

GENERAL ASSEMBLY OF NORTH CAROLINA  
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SENATE BILL DRS45241-RIF-22

Short Title: Recycling and Restoration/Renewable Energy. (Public)

Sponsors: Senators Newton, Rabon, and Hise (Primary Sponsors).

Referred to:

1 A BILL TO BE ENTITLED  
2 AN ACT TO REQUIRE (I) RESPONSIBLE DECOMMISSIONING OF UTILITY-SCALE  
3 SOLAR FACILITIES AND WIND ENERGY FACILITIES UPON CESSATION OF  
4 ACTIVITIES AT A FACILITY AND (II) RECYCLING OF ALL END-OF-LIFE SOLAR  
5 ENERGY EQUIPMENT LOCATED WITHIN THE STATE.

6 The General Assembly of North Carolina enacts:

7  
8 **DECOMMISSIONING OF UTILITY-SCALE SOLAR FACILITIES AND WIND**  
9 **ENERGY FACILITIES UPON CESSATION OF ACTIVITIES AT A FACILITY**

10 **SECTION 1.(a)** Article 17 of Chapter 62 of the General Statutes is amended by  
11 adding a new section to read:

12 **"§ 62-352. Decommissioning and reclamation of utility-scale solar projects; financial**  
13 **assurance requirements; recycling of project components required.**

14 (a) Decommissioning Requirement. – The owner or operator of a utility-scale solar  
15 project shall be responsible for proper decommissioning of the project upon cessation of activities  
16 and reclamation of the property to its condition prior to commencement of activities on the site,  
17 including all costs associated therewith, no later than one year following completion of the  
18 operations. At a minimum, an owner or operator shall take all of the following steps in  
19 decommissioning a project:

20 (1) Disconnect the solar project from the power grid.

21 (2) Remove all equipment from the solar project, including solar panels, the entire  
22 solar module racking system, aboveground electrical interconnection and  
23 distribution cables that are no longer deemed necessary, any metal fencing,  
24 electrical and electronic devices, including transformers and inverters, and  
25 collect and ship them to another project for reuse, or recycle all of the  
26 components thereof capable of being recycled, in compliance with subsection  
27 (d) of this section. For components that will not be shipped to another project  
28 for reuse, and are incapable of being recycled, those components shall be  
29 properly disposed of in a manner prescribed by the Department.

30 (b) Financial Assurance Requirement. – The owner or operator of a utility-scale solar  
31 project shall establish financial assurance in an amount acceptable to the Department of  
32 Environmental Quality that will ensure that sufficient funds are available for decommissioning  
33 of the facility and reclamation of the property to its condition prior to commencement of activities  
34 on the site, even if the owner or operator becomes insolvent or ceases to reside in, be  
35 incorporated, do business, or maintain assets in the State. To establish sufficient availability of  
36 funds under this section, the owner or operator of a utility-scale solar project may use insurance,



1 financial tests, third-party guarantees by persons who can pass the financial test, guarantees by  
2 corporate parents who can pass the financial test, irrevocable letters of credit, trusts, surety bonds,  
3 or any other financial device, or any combination of the foregoing, shown to provide protection  
4 equivalent to the financial protection that would be provided by insurance if insurance were the  
5 only mechanism used.

6 (c) Financial Assurance Rules. – The Department of Environmental Quality shall adopt  
7 rules establishing criteria to set the amount of financial assurance required for utility-scale solar  
8 projects as set forth in subsection (b) of this section. These rules shall consider, at a minimum,  
9 the solar technology to be employed, i.e., PV, CPV, or CSP; the approximate number and size of  
10 solar panels included in the solar arrays to be constructed; any ancillary facilities to be  
11 constructed in association with the project; the condition of the property prior to construction of  
12 a utility-scale solar project; the amount of acreage that would be impacted by the proposed  
13 project; and any other factors designed to enable establishment of adequate financial assurance  
14 for decommissioning and reclamation on a site-by-site basis.

15 (d) Recycling Requirements. – In addition to the requirements for recycling components  
16 of utility-scale solar projects established under subsection (a) of this section, an owner or operator  
17 of a utility-scale solar project shall be responsible for properly recycling each solar panel used in  
18 the project at the end of the panel's useful life. Recycling requirements established by this section  
19 shall be conducted in compliance with environmentally sound management practices to transport  
20 and recycle such items. An owner or operator shall conduct and document due diligence  
21 assessments of the recyclers it contracts with, including an assessment of compliance with  
22 environmentally sound recovery standards adopted by the Department. An owner or operator  
23 shall notify the Department within 30 days of cessation of activities for the purpose of completion  
24 of the project's operations, which notice shall include a detailed description of the steps to be  
25 taken to properly decommission the project, and for reclamation of the site.

