

Decommissioning of Solar Farms in Georgia

Overview

Over the last decade, the number of solar power projects in Georgia (“solar farms”) has grown substantially. In Georgia Power Company’s (“Georgia Power”) territory alone, by the end of 2022 it is projected that there will be over 4 gigawatts of renewable energy on the grid, enough to power about 450,000 homes.¹ Not only has this growth allowed for Georgia Power to diversify its energy mix and provide long term energy savings to its 2.4 million customers, but it has also provided additional revenue from land leases to rural Georgia landowners and increased land values and ad valorem tax revenues for Georgia counties and cities.

As the growth of solar farms continues, forward-thinking planners and policy makers have raised questions surrounding what will happen at the end of the useful life of these solar farms, and who will be responsible for ensuring that the land is restored to its pre-solar farm condition. The Georgia Public Service Commission (“Commission” or “GPSC”) is providing this update on solar farm decommissioning in response to the request of the Georgia House of Representatives Rural Development Council.

Most solar farms developed in Georgia are located on land leased normally for twenty years with multiple five year options from private landowners. Developers of these projects typically enter into long-term power purchase agreements with Georgia Power which are reviewed and approved by the Commission.* Such agreements do not address the decommissioning of the solar farm at the end of its useful life. This issue is generally addressed by the landowner or by the county in which the property/solar farm is located. The landowner, as part of the land lease agreement, may require that the developer return the property to pre-solar farm conditions.

* Because of the GPSC's involvement in approving solar all over Georgia, there is interest in creating a working group of companies and organizations involved in solar and recycling to create and annually update a strategic plan regarding the recycling of solar panels and solar decommissioning. Georgia has companies like Cox Enterprises and Interface Carpet known industry-wide for their leadership in industrial recycling and their involvement in a working group might generate new ideas and opportunities to better utilize panels than putting them in inert landfills.

The county in which the solar project is located may require a decommissioning plan from the solar developer and in some cases require the developer to maintain decommissioning security. In addition to solar developers, Georgia Power has self-built multiple solar farms on various military sites across the state. The land lease agreements for these projects typically contain a requirement that at the conclusion of the solar farm's useful life Georgia Power will rough grade the solar farm land and return it to a condition substantially the same as that which existed prior to the project, with the exception of trees and/or obstructions that were removed prior to the solar installation.

Legislative and Stakeholder Policy Activity

Several states have passed legislation to provide clarity on the rules governing 'end of life' disposal of solar farms. Most of the current state policies provide guidance for county ordinances and recommend requiring basic decommissioning plans as part of the solar project permit proposal, such as in Virginia and New Jersey. State mandated policies run the risk of discouraging solar development by increasing the costs associated with the development of the project. States such as California and Vermont, with state mandated renewable goals, have enacted strict policies requiring detailed plans and securities. Other states, such as Hawaii and New Jersey, restricted their actions to only protecting agricultural lands. Currently, only eleven states have enacted rules addressing solar decommissioning. Additionally, a variety of non-governmental stakeholders have self-implemented or proposed solar end of life policies.

Multiple states such as Virginia, Nebraska, Oklahoma and Louisiana require a description of decommissioning plans and/or security before a county permit is issued for the site of the future solar farm. New Jersey rules are targeted for agricultural lands which must comply with local ordinances to restore land to its previous productive use. California, Washington, Vermont and Hawaii have more stringent requirements such as proof of financial security, specific disposal plans, or restrictive waste designations raising the costs for the projects. These four states have high renewable energy goals required by a Renewable Portfolio Standard which does not exist in Georgia. These specific state policies, and others, are described fully in Appendix II.

In July 2018, representatives from the Emory Law School, Georgia Institute of Technology, and University of Georgia released a Georgia Model Solar Zoning Ordinance² ("Georgia Model Ordinance") in response to the growth of solar projects being constructed in Georgia. The Georgia

Model Ordinance is intended as a “best practices” guidebook for solar zoning policies from the industry and is provided for informational purposes only. The Georgia Model Ordinance is meant to be tailored to meet the needs of individual county zoning boards and is similar to current regulations in New Jersey, Nebraska, Oklahoma, Louisiana, and Virginia. In fact, the South Georgia Regional Commission (“SGRC”) has drafted a Model Ordinance which requires a decommissioning plan. This requirement should be considered during the adoption of the ordinance by local governments. See Appendix I for the full text of SGRC’s Model Ordinance.

