



New York Community Solar Facility Decommissioning Plan

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Prepared For:
Town of Dryden, NY

Delaware River Solar
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1. Introduction

Delaware River Solar (“**DRS**”) proposes to build multiple photovoltaic (PV) solar facilities (each a “**Solar Facility**”) throughout New York State under New York State’s Community Solar initiative. Each Solar Facility is planned to have a nameplate capacity of approximately 2 megawatts (MW) alternating current (AC) and be built on a 10-12 acre parcel of private land (each a “**Facility Site**”).

This Decommissioning Plan (“**Plan**”) provides an overview of activities that will occur during the decommissioning phase of a Solar Facility, including; activities related to the restoration of land, the management of materials and waste, projected costs, and a decommissioning fund agreement overview.

Each Solar Facility will have a maturity date of twenty (20) to thirty (30) years; however, each Solar Facility has an estimated useful lifetime of 30 years or more. This Plan assumes that a Solar Facility will be dismantled and the Facility Site restored to a state similar to its pre-construction condition at the 20 year maturity date. The Plan also covers the case of the abandonment of a Solar Facility, for any reason; prior to the 20 year maturity date.

Decommissioning of the Solar Facility will include the disconnection of the Solar Facility from the electrical grid and the removal of all Solar Facility components, including:

- Photovoltaic (PV) modules, panel racking and supports;
- Inverter units, substation, transformers, and other electrical equipment;
- Access roads, wiring cables, communication tower, perimeter fence; and,
- Concrete foundations.

This decommissioning plan is based on current best management practices and procedures. This Plan may be subject to revision based on new standards and emergent best management practices at the time of decommissioning. Permits will be obtained as required and notification will be given to stakeholders prior to decommissioning.

2. The Proponent

Delaware River Solar LLC (DRS) will manage and coordinate the approvals process. DRS will obtain all necessary regulatory approvals that vary depending on the jurisdiction, project capacity, and site location. DRS will build a long-term relationship with the community hosting a Solar Facility and DRS will be committed to the safety, health, and welfare of the townships.

Contact information for the proponent is as follows:

Full Name of Company:	Delaware River Solar, LLC
Contact:	Richard Winter
Address:	33 Irving Place Suite 1090, New York, NY 10036
Telephone:	(646) 998-6493
Email:	rich.winter@delawareriversolar.com

2.1 Project Information

Address:	Dryden Road, Dryden NY 13053 (South of Dryden Road - between Irish Settlement Road and Springhouse Road)
Tax ID:	47.-1-7.3
Project Size (estimated):	One Project of 2.47 MWdc
Landowner:	Evan and Brenda Carpenter
Own / Lease:	Lease

Decommissioning of the Solar Facility

At the time of decommissioning, the installed components will be removed, reused, disposed of, and recycled, where possible. The Facility Site will be restored to a state similar to its pre-construction condition. All removal of equipment will be done in accordance with any applicable regulations and manufacturer recommendations. All applicable permits will be acquired.

2.1 Equipment Dismantling and Removal

Generally, the decommissioning of a Solar Facility proceeds in the reverse order of the installation.

1. The Solar Facility shall be disconnected from the utility power grid.
2. PV modules shall be disconnected, collected, and disposed at an approved solar module recycler or reused / resold on the market. Although the PV modules will not be cutting edge technology at the time of decommissioning, they are estimated to still produce 80% of the original electricity output at year 20 and add value for many years.
3. All aboveground and underground electrical interconnection and distribution cables shall be removed and disposed off-site by an approved facility.
4. Galvanized steel PV module support and racking system support posts shall be removed and disposed off-site by an approved facility.
5. Electrical and electronic devices, including transformers and inverters shall be removed and disposed off-site by an approved facility.
6. Concrete foundations shall be removed and disposed off-site by an approved facility.
7. Fencing shall be removed and will be disposed off-site by an approved facility.

