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May 8, 2020

Minnesota Public Utilities Commission  
121 7<sup>th</sup> Place East, Suite 350  
Saint Paul, MN 55101-2147

Comments submitted by e-mail to: [publicadvisor.puc@state.mn.us](mailto:publicadvisor.puc@state.mn.us)

Re: PUC Docket Number(s): E-999/M-17-123  
Public comment period on Department of Commerce Energy Environmental Review and Analysis's (EERA) filing *Recommendations on Review of Solar and Wind Decommissioning Plans* submitted on March 16, 2020. This document was submitted as Document ID 20203-161292-01. Comments due May 8, 2020

To whom it may concern,

The Minnesota Pollution Control Agency is pleased to submit the following comments regarding the *Recommendations on Review of Solar and Wind Decommissioning Plans* [DOC Decommissioning Recommendations].

This document was developed by the Department of Commerce following the 2019 public comment period on the Report and Recommendations of the Department of Commerce Working Group on Decommissioning of Wind and Solar Facilities (August 2018).

The Agency appreciates that the Department of Commerce incorporated many of the Agency's comments on the Working Group Report and Recommendations in the current DOC Decommissioning Recommendations. It is very important to set clear expectations, require thoughtful and thorough planning from the project outset, ensure that decommissioning is fully funded, and ensure environmentally and economically responsible management of the material and energy resources associated with the decommissioning of renewable energy generation facilities.

The Agency supports the recommendation for Decommissioning Plans to be stand-alone documents that contain all of the planning and project information that may be needed by the general public and state and local government to understand what is planned and implemented.

To reiterate our comments from 2019, the Agency believes it is very important to establish clear and detailed criteria, processes, and timelines for permittees and owners to plan, finance, and implement environmentally sustainable decommissioning plans for energy production facilities that are intended to be and are publicly represented and promoted as environmentally sustainable energy production facilities. Reliance on disposal, or failure to recover low to high value materials and embodied energy, is not consistent with the overall societal and technological goals of renewable energy production. The Agency assists Commerce, PUC, and facility owners with recycling, solid waste, and hazardous waste disposal expertise related to operations and decommissioning of energy generation and transmission infrastructure. The Agency also regulates stormwater activities on the site that are associated with construction, operation, decommissioning, and restoration of the site to its original or new intended use. Other organizations, both non-profit and for-profit, can assist with reuse or repurposing of durable goods that are being removed from service in renewable energy installations.

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The Agency, with the assistance of Commerce staff, is currently conducting a stakeholder process to develop recommendations for end of life management of photovoltaic panels and ancillary equipment used in all types and sizes of solar energy installations. The Agency anticipates that the recommendations will result in legislative and regulatory proposals and will also be communicated to the Department of Commerce for inclusion in Commerce's Decommissioning Recommendations as appropriate.

The format of the Agency comments starting on the next page is a numbered list of the Department of Commerce Requests in the Notice of Public Comment Period and an Agency Response to each Request.

If there are questions or a need for additional information regarding these comments, please contact John Gilkeson at 651-757-2391 or [john.gilkeson@state.mn.us](mailto:john.gilkeson@state.mn.us), or Shelly Siewert at 651-757-2723 or [shelly.siewert@state.mn.us](mailto:shelly.siewert@state.mn.us).

Respectfully submitted,

A handwritten signature in blue ink, appearing to read "Tina Patton", with a long horizontal flourish extending to the right.

Tina Patton  
Supervisor, Product Sustainability and Partnerships Unit  
Sustainability and Environmental Assistance Section  
Resource Management and Assistance Division]

PUC/Commerce Requests in Notice of Public Comment Period and Agency Responses

**1. PUC/Commerce Request:**

- Describe any concerns or suggestions about the proposed order and timeline for reviewing open wind and solar dockets.

**MPCA Response:**

The Agency supports the proposed order and timeline for requiring initial and updated decommissioning plans and associated financial assurance requirements. The agency supports the requirement for detailed cost estimates for removal and end of life management of all facility components.

The Agency appreciates that Commerce has highlighted recycling for the permittee's attention in 'Decommissioning Tasks and Timing.' As described below, the Agency supports a more detailed evaluation by the permittee of reuse/repurpose and recycling options for facility components. The vast majority of the components are of durable materials and construction lending themselves to reuse/repurpose, or they are readily recyclable for their materials content. Reuse/repurpose can have a higher value than scrap, and it has the advantage of conserving the embodied energy used to manufacture the specific product.

The Agency recommends the development of a 'facility design and end of life environment and sustainability checklist' for permittees to be included in 'decommissioning tasks and timing' and in the 'detailed cost estimate.' Encourage permittees to design and build wind and solar installations with materials that will be reusable and recyclable at the time of decommissioning. Encourage permittees to specify components that have environmental certifications, for example, EPEAT rated solar panels and RoHS compliant electrical and electronic components.

**2. PUC/Commerce Request:**

- Describe any concerns or suggestions for procedures for reviewing decommissioning plans.