The Georgia Model Ordinance includes an option for counties to require all proposed solar projects to have a decommissioning plan that contains provisions for recycling or otherwise reusing all materials. Specifically the language from the Georgia Model Ordinance states “Unless otherwise approved by the zoning authority, decommissioning should begin no later than 12 months after the solar project has ceased to generate electricity or thermal energy, ...and all panels and structures associated with it shall be removed, all materials recycled or otherwise reused to the extent reasonably practicable, and the property returned to its condition prior to the installation of the project or to some other condition reasonably appropriate for the designated land use.”

As recommended in the Georgia Model Ordinance, recycling is a preferred method of disposition of materials from a solar farm once the solar project reaches the end of its useful life. Solar photovoltaic (“PV”) panels (“solar panels”) have an average life of 30 years; however, projects may be repowered to extend the life of the project. Solar panel recycling as an industry is still growing and learning. Currently, only moderate solar panel waste quantities are created each year due to the infancy of the solar power technology being deployed and the expected life of such projects.

End of Life Disposal Options

Solar panels, depending on their type and condition, may be reused or refurbished to continue generating electricity. Reuse as a building material, such as roofs or walls for agricultural buildings, is a viable option as they are designed for operation in harsh conditions. Undamaged or lightly damaged panels can also be sold in the open market or used as replacement panels for an existing solar farm or to construct smaller solar power projects. These options allow for adaptive reuse of solar panels, keeping them out of landfills.

According to the International Renewable Energy Agency, “The major components of [silicon] panels, including glass, aluminum, and copper, can be recovered at cumulative yields greater than 85% by panel mass through a purely mechanical separation.” Compared to other forms of energy generation, solar panels generate a tiny fraction of the amount of wastes per megawatt-hour.³

Current Federal regulatory policy classifies solar panel waste as ‘solid waste’ under the Resource Conservation and Recovery Act. The Code of Federal Regulations CFR Title 40, Chapter 1, Sub-Chapter I, defines solid wastes and hazardous wastes, but does not specifically list solar panels as a hazardous waste. The hazardous waste categorization is determined according to test Method 1311, Toxicity Characteristic Leaching Procedure (“TCLP”), in which samples are tested to predict their toxic release in a landfill.⁴ To our knowledge, no solar panels in current production are classified as hazardous waste. Panels that contain the most potentially hazardous material, cadmium (in the form of cadmium telluride), do not fail the TCLP test and are simply solid waste.⁵

Most of the materials used in the construction of solar farms consist of common everyday items such as glass, aluminum and plastic, along with a variety of trace metals. Current solar panels do not contain significant quantities of any potentially toxic materials, as clearly defined above. The Solar Energy Industries Association (“SEIA”) has established a Recycling Partner Network to address recycling of solar system components, having processed over 4 million pounds of solar panels and related equipment.⁶ Solar panel recycling has typically been processed in Georgia by existing electronics (“e-waste”) recycling plants.

The e-waste industry self-regulates through the R2 (Responsible Recycling) program administered by Sustainable Electronics Recycling International, “a nonprofit organization dedicated to advancing safe and sustainable reuse and recycling of used electronics through consensus-driven standards.”⁷ Many well established R2 certified processors exist within the State of Georgia, with decades of experience handling challenging materials. Most of the electrical components of the system, which convey the electricity from the solar panels to the electric grid, can be recycled through in-state R2 certified e-waste recyclers. The metal racking systems which hold the solar panels in place can either be reused with newer solar power technology or recycled.

The use of in-state R2 certified recyclers for the decommissioning of solar farms could improve the efficiency of the process by using a single vendor for all materials thereby lowering

transportation and logistics costs. Their expertise in handling of similar materials helps maximize the recovery of valuable commodities and minimizes landfill costs for non-toxic materials that are not economical to recover, while protecting the environment. These companies can handle both the panels and all the associated electronics.