26 (e) Definitions. – For purposes of this section the following definitions apply:

27 (1) "Utility-scale solar project" means a ground-mounted photovoltaic (PV),  
28 concentrating photovoltaic (CPV), or concentrating solar power (CSP or solar  
29 thermal) project capable of generating one megawatt (MW) or more directly  
30 connected to the electrical grid for sale to wholesale customers. The term  
31 includes the solar arrays, accessory buildings, transmission facilities, and any  
32 other infrastructure necessary for the operation of the project.

33 (2) "Recycle" means the processing, including disassembling, dismantling, and  
34 shredding of solar modules or other equipment from utility-scale solar  
35 projects, or their components, to recover a usable product. Recycle does not  
36 include any process that results in the incineration of such equipment.

37 (3) "Reuse" means any operation by which a solar module or other equipment  
38 from utility-scale solar projects, or their components, changes ownership and  
39 is used for the same purpose for which it was originally purchased.

40 (f) No later than September 1 of each year, the Utilities Commission shall provide the  
41 Department of Environmental Quality with an annual list of all utility-scale solar projects  
42 operating within the State as of the date of the report."

43 **SECTION 1.(b) G.S. 143-215.121 reads as rewritten:**

44 **"§ 143-215.121. Financial assurance requirements. Decommissioning and reclamation of**  
45 **wind energy facilities; financial assurance requirements; recycling of project components**  
46 **required.**

47 (a) Decommissioning Requirement. – The owner or operator of a wind energy facility  
48 shall be responsible for proper decommissioning of the facility upon cessation of activities and  
49 reclamation of the property to its condition prior to commencement of activities on the site,  
50 including all costs associated therewith, no later than one year following completion of the

1 operations. At a minimum, an owner or operator shall take all of the following steps in  
2 decommissioning a project:

3 (1) Disconnect the facility from the power grid.

4 (2) Remove all the turbines, accessory buildings, transmission facilities, and any  
5 other equipment necessary for the operation of the facility, including  
6 aboveground electrical interconnection and distribution cables that are no  
7 longer deemed necessary, any metal fencing, and electrical and electronic  
8 devices, including transformers and inverters, and collect and ship them to  
9 another project for reuse, or recycle all of the components thereof capable of  
10 being recycled, in compliance with subsection (c) of this section. For  
11 components that will not be shipped to another project for reuse, and are  
12 incapable of being recycled, those components shall be properly disposed of  
13 in a manner prescribed by the Department.

14 (b) Financial Assurance. – The applicant for a permit or a permit holder for a wind energy  
15 facility shall establish financial assurance that will ensure that sufficient funds are available for  
16 decommissioning of the facility and reclamation of the property to its condition prior to  
17 commencement of activities on the site, even if the applicant or permit holder becomes insolvent  
18 or ceases to reside in, be incorporated, do business, or maintain assets in the State. To establish  
19 sufficient availability of funds under this section, the applicant for a permit or a permit holder for  
20 a wind energy facility may use insurance, financial tests, third-party guarantees by persons who  
21 can pass the financial test, guarantees by corporate parents who can pass the financial test,  
22 irrevocable letters of credit, trusts, surety bonds, or any other financial device, or any combination  
23 of the foregoing, shown to provide protection equivalent to the financial protection that would  
24 be provided by insurance if insurance were the only mechanism used.

25 (c) Recycling Requirements. – In addition to the requirements for recycling of wind  
26 energy facility equipment established under subsection (a) of this section, an owner or operator  
27 of a wind energy facility shall be responsible for properly recycling turbines, accessory buildings,  
28 transmission facilities, and any other equipment necessary for the operation of the facility,  
29 including aboveground electrical interconnection and distribution cables that are no longer  
30 deemed necessary, any metal fencing, and electrical and electronic devices, including  
31 transformers and inverters, and collect and ship them to another project for reuse, or recycle all  
32 of the components thereof capable of being recycled, at the end of the equipment's useful life.  
33 Recycling requirements established by this section shall be conducted in compliance with  
34 environmentally sound management practices to transport and recycle such items. An owner or  
35 operator shall conduct and document due diligence assessments of the recyclers it contracts with,  
36 including an assessment of compliance with environmentally sound recovery standards adopted  
37 by the Department. An owner or operator shall notify the Department within 30 days of cessation  
38 of activities for the purpose of completion of the project's operations, which notice shall include  
39 a detailed description of the steps to be taken to properly decommission the project, and for  
40 reclamation of the site.

