South Carolina Department of Health and Environmental Control

Dr. Edward D. Simmer
Director

1st Quarterly Report on the Activities Conducted to Establish a Regulatory Program for End-of-Life Management of Photovoltaic Modules and Energy Storage Systems

Pursuant to R-116, H.4100, the Fiscal Year 2021-2022 General Appropriations Act, Part 1B, Section 34, Proviso 34.62

September 30, 2021

TO: Chairman of the Senate Judiciary Committee
Chairman of the House Labor, Commerce and Industry Committee

FROM: Dr. Edward D. Simmer, Director
S.C. Department of Health and Environmental Control

DATE: September 30, 2021

SUBJECT: Photovoltaic Modules and Energy Storage Systems

Enclosed is the 1st Quarterly Report on the Activities Conducted to Establish a Regulatory Program for End-of-Life Management of Photovoltaic Modules and Energy Storage Systems Pursuant to R-116, H.4100, the Fiscal Year 2021-2022 General Appropriations Act, Part 1B, Section 34, Proviso 34.62

Quarterly Report on the Activities Conducted to Establish a Program for End-of-Life Management of Photovoltaic Modules and Energy Storage Systems

I. Executive Summary

Pursuant to R-116, H.4100, the Fiscal Year 2021-2022 General Appropriations Act, Part 1B, Section 34, Proviso 34.62, the Department of Health and Environmental Control must submit quarterly interim reports to the Chairman of the Senate Judiciary Committee and the Chairman of the House Labor, Commerce and Industry Committee, concerning implementation of the proviso. These reports are to detail the activities of the Department, including initiation of a stakeholder process, updates on the development of rules governing end-of-life solar panels and energy storage systems, and recommendations for financial assurance requirements for the decommissioning of utility-scale solar projects. This report details the activities of the first quarter, July 1, 2021 to September 30, 2021.

II. Matters Entrusted to the Department:

Pursuant to Budget Proviso 34.62, the Department is to consider six matters when developing regulations for the managing of solar panels and energy battery systems and the decommissioning of utility-scale solar projects. The Department is directed to collaborate with stakeholders to consider:

1. Whether photovoltaic modules, energy storage system batteries, their materials, or other equipment used in utility-scale solar projects exhibit any of the characteristics of hazardous waste, as identified in 40 C.F.R. Part 261, or under rules adopted pursuant to the S.C. Hazardous Waste Management Act, Section 44-56-10 of the 1976 Code, or if any such equipment is properly characterized as solid waste under State and Federal law.

2. Preferred methods to responsibly manage end-of-life photovoltaic modules, energy storage system batteries, or the constituent materials thereof, or other equipment used in utility-scale solar projects, including the extent to which such equipment may be:

(a) reused, if not damaged or in need of repair, for a similar purpose;

(b) refurbished, if not substantially damaged, and reused for a similar purpose;

(c) recycled with recovery of materials for similar or other purposes;

(d) safely disposed of in construction and demolition or municipal solid waste landfills for material that does not exhibit any of the characteristics of hazardous waste under state or federal law; or

(e) safely disposed of in accordance with state and federal requirements governing hazardous waste for materials that exhibit any of the characteristics of hazardous waste under state or federal law.

3. The volume of photovoltaic modules and energy storage system batteries currently in use in the State, and projections, based upon the data on life cycle identified currently on impacts that may be expected to the State's landfill capacity if landfill disposal is permitted for such equipment at end-of-life.

4. Whether adequate financial assurance requirements are necessary to ensure proper decommissioning of solar projects in excess of thirteen acres upon cessation of operations.

5. Infrastructure that may be needed to develop a practical, effective, and cost-effective means to collect and transport end-of-life photovoltaic modules, energy storage system batteries, and other equipment used in utility-scale solar projects for reuse, refurbishment, recycling, or disposal.

6. Whether or not manufacturer or installer stewardship programs for the recycling of end-of-life photovoltaic modules and energy storage system batteries should be established for applications other than utility-scale solar project installations, and if so, fees that should be established for these manufacturers and installers to support the implementation of such requirements.