If options such as recycling and/or refurbishing are not feasible, solar panels and other solar farm waste may be placed into landfills. This is currently the most economical disposal method of solar panels. Municipal Solid Waste permitted landfill fees average less than \$50/ton in Georgia resulting in disposal fees of less than \$1/panel.⁸ This is a statewide number and the cost for South Georgia may differ. Lower costs may be achieved by using Construction and Demolition landfills.

Conclusion

As solar farms continue to expand across Georgia, developing a sensible plan to address the end of life issues rural Georgia landowners may experience is important. Ensuring landowners that the land itself will be restored to pre-installation conditions is a logical requirement for large solar installations. With guidance from the Georgia Model Ordinance, rural counties can draft an ordinance that best addresses solar decommissioning locally. They can also determine what requirements, such as the development of decommissioning plans, must be met prior to the approval of the solar project. Enacting strict state-wide requirements will not benefit landowners and local communities who want to maximize the benefits of hosting solar farms. Georgia is well positioned to recycle and dispose of solar materials with existing infrastructure. As the quantity of materials increase, a coordinated state-wide effort may be helpful to ensure best management practices but as of today the current number of solar plants reaching their end-of-life is minimal.

Works Cited

1. <https://www.seia.org/initiatives/whats-megawatt>
2. http://www.energy.gatech.edu/sites/default/files/documents/2018-07-30_final_model_solar_ordinance.pdf
3. <https://www.irena.org/publications/2016/Jun/End-of-life-management-Solar-Photovoltaic-Panels>
4. <https://www.epa.gov/hw/final-rule-2018-definition-solid-waste-dsw-response-court-vacatur>
5. <https://www.nrel.gov/docs/fy03osti/33561.pdf>
6. <https://www.seia.org/initiatives/recycling-end-life-considerations-photovoltaics>
7. <https://sustainableelectronics.org/>
8. <https://erefdn.org/product/analysis-msw-landfill-tipping-fees-2/>

Appendix I: SGRC Model Solar Energy Systems Ordinance

SOUTHERN GEORGIA REGIONAL COMMISSION

**MODEL ORDINANCE
FOR THE DEVELOPMENT OF
SOLAR ENERGY SYSTEMS
AND SOLAR ENERGY FACILITIES**

RESOLUTION

**ORDINANCE No. _____
PROVIDING REGULATIONS FOR
RESIDENTIAL AND NON-RESIDENTIAL
SOLAR ENERGY SYSTEMS
AND SOLAR ENERGY FACILITIES**

WHEREAS, [local government] is permitted by Georgia state law to exercise zoning powers, pursuant to Title 36, Chapter 66, Official Code of Georgia Annotated, as amended;

NOW, THEREFORE, BE IT ORDAINED that the [Mayor and Council/Board of County Commissioners] of [local government] hereby adopts the following provisions:

**Chapter/Article/Division _____
RESIDENTIAL AND NON-RESIDENTIAL
SOLAR ENERGY SYSTEMS AND SOLAR ENERGY PRODUCTION FACILITIES**

1. Purpose

An ordinance of [local government], providing definitions relating to solar energy systems and solar energy production facilities, and standards to guide the development of solar energy systems and facilities in order to protect the public health, safety, and welfare and avoid significant impacts on resources and adjacent uses.

By enacting this ordinance it is the intent of [local government] to:

1. Encourage the use of existing buildings for the placement of solar energy systems;
2. Encourage the location of solar energy production facilities, to the extent possible, in areas where any potential adverse impacts on the community will be minimized;
3. Encourage the utilization of established public infrastructure for the development of solar energy systems and solar energy production facilities.

2. Definitions

Accessory Structure: A detached, permanent or semi-permanent subordinate structure, measuring [____] feet or more on one side, located on the same lot as the principal structure or use.

Accessory Use: A use customarily incidental and subordinate to the primary use of a property and located on the same lot.

Administrative Approval: Zoning approval that the Zoning Administrator or designee is authorized to grant after administrative review.

Administrative Review: Non-discretionary evaluation of an application by the Zoning Administrator. This process is not subject to a public hearing.

International Building Code (IBC): A model building code developed by the International Code Council. It has been adopted for use as a base code standard by most jurisdictions in the United States.

International Residential Code (IRC): Part of the International Building Code (IBC), the IRC sets buildings standards for residential structures.

Inverter: A device that converts Direct Current (DC) electricity into usable Alternating Current (AC) electricity for transmission to the power grid.

