



DECOMMISSIONING PLAN GUIDANCE FOR SOLAR, ENERGY STORAGE, AND WIND GENERATING FACILITIES PERMITTED BY THE MINNESOTA PUBLIC UTILITIES COMMISSION

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1 Introduction

Site permits for solar, energy storage, and wind generating facilities issued by the Minnesota Public Utilities Commission (PUC) require permittees to file decommissioning plans prior to construction and to update the plans throughout the operating life of the facility. The intent of the decommissioning plan is to ensure that the site is restored at the end of the facility's useful life, with the costs of the restoration borne by the permittee.

This document is intended to assist project proposers and permittees in developing decommissioning plans for large energy infrastructure facilities that meet relevant site permit conditions and provide the PUC and other interested parties information on how the decommissioning of the facility will be accomplished and paid for. assurance that the costs for decommissioning and site restoration will be borne by each facility's permittee.

This guidance document clarifies:

- Recommended plan content,
- Milestones at which decommissioning plans are reviewed, and
- Review process for decommissioning plans.

While this document is directed toward project owners, the guidance will also clarify the content requirements and review process for interested persons as well as state and local governments participating in the review of large energy infrastructure facilities.

2 Decommissioning Plan Content

Decommissioning plans serve as stand-alone documents, containing sufficient information for any reader, including, but not limited to, PUC commissioners and staff, landowners, local government representatives, and state agencies, to understand basic information about the energy facility and how it will be decommissioned.

While this guidance acknowledges the need for flexibility in the organization of the plan, to ensure consistent treatment of permitted facilities all decommissioning plans should:

- Describe the permitted facility as it exists on the ground,
- Detail the steps required to remove the facility and restore the site at the end of its life,
- Provide a detailed estimate of decommissioning costs, and
- Describe how sufficient funds will be available to accomplish the required decommissioning tasks.

2.1 Cover Sheet

The plan cover should include the project name, docket number(s), and date of plan. In the case of updated plans, the cover should also indicate the date of the plan that is superseded.

2.2 Project Description

The plan should contain a brief description of the project including:

- **Project Description:** A brief narrative describing the project and associated facilities. The description should include nameplate capacity in megawatts (MW), project size in acres, miles of access roads, miles of underground cable, and an anticipated date for decommissioning. Gen-tie lines that connect the facility to the electric grid should be described as part of the facility; if the gen-tie line has its own route permit from the PUC, the docket number for the gen-tie line should be included on the cover and in the description. Depending upon the type of facility, additional information should include:
 - Energy Storage Systems: describe the batteries used, the battery duration, and the total energy capacity in megawatt hours (MWh)
 - Wind Facilities: include the number and model(s) of the turbines used. Describe any battery storage component of the facility.
 - Solar Facilities: include the number and model(s) of panels. Describe any battery storage component of the facility.
- **Location of the facility:** A brief narrative describing the location of the facility including the county, nearby cities, township, range, and sections. The narrative should also include a brief description of surrounding land uses (e.g., cultivated agriculture, industrial uses).
- **Ownership:** A statement of the ownership of the facility including the permittee and, if applicable, the permittee's parent(s).
- **Commercial Operation Date:** The anticipated commercial operation date should be included in the draft and pre-construction plans. Plans filed after the project becomes operational should include the actual commercial operation date and, if applicable, repowering date(s).
- **Facility Map:** A map of the facility, showing the location of facility components, including associated facilities such as electric collector systems, transmission interties, roads, stormwater basins, etc.

2.3 Use of the Generation Output:

The plan should contain a general statement of where the generation will be used. Examples include, but are not limited to:

- Power Purchase Agreement (PPA). For any portion of the output sold through a PPA, the description should include the expiration date of any PPA(s).
- Utility-owned generation portfolio.
- Sold directly into the MISO market

2.4 Decommissioning Objective

The plan should include a clear statement of the objective of decommissioning. Consistent with standard permit language, the objective for most facilities will be to restore the site to its prior use. It is possible that, as the facility matures and surrounding land uses evolve, permittees may seek to restore the site to a different use consistent with surrounding land uses at the time of decommissioning (e.g. industrial, commercial or residential).

2.5 Notification

The plan should include a statement on how the permittee will notify landowners, local governments, and the PUC when decommissioning activities are to begin and when final restoration is complete.

2.6 Decommissioning Tasks and Timing

The plan should include a description of the project components that will be removed, the tasks involved in decommissioning, the sequence of the tasks, end of life management, and restoration of the site. If applicable, the plan should also identify and discuss any site condition improvements required for decommissioning. Staff anticipates that these tasks may change over time as the facility matures and best practices evolve.