III. DHEC Report of Activities

To initiate a regulation development process, the Department published a Notice of Drafting in the July 23, 2021, edition of the *State Register*, which can be seen in the appendix of this report.

The Department has commenced researching possible hazardous waste characteristics of photovoltaic modules, preferred methods for end-of-life management, the volume of photovoltaic voltaic modules in the state and projections about their impact on the State's landfill capacity, financial assurance requirements, and potentially required infrastructure to collect and transport the relevant products.

The Department has assembled a stakeholder group and convened its members for two meetings to discuss the development of rules for managing end-of-life photovoltaic modules and storage battery systems and decommissioning requirements for solar farms.

The Department created a webpage to provide detailed and relevant information to the public on the work of this stakeholder group, which can be seen at: **https://scdhec.gov/environment/land-management/solar-panel-stakeholder-group**.

Stakeholder Group

The following governmental, private, and not-for-profit groups were invited to participate in the stakeholder process initiated to help fulfill the requirements of Budget Proviso 34.62. The Department solicited stakeholder's feedback to broaden and include participation from all potentially interested parties.

Parker Poe	SC Department of Consumer Affairs
SC Office of Regulatory Staff	SC Coastal Conservation League
Conservation Voters of SC	NP/Waste Management
SC Association of Counties	Solar Energy Industries Association
SC Municipal Association	SC Department of Commerce
Dominion	SC Recyclers Association
Duke Energy	Dynamic Lifecycle Innovations
Santee Cooper	SC SWANA/ HDR Inc.
Electric Cooperatives of SC	Capcon

Southern Alliance for Clean Energy	SC Department of Agriculture
Sunstore	Carolinas Clean Energy Business Alliance
Southern Current	Pinegate Renewables
Gregory Electric	Cleanlites Recycling
Richland County	Cypress Creek Renewables
Newberry County	U.S. Department of Agriculture

Materials Gathered

1. ORS provided the Department with links to articles and information from their past research into solar energy.

2. Pinegate Renewables held a video conference with staff to answer some of the Department's questions about how solar companies and their devices operate.

3. The Solar Energy Industries Association's (SEIS) website provided useful background information on solar energy in the state.

4. The South Carolina Energy Office, located in the ORS, submitted a spreadsheet which listed current counties and municipalities with ordinances and regulations regarding solar panels.

5. Department staff conducted research on ordinances, regulations, and best management practices used in municipalities, counties and states for the management of end-of-life photovoltaic modules and their decommissioning requirements.

6. The U.S. Energy Information Administration provided the Department a list of existing solar facilities in South Carolina that are either grid-connected or have a capacity of 1 MW or greater.

Meetings Held

1. The first Solar Panel Stakeholder Workgroup Meeting was held on August 4, 2021. Representatives from the Department, solar panel manufacturers, developers, and recyclers, energy producers, environmental organizations, other government participants and other interested parties were in attendance. This discussion provided a background of solar energy in South Carolina, the matters the stakeholder group is entrusted with considering, and a brief introduction of the various stakeholders invited to participate in the process.

2. The second Solar Panel Stakeholder Workgroup Meeting was held on September 14, 2021. Discussion was primarily focused on decommissioning requirements for large-scale solar projects and whether financial assurance requirements are necessary to ensure proper cessation of operations. Representatives from solar leasing companies, local governments, energy providers and other organizations offered their own experiences with the matter.

Upcoming Activities

The Department is planning to convene stakeholder meetings on a regular basis throughout 2021 to assist the Department in developing rules to manage end-of-life photovoltaic modules and storage battery systems and decommissioning large solar energy projects. The next stakeholder meeting is tentatively scheduled for October 20. Pursuant to Budget Proviso 34.62, the next report will be submitted on or before December 31, 2021.