Mechanical Equipment: All items not listed in these definitions that are directly related to construction and operation of a solar energy system or facility including, but not limited to, onsite transmission lines, pumps, batteries, inverters, mounting brackets, framing, foundations or other structures, etc.

National Electric Code (NEC): A regionally adoptable standard for the safe installation of electrical wiring and equipment. It is developed by the National Fire Protection Association and is typically adopted by states and municipalities, sometimes with amendments, in an effort to standardize their enforcement of safe electrical practices.

Planning Commission: An appointed body that delivers recommendations to the local government regarding land use and development decisions.

Power grid: An interconnected network for delivering electricity from producers to consumers. In a power grid, generating stations produce electric power, which is then sent through a substation in order to adjust the voltage. The power is then sent from the substation to high-voltage transmission lines. From there, distribution lines provide power to individual consumers. In some cases, customers can receive a payment or credit for surplus electricity that is generated by their solar energy system and fed into the grid.

Setback: The area between the boundary of a land parcel and the part of the land parcel in which primary and accessory buildings may be constructed, as specified in the applicable local government regulations.

Solar Energy: Radiant energy (i.e., light) received from the sun that can be collected by solar panels and converted into electricity in a solar energy system or solar energy production facility.

Solar Energy Production Facility, also known as Solar Farm: A utility-scale facility for the collection and distribution of solar energy. These facilities are generally more than two acres in size and have capacities in excess of one megawatt. These facilities are typically connected to the local utility power grid in order to supply electricity to the grid and power multiple properties.

Solar Energy System: A system for converting solar energy into electricity, typically for on-site consumption.

Solar Energy System, Building-Integrated: A solar energy system that is built into, rather than installed onto, a structure.

Solar Energy System, Building-Mounted: A solar energy system that is added onto an existing structure, with solar panels typically located on the roof. Roof-mounted solar energy systems fall within this category.

Solar Energy System, Ground-Mounted: A solar energy system that is installed on the ground and is not attached or affixed to any structure.

Solar Panel: A device for the direct conversion of sunlight into electric power.

Substation: A set of equipment for converting the high-voltage electricity produced by a power plant or solar energy production facility into a voltage suitable for supply to consumers.

3. Applicability

3.1. This ordinance shall apply to all solar energy systems and solar energy production facilities (solar farms) installed, constructed, or modified or expanded in such a way that the footprint or height of the system is increased, after the effective date of this Ordinance.

3.2. Solar energy systems and solar energy production facilities (solar farms) constructed prior to the effective date of this ordinance shall not be required to meet the requirements of this ordinance.

- 3.3.** All solar energy systems and solar energy production facilities (solar farms) shall be designed, erected, and installed in accordance with all applicable local, state, utility, and national codes, regulations, and standards.

4. General Requirements for Solar Energy Systems

- 4.1.** Solar energy systems may not be connected to any electric utility grid without the approval of the applicable electric utility. Off-grid solar energy systems shall be exempt from this requirement.
- 4.2.** If solar storage batteries are included as part of the solar energy system, they must be installed according to all requirements set forth in the National Electric Code and State Fire Code when in operation. When no longer in operation, the batteries shall be disposed of in accordance with all local, state, and federal laws and regulations.
- 4.3.** Prior to operation, electrical connections must be inspected by an appropriate electrical inspection person or agency, as determined by the local government.
- 4.4.** Unless otherwise specified through a contract or agreement, the property owner of record will be presumed to be the responsible party for owning and maintaining the solar energy system. Decommissioning will be the responsibility of the owner unless otherwise specified.
- 4.5.** The design of the solar energy system shall conform to applicable local, state, and national solar codes and standards, and to all local government regulations. All design and installation work shall comply with all applicable provisions in the National Electric Code (NEC), the International Residential Code (IRC), International Commercial Building Code, State Fire Code, and any additional requirements set forth by the local utility (for any grid-connected solar systems) or by the local government.
- 4.6.** All applicable building permits shall be secured prior to beginning construction of a solar energy system. No solar energy systems may be installed that cannot be safely supported by the existing roof structure.
- 4.7.** All solar energy systems shall comply with the local Floodplain Management Ordinance, as applicable.
- 4.8.** Components of solar energy systems are not exempt from height requirements.
- 4.9.** Solar energy systems located in historic districts shall not be constructed without prior approval, as applicable, from the appropriate governing body.

