

South Carolina Department of Health and Environmental Control

Dr. Edward D. Simmer
Director



3rd 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

March 31, 2022



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: March 31, 2022

SUBJECT: Photovoltaic Modules and Energy Storage Systems

Enclosed is the 3rd 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

II. Matters Entrusted to the Department

III. DHEC Report of Activities

- Stakeholder Group
- Regulation Development
- Materials Gathered
- Meetings Held
- Upcoming Activities
- Status on Proviso Matters

IV. Appendix

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 third quarter, January 1, 2022, to March 31, 2022.

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.

In addition to requirements from R-116, H.4100, the Fiscal Year 2021-2022 General Appropriations Act, Part 1B, Section 34, Proviso 34.62, the stakeholder group is also complying with Act No. 119, which went into effect on January 27, 2022. Section 5 of this act directs the Department to submit regulations for the management of end-of-life photovoltaic modules which will include requirements for local approval of a site plan and the submission of a nonbinding decommissioning plan. The rules may also include other requirements as the stakeholder group recommends.

III. DHEC Report of Activities

Stakeholder Group

The following governmental, private, and not-for-profit groups participated in the stakeholder process initiated to help fulfill the requirements of Budget Proviso 34.62 during the activities from January 1, 2022, to March 31, 2022.

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 Dept. 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 Dept. of Agriculture
Sunstore	Carolinas Clean Energy Business Alliance
Southern Current	Pinegate Renewables
Gregory Electric	Cleanlites Recycling
Richland County	Representing Cypress Creek Renewables
Newberry County	Farm Bureau
United States Department of Agriculture	Central Electric Power Cooperative, Inc.

Regulation Development

1. Pursuant to 2022 Act No. 119, Section 5, the Department is directed to submit regulations for the management of end-of-life photovoltaic modules and energy storage system batteries on solar projects in excess of thirteen acres.
2. The Department had a Notice of Drafting published in the February 25, 2022, State Register. A copy of the Notice of Drafting is in the appendix of this report. The Department received comments from zero parties by the March 28, 2022, close of the public comment period. This notice supersedes the Notice of Drafting that was published in the South Carolina State Register Volume 45, Issue 7 on July 23, 2021.
3. Internal Department staff and external stakeholders are putting together draft language for a new regulation, R. 61-107.20, Solar Energy Systems, to establish requirements for operating solar energy facilities in the state. Once completed, this language will be sent in the form of a Notice of Proposed Regulation to the S.C. Board of Health and Environmental Control for approval.

Materials Gathered

1. Department staff conducted research and held internal meetings related to the state's rules, regulations and procedures for handling hazardous waste and how these requirements relate to end-of-life management of photovoltaic modules and storage system batteries.
2. Department staff conducted research and held internal meetings related to preferred methods to manage end-of-life PV modules and energy storage system batteries.
3. Amanda Cotton from the Minnesota Pollution Control Agency provided the report and recommendations produced from efforts of the Minnesota Department of Commerce's solar and wind decommissioning working group that focused on developing decommissioning requirements for solar and wind facilities.
4. The Solar Energy Technologies Office from the U.S. Department of Energy prepared an End-of-Life Action Plan with the goal of establishing safe, responsible, and economic EOL practices to allow for the greater deployment of solar energy while reducing the environmental impacts of utilizing PV modules. This plan will include three main areas: outreach with stakeholders, data gathering and analysis, and research on hardware and processes.

Meetings Held

The fifth Solar Panel Stakeholder Workgroup Meeting was held on February 17, 2022. The group in this meeting reviewed the progress made by the stakeholder group in previous meetings and engagements. The group also went over the effects that the enactment of Act No. 119 would have on the group's activities, including the beginning of a regulation development

process. A basic timeframe for the regulation development of regulation to manage end-of-life PV modules was discussed.

Upcoming Activities

The Department is planning to hold the sixth Solar Panel Stakeholder Workgroup Meeting on April 8, 2022, to discuss draft language for R. 61-107.20, Solar Energy Systems, a regulation to establish requirements for operating solar energy facilities in the state.

The Department is planning to convene stakeholder meetings on a regular basis throughout 2022 until June 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 late April. Pursuant to Budget Proviso 34.62, the final report will be submitted on or before June 30, 2022.