41 (d) Definitions. – For purposes of this section the following definitions apply:

42 (1) "Recycle" means the processing, including disassembling, dismantling, and  
43 shredding of equipment from wind energy projects, or their components, to  
44 recover a usable product. Recycle does not include any process that results in  
45 the incineration of such equipment.

46 (2) "Reuse" means any operation by which equipment from wind energy projects,  
47 or their components, changes ownership and is used for the same purpose for  
48 which it was originally purchased."

49 **SECTION 2.** Article 9 of Chapter 130A of the General Statutes is amended by  
50 adding a new Part to read:

51 "Part 2J. Management of Solar Energy Equipment.

"§ 130A-309.240. Recycling required for end-of-life solar energy equipment.(a) Findings. – The legislature finds:

- (1) According to a publication by the International Renewable Energy Agency (IRENA), solar photovoltaic deployment has grown at unprecedented rates since the early 2000s. As the global PV market increases, so will the volume of decommissioned PV panels, and large amounts of annual waste are anticipated by the early 2030s. Growing PV panel waste presents a new environmental challenge, but also unprecedented opportunities to create value and pursue new economic avenues. In addition, the report found: (i) more than 90 percent (90%) of the materials in typical photovoltaic solar panels, including silicon, aluminum, and glass, can be recycled and used again in the production of new solar panels; (ii) recycling or repurposing solar photovoltaic panels at the end of their roughly 30-year lifetime can unlock an estimated stock of 78 million tons of raw materials and other valuable components globally by 2050; (iv) if fully injected back into the economy, the value of the recovered material could exceed 15 billion dollars by 2050.
- (2) Heavy metals like cadmium and lead are found in solar cells, which can harm the natural environment if they are not recycled or disposed of properly.
- (3) 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.
- (4) That manufacturers are responsible for employing environmentally sound management practices to fulfill their obligations under this Part to finance and implement a stewardship plan to recycle or reuse the photovoltaic modules they manufacture.

(b) Definitions. – For purposes of this section the following definitions apply:

- (1) "Consumer electronic device" means any device containing an electronic circuit board that is intended for everyday use by individuals, such as a watch or calculator.
- (2) "End-of-life photovoltaic module" means a photovoltaic module that is removed and taken out of service, which will not be reused.
- (3) "Manufacturer" means any person in business or no longer in business but having a successor in interest who, irrespective of the selling technique used, including by means of distance or remote sale meets any of the following criteria:
  - a. Manufactures or has manufactured a photovoltaic module under its own brand names for sale in or into this State.
  - b. Assembles or has assembled a photovoltaic module that uses parts manufactured by others for sale in or into this State under the assembler's brand names.
  - c. Resells or has resold in or into this State under its own brand names a photovoltaic module produced by other suppliers, including retail establishments that sell photovoltaic modules under their own brand names.
  - d. Manufactures or has manufactured a cobranded photovoltaic module product for sale in or into this State that carries the name of both the manufacturer and a retailer.
  - e. Imports or has imported a photovoltaic module into the United States that is sold in or into this State. However, if the imported photovoltaic module is manufactured by any person with a presence in the United

