



Utility-Scale Solar Projects - Financial Assurance and Decommissioning

Environmental Review Commission
February 7, 2024

NCDEQ Division of Waste Management



Overview of Utility-Scale Solar Projects in North Carolina

- North Carolina is one of the nation's leaders for the number of solar projects supplying power to the electricity grid.
- At the end of 2022, North Carolina had about 6,000 megawatts (MW) of grid-connected solar power capacity from utility-scale solar projects (those over 2 MW AC nameplate capacity).*
- This power is supplied by almost 680 utility-scale solar projects that are capable of generating 2 MW or more.
- These projects are located in 75 of 100 NC counties, and the land is generally leased to the project owner by the landowner.

(*) "Utility-scale solar project" as defined in [NC Session Law \(SL\) 2023-58](#).



Overview

- Based on 5 years of data obtained from the US Energy Information Administration (2018-2022), an average of approximately 40 - 50 utility-scale solar projects are expected to be added in North Carolina per year.
- These projects would provide an additional 500 MW to the grid per year in total.
- Facility capacity is also expected to increase in the future, with more facilities expected to be greater than 5 MW.



Year Utility-Scale Solar Facilities Came Online by Size Range

Year	2 - <5 MW	5 - <20 MW	20 - <50 MW	50 - <70 MW	70 – 100 MW	Total
2011	3	-	-	-	-	3
2012	10	10	-	-	-	20
2013	12	30	2	-	-	44
2014	23	47	3	-	-	73
2015	33	79	8	1	1	122
2016	33	72	2	1	2	110
2017	15	50	4	6	2	77
2018	27	28	1	4	3	63
2019	18	33	2	-	3	56
2020	18	15	3	-	4	40
2021	21	18	2	4	2	47
2022	8	12	2	2	-	24
Total	221	394	29	18	17	679

Solar Panel Decommissioning Legislation

SL 2019-132 (H329) – Eff. July 19, 2019

- The NC Environmental Management Commission and DEQ evaluated the end-of-life management of renewable energy equipment and summarized the evaluation in the January 1, 2021 "Final Report on the Activities Conducted to Establish a Regulatory Program for the Management and Decommissioning of Renewable Energy Equipment."

SL 2021-165 (H951) – Eff. October 7, 2021

- DEQ evaluated options for the decommissioning of utility-scale solar projects and financial assurance and summarized the evaluation in the March 1, 2022 "Plan and Recommendations for Financial Resources for Decommissioning of Utility-Scale Solar Panel Projects."



Solar Panel Decommissioning Legislation

SL 2023-58 (H130) – Eff. June 26, 2023

- Established statutory requirements for the following, effective November 1, 2025:
 - Decommissioning standards/criteria for new and existing utility-scale solar projects (over 2 MW AC only) will apply after the effective date.
 - Existing projects must submit any existing decommissioning plans and financial assurance where previously required by local ordinance or lease agreements by the effective date.
 - New projects must develop/establish and submit decommissioning plans and financial assurance that comply with the statutory requirements after the effective date for submittal to DEQ.
 - Existing projects must have registered with the DEQ by the effective date, including payment of a fee, with updates every 5 years. New projects must begin doing so after the effective date.



Solar Panel Decommissioning Legislation

SL 2023-58 (H130) – Eff. June 26, 2023 (continued)

- Established statutory requirements for the following:
 - Made DEQ the lead agency in administration and enforcement of utility-scale solar project registration, decommissioning, and financial assurance (FA) program for new projects, and for enforcing the new state-level statutory registration and decommissioning requirements for existing projects.
 - Counties would continue to administer/enforce any FA requirements in ordinance for existing projects, and any more stringent decommissioning requirements in ordinance for new and existing projects.
 - Requires reuse or recycling of all components of equipment practicably capable of being recycled.