Status on Proviso matters


The following chart provides a brief summary of the efforts of the Department and the stakeholder group to answer the 6 matters presented by Proviso 34.62. A full reporting of the Department's conclusions along with stakeholder feedback will be presented in the final report due on or before June 30, 2022.

Proviso 34.62	Activities Performed	Status
<p>Whether PV modules or energy storage system batteries exhibit characteristics of hazardous waste</p>	<ul style="list-style-type: none"> • The Department has made presentations detailing typical hazardous waste identification procedures. • The Department has reviewed current hazardous waste methodology and how the current regulations would apply to PV modules and energy storage system batteries. 	<ul style="list-style-type: none"> • PV modules and storage system batteries must undergo the same hazardous waste procedures as other kinds of waste. A hazardous waste determination must be made using generator knowledge or a TCLP test. • The Department believes that the state should adopt PV modules as a universal waste should the EPA issue a rule that does so. • The Department believes the state should adopt any testing methods for PV modules that are developed by the ASTM and approved by the EPA to ensure the most up-to-date testing methods are being used by generators of PV waste.
<p>Preferred methods to manage end-of-life PV modules and energy storage system batteries</p>	<ul style="list-style-type: none"> • The Department has had discussions with interested parties and conducted research. 	<ul style="list-style-type: none"> • The Department believes that the waste management hierarchy is applicable for PV modules. PV module waste generation should be reduced as much as possible, materials that can be should be reused, recycled, and recovered, and materials that cannot be reused, recycled, or recovered should be properly disposed.
<p>Impact of end-of-life management of PV modules and energy storage system batteries on SC's landfill capacity</p>	<ul style="list-style-type: none"> • The Department has had discussions with interested parties and conducted analysis of the state's capacity and the incoming future volume of PV modules and energy storage system batteries. 	<ul style="list-style-type: none"> • The Department is currently attempting to estimate the future volume of PV modules and its impact on the state's landfill capacity.

Proviso 34.62	Activities Performed	Status
Whether financial assurance should be required for large-scale solar projects (>13 acres)	<ul style="list-style-type: none"> Stakeholders and the Department have had discussions on the need for FA for large-scale PV module projects. The Department has researched other model template language and state/local rules for decommissioning PV module facilities. 	<ul style="list-style-type: none"> The Department is working internally and with external stakeholders to put together language for decommissioning requirements for large solar facilities that cease operations.
Infrastructure that may be needed to collect and transport end-of-life PV modules and energy storage system batteries.	<ul style="list-style-type: none"> The Department has had discussions with interested parties and conducted research. 	<ul style="list-style-type: none"> The Department does not believe a specialized collection infrastructure is needed for managing EOL PV modules and battery equipment. The Department encourages the continued expansion of recycling technologies to increase the capability of PV module recycling services.
Utility of a manufacturer stewardship program for recycling end-of-life PV modules and energy storage system batteries.	<ul style="list-style-type: none"> The Department has had discussions with interested parties and conducted research. 	<ul style="list-style-type: none"> The Department is planning to solicit feedback on this matter from the larger stakeholder group at a future meeting. The Department is looking into legislation in Washington State, which involves a stewardship program for manufacturers of PV modules.

IV. Appendix


1. PowerPoint Presentation from February 17
2. Notice of Drafting



End-of-life Management of Photovoltaic Systems
Solar Stakeholder Group
February 17, 2022

South Carolina Department of Health and Environmental Control
Healthy People. Healthy Communities.

1




South Carolina Department of Health and Environmental Control
Healthy People. Healthy Communities.

Agenda

- Recap of progress on the Proviso.
- Discussion of S. 525
- Other Proviso matters.

2




South Carolina Department of Health and Environmental Control
Healthy People. Healthy Communities.

Budget Proviso 34.62

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.

3




South Carolina Department of Health and Environmental Control
Healthy People. Healthy Communities.

Budget Proviso Matters

- Disposal of PV modules as HW or SW
- Preferred methods to dispose of PV modules
- PV module waste impact on SC LFs
- Decommissioning requirements/guidance
- Infrastructure to collect, transport EOL material
- Stewardship programs

4



South Carolina Department of Health and Environmental Control
Healthy People. Healthy Communities.