5. Specific Requirements for Solar Energy Systems

5.1. Building-Mounted Systems

A building-mounted solar energy system shall be subject to the following regulations:

- i. No solar energy system shall be mounted or affixed to any freestanding wall or fence.
- ii. A building-mounted, on-roof system shall not extend beyond the edge of the roof.
- iii. Solar panels installed on a building with a sloped roof shall not project vertically more than 4 feet above the roof surface, ridge line, or highest point of the roof.
- iv. Solar panels installed on a building with a flat roof shall not extend more than 4 feet above the highest point of the roofline.

5.2. Ground-Mounted Systems

A ground-mounted solar energy system shall be subject to the following regulations:

- i. Ground-mounted components shall not be located in the required setbacks of the underlying zoning district.
- ii. Ground-mounted solar energy systems shall not be located in the floodway.
- iii. In the case of double frontage lots, ground-mounted components shall observe front yard requirements on both street frontages wherever there are any principal buildings fronting on said streets in the same block or adjacent blocks.
- iv. The height of ground-mounted solar energy panels shall not exceed sixteen (16) feet above the ground, as measured from the point (on the ground) directly below the panel, when tilted at the highest aspect.
- v. The area of solar components and accessory structures in the aggregate shall not exceed the ground floor area of the principal building for residential uses; for commercial uses, the aggregate may not exceed the lot coverage for the underlying zoning district. Areas zoned for agriculture or manufacturing are exempt from this requirement, but must meet the required setbacks of the district. Solar canopies covering permanent parking are exempt from this section but must meet the required setbacks of the district.
- vi. Mechanical equipment and components of solar systems shall be screened from adjacent residential uses. The screen shall consist of shrubbery, trees, or other non-invasive plant species which provide a visual screen with a mature height of at least 6 feet. In lieu of a planting screen, an opaque fence may be used. The installed screen shall be maintained for the life of the usage of the ground-

mounted system. Maintenance of the screening shall be the responsibility of the owner or operator of the system.

6. Requirements for Solar Energy Production Facilities (Solar Farms)

- 6.1.** Sections 4.1 – 4.4 of this Ordinance shall also apply to Solar Energy Production Facilities.
- 6.2.** Solar Energy Production Facilities as a principal use shall be permitted by Special Exception in the following Zoning Districts: _____ (not in Residential districts), provided that requirements of this ordinance are met. The Standards for Special Exception Review, per Section _____ of the Zoning Ordinance, shall apply. The local government shall not take final action on the application until it has received a recommendation from the Planning Commission.
- 6.3.** The design of the solar energy production facility shall conform to applicable local, state, and national solar codes and standards, and to all local government regulations. All design and installation work shall comply with all applicable provisions in the National Electric Code (NEC), the International Residential Code (IRC), International Commercial Building Code, State Fire Code, and any additional requirements set forth by the local utility (for grid-connected solar energy production facilities) or by the local government.
- 6.4.** All applicable building permits shall be secured prior to beginning construction of a solar energy production facility.
- 6.5.** Onsite power lines and interconnections shall be placed underground, to the greatest extent possible.
- 6.6.** A solar energy production facility connected to the utility grid shall provide evidence from the applicable electric utility acknowledging the solar energy production facility will be interconnected to the utility grid in order to sell electricity to the utility.
- 6.7.** Solar energy production facilities shall not be permitted in the floodway. All solar energy production facilities shall comply with the local Floodplain Management Ordinance, as applicable.
- 6.8.** Minimum Lot Size: The minimum lot size for a solar energy production facility (solar farm) as a principal use is _____ acres.
- 6.9.** Setbacks: Solar energy production facilities shall have a minimum setback of the underlying zoning district. Power inverters, transformers, and other related equipment related to the inversion of power shall have a setback of 50 feet from all property lines.
- 6.10.** Height of collector: The height of ground-mounted collectors and mounts shall not exceed 20 feet in height. Components of solar energy production facilities are not exempt from height requirements.