2.6.1 Decommissioning Tasks and Schedule

The plan should identify the major project components and describe decommissioning tasks and the overall schedule and sequencing of decommissioning for all components of the facility. The decommissioning plan should include all components of the facility including:

- **Generators and Storage Systems:** wind turbines and foundations, solar modules and racking, batteries, and containers,
- **Associated Facilities:** substations, operating and maintenance buildings, driveways and access roads, electric collector lines (above and below ground), inverters and transformers, fences, and stormwater basins.
- **Transmission Intertie:** The interconnection between the generation or storage facility and the point of interconnection (e.g., gen-tie line, tap line, others) is considered part of the facility for purposes of decommissioning and should be included.
- **Equipment and Temporary Improvements:** The plan should provide a brief discussion of the equipment anticipated to complete decommissioning and associated temporary or permanent infrastructure improvements required for decommissioning. Improvements could include, but are not limited to, crane paths, new or widened access roads, temporary staging or storage areas, new driveways, or temporary access from public roads.

The plan should discuss how the components will be removed from their locations. For example, wind turbines may be broken down at the site (e.g. cranes remove turbine blades, nacelles, and then towers) or may be felled and then broken into smaller components for transport. The plan should also discuss the depth to which components will be removed, consistent with applicable permit conditions.

The plan should also discuss how the facility components will be removed from the site and what kind of intermediate steps are anticipated between removing from the site processing will take place at the site. For example, will components be removed from the site directly (e.g. at the turbine location) or moved to another location for storage pickup. The plan should also discuss whether further processing is required prior to removal from the site.

2.6.2 Site Restoration

The plan should discuss how the permittee will restore the site after decommissioning is complete. Site permits typically require the permittee to restore and reclaim the site to pre-project conditions to the extent feasible within 18 months of termination. In some cases, landowners may wish to retain the established vegetation or may wish to have the site restored to another use. All agreements between the permittee and affected landowners should be submitted to the PUC prior to the completion of restoration activities.

2.6.3 End of Life Management

The plan should discuss how the permittee will ensure that the project components will be removed from the site and will be reused, recycled, or repurposed, to the extent practicable. The plan should identify materials that are hazardous, regulated (e.g., component containing PFAS), or will likely be disposed of in industrial, solid waste, or hazardous waste disposal facilities due to lack of other end of life options.

Staff anticipates that plans for end of life management will evolve over time as the technological and economic landscape for end of life management continues to evolve and mature. While recycling options for materials such as fencing and turbine towers are well developed, reuse and recycling options for solar panels, batteries, and turbine blades are still developing and the market for these opportunities is not yet mature.

The plan should identify where components will be taken after they are removed from the site, whether to a reseller, recycling facility, solid waste or hazardous waste disposal facility. Transportation costs should be included in the cost estimate.

2.7 Detailed Cost Estimate

The plan should include a detailed cost estimate for dismantling and removal of project infrastructure prepared by a knowledgeable independent party. End of life material values and management costs and methods are difficult to predict 20-30 years in the future and other market dynamics can change rapidly. Forecasts for decommissioning costs can identify current conditions but periodic updates inform both the permittee and interested parties of changes in best practices, evolving regulation, technological updates, and market conditions.

- Cost estimates should include both total and net (total costs less the estimated salvage value) costs.
- Cost estimates should be broken down by task (e.g., turbine or solar array dismantling, foundation removal, access road removal, transportation of materials off site, disposal fees, mobilization, removal of stormwater basins, project management).
- Estimated scrap or salvage value should also be broken down by component.
- This estimate should also include a description of cost assumptions (e.g., major equipment needs, labor, costs for reuse/recycling, what type of disposal sites are required for component disposal, depth of removal, scrap value).

2.8 Financial Assurance

As a condition of the site permit issued by the PUC, the facility owner is responsible for paying for the cost of removal of wind and solar generating facilities and site restoration at the end of the facility's operating life. As a business practice, decommissioning costs should be considered a cost of doing business and the impending expense should be planned over the operating life of the facility.

Although the understanding is that facility owners will be setting aside funds for decommissioning as an operating expense or future obligation, unless the facility owner is a regulated utility the PUC does not have access to the owner's financial records. Financial assurance serves as a backup guaranty that the costs of decommissioning are borne by the project owner. To ensure that the financial and logistical responsibility of decommissioning is borne by the facility owner and that landowners, ratepayers, and local taxpayers are protected from financial risk if the project owner does not fulfill its decommissioning obligations, PUC-issued permits for wind and solar generating facilities require permittees to demonstrate financial assurance sufficient to cover the costs of decommissioning.

The plan should include a description of the financial assurance the permittee will provide to ensure that decommissioning costs are borne by the permittee. There are different types of financial assurance instruments. In general, these methods can be divided into two categories:

- (1) fully funded methods (asset depreciation, trust of escrow, and a pooled fund) where funds are set aside over time to pay for the actual decommissioning cost and
- (2) financial instrument methods (letter of credit, surety bond, and a parent or corporate guarantee) where the project owner provides a financial instrument whereby another entity (the bank issuing a LOC, the bond issuer, or the owner's parent) assumes liability for covering the cost of decommissioning if the project owner defaults on its decommissioning obligation.