IV. Appendix

1. PDF of Budget Proviso 34.62

2. Notice of Drafting

3. PowerPoint Presentation from August 4

4. PowerPoint Presentation from September 14

34.62. (DHEC: Solar Projects) From the funds appropriated to the Department of Health and Environmental Control, and within one hundred and twenty days after the effective date of this act, the department shall submit regulations to guide all South Carolinians invested in, selling, installing, and using photovoltaic modules and energy storage system batteries in the management of end-of-life photovoltaic modules and energy storage system batteries on solar projects and the decommissioning of solar projects in excess of thirteen acres. Management of end-of-life photovoltaic modules and energy storage system batteries shall include both partial refurbishing of a solar project and complete decommissioning. In the development of these rules, the department shall collaborate with stakeholders and shall consider all of the following matters:

(1) Whether photovoltaic modules, energy storage system batteries, their materials, or other equipment used in utility-scale solar projects exhibit any of the characteristics of hazardous waste, as identified in 40 C.F.R. Part 261, or under rules adopted pursuant to the S.C. Hazardous Waste Management Act, Section 44-56-10 of the 1976 Code, or if any such equipment is properly characterized as solid waste under State and Federal law.

(2) Preferred methods to responsibly manage end-of-life photovoltaic modules, energy storage system batteries, or the constituent materials thereof, or other equipment used in utility-scale solar projects, including the extent to which such equipment may be:

(a) reused, if not damaged or in need of repair, for a similar purpose;

(b) refurbished, if not substantially damaged, and reused for a similar purpose;

(c) recycled with recovery of materials for similar or other purposes;

(d) safely disposed of in construction and demolition or municipal solid waste landfills for material that does not exhibit any of the characteristics of hazardous waste under state or federal law; or

(e) safely disposed of in accordance with state and federal requirements governing hazardous waste for materials that exhibit any of the characteristics of hazardous waste under state or federal law.

(3) The volume of photovoltaic modules and energy storage system batteries currently in use in the State, and projections, based upon the data on life cycle identified currently on impacts that may be expected to the State's landfill capacity if landfill disposal is permitted for such equipment at end-of-life.

(4) Whether or not adequate financial assurance requirements are necessary to ensure proper decommissioning of solar projects in excess of thirteen acres upon cessation of operations.

(5) Infrastructure that may be needed to develop a practical, effective, and cost-effective means to collect and transport end-of-life photovoltaic modules, energy storage system batteries, and other equipment used in utility-scale solar projects for reuse, refurbishment, recycling, or disposal.

(6) Whether or not manufacturer or installer stewardship programs for the recycling of end-of-life photovoltaic modules and energy storage system batteries should be established for applications other than utility-scale solar project installations, and if so, fees that should be established for these manufacturers and installers to support the implementation of such requirements.

The department shall submit interim reports to the Chairman of the Senate Judiciary Committee and the Chairman of the House Labor, Commerce and Industry Committee on all activities pursuant to this provision on a quarterly basis beginning July 1, 2021, and shall submit a final report with findings, including stakeholder input, to the to the Chairman of the Senate Judiciary Committee and the Chairman of the House Labor, Commerce and Industry Committee no later than June 30, 2022.

DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

CHAPTER 61

Statutory Authority: R.116, H.4100, the Fiscal Year 2021-2022 General Appropriations Act, Part 1B, Section 34, Proviso 34.62; 1976 Code Sections 44-56-10 et. seq.; and 1976 Code Sections 44-96-10 et. seq.

Notice of Drafting:

The Department of Health and Environmental Control ("Department") proposes drafting a new regulation for the management of end-of-life photovoltaic modules and energy storage system batteries on solar projects in excess of thirteen acres. Interested persons may submit comment(s) on the proposed new regulation to Juli Blalock of the Bureau of Land and Waste Management; S.C. Department of Health and Environmental Control, 2600 Bull Street, Columbia, S.C. 29201; swregdev@dhec.sc.gov. To be considered, the Department must receive comments no later than 5:00 p.m. on August 23, 2021, the close of the Notice of Drafting comment period.

Synopsis:

Pursuant to R.116, H.4100, the Fiscal Year 2021-2022 General Appropriations Act, Part 1B, Section 34, Proviso 34.62 ("Proviso"), the Department was directed to submit regulations which develop rules to guide all South Carolinians invested in, selling, installing, and using photovoltaic modules and energy storage system batteries in the management of end-of-life photovoltaic modules and energy storage system batteries on solar projects and the decommissioning of solar projects in excess of thirteen acres. The Department proposes promulgating a new regulation as directed in the Proviso. The new regulation will establish rules for the responsible management and disposal of materials and equipment used in utility-scale solar projects.