- 6.11.** Airports: Any solar energy production facility proposed within a 2-mile radius of an airport shall present evidence that they have gone through a review process with the Federal Aviation Administration (FAA). This review from the FAA shall indicate that the proposed facility shall not interfere with the normal operation of aircraft in the area.
- 6.12.** Fencing: A security fence of chain link or similar material at a minimum height of 6 feet with a gate and locking mechanism shall enclose the perimeter of the solar energy production facility to deny access to any individuals not authorized to be on the property and for public safety. Signage should be included on the property alerting individuals to the risk from high voltage on the site.
- 6.13.** Buffer: Areas that abut residentially zoned or residential uses shall be buffered by at least one of the following:
- i. A double row of off-set evergreens absent mature vegetation, installed at a height of five (5) feet achieving opaqueness at time of installation and a minimum height of 10 feet in 5 years.
 - ii. On-site mature vegetation existing at a minimum height of 10 feet and a depth of 75 feet between the on-site security fence and adjacent properties or right-of-way.
 - iii. A single row of evergreens in combination with mature vegetation installed at a height of 5 feet achieving opaqueness and a minimum height of 10 feet in 5 years.
 - iv. The above requirement may be met by existing vegetation subject to administrative approval, as long as sufficient opaqueness and the required height are achieved.
 - v. Maintenance of the buffer shall be the responsibility of the property owner.
- 6.14.** Decommissioning: The application to establish a solar energy production facility must include a decommissioning plan, containing the following:
- i. The name, address, telephone number, and e-mail address of the person(s) or entity(ies) responsible for implementing the decommissioning plan;
 - ii. A statement of conditions that require the decommissioning plan to be implemented;
 - iii. Identification of all components of the solar energy production facility;
 - iv. A plan with timeline for removing all components of the solar energy production facility from the property in the event of decommissioning;
 - v. A plan for recycling or otherwise reusing all components to the greatest extent practicable.

7. Abandonment and removal

- 7.1.** If a ground-mounted solar energy system is removed, any earth disturbance as a result of the removal shall be landscaped in accordance with local regulations.
- 7.2.** A solar energy system or solar energy production facility is considered to be abandoned if it has not been in operation for a period of twelve (12) months or for the time period specified in the decommissioning plan. If abandoned, the system or facility shall be repaired by the owner to meet federal, state, and local safety standards, or be removed by the owner within a period of twelve (12) months or within the time period specified in the decommissioning plan. If the owner fails to remove or repair the abandoned system or facility, the local government may pursue a legal action to have the system or facility removed at the owner's expense.
- 7.3** If a solar energy system or facility is removed, all components shall be recycled or reused to the greatest extent practicable.

8. Application and Approval

- 8.1** Solar Energy Systems shall be permitted as an accessory use in the following Zoning Districts: _____, provided that the requirements of this ordinance are met and Administrative Approval or Approval with Conditions is granted by the Zoning Administrator. An application for a Solar Energy System as an accessory use shall include the following:
- i. A site plan illustrating the location of principal building, accessory structures, and proposed location of solar panels.
 - ii. An elevation sketch illustrating the height and orientation of ground-mounted components, or profile of any roof-mounted solar panels

9. Appeals

- 9.1.** If the owner of a solar energy system is found to be in violation of the provisions of this Ordinance, appeals should be made in accordance with the established procedures of the local government code.

10. Effectiveness, Interpretation, Separability

- 10.1.** This ordinance shall become effective immediately upon its adoption.
- 10.2.** All other portions, parts and provisions of the Zoning Ordinance of [local government], as heretofore enacted and amended, shall remain in force and effect.
- 10.3.** All Ordinances, or parts of Ordinances, in conflict herewith are repealed.
- 10.4.** If any part of this ordinance conflicts with any other applicable federal, state, or local regulation, the more restrictive regulation shall control.
- 10.5.** If any section, clause, portion or provision of this ordinance is found unconstitutional, such invalidity shall not affect any other portion of this ordinance.