Solar Panel Decommissioning Legislation

SL 2023-58 (H130) – Eff. June 26, 2023 (continued)

- Established statutory requirements for the following:
 - By August 1, 2025, DEQ must adopt rules to interpret the statutes and provide additional details and clarification, including fees and salvage value.
 - DEQ must include solar panel/project information in annual reports to the NCGA.
 - Beginning July 2024, requires NCUC to provide an annual list of facilities.
- Additional requirements established by the Session Law:
 - Requires quarterly status reporting from DEQ to the NCGA for 2 years.
 - The first quarterly report was submitted to the NCGA prior to December 1, 2023.
 - Requires NCUC to provide lists of existing facilities and to identify existing regulations that may allow recovery of decommissioning costs for existing facilities.

Other State Legislation Involving Solar Panels

SL 2023-137 (H600) – Eff. December 1, 2026

- Encourages recycling and prohibits the disposal of solar panels in construction & demolition or other unlined landfills.

"Photovoltaic modules, or components thereof, not shipped for reuse, are incapable of being recycled, and do not meet the definition of hazardous waste shall be properly disposed of in (i) an industrial landfill or (ii) a municipal solid waste landfill. PV modules that meet the definition of a hazardous waste shall comply with hazardous waste requirements for recycling and disposal, as applicable."



Utility-Scale Solar Management Program



- As a result of SL 2023-58, a new Program has been established under the DEQ Division of Waste Management.
- Webpage:
<https://www.deq.nc.gov/about/divisions/waste-management/utility-scale-solar-management-program>
- Guidance and program information can be found on the webpage.

Utility-Scale Solar Management Program



The Division of Waste Management, Utility-Scale Solar Management Program administers the requirements applicable to utility-scale solar projects as mandated in North Carolina [Session Law \(SL\) 2023-58, Part II and III](#).

North Carolina [Session Law \(SL\) 2023-58](#) requires the owner of a utility-scale solar project capable of generating two (2) or more megawatts (MW) alternating current (AC) that is directly connected to the electrical grid to:

- Properly decommission the project upon cessation of operations and restore the property.
- Register with the North Carolina Department of Environmental Quality (NCDEQ) and pay a fee.
- Submit a decommissioning plan and establish financial assurance for new and rebuilt/expanded utility-scale solar projects.

Additional information on these requirements is provided below.



NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WASTE MANAGEMENT
UTILITY-SCALE SOLAR MANAGEMENT PROGRAM

Utility-Scale Solar Project Decommissioning and Financial Assurance Guidance

North Carolina [Session Law \(SL\) 2023-58](#) requires the owner of a utility-scale solar project capable of generating two (2) or more megawatts (MW) alternating current (AC) that is directly connected to the electrical grid to:

- Properly decommission the project upon cessation of operations and restore the property.
- Register with the North Carolina Department of Environmental Quality (NCDEQ) and pay a fee.
- Submit a decommissioning plan and establish financial assurance for new and rebuilt/expanded utility-scale solar projects.

Who must comply?

Only [utility-scale solar projects](#) capable of generating **2 or more MWAC** that are directly connected to the local or regional electrical grid with the ability to deliver power to the electrical grid must comply with the requirements set forth in [SL 2023-58](#).

- The requirements to [decommission/restore the site](#), to [register](#) with NCDEQ, and [pay a fee](#) apply to existing and new utility-scale solar projects.
- The requirements for submittal of a [decommissioning plan and financial assurance](#) apply to utility-scale solar projects:
 - For which applications for certificates of public convenience and necessity (CPCN) are pending or submitted on or after November 1, 2025 and
 - Generating solar energy or are interconnected to a transmission facility on November 1, 2025, that are rebuilt or expanded after November 1, 2025.

These requirements **do not apply** to utility-scale solar projects smaller than 2 MWAC, or to renewable energy facilities owned or leased by a retail electric customer intended primarily for the customer's own use or to offset the customer's own retail electrical energy consumption at the premises or for net metering.

When is the compliance date?

The requirements become effective **November 1, 2025**.