Proviso progress

- Budget proviso went into effect July 2021.
- Two quarterly reports have been sent to the legislature.
- Four stakeholder meetings have been held with other discussions being held with appropriate stakeholders.
- Research into the proviso matters has been underway since July 2021.
- Field trip to a Pelion, SC solar site in November 2021.

5




South Carolina Department of Health and Environmental Control
Healthy People. Healthy Communities.

Website

- Solar website: <https://scdhec.gov/environment/land-management/solar-panel-stakeholder-group>
- Now contains both quarterly reports completed so far, next one will be uploaded in April.

6




South Carolina Department of Health and Environmental Control
Healthy People. Healthy Communities.

Feedback from previous meetings

- Focus of the past four meeting and discussions has been on decommissioning requirements.
- Main questions:
 - Definition of “decommissioning”
 - What would be the EOL timeline?
 - Who is responsible?
 - What entity (if any) should oversee this process?
 - Financial assurance?

7



South Carolina Department of Health and Environmental Control
Healthy People. Healthy Communities.

Feedback from previous meetings (cont'd)

- Majority consensus from the group seemed to prefer local oversight of solar farms.
- DHEC should provide local governments templates for decommissioning requirements for solar farms.
- DHEC is currently working on such language, is planning to provide a variety of possible decommissioning models to fit needs of different counties.

8

dhec South Carolina Department of Health and Environmental Control
Healthy People. Healthy Communities.

S. 525

- Signed by Governor on 1/27/22
- Section 5 of the Act contains the language from Budget Proviso 34.62 and requires the Department to create an application for solar farms in excess of thirteen acres.
- This application shall include “local approval of a site plan” and submission of a “nonbinding plan” to manage EOL Solar Panels + Equipment.

9

dhec South Carolina Department of Health and Environmental Control
Healthy People. Healthy Communities.

S. 525

The department must require, as part of a new application or an application pending on July 1, 2022, local approval of a site plan for a solar farm in excess of thirteen acres, that an owner, lessee, or developer of real property upon which the site is situated must submit to the department a nonbinding plan to manage and dispose of end-of-life photovoltaic modules and energy storage system batteries and decommission solar energy equipment, facilities, or devices. The department is authorized to, by regulation, establish a more formal or detailed process for receiving the plans submitted pursuant to this provision, to include increased reporting requirements.

10

dhec South Carolina Department of Health and Environmental Control
Healthy People. Healthy Communities.

Regulation Development

```

    graph LR
      A[Initiation of Action] --> B[Notice of Drafting]
      B --> C[Notice of Proposed Regulation]
      C --> D[Notice of Final Regulation]
      D --> E[Legislative Review]
    
```


11

dhec South Carolina Department of Health and Environmental Control
Healthy People. Healthy Communities.

Regulation Development

- The Department submitted a Notice of Drafting (NOD) for publication in the State Register on February 25.
- 30-Day comment period ends March 28.
- Notice of Proposed Regulation (NOPR) will be developed and published on April 22.
- Scheduled for eventual submission to the legislature in June.

12




South Carolina Department of Health and Environmental Control
Healthy People. Healthy Communities.

Questions for Stakeholders

- What is the best way to calculate how much (in tons) of PV modules exist in SC? (LF capacity)
 - How many and how old are they? (estimated lifespan of ~25 years)
- What kinds of infrastructure is missing to facilitate the recycling of PV modules + batteries?
- How demanding is it to recycle/dispose of PV modules?
 - How cost effective, what is the process, where do the modules go?

13



South Carolina Department of Health and Environmental Control
Healthy People. Healthy Communities.

Next steps

- Regulation Development:
 - Send NOD comments by March 28.
 - Department is working on language to address 525.
- Proviso matters:
 - Send info to the Department.
 - Department will continue gathering research, coordinating answers to Proviso questions with stakeholder group.
- Next Quarterly Report will cover the activities from January 1-March 31.

14



South Carolina Department of Health and Environmental Control
Healthy People. Healthy Communities.

