



Greenskies Clean Energy LLC

Decommissioning Plan for Proposed 4.0 MW AC Ground-mounted Commercial Solar Photovoltaic Energy Facility

Prepared for
Connecticut Siting Council

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1.0 Project Introduction

Greenskies Clean Energy LLC (“Greenskies”) is proposing to construct and operate a 4.0 +/- megawatt (MW) AC solar farm. In addition to Greenskies’ resources and personnel, SLR International Corporation (“SLR”) has been actively involved in the siting, design, and environmental evaluations of the proposed Project. The Project site location is 129 Bartholomew Hill Rd, Goshen, CT. The Project will occupy approximately 13.5 acres of the 69.1-acre parcel of land. The primary and sole site access point is proposed to be via an existing, unpaved full-service access driveway from Bartholomew Hill Rd., which is a paved local road, at the southern end of the Project Site. There is currently an existing dirt farm road extending from behind the existing barn to the Project area to the north. Point of interconnection will be at Bartholomew Hill Rd.

The current basis of design for the proposed layout/site plan includes approximately 9,792 PV design modules (475-watt), 14-foot row spacing, and an approximately 25-degree tilt above horizontal; modules will be set 2-high in portrait layout. Driven post panel racking systems will be utilized throughout the project site, unless subsurface conditions require an alternative installation method, which will be determined during pre-construction, geotechnical analysis for structural design. There will be two equipment pads, one located north-centrally and the other at the southern end of the array. Each will house a transformer, switchboard, inverters, monitoring control panel and grounding transformer, if required by the utility. Wiring that connects the panels will be placed in above grade wire systems/cable trays or trenched conduits. The area under the panels will remain vegetated and disturbed areas will be seeded. The proposed Project will include a 7-foot-high perimeter fence surrounding the solar array, which will be underlain with herbaceous vegetation.

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2.0 Decommissioning and Restoration Plan

2.1 Project Decommissioning

At the end of the Project life, decommissioning will include disassembly and removal of above-ground structures, removal of subsurface structures to a minimum depth of 24 inches below grade, and re-grading and restoration of disturbed areas. Where reasonably required, restoration will include regrading, seeding, and mulching to establish vegetation and prevent soil loss and erosion. Racking posts pulled from the ground are expected to create very minimal ground disturbance. Any disturbed areas will be seeded with the same seed mix used across the site during the life of the Project or, if landowner prefers, another acceptable mix will be selected.

Under the proposed decommissioning plan, Greenskies shall be responsible for all decommissioning costs and demonstration of ability to cover costs, as specified in Section 3.0, below. Any additional permits or approvals required for decommissioning, removal, and legal disposal of Project components will be obtained before decommissioning activities begin. All activities will be conducted in accordance with all permits and applicable rules and regulations. Disposal of all solid and hazardous waste will be conducted in accordance with local, state, and federal waste disposal regulations.

2.2 Facility Materials/Equipment

PV facilities are constructed using the same basic materials and methods of installation common to their application. Materials include:

Metals: Steel from pier foundations, racking, conduits, electrical enclosures, fencing; aluminum from racking, module frames, electrical wire, and transformers; stainless steel from fasteners, electrical enclosures, and racking; copper from electrical wire, transformers, and inverters.

Concrete: Equipment pads and footings.

PV Cells: PV Modules are typically constructed of glass front sheets (some use glass back sheets as well), plastic back sheets and laminates, semiconductor rigid silicon cells, internal electrical conductors (aluminum or copper), silver solder, plus a variety of micro materials. The semiconductor PV cell materials represent a very small part of a PV module's weight, between 1 and 2%. As manufacturers pursue lower-cost modules, thinner layers of semiconductor materials are used which reduces this percentage. The most commonly used semiconductor material for the construction of PV modules is silicon.

Glass, aluminum, and copper are easily recyclable materials, and silicon can be recycled by specialty electronics recyclers.

Glass: Most PV modules are approximately 80% glass by weight. There are certain modules, which use plastic and/or metal sheets for their foundations, however, these are very specialized in their application and are generally not used for ground-mounted projects.

Plastics: A limited quantity of plastic materials are used in PV systems due to a system's continuous exposure to the elements and long operational lifetime. Plastics typically are found in PV facilities as wire insulation, electrical enclosures, control and monitoring equipment, and inverter components.