2.2 Environmental Effects

Decommissioning activities, particularly the removal of project components could result in environmental effects similar to those of the construction phase. For example, there is the potential for disturbance (erosion/sedimentation/fuel spills) to adjacent watercourses or significant natural features. Mitigation measures similar to those employed during the construction phase of the Solar Facility will be implemented. These will remain in place until the site is stabilized in order to mitigate erosion and silt/sediment runoff and any impacts on the significant natural features or water bodies located adjacent to the Facility Site.

Road traffic will temporarily increase due to the movement of decommissioning crews and equipment. There may be an increase in particulate matter (dust) in adjacent areas during the decommissioning phase. Decommissioning activities may lead to temporary elevated noise levels from heavy machinery and an increase in trips to the project location. Work will be undertaken during daylight hours and conform to any applicable restrictions.

2.3 Site Restoration

Through the decommissioning phase, the Facility Site will be restored to a state similar to its pre-construction condition.

All project components (discussed in **Table 1**) will be removed. Rehabilitated lands may be seeded with a low-growing species such as clover to help stabilize soil conditions, enhance soil structure, and increase soil fertility.

2.4 Managing Materials and Waste

During the decommissioning phase a variety of excess materials and wastes (listed in **Table 1**) will be generated. Most of the materials used in a Solar Facility are reusable or recyclable and some equipment may have manufacturer take-back and recycling requirements. Any remaining materials will be removed and disposed of off-site at an appropriate facility. DRS will establish policies and procedures to maximize recycling and reuse and will work with manufacturers, local subcontractors, and waste firms to segregate material to be disposed of, recycled, or reused.

DRS will be responsible for the logistics of collecting and recycling the PV modules and to minimize the potential for modules to be discarded in the municipal waste stream. Currently, some manufacturers and new companies are looking for ways to recycle and/or reuse solar modules when they have reached the end of their lifespan. Due to a recent increase in the use of solar energy technology, a large number of panels from a variety of projects will be nearing the end of their lifespan in 15 - 25 years. It is anticipated there will be more recycling options available for solar modules at that time. DRS proposes to determine the best way of disposing of the solar modules using best management practices at the time of decommissioning.

Table 1: Management of Excess Materials and Waste

Material / Waste	Means of Managing Excess Materials and Waste
PV panels	If there is no possibility for reuse, the panels will either be returned to the manufacturer for appropriate disposal or will be transported to a recycling facility where the glass, metal and semiconductor materials will be separated and recycled.
Metal array mounting racks and steel supports	These materials will be disposed off-site at an approved facility.
Transformers and substation components	The small amount of oil from the transformers will be removed on-site to reduce the potential for spills and will be transported to an approved facility for disposal. The substation transformer and step-up transformers in the inverter units will be transported off-site to be sent back to the manufacturer, recycled, reused, or safely disposed off-site in accordance with current standards and best practices.
Inverters, fans, fixtures	The metal components of the inverters, fans and fixtures will be disposed of or recycled, where possible. Remaining components will be Disposed of in accordance with the standards of the day.
Gravel (or other granular)	It is possible that the municipality may accept uncontaminated material without processing for use on local roads, however, for the purpose of this report it is assumed that the material will be removed from the project location by truck to a location where The aggregate can be processed for salvage. It will then be reused As fill for construction. It is not expected that any such material will be contaminated.
Geotextile fabric	It is assumed that during excavation of the aggregate, a large portion of the geotextile will be “picked up” and sorted out of The aggregate at the aggregate reprocessing site. Geotextile fabric that is remaining or large pieces that can be readily removed from the excavated aggregate will be disposed of off-site at an approved disposal facility.
Concrete inverter/transformer Foundations	Concrete foundations will be broken down and transported by certified and licensed contractor to a recycling or approved disposal facility.
Cables and wiring	The electrical line that connects the substation to the point of common coupling will be disconnected and disposed of at an approved facility. Support poles, if made of untreated wood, will be chipped for reuse. Associated electronic equipment (isolation switches, fuses, metering) will be transported off-site to be sent back to the manufacturer, recycled, reused, or safely disposed off-site in accordance with current standards and best practices.
Fencing	Fencing will be removed and recycled at a metal recycling facility.
Debris	Any remaining debris on the site will be separated into recyclables/residual wastes and will be transported from the site and managed as appropriate.