CONTACT US

SWRegDev@dhec.sc.gov

Stay Connected

 [dhec](#)
 [@dhec](#)
 [http://dhec.sc.gov](#)
 [dhec](#)
 S.C. Department of Health and Environmental Control

15

DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
CHAPTER 61

Statutory Authority: 1976 Code Sections 44-7-110 through 44-7-394, 44-37-40, 44-37-50, and 63-7-40

Notice of Drafting:

The Department of Health and Environmental Control (“Department”) proposes amending R.61-16, Minimum Standards for Licensing Hospitals and Institutional General Infirmaries. Interested persons may submit written comments to the Office of Policy and Communications, S.C. Department of Health and Environmental Control, 2600 Bull Street, Columbia, S.C. 29201; HQRegs@dhec.sc.gov; or the [Healthcare Quality Public Comment Form](#). To be considered, the Department must receive comments no later than 5:00 p.m. on March 28, 2022, the close of the Notice of Drafting comment period.

Synopsis:

Pursuant to S.C. Code Section 44-7-260(A)(1), the Department establishes and enforces basic standards for the licensure, maintenance, and operation of health facilities and services to ensure the safe and adequate treatment of persons served in this state. The Department proposes amending R.61-16, Minimum Standards for Licensing Hospitals and Institutional General Infirmaries, to ensure alignment with current state laws and to update and revise definitions and requirements regarding licensure, inspections, enforcement, management, medical staff, nursing services, patient safety, policies and procedures, incident reporting, accommodations for patients, medical records, vital statistics, emergency preparedness and response, food service, maintenance, laundry, linen, housekeeping, refuse disposal, infection control, physical plant, design requirements, construction requirements, hazardous elements of construction, fire protection, fire prevention, engineering and exits, and standards for specialized departments or services.

The proposed amendments may also include corrections for clarity and readability, grammar, punctuation, codification, and other such regulatory text improvements.

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

DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
CHAPTER 61

Statutory Authority: 2022 Act No. 119, Section 5, effective January 27, 2022

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 March 28, 2022, the close of the Notice of Drafting comment period.

This notice supersedes the Notice of Drafting that was published in the South Carolina State Register Volume 45, Issue 7 on July 23, 2021.

20 DRAFTING NOTICES

Synopsis:

Pursuant to Section 5 of 2022 Act No. 119 (the “Act”), 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 Act. The new regulation will establish rules for the responsible management and disposal of materials and equipment used in utility-scale solar projects, including local approval of a site plan and the submission of a nonbinding management plan. The rules may also include financial assurance, stewardship, and reporting requirements.

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

DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

CHAPTER 61

Statutory Authority: 1976 Code Sections 48-1-10 et seq.

Notice of Drafting:

The Department of Health and Environmental Control (“Department”) proposes amending R.61-68, Water Classifications and Standards. Interested persons may submit comment(s) on the proposed amendments to Andrew Edwards, Water Quality Standards Coordinator of the Bureau of Water; S.C. Department of Health and Environmental Control, 2600 Bull Street, Columbia, S.C. 29201; edwardaj@dhec.sc.gov. To be considered, the Department must receive comments no later than 5:00 p.m. on March 28, 2022, the close of the Notice of Drafting comment period.

Synopsis:

Pursuant to Section 303(c) of the federal Clean Water Act (“CWA”), South Carolina’s water quality standards must be reviewed and revised, where necessary, at least once every three years. Referred to as the triennial review, this required process consists of reviewing the designated water uses, criteria, and antidegradation policy. The Department will review and adopt, where appropriate, the Environmental Protection Agency’s updated numeric and narrative criteria according to Section 304(a), Section 304(f), and Section 307(a) of the CWA. In reviewing its water classifications and standards, the Department will give consideration to the factors listed in S.C. Code Section 48-1-80 and update R.61-68, Water Classifications and Standards, where appropriate.

The Department proposes amending R.61-68 to adopt revised water quality standards as deemed necessary to comply with federal updates and recommendations. The Department also proposes amending R.61-68 as deemed necessary to comply with the Pollution Control Act, S.C. Code Sections 48-1-10 et seq.

The proposed amendments may also include corrections for clarity and readability, grammar, punctuation, codification, and other such regulatory text improvements.

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