

# Orange Solar, Orange, CT Decommissioning Plan

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## Anticipated Life of Solar Field

As the owner of the Orange Solar (Project), Greenskies Clean Energy, LLC (GCE) is responsible for decommissioning the Project. Commercial-scale solar fields are designed for a minimum expected operational life of 20 years, but may operate for 25 to 30 years or more. As the solar field approaches the end of its operational life, it is expected that technological advances will make more efficient and cost-effective solar arrays that will economically drive the replacement of the existing solar arrays.

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## Estimated Cost of Decommissioning

Obviously, the cost of decommissioning a solar array more than 20 years into the future cannot be known with any precision. However, given the cost of components today, and the salvage value associated with such components today, one can begin to have an educated estimate as to the cost of salvage. For purposes of the Project, this means that the cost of decommissioning the solar arrays will be offset by the salvage value of the solar panels and components (i.e. glass, metal, copper). As of the date of this plan, the estimated salvage value is expected to exceed the decommissioning costs, as shown below.

<b>Item</b>	<b>Salvage Value</b>	<b>Cost</b>	<b>Net</b>
Project Management	\$0	\$50,000	-\$50,000
Site Reclamation	\$0	\$150,000	-\$150,000
Solar Array Components	\$350,000	\$150,000	\$200,000
<i>Total</i>	\$350,000	\$350,000	\$0

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## Decommissioning Process Description

Decommissioning and restoration activities will adhere to the requirements of appropriate governing authorities, and will be in accordance with applicable federal, state, and local permits. The decommissioning and restoration process comprises removal of above-ground structures; grading, to the extent necessary; restoration of topsoil (if needed) and seeding. The process of removing structures involves evaluating and categorizing all components and materials into categories of recondition and reuse, salvage, recycling and disposal. The Project consists of numerous materials that can be recycled, including steel, aluminum, glass, copper and plastics. In the interest of increased efficiency and minimal transportation impacts, components and material may be stored on-site until the bulk of similar components or materials are ready for transport. The components and material will be transported to the appropriate facilities for reconditioning, salvage, recycling, or disposal. Above-ground structures include the

panels, racks, inverters, pads and any interconnection facilities located on the property. The above-ground structures and below-ground structures are collectively referred to herein as the "Project Components."

Temporary erosion and sedimentation control best management practices will be used during the decommissioning phase of the project. Control features will be regularly inspected during the decommissioning phase and removed at the end of the process.

#### Project Component Removal

Control cabinets, electronic components, and internal cables will be removed. The panels, racks and inverters will be lowered to the ground where they may be transported whole for reconditioning and reuse, or disassembled/cut into more easily transportable sections for salvageable, recyclable, or disposable components.

#### PV Module Removal

Solar photovoltaic modules used in the project are manufactured within regulatory requirements for toxicity based on Toxicity Characteristic Leaching Procedure (TCLP). The solar panels are not considered hazardous waste. The panels used in the Project will contain silicon, glass, and aluminum which have value for recycling. Modules will be dismantled and packaged per manufacturer or approved recyclers specifications and shipped to an approved off-site approved recycler.

#### Component Pad Removal

Pads will be excavated to a depth sufficient to remove all anchor bolts, rebar, conduits, cable, and concrete to a depth of 24 inches below grade. The remaining excavation will be filled with clear sub-grade material of quality comparable to the immediate surrounding area. The sub-grade material will be compacted to a density similar to surrounding subgrade material. All unexcavated areas compacted by equipment used in decommissioning shall be de-compacted in a manner to adequately restore the topsoil and sub-grade material to the proper density consistent and compatible with the surrounding area.

#### Electric Wire Removal

Electric wire made from copper or aluminum has value for recycling. DC wiring can be removed manually from the panels to the inverter. Underground wire in the array of the array will be pulled and removed from the ground. Overhead cabling for the interconnection will be removed from poles. All wire will be sent to an approved recycling facility.

#### Racking and Fencing Removal

All racking and fencing material will be broken down into manageable units and removed from facility and sent to an approved recycler. All racking posts driven into the ground will be pulled and removed.

#### Concrete Slab Removal

Concrete slabs used as equipment pads will be broken and removed to a depth of two feet below grade. Clean concrete will be crushed and disposed of off-site and/or recycled and reused either on or off-site.

#### Access Road

During decommissioning, the processed stone access roads will be stripped exposing the geotextile beneath. The geotextile will then be removed and disposed revealing the original soil surface. The compacted soil beneath the road fill may require ripping with a subsoiler plow to loosen it before it can be returned to crop production.

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## **Site Restoration Process Description**

Following decommissioning activities, the sub-grade material and topsoil from affected areas will be de-compacted and restored to a density and depth consistent with the surrounding areas. If the subsequent use for the Project site will involve agriculture, a deep till of the project site will be undertaken. The affected areas will be inspected, thoroughly cleaned, and all construction-related debris removed. Disturbed areas will be reseeded to promote re-vegetation of the area, unless the area is to be immediately redeveloped. In all areas restoration shall include, as reasonably required, leveling, terracing, mulching, and other necessary steps to prevent soil erosion, to ensure establishment of suitable grasses and forbs, and to control noxious weeds and pests.

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## **Decommissioning Terms**

The project shall be decommissioned within 180 days of the end of the project's operational life. Areas disturbed during the decommissioning phase will be with seeded with a drought-tolerant grass seed mix appropriate for the area, unless such areas are being immediately redeveloped for other uses.

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## **Emergency Response**

GCE and the O&M services provider will coordinate with the Town of Orange police and volunteer fire departments regarding access to the facility and emergency shutoff switches. Annual emergency response training will be conducted with the Town of Orange emergency service providers. Provided below is an emergency contact list for the Town of Orange.

Each of the entrance gates will have a universal key lock (e.g. Knox lock) for emergency responders. Emergency shut-off switches will also be locked with universal locks and be clearly labeled and lit at night. Communication with emergency service providers is available in the area via cell phone coverage.

Emergencies	Dial 911
Greenskies Clean Energy O & M	(860) 398-5408
Orange Police Department	(203) 891-2130
Orange Fire Department	(203) 891-4703