2.3 Project Schedule

Solar modules (panels) typically have a useful life of approximately 30 years; however, the design and development of the Project will allow for components to be upgraded while only causing minor interruptions (*i.e.*, individual panels can be removed/replaced from installed support racking). Therefore; it is anticipated that the operational life of the array will be much longer than that of originally installed equipment. Greenskies will construct the solar arrays on leased lands. Lease agreements are effective for a term of 21 years from the commencement of energy generation, with two (2), five-year, optional extensions. Based on these terms, the array could, feasibly, be operational for approximately 40-years.

Decommissioning of the Project shall commence at the end of the project's life or after 12 consecutive months of no power generation at the facility except in the case of a natural disaster, act of violence, or other event which results in the absence of electrical generation for 12 months. By the end of the twelfth month of nonoperation, if Greenskies cannot demonstrate to the CT Siting Council that the Project shall be substantially operational and producing electricity within 12 months of the event, decommissioning shall be initiated 12 months after the event.

2.4 Sequence of Decommissioning

The following sequence for the removal of the components will be used:

PV Site:

- Disconnect PV facility from the utility power grid;
- Disconnect all aboveground wirings, cables and electrical interconnections and recycle offsite by an approved recycling facility;

- Remove concrete foundations. Electric components and their foundations will be removed and recycled off-site by a concrete recycler, unless landowners choose to leave them in place and are granted permission to do so from the City;
- Remove PV modules and transport to recycling facilities for recycling and material reuse;
- Remove the perimeter fence and recycle off-site by an approved metal recycler;
- Remove all waste.

Inverters/Transformers:

- Disconnect all electrical equipment;
- Remove all on site inverters, transformers, meters, fans, and other electrical components and recycle off-site by an approved recycler;
- Remove all waste.

Access Road:

- The access road built on the project, and associated drainage infrastructure will remain as a means to access the site in the future, if landowners choose to do so and are granted permission from the City.

Below-Ground Structure Decommissioning:

- Disconnect and remove all underground cables and transmission lines to a depth of 24" below grade and recycle off-site by an approved recycling facility;
- Removal of steel rack foundations.

Site Restoration:

- Seeding and mulching;
- Minor regrading.

3.0 Estimated Cost and Financial Assurance

3.1 Cost Estimate

The estimate of probable cost for the decommissioning of the approximately 4.0 MW AC ground-mounted solar project proposed in Goshen, CT, is \$120,420. The site is approximately 13.5 acres. The estimate of probable cost is summarized in the table below which presents a breakdown of each expected task required to decommission the Project. The baseline estimated costs for decommissioning activities are based on the New York State Guidebook Decommissioning Solar Systems published in 2019 by the New York State Energy Research and Development Authority (NYSERDA).

A key assumption is that the fencing, electrical cabinetry, solar racking, solar modules, wiring, and all other equipment is recyclable and that there will be regional, state and/or local recycling facilities at the time of decommissioning. Therefore, the primary cost of decommissioning is the labor associated with dismantling and loading the equipment to be transported for disposal. Any material that meets the definition of hazardous waste will be removed and disposed of in accordance with the Maine Hazardous Waste Rules.

3.2 Breakdown of Costs

Table 1: Decommissioning Cost Breakdown

| Scope/Task: | Cost per MW: | Total Cost: |
|--|-----------------|---------------------|
| Remove Racking Wiring | \$1,230 | \$4,920.00 |
| Remove Panels | \$1,225 | \$4,900.00 |
| Dismantle Rack | \$6,175 | \$24,700.00 |
| Remove Electrical Equipment | \$925 | \$3,700.00 |
| Breakup and Remove Concrete Pads (if not being left in place) | \$750 | \$3,000.00 |
| Remove Racks | \$3,900 | \$15,600.00 |
| Remove Cables | \$3,250 | \$13,000.00 |
| Remove Utility Poles and Interconnection Equipment | \$6,925 | \$27,700.00 |
| Remove Fence | \$2,475 | \$9,900.00 |
| Grading | \$2,000 | \$8,000.00 |
| Seed Disturbed Areas | \$125 | \$500.00 |
| Trucking to Recycling Center | \$1,125 | \$4,500.00 |
| Decommissioning Total: | \$30,105 | \$120,420.00 |