- The requirements to properly [decommission upon cessation of operation and restoration of the site](#) apply as of November 1, 2025 to existing and new utility-scale solar projects.
- The owner of a utility-scale solar project must [register](#) with NCDEQ, and [pay a fee](#) as follows:
 - By November 1, 2025, or at least 90 days prior to the commencement of construction of the project if the project is to be constructed after November 1, 2025; and
 - At least 90 days prior to commencement of a rebuild or expansion of a utility-scale solar project.
- The owner of a utility-scale solar project must submit a [decommissioning plan and establish financial assurance](#) as follows:
 - By November 1, 2025, or prior to commencement of construction of the project if the project is constructed after November 1, 2025, and
 - Prior to commencement of a rebuild or expansion of a utility-scale solar project.

Rulemaking

DEQ staff are drafting rules to establish:

Criteria to set the amount of financial assurance required for utility-scale solar projects.

Clarification on use of salvage values to offset decommissioning cost.

Requirements and processes for submittal and review of decommissioning plans.

Registration fee structure and requirements.

Federal Rulemaking Effort – Solar Panels as Universal Waste

EPA is in the early stages of a proposed federal rulemaking effort to add solar panels to the federal universal waste regulations.

This effort is expected to improve the recycling and management of end-of-life solar panels.

Read more about this effort on the EPA website:
<https://www.epa.gov/hw/improving-recycling-and-management-renewable-energy-wastes-universal-waste-regulations-solar>

Solar Panel Disposal

- In the report submitted per SL 2019-132 (H329), the Department estimated that approximately 500,000 tons of PV modules were installed at the time (2021).
- Considering that more modules have been added since then and giving a conservative estimate of 1,000,000 tons of PV modules, PV modules would still account for less than 10% of the total tonnage disposed in landfills.
- The PV requirement for recycling and the landfill ban of PV modules provided a better outlook in the market for recycling businesses and encouraged at least one electronics recycling business in NC to choose to expand their facility in NC to take advantage of this expanding market.



Solar Panel Recycling

Powerhouse Recycling in Salisbury, NC has invested in solar panel recycling processing equipment to provide sustainable end-of-life options for the solar industry.

Installed the state's first dedicated solar panel recycling line in 2023, making history as the inaugural facility on the East Coast. Aims to recover 100% of silicon, metals, glass, plastics and aluminum.



Proposed Schedule

Due Date	Action
March 2024	Draft rules ready for stakeholder feedback
	Begin testing online Registration Form, process, database
May 2024	Beginning of 60-day public comment period for rules
July 2024	End of comment period for rules
	NCUC to submit annual list of all projects operating in the state to DEQ
October 2024	Goal for DEQ to adopt rules
December 2024	Rules Review Commission Meeting for approval of rules



Proposed Schedule (continued)

Due Date	Action
January 2025	Goal for Effective Date of Rules
	NCUC Public Staff to submit list of all utility-scale solar projects operating within the State to NCGA
February 2025	Make registration form and payment system live on website
August 2025	Session Law Deadline for DEQ rule adoption
November 2025	All parts of new statutes and Session Law become effective
December 2025	Final Quarterly Report due to ERC and JLC-EP



NCDEQ – Division of Waste Management Contacts

Michael Scott
Division Director

Michael.Scott@deq.nc.gov
919-707-8246

Adam Ulishney
Deputy Director

Adam.Ulishney@deq.nc.gov
919-707-8210

Heather Goldman
Hazardous Waste Section Chief

Heather.Goldman@deq.nc.gov
919-707-8203

Jessica Montie
Environmental Program Consultant
Solid Waste Section

Jessica.Montie@deq.nc.gov
919-707-8247

Jenny Patterson
Environmental Program Consultant
Hazardous Waste Section

Jenny.Patterson@deq.nc.gov
919-270-3124



A large array of solar panels is shown in a field under a clear blue sky. The panels are tilted and arranged in rows, with a grassy field in the foreground and a dirt path or road in the background. The word "Questions?" is written in a white, cursive font across the middle of the image.

Questions?