- 1                   States meeting the criteria of manufacturer under a. through d. of this  
2                   subdivision, that person is the manufacturer.
- 3                   f. Sells at retail in or into this State a photovoltaic module acquired from  
4                   an importer that is the manufacturer and elects to register as the  
5                   manufacturer for those products.
- 6                   g. Elects to assume the responsibility and register in lieu of a  
7                   manufacturer as defined under (3)a. through e. of this subdivision.
- 8                   (4) "Photovoltaic module" means the smallest nondivisible, environmentally  
9                   protected assembly of photovoltaic cells or other photovoltaic collector  
10                   technology and ancillary parts intended to generate electrical power under  
11                   sunlight, except that "photovoltaic module" does not include: (i) a  
12                   photovoltaic cell that is part of a consumer electronic device for which it  
13                   provides electricity needed to make the consumer electronic device function;  
14                   or (ii) a photovoltaic cell that is part of a utility-scale solar project as that term  
15                   is defined under G.S. 62-352(e). "Photovoltaic module" includes  
16                   interconnections, terminals, and protective devices such as diodes that: (i) are  
17                   installed on, connected to, or integral with buildings; or (ii) are used as  
18                   components of freestanding, off-grid, power generation systems, such as for  
19                   powering water pumping stations, electric vehicle charging stations, fencing,  
20                   street and signage lights, and other commercial or agricultural purposes.
- 21                   (5) "Rare earth element" means lanthanum, cerium, praseodymium, neodymium,  
22                   promethium, samarium, europium, gadolinium, terbium, dysprosium,  
23                   holmium, erbium, thulium, ytterbium, lutetium, yttrium, or scandium.
- 24                   (6) "Recover" means the process of reusing or recycling photovoltaic modules.
- 25                   (7) "Recycle" means the processing, including disassembling, dismantling, and  
26                   shredding, of photovoltaic modules or their components to recover a usable  
27                   product. Recycle does not include any process that results in the incineration  
28                   of a photovoltaic modules.
- 29                   (8) "Recycler" means a person that recycles photovoltaic modules.
- 30                   (9) "Reuse" means any operation by which a photovoltaic module or a component  
31                   of a photovoltaic module changes ownership and is used for the same purpose  
32                   for which it was originally purchased.
- 33                   (10) "Stewardship plan" means the plan developed by a manufacturer or its  
34                   designated stewardship organization for a self-directed stewardship program.
- 35                   (11) "Stewardship program" means the activities conducted by a manufacturer or  
36                   a stewardship organization to fulfill the requirements of this section and  
37                   implement the activities described in its stewardship plan.
- 38                   (c) Program Guidance, Review, and Approval. – The Department must develop guidance  
39                   for a photovoltaic module stewardship and takeback program to guide manufacturers in preparing  
40                   and implementing a self-directed program to ensure the convenient, safe, and environmentally  
41                   sound takeback and recycling of photovoltaic modules and their components and materials. By  
42                   January 1, 2020, the Department must establish a process to develop guidance for photovoltaic  
43                   module stewardship plans by working with manufacturers, stewardship organizations, and other  
44                   stakeholders on the content, review, and approval of stewardship plans. The Department's process  
45                   must be fully implemented and stewardship plan guidance completed by July 1, 2020.
- 46                   (d) Stewardship Organization as Agent of Manufacturer. – A stewardship organization  
47                   may be designated to act as an agent on behalf of a manufacturer or manufacturers in operating  
48                   and implementing the stewardship program required under this section. Any stewardship  
49                   organization that has obtained such designation must provide to the department a list of the  
50                   manufacturers and brand names that the stewardship organization represents within 60 days of  
51                   its designation by a manufacturer as its agent, or within 60 days of removal of such designation.

1       (e) Registration and Stewardship Plans. – Each manufacturer shall prepare and submit a  
2 stewardship plan to the Department by the later of January 1, 2021, or within 30 days of its first  
3 sale of a photovoltaic module in or into the State. A stewardship plan shall:

- 4           (1) Describe how the manufacturer will finance the takeback and recycling or  
5 reuse of all photovoltaic modules it manufactures that are sold in or into the  
6 State; and identify an adequate funding mechanism to finance the costs of  
7 collection, management, and recycling or reuse of photovoltaic modules and  
8 residuals sold in or into the State by the manufacturer with a mechanism that  
9 ensures that photovoltaic modules can be delivered to takeback locations  
10 without cost to the last owner or holder.
- 11           (2) Describe how the program will minimize the release of hazardous substances  
12 into the environment and maximize the recovery of other components,  
13 including rare earth elements and commercially valuable materials.
- 14           (3) Provide for takeback of photovoltaic modules at locations that are within the  
15 region of the State in which the photovoltaic modules were used and are as  
16 convenient as reasonably practicable, and if no such location within the region  
17 of the State exists, include an explanation for the lack of such location.
- 18           (4) Identify how relevant stakeholders, including consumers, installers, building  
19 demolition firms, and recycling and treatment facilities, will receive  
20 information required in order for them to properly dismantle, transport, and  
21 treat the end-of-life photovoltaic modules in a manner consistent with the  
22 objectives described in subdivision (2) of this subsection.
- 23           (5) Provide for environmentally sound management practices to transport and  
24 recycle discarded computer equipment. The manufacturer shall provide proof  
25 of contract or agreement with a recycler that: (i) is certified as adhering to  
26 Responsible Recycling ("R2") practices, (ii) is certified as an e-Steward  
27 recycler adhering to the e-Stewards Standard for Responsible Recycling and  
28 Reuse of Electronic Equipment®, or (iii) maintains another certification  
29 approved by the Department for responsible recycling of computer equipment  
30 to process the discarded computer equipment. The manufacturer shall notify  
31 the Department within 30 days of any change in status of a certified recycler  
32 with which it contracts.