**MPCA Response:**

Given the roles and responsibilities of other state agencies and local units of government in waste/recycling, stormwater management, land use, and other issues associated with facilities and their decommissioning, it may be appropriate to establish a process for interagency/ intergovernmental review of decommissioning plans.

**3. PUC/Commerce Request:**

- Are there any other topics that should be addressed in a decommissioning plan?

**MPCA Response:**

**Project Funding and Salvage Value Estimates:**

The recommendations identify the need and various options for the permittee to fully fund the decommissioning activities before the facility retirement date. The recommendations note the need to fully identify all costs in the plan and also note that the permittee should include the estimated salvage value of materials. The recommendations are silent on whether estimated salvage values can offset the funding set aside for decommissioning. The Agency recommended in September 2019 that estimated salvage values not be allowed to offset any decommissioning funding. We stand by that recommendation now, in the face of a global recession or depression that illustrates the volatility and unpredictability of salvage values. A salvage value offset is an incentive to overestimate salvage value and underfund the project. Salvage value income

should be the bonus of a well planned and executed decommissioning project. Salvage value speculation cannot be the foundation of a plan.

**Battery Energy Storage Systems and Ancillary Equipment:**

Battery energy storage systems may be part of renewable energy generating facilities in the state in the future, if they are not already. These systems have several constituent parts and ancillary systems that will require attention at end of life due to hazardous or otherwise regulated materials. All can be recovered and recycled but further research is needed to provide detailed decommissioning suggestions at this time. The constituent parts and ancillary systems requiring attention are the batteries, temperature management systems and refrigerants, fire suppression systems and chemicals, and electrical and electronic control systems for battery charging and discharging.

**Environmental Checklist:**

Due to the significant material, waste, and other environmental implications of renewable energy facility decommissioning, the Agency recommends the development of an environmental checklist for both facility design and decommissioning that will provide permittees with a framework for planning, funding and carrying out the decommissioning and managing materials in compliance with state requirements and in a sustainable manner. The Agency further recommends that permittees take a 'no-waste' or 'no landfill' approach to decommissioning as a further sign of their commitment to long term sustainable use of resources.

Possible components of an environmental checklist include the following:

**Stormwater permitting:**

Contact the Agency to determine the need for, and to obtain if required, a construction stormwater permit for decommissioning and land restoration activities.

**Solid Waste management and beneficial use:**

Upon decommissioning of a wind turbine, abandonment of any portion of the structure constitutes disposal of a solid waste requiring a permit from the Agency. If a regulated party intends to leave solid waste (any portion of the structure) in place, certain conditions must be met including submittal of a Case-specific Beneficial Use Determination application to the Agency. The Agency will review this application to determine if the proposed management option for the specific solid waste is beneficial use.

**Hazardous Waste/Universal Waste/Electronic Waste (e-waste):**

Solar panels, batteries, and electrical and electronic controls and equipment may be subject to regulation in one or more of these categories under the Resource Conservation and Recovery Act. Universal Waste and e-waste designated for recycling have the most streamlined and least burdensome and least costly regulatory framework.

**Miscellaneous:**

Refrigerants and fire suppression chemicals used in battery energy storage systems are regulated substances and must be recovered and managed properly when a facility is decommissioned.

**Land use:**

Checklist of land use, soil types, drainage, vegetation, elevations, etc. to be considered for restoration to original configuration or modification for other uses or environmental landscape assets. For example, cropland, wetlands, woodland/forest, prairie, public open space, residential or commercial use.

Example checklist for design and management of Wind and Solar generation facility components that can be reused/repurposed or recycled:

Item/material	Reuse/Repurpose	Recycling	Landfill or other disposal may be necessary
Metal fencing	X	X	
Metal PV racking	X	X	
Metal electrical conduit/boxes	X	X	
PVC/other electrical conduit/boxes	Limited	Limited	X
Wiring	Limited	X	
PV panels	X	X e-waste or Universal Waste for recycling	
Inverters, optimizers, transformers, motors, generators, etc.	X	X e-waste or electrical scrap for recycling	
Batteries for energy storage systems	X	X	
Concrete footings and foundations [fencing, racking, towers, etc.]		X	Leaving in place constitutes solid waste disposal
Metal wind towers	?	X	
Wind turbine blades [evaluate for lead, other toxics]	?	In development 2020	X
Composite materials	X	Limited options contact mfr or brokers	X
Asphalt and gravel	X	X	

**Enforcement:**

The Agency recommends that Commerce include any appropriate general or specific enforcement language, which may include statutory or regulatory citations.

**Final Report:**

The Agency recommends that permittees file a final report with the Dept. of Commerce and Agency when decommissioning is complete. The final report would describe whether and how the final decommissioning activities varied from the final plan filed by the permittee and approved by Commerce. The final report would describe the management methods and destination facilities used for the materials removed and managed. The Agency recommends that the report specifically identify the management method and destination facility for PV panels and provide the results of any TCLP analysis carried out on the PV panels. The Agency recommends that the permittee include recommendations for improving the decommissioning planning process and decommissioning project implementation based on the permittee's experience.