3.5 Decommissioning During Construction or Abandonment Before Maturity

In case of abandonment of the Solar Facility during construction or before its 20 year maturity, the same decommissioning procedures as for decommissioning after ceasing operation will be undertaken and the same decommissioning and restoration program will be honored, in as far as construction proceeded before abandonment. The Solar Facility will be dismantled, materials removed and disposed, the soil that was removed will be graded and the site restored to a state similar to its preconstruction condition.

3.6 Decommissioning Notification

Decommissioning activities may require the notification of stakeholders given the nature of the works at the Facility Site. The local municipality in particular will be notified prior to commencement of any decommissioning activities. Six months prior to decommissioning, DRS will update their list of stakeholders and notify appropriate municipalities of decommissioning activities. Federal, county, and local authorities will be notified as needed to discuss the potential approvals required to engage in decommissioning activities.

3.7 Approvals

Well-planned and well-managed renewable energy facilities are not expected to pose environmental risks at the time of decommissioning. Decommissioning of a Solar Facility will follow standards of the day. DRS will ensure that any required permits are obtained prior to decommissioning.

This Decommissioning Report will be updated as necessary in the future to ensure that changes in technology and site restoration methods are taken into consideration.

3. Costs of Decommissioning

The costs below are the current estimated costs to decommission a 2 MWac Solar Facility, based on guidance from NYSERDA and estimates from the Massachusetts solar market, a mature solar market with experience decommissioning projects. The salvage values of valuable recyclable materials (aluminum, steel, copper, etc) are not factored into the below costs. The scrap value will be determined on current market rates at the time of salvage.

Tasks	Estimated Cost (\$)
Remove Panels	\$2,450
Remove Rack Wiring	\$2,459
Dismantle Racks	\$12,350
Remove and Load Electrical Equipment	\$1,850
Break up Concrete Pads	\$1,500
Remove Racks	\$7,800
Remove Cable	\$6,500
Remove Ground Screws and Power Poles	\$13,850
Remove Fence	\$4,950
Grading	\$4,000
Seed Disturbed Areas	\$250
Truck to Recycling Center	\$2,250
Current Total	\$60,200
Total After 20 Years (2.5% inflation rate)	\$98,300

NY PVTN Decommissioning Fact Sheet.pdf

4. Decommissioning Fund

DRS will create a decommissioning fund to guarantee that monies are available to perform the facility decommissioning. Although DRS intends to perform the decommissioning, unforeseen circumstances such as DRS selling the project to another party or DRS going out of business are possible. The funds will be held in a 3rd party escrow account, and they will remain available to any party performing the decommissioning such as a municipality or a landowner.

During project construction, DRS will deposit \$60,000 into the fund (prorated for the actual facility size). After every year of operation, DRS will deposit an additional 2.5% of the previous balance to keep up with inflation and expected decommissioning costs.

Decommissioning Fund (Deposits)		
Timeframe	Amount	Cumulative
Construction	60,000	60,000
Year 1	1,500	61,500
Year 2	1,538	63,038
Year 3	1,576	64,613
Year 4	1,615	66,229
Year 5	1,656	67,884
Year 6	1,697	69,582
Year 7	1,740	71,321
Year 8	1,783	73,104
Year 9	1,828	74,932
Year 10	1,873	76,805
Year 11	1,920	78,725
Year 12	1,968	80,693
Year 13	2,017	82,711
Year 14	2,068	84,778
Year 15	2,119	86,898
Year 16	2,172	89,070
Year 17	2,227	91,297
Year 18	2,282	93,580
Year 19	2,339	95,919
Year 20	2,398	98,317

Assumed 2MWac Facility