33       (f) Stewardship Plan Amendments. – A manufacturer may periodically amend its  
34 stewardship plan. The Department shall approve the amendment if it meets the requirements of  
35 subsection (e) of this section, and rules adopted thereunder. When submitting proposed  
36 amendments, the manufacturer must include an explanation of why such amendments are  
37 necessary.

38       (g) Plan Approval and Implementation. – No later than six months after receipt of a  
39 stewardship plan submitted for approval pursuant to subsection (e) of this section, the  
40 Department shall approve, approve with modifications, or deny a stewardship plan. The  
41 Department shall only approve a plan if it determines that the plan addresses each of the criteria  
42 set forth in subsection (e) of this section, and any rules adopted thereunder. Once approved, the  
43 manufacturer shall implement the approved plan.

44       (h) Annual Report. –

- 45           (1) The report may include any recommendations to the Department or the  
46 legislature on modifications to the program that would enhance the  
47 effectiveness of the program, including management of program costs, and  
48 mitigation of environmental impacts of photovoltaic modules.
- 49           (2) The manufacturer or stewardship organization must post this report on a  
50 publicly accessible Web site.

1       (i) Enforcement. – Beginning July 1, 2021, no manufacturer may sell or offer for sale a  
2 photovoltaic module in or into the State unless the manufacturer has submitted to the Department  
3 a stewardship plan, which has been approved by the Department. After that date, the Department  
4 shall send a Notice of Violation to any manufacturer that does not have an approved plan, which  
5 shall inform the manufacturer that it must submit a plan or participate in a plan within 30 days of  
6 the notice, subject to the assessment of civil penalties. The Department may assess a penalty of  
7 up to ten thousand dollars (\$10,000) for each sale of a photovoltaic module in or into the State  
8 that occurs after issuance of the Notice of Violation. Parties aggrieved by a final decision of the  
9 Department issued pursuant to subsection (d) of this section may appeal the decision as provided  
10 under Article 3 of Chapter 150B of the General Statutes.

11       (j) Fee. – A manufacturer, before selling or offering for sale photovoltaic modules in the  
12 State shall pay an initial registration fee of two thousand five hundred dollars (\$2,500) to the  
13 Department. An initial registration shall be valid from the day of registration through the last day  
14 of the fiscal year in which the registration fee was paid. A manufacturer that has registered shall  
15 pay an annual renewal registration fee of two thousand five hundred dollars (\$2,500) to the  
16 Department. The annual renewal registration fee shall be paid to the Department each fiscal year  
17 no later than June 30 of the previous fiscal year. The proceeds of these fees shall be credited to  
18 the Photovoltaic Module Management Fund.

19       (k) Account. – The Photovoltaic Module Management Fund is created as a special fund  
20 within the Department. The Fund consists of revenue credited to the Fund from the proceeds of  
21 the fee imposed on computer equipment manufacturers under subsection (j) of this section.  
22 Moneys in the Fund shall be used by the Department to implement the provisions of this section.

23       (l) Report. – Information regarding permanent recycling programs for photovoltaic  
24 modules for which funds are received pursuant to this section shall be included in the annual  
25 report required under G.S. 130A-309.09A."

## 26 27 **DEPARTMENT OF ENVIRONMENTAL QUALITY TO ADOPT RULES AND** 28 **REPORTING**

29       **SECTION 3.** The Department of Environmental Quality shall adopt temporary rules  
30 implementing the requirements of this act no later than September 1, 2019. Notwithstanding  
31 G.S. 150B-21.1(d), the temporary rules shall remain in effect until the effective date of the  
32 permanent rule adopted to replace the temporary rule.

33       **SECTION 4.** No later than September 1, 2019, the Department of Environmental  
34 Quality shall report to the Environmental Review Commission and the Joint Legislative  
35 Commission on Energy Policy on the status of the rule making required by this act and shall  
36 include in the report an estimate of moneys needed by the Department in order to implement a  
37 program to oversee the recycling requirements established by this act.

## 38 39 **SEVERABILITY CLAUSE**

40       **SECTION 5.** If any section or provision of this act is declared unconstitutional or  
41 invalid by the courts, it does not affect the validity of this act as a whole or any part other than  
42 the part declared to be unconstitutional or invalid.

## 43 44 **EFFECTIVE DATE**

45       **SECTION 6.** This act becomes effective September 1, 2019, except: (i) Section 3 of  
46 this act becomes effective when this act becomes law and (ii) the financial assurance  
47 requirements established in G.S. 62-352(b), as enacted by Section 1(a) of this act, shall become  
48 effective January 1, 2020.