial assurance. N.J. Stat. Ann. § 48:3-87.1(a)(8).

[123] N.M. Stat. Ann. § 62-16-6 (C).

[124] N.Y. Comp. Codes R. & Regs. tit. 19, § 900-10.2.

[125] *Id.*

[126] *Id.*

[127] N.Y. Comp. Codes R. & Regs. tit. 19, § 900-1.3 (a) (3).

[128] N.Y. Comp. Codes R. & Regs. tit. 16, § 1001.29 (a).

[129] *Id.* § (b).

[130] *Id.* § (c).

[131] New York Bill A03117C, 2023-2024 Regular Session, § 3 Section 94-c. (ii).

[132] *Id.*

[133] N.C. Gen. Stat. Ann. §§ 143-215.119(a)(13), .121.

[134] N.C. Gen. Stat. Ann. §§ 143-215.121.

[135] N.C. Gen. Stat. Ann. §§ 143-215.119(a)(13).

[136] N.C. Gen. Stat. Ann. §§ 130A-309.240(c),(d).

[137] *Id.* § (c).

[138] *Id.* § (b).

[139] *Id.* § (g).

[140] N.D. Admin. Code 69-09-10.

[141] N.D. Admin. Code 69-09-09.

[142] N.D. Admin. Code 69-09-09-01, 09-06, -10-01, -10-06.

[143] N.D. Admin. Code 69-09-09-02, -10-02.

[144] N.D. Admin. Code 69-09-09-04, -10-04.

[145] N.D. Admin. Code 69-09-09-01, -06, -10-01, -10-06.

[146] N.D. Admin. Code 69-09-09-07, -09-08, -10-07, -10-08.

[147] N.D. Admin. Code 69-09-09-08, -10-08.

[148] Ohio Admin. Code 4906-4-09, (I)(1).

[149] *Id.*

[150] *Id.* (I)(1)(a)-(c).

[151] *Id.* (I)(7).

[152] *Id.*

[153] *Id.*

[154] *Id.* (I)(8).

[155] *Id.* (I)(5).

[156] Okla. Stat. 17- 160.12.

[157] *Id.*

[158] Okla. Stat. § 17-160.14(A).

[159] Okla. Stat. Ann. tit. 17, §§ 160.14, 160.13; Okla. Admin. Code 165:35-45-7.

[160] Okla. Stat. Ann. 17-160.14 (B).

[161] Okla. Admin. Code 165:35-45-7 (b).

[162] Okla. Stat. § 17-160.15 (B).

[163] *Id.* § (A).

[164] *See generally id.*

[165] Or. Rev. Stat. Ann. § 215.446(3)(f).

[166] *Id.* § (4)(c).

[167] Or. Admin. R. 141-140-0095(1).

[168] S.B. 211, 2023 Gen. Assemb., Reg. Sess. (Pa. 2023).

[169] *Id.*

[170] *Id.*

[171] *Id.*

[172] *Id.*

[173] 42 R.I. Gen. Laws Ann. § 42-98-8(a)(6).

[174] 42 R.I. Gen. Laws Ann. § 42-98-3(d).

[175] 880 R.I. Code R. 00-00-4.14(B)(10)(b)(1)-(3).

[176] *Id.* (B)(10)(b).

[177] *Id.*

[178] *Id.* (B)(10)(a).

[179] *Id.* (B)(1).

[180] S.B. 499, 2023 Gen. Assemb., Reg. Sess. (R.I. 2023).

[181] *Id.*

[182] *Id.*

[183] S.D. Admin. R. 20:10:22:33; S.D. Admin. R. 20:10:22:33.01.

[184] S.D. Admin. R. 20:10:22:33.01.

[185] S.D. Codified Laws § 49-41B-39.

[186] *Id.*

[187] Tenn. Code Ann. § 66-9-207(b)(2).

[188] *Id.* § (c).

[189] *Id.* § (c)(1)(A)-(C).

[190] *Id.* § (c)(2)(A)-(H).

[191] Tenn. Code Ann. § 65-17-105(a).

[192] *Id.*

[193] *Id.* § (e)(2)(E).

[194] *Id.* § (e)(2)(F).

[195] *Id.* § (e)(2)(G).

[196] Tenn. Code Ann. § 4-10-116.

[197] *Id.*

[197] TACIR, MANAGING SOLAR ENERGY DEVELOPMENT TO BALANCE PRIVATE PROPERTY RIGHTS AND CONSUMER PROTECTION WITH THE PROTECTION OF LAND AND COMMUNITIES, 6–7 (2023), https://www.tn.gov/content/dam/tn/tacir/2023publications/2023_Solar.pdf.

[197] Tenn. Code Ann. § 4-10-116(d).

[200] Tex. Util. Code Ann. §§ 301.0003, 302.0004.

[201] *Id.*

[202] Tex. Util. Code Ann. §§ 301.0004, 302.0005.

[203] Tex. Util. Code Ann. §§ 301.0002, 302.0003.

[204] Utah Code Ann. § 79-6-407; Utah Code Ann. § 11-13-318.

[205] 18-1 Vt. Code R. § 22c:5.903.

[206] 18-1 Vt. Code R. § 22c:5.904.

[207] Va. Code Ann. § 45.2-1708.

[208] Va. Code Ann. § 15.2-2241.2 (A).

[209] *Id.*

[210] *Id.* § (B).

[211] *Id.*

[212] Wash. Admin. Code 463-68-020.

[213] Wash. Admin. Code 463-72-040 (1).

[214] *Id* (2).

[215] *Id.* (3).

[216] Wash. Admin. Code 463-60-085.

[217] Chapter 70A.510.010 RCW.

[218] W. Va. Code Ann. § 22-32-3, 4.

[219] W. Va. Code Ann. § 22-32-3(b)(1)-(b)(4).

[220] W. Va. Code R. § 60-11-6.

[221] W. Va. Code Ann. § 22-32-4(a)(2)(A).

[222] *Id.* § (h)(1).

[223] *Id.* § (h)(2).

[224] *Id.* § (l).

[225] *Id.* § (a)(2)(A), (i).

[226] W. Va. Code Ann. § 22-32-8.

[227] W. Va. Code R. § 60-11-4.2; W. Va. Code Ann. § 22-32-4(d).

[228] W. Va. Code R. § 60-11-4.3.

[229] W. Va. Code R. § 60-11-4.4.

[230] Wis. Admin. Code PSC § 128.19(1)(a).

[231] *Id.* § (b).

[232] Wis. Stat. Ann. § 196.378(4g)(a)(2).

[233] PSC 128.19(1)(c).

[234] *Id.*(1)(f).

[235] *Id.*(3)(a).

[236] *Id.*(3)(b).

[237] *Id.*(3)(c).

[238] Wyo. Stat. Ann. §§ 18-5-501(a)(ii), (vi).

[239] Wyo. Stat. Ann. § 18-5-503(x).

[240] *Id.*

[241] 020-1 Wyo. Code R. § 1-9, https://www.law.cornell.edu/regulations/wyoming/020-1-Wyo-Code-R- SS-1-9.

[242] *Id.*

[243] Wyo. Stat. Ann. § 35-12-109(a)(xx), (xxi).

[244] *Id.*