Based on the recommendation of the Solar and Wind Decommissioning Working Group, staff recommends that permittees establish and begin funding a financial assurance mechanism beginning no later than year 10 of operation with payments increasing to ensure full funding prior to the expiration of the PPA. For projects that do not have a power purchase agreement, staff recommends that decommissioning should be fully funded prior to year 20 of operation.

While a discussion of potential financial assurance mechanisms under consideration by the permittee is acceptable in the draft plan included in the application and in the pre-construction version of the plan, by year 10 of operation, the plan should specify the type, amount, issuer/holder, and beneficiary of the financial assurance. Updating the plans every five years allows for adjustments in the amount of surety and beneficiary.

3 Plan Review Milestones and Process

Decommissioning plans will be reviewed prior to facility construction and throughout the operating life of the facility. Although specific language varies between permits, all permits stipulate the PUC¹ may at any time require the permittee to file information on how it is fulfilling its decommissioning obligation. Permits that are more recent specifically call for review at five-year intervals. With the goal of reviewing all decommissioning

¹ In some older permits, the authority to require these reports lies with the MEQB, the issuer of the permit.

plans on a rolling five (5) year schedule, Staff recommends the following approach depending upon where projects are in their lifespan.

3.1 Application

Applicants should include a draft plan as an appendix with the site permit application for wind or solar facility. The draft plan should include content described in [Section 2](#) of this document. By including a draft version of the plan in the application, the plan is available for public review and comment to ensure that the project decommissioning plan can be considered at the time the PUC is making a final permit decision on the project.

Plan review mechanism: Plans are available for the public and agencies to comment on during comment periods associated with the initial public meeting and the hearing. Staff will comment on the plan's adequacy during the review process, typically through hearing comments. The PUC may, at its own discretion, specifically address the appropriateness of the decommissioning plan in its permit order.

3.2 Pre-construction

Site permits issued by the PUC require the permittee to file an updated plan prior to construction of the permitted facility. The pre-construction version of the plan should address comments on the draft plan and should describe the facility that will be constructed and operated as shown in the site plans. If there are no changes to the project as described in the draft plan and no comments to address, permittees may file a letter in the docket indicating that the draft plan provided in the application meets the requirements of the pre-construction filing. The updated plan or letter should be filed least 14 days prior to a pre-construction meeting.

The pre-construction version of the plan should describe the facility as it will be constructed and operated. To the extent that the final version of the project has changed from the facility described in the application (e.g., changes in acreage, anticipated operating date, use of power user, or other aspects of the facility), changes should be highlighted in the cover letter.

The pre-construction version of the plan should also address comments on the draft plan. To the extent that the revised plan does not incorporate substantive comments, these comments should be briefly addressed in a cover letter.

Plan review mechanism: Permittees file a pre-construction version of the decommissioning plan at least 14 days prior to the pre-construction meeting. As with other required pre-construction filings, staff will review the plan for compliance with the permit and the record prior to the pre-construction meeting. Staff will discuss any outstanding issues (e.g. financial assurance instruments and timeframe) with the permittee at the pre-construction meeting, allowing the permittee an opportunity to update the plan to address any identified issues. After the permittees files notes from the pre-construction meeting and any updated filings, staff will file its review of compliance filings, and recommendation on whether the filings are consistent with the permit.

3.3 5-year updates

Beginning at the commercial operation date, the permittee should update and file the plan every five years. The updates should be filed no later than **December 31** of the calendar year every five years following the

commercial operation date. For example, if the commercial operation date is January 1, 2025, updates should be filed by December 31 of 2030, 2035, 2040, 2045, etc., through the permit expiration date.

Plan review mechanism: After the updated decommissioning plan is filed, PUC staff will file its compliance review. Staff anticipate that updated plans will be brought to the PUC at the time that financial assurance is established and prior to actual decommissioning.

3.4 Project and Ownership Changes

Staff recommends that permittees address decommissioning in filings informing the PUC of ownership changes and petitions for permit transfers, repowering, or permit amendments. Depending upon project changes or changes in organizational structure, a revised decommissioning plan may be appropriate. Ownership changes are common over the course of a facility's operating life through both a direct sale or transfer of the facility or more indirectly through changes in the ownership structure of the facility's parent and owners should be fully aware of their obligations. New owners may prefer different decommissioning strategies or may wish to use a different type of financial assurance.

Staff recommends that permittees review the most current plan prior to informing the PUC to ensure that the information is accurate and that the permittee, or their successor in the event of a change in ownership or ownership structure is aware of its obligations and able to comply with permit requirements. The filing should address the decommissioning plan and, if necessary, include an updated plan.

Plan review mechanism: The PUC may, at its discretion, open a comment period on the decommissioning plan following the initial filing by the permittee. Regardless of whether a public comment period, staff will file comments on the revised plan.