The Administrative Procedures Act, S.C. Code Section 1-23-120(A), requires General Assembly review of the proposed new regulation.

DEPARTMENT OF LABOR, LICENSING AND REGULATION

CHAPTER 10

Statutory Authority: 1976 Code Sections 40-1-50, 40-7-50, and 40-7-60

Notice of Drafting:

The South Carolina Department of Labor, Licensing and Regulation proposes to amend the fee schedule for the Board of Barber Examiners whose fees appear in Chapter 10 of the South Carolina Code of Regulations, specifically in R.10-6. Interested persons may submit comments to Holly Beeson, Counsel to the Office of Communications and Governmental Affairs, South Carolina Department of Labor, Licensing and Regulation, Post Office Box 11329, Columbia, SC 29211.

Synopsis:

The South Carolina Department of Labor, Licensing and Regulation proposes to amend the fee schedule for the Board of Barber Examiners whose fees appear in R.10-6, in Chapter 10 of the South Carolina Code of Regulations. Specifically, fees will be added as they relate to portable barber operations and mobile barber shops, new licensure types created by Act No. 65 of 2021. Additionally, existing fees will be clarified and/or renamed, and other fees will be added as needed or as required by statute.

Legislative review of this amendment is required.

End-of-life Management of Photovoltaic Systems

Stakeholder Workgroup
August 4, 2021

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Budget Proviso

The department shall submit regulations to guide in:

- the management of end-of-life photovoltaic modules and energy storage system batteries on solar projects
- the decommissioning of solar projects in excess of thirteen acres- to include partial refurbishing and complete decommissioning

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Budget Proviso

Consider:
- Disposal as HW or SW
- Reuse/recycling options
- Impact on landfill capacity
- Financial Assurance needs for decommissioning
- Infrastructure to collect, transport EOL material
- Stewardship for smaller-scale installations

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Budget Proviso

Reporting

Quarterly interim reports to Senate Judiciary Committee and the House Labor, Commerce and Industry Committee on all activities

Final report with findings, including stakeholder input, to the to the Chairman of the Senate Judiciary Committee and the Chairman of the House Labor, Commerce

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Purpose/Goals

- Convene stakeholders
- Consider proviso directives
- Accept input, information and guidance
- Prepare recommendations/regulations
- Report to legislature

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Timeline

NOD- July 23, 2021

Quarterly Reports due beginning Sept. 30

Final Report due June 31, 2022

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DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
CHAPTER 61
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The Administrative Procedures Act, S.C. Code Section 1-23-120(A), requires General Assembly review of the proposed new regulation.

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Stakeholders

- Manufacturers
- Developers
- Recyclers
- Energy producers
- Environmental organizations
- Local Governments
- SC Office of Regulatory Staff
- Other interested parties
- **To recommend additional parties, please send contact information to swregdev@dhec.sc.gov**

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Solar Power in SC

❖South Carolina Statistics

- 1,891.44 MW of Solar PV modules installed
- 3,086 jobs in the Solar Industry
- 2.35% of it's power drawn from solar energy; and
- Projected to install 1,320.44 MW worth of Solar PV modules in the next 5 years

❖Source: Solar Energy Industries Association, South Carolina

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Decommissioning in SC

- 17 counties w. ordinances to regulate PVMs
- 14 counties w. decommissioning requirements for large-scale projects
- 8 ordinances require financial assurance
- No statewide requirements for decommissioning large-scale projects

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Decommissioning in SC (cont'd)

- Typically required within six-months after a six-month period of no electricity being generated or sold
- Includes removal of solar panels, buildings, cabling, electrical components and any other associated facilities

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Background

A one-megawatt system will generally require about six acres of land for 3,000 to 4,000 individual solar panels and will cost $2 million to $3 million to build

Source: New York State Energy Research and Development Authority

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End-of-Life Management

- EOL Options: Refurbish, recycle, dispose
- Concerns: Responsible parties
- Costs and Financial Assurance
- Items: panels, inverters, ballasts, batteries

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Regulatory Authority

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Regulatory Authority
Other Issues

Subtitle D

Household Hazardous Waste Exemption

Universal Waste Rules

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Financial Assurance

Should it be required? If so:

- By whom?
- To whom?
- When?
- Using what mechanisms?
- How should costs be determined?