Appendix II: State Solar Decommissioning Policies

State	Details	Governing Body	Law
California	The Department of Toxic Substances Control adopted regulations to designate end-of-life PV modules that are hazardous wastes as a universal waste allowing for management standards in California Codes of Regulations to apply to solar panels. This designation differentiates solar panels from other electronics and allows the panels to be disposed by many more facilities commensurate with their low risks. The California Legislature allows for county and city governments, if deemed necessary to ensure that decommissioning requirements are met, the provision for financial assurances, such as performance bonds, letters of credit, a corporate guarantee, or other securities to fund, upon the cessation of the solar PV use, the restoration of the land that is subject to the easement to the conditions that existed before the approval or acceptance of that easement by the time that the easement terminates.	Department of Toxic Substances Control	California Health and Safety Code - 25259 California Law - 51191.3
Hawaii	Class B and C Agricultural Lands are required to have proof of financial security to decommission the project to the satisfaction of the county planning commission and to be decommissioned at the owner's expense including all equipment within twelve months of the conclusion of the facility's useful life and to restore the property to substantially the same physical condition as existed prior to the solar facility development.	Hawaii State Legislature	HRS 205-4.5
Louisiana	Solar facilities on state-owned land require decommissioning plans for permitting.	Louisiana Legislature	LAC 43:V.921
Massachusetts	Provides guidance for local ordinances.	Dep. of Energy Resources and Environmental Protection	
Nebraska	Solar facilities are required to have a description of any decommissioning security and local requirements before a permit is issued for the site.	Nebraska Legislature	Statute 66-911.01
New Hampshire	All facilities larger than 30 MW are required to have a decommissioning plan and financial assurances to apply for a certificate to operate.	New Hampshire Legislature	162-H
New Jersey	For agricultural lands, bill 2:76-2A.12 requires decommissioning to comply with local ordinances and in accordance with a conservation plan requiring the land to be restored to achieve as much agricultural productivity of the soil as practicable. For Pinelands management areas, bill 7:50-5.36 requires within 12 months of cessation of its utilization removal of all facilities, restoration in accordance with local ordinance, and any other measure necessary to address ecological and visual impacts.	New Jersey Legislature	2:76-2A.12 7:50-5.36
New York	Proposed legislation in 2019 called the "Solar Panel Collection Act". The act did not move forward in 2020. The act requires panel manufacturers to track panels and ensure safe disposal or recycling and determine their need for hazardous waste disposal. Wholesalers and retailers are restricted to sell only panels that comply with decommissioning standards. The panels cannot be commingled with standard solid waste or recyclable materials and must be sent to a facility that can properly dispose or recycle the panels.	NY State Assembly Bill	S00942
North Carolina	Law 2019-132 requires the Environmental Management Commission to establish a regulatory program by January 1, 2022 to govern the management of end-of-life photovoltaic modules and decommissioning of utility-scale solar projects. The act established a stakeholder process and quarterly reports and a final report with progress, findings, and recommendations.	General Assembly of North Carolina Session law	2019-132
Oklahoma	Solar facilities are required to have a description of any decommissioning security before a permit is issued for the site.	Oklahoma Legislature	60-820.1
Vermont	All facilities must be removed when no longer in service. Non-utility owned facilities larger than 500 kW are required to provide cost estimates and proof of credit for decommissioning.	Vermont PUC	Rule 5.900: pursuant to 30 VSA 248
Virginia	Signed in 2019. As part of the local legislative approval process or as a condition of approval of a site plan, any locality shall require an owner, lessee, or developer of real property subject to this section to enter into a written agreement to decommission solar energy equipment, facilities, or devices to (i) allow access to panels without further consent and (ii) such owner, lessee, or developer provides financial assurance of decommissioning less net salvage value plus reasonable administrative costs. No requirements for the method of disposal or recycling were imposed. Counties have a variety of policies for solar decommissioning, SolUnesco has a paper detailing such policies.	Virginia State Code	15.2-2241.2
Washington	Chapter 463-72 WAC requires a solar facility to develop a plan for site restoration in sufficient detail to identify, evaluate, and resolve all major environmental and public health and safety issues anticipated and prove the ability to fund the decommissioning. Chapter 70-355 RCW requires that a convenient, safe, and environmentally sound system for the recycling of photovoltaic modules, minimization of hazardous waste, and recovery of commercially valuable materials must be established. Also, the responsibility for this system must be shared among all stakeholders, with manufacturers financing the takeback and recycling system. By January 1, 2021 all manufacturers are required to comply with this order.	Washington State Legislature	463-72 and 70.355 RCW
All others	No current state policy		