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Purpose/Goals (revisited)

- Convene stakeholders
- Consider proviso directives
- Accept input, information and guidance
- Prepare recommendations/regulations
- Report to legislature

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Other discussion items (TBD)

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Next Steps

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Questions?

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CONTACT US
Jana White – Section Manager - (803) 898-1346 - whitejm@dhec.sc.gov
Tim Wilbur – Reg Writer – (803) 898-2375 – wilburtd@dhec.sc.gov
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@scdhec
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End-of-life Management of Photovoltaic Systems

Stakeholder Workgroup
September 14, 2021

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1

Budget Proviso

The department shall submit regulations to guide in:

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- the decommissioning of solar projects in excess of thirteen acres- to include partial refurbishing and complete decommissioning

2

Budget Proviso

Consider:
- Disposal as HW or SW
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- Impact on landfill capacity
- Financial Assurance needs for decommissioning
- Infrastructure to collect, transport EOL material
- Stewardship for smaller-scale installations

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End-of-Life Management

- EOL Options: Refurbish, recycle, dispose
- Concerns: Responsible parties
- Costs and Financial Assurance
- Items: panels, inverters, ballasts, batteries

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Decommissioning in SC

- 18 counties w. ordinances to regulate PVMs
- 14 counties w. decommissioning requirements for large-scale projects
- 9 ordinances require financial assurance
- No statewide requirements for decommissioning large-scale projects

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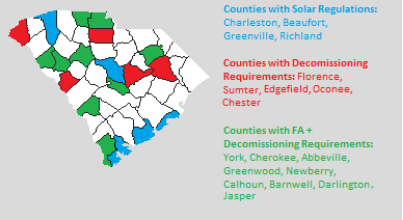
Decommissioning in SC (cont'd)



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Decommissioning in SC (cont'd)

- Typically required within six-months after a six-month period of no electricity being generated or sold
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Decommissioning Questions

- Are facilities being decommissioned and/or refurbished?
- What is the EOL timeline?
- Who has responsibility for EOL facilities?
- What entities perform decommissioning?
- Should SC enact statewide decommissioning requirements?
- Should SC publish guidance for LGs in establishing decommissioning requirements

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Financial Assurance Questions

Should it be required? If so:
- Payable by whom?
- Payable to whom?
- Payable in full at start?
- How triggered?
- How should costs be determined?

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Other discussion items (TBD)

- Who is missing from this group?

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Quarterly Reports

1st report due Sept. 30
- Summary of directives
- Process overview

Subsequent reports due Dec. 31, March 31
Final report due June 30, 2022

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Next Steps

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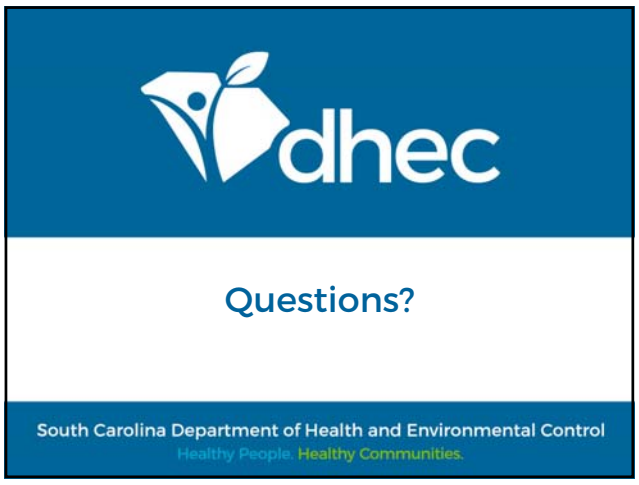
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Jana White – Section Manager - (803) 898-1346 - whitejm@dhec.sc.gov
Tim Wilbur – Reg Writer – (803) 898-2375 – wilburtd@dhec.sc.gov
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