PROJECT SUMMARY

3.9 MWac SOLAR FACILITY

318 Moore Hill Road
SBL: 18-1-9.1

And

Adjacent to 211 Hastings Drive
SBL: 26.-1-6.1

Prepared for

Town of Neversink Planning Board

Prepared by:
NY Neversink I, LLC

September 20, 2023

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ACRONYMS

AC	Alternating Current
DC	Direct Current
kV	Kilovolt
MW	Megawatt
PV	Photovoltaic

INTRODUCTION

Ny Neversink I, LLC ("**Project Owner**") has prepared this preliminary project summary ("**Project Summary**") for the proposed development, installation, and operation of a solar photovoltaic facility ("**Solar Facility**") including an interconnection line ("**Interconnection Line**") to interconnect the Solar Facility to Central Hudson ("**Utility**") electrical grid. The proposed Solar Facility and Interconnection Line are referred to collectively as the "**Project**".

This Project is being submitted to the Town of Neversink ("**Town**") as part of the application with respect to the special use permit and site plan review by the Town as set forth in the Code of the Town of Neversink, Section 50-8 Schedule of District Regulations Zone RR3 (12) Large Solar Energy Systems.

The proposed site for the Solar Facility ("**Project Site**") is on approximately 30 acres of undeveloped land within approx. 166.6 acre across two parcels, Tax ID: 18-1-9.1 and 26-1-6.1 ("**Property**"). The Property is located north of Hastings Drive or South of Moore Hill Road within the jurisdiction of the Town.

The connection of the Solar Facility to the Utility electrical grid, including the specific interconnection equipment, will be part of a standard "**Interconnection Agreement**" to be executed between the Project Owner and Utility. The Solar Facility will have a total generation capacity of not more than 3.9 MW AC. The final generation capacity will be determined based on the final site plan approved by the Town.

Energy generated from the Solar Facility will be distributed to the Utility for daily use by the Utility's customers and directly benefit customers enrolled in the Project Owner's "**Community Solar Program**". The objective of the Community Solar Program is to offer electricity at a discount to the Utility's rate. The Project Owner's goal is to provide residences and businesses in the Town with the opportunity to enroll in its Community Solar Program.

The Solar Facility design will adhere to technical and environmental requirements in accordance with electricity distribution companies' codes and current federal, county and municipality laws, including all applicable codes, regulations, and industry standards as referenced in the New York State Uniform Fire Prevention and Building Code ("**Building Code**"), the New York State Energy Conservation Code ("**Energy Code**"), and the Town Code.

Key Attributes of the Project Include:

- Direct conversion of sunlight to electricity without generation of waste materials.
- Solar power generated producing no carbon emissions or air pollutants.
- Minimal ambient noise generated during solar power generation, no noise during nighttime.
- Minimal traffic disturbance during Project operational lifespan.
- No use of public water utilities.
- Uniform arrays approximately, on average ten feet in height to minimize visual effect.
- All non-array structures approximately 16 feet in height to minimize visual effects.
- If necessary, vegetation to be planted around the Project Site to minimize visual effects.
- Modules secured using a racking system minimizing ground grading and ground disturbance.

This Project Summary includes **general descriptions of and guidelines** for design, construction, operation, maintenance, and decommissioning of the Project. Design, construction, operation maintenance, and decommissioning of the Project will meet or exceed the requirements of the National Electrical Safety Code and U.S. Department of Labor Occupational Safety and Health Standards, as well as Town and municipality requirements for the safety and protection of landowners and property. Project Owner may submit additional materials/documents regarding the above containing more detail (including a separate Decommissioning Plan and Operations and Maintenance Plan).

The Project Owner has compiled this Project Summary with, to the best of its knowledge, currently available information. Certain additional reports, such as topography, geotechnical, and environmental, have been completed, or will be completed, during the Town permitting process.

THE INFORMATION CONTAINED IN THIS PROJECT SUMMARY IS PRELIMINARY AND NOT INTENDED TO DESCRIBE ALL RELEVANT PROJECT INFORMATION AND IS QUALIFIED IN ITS ENTIRETY BY THE PROJECT OWNER'S FINAL APPLICATION AND SITE PLANS APPROVED BY THE TOWN DURING THE TOWN'S REVIEW PROCESS.

1.1. Purpose

Provide a cost-effective source of renewable solar electricity. Additional objectives include:

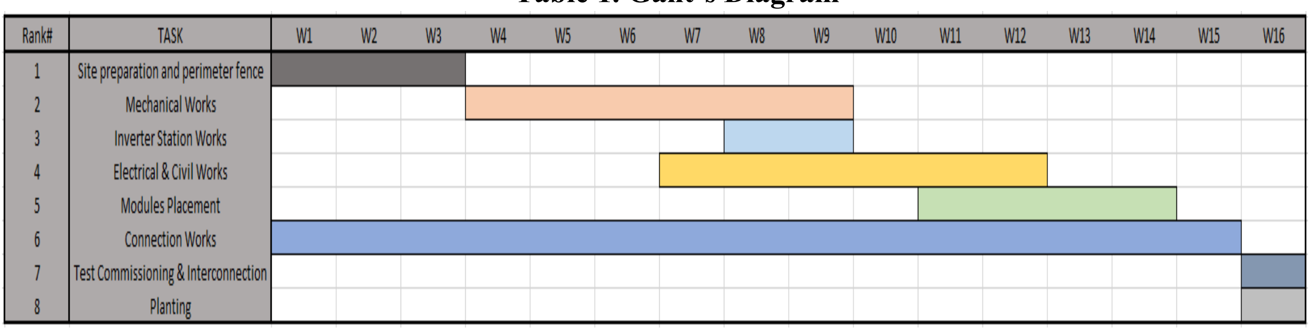
- Develop a solar generation facility that is feasible, quick to construct and easy to operate while providing the Utility and its customers with a cost-effective, cleaner alternative.
- Establish emission-free solar electricity and reduce greenhouse gas (GHG) emissions while avoiding, minimizing, and mitigating the impacts to the environment.
- Generate electricity without utility water supply needs.
- Provide other important economic and environmental benefits to the Utility and the municipality, including improving local air quality and public health, developing local energy sources, promoting local jobs, and diversifying the energy supply.
- Contribute to the State of New York goal of 100% of electricity from renewable sources.

Based on historical information, the energy usage for a standard home is 10,000 kWh/year. The proposed Solar Facility would generate approximately 7,743,400 kWh/year, equivalent to the electricity consumption of 774 homes. The Project Owner's goal is to provide residents and businesses in the Town the opportunity to enroll in the Project Owner's Community Solar Program.

1.2. Estimated Construction Schedule

Construction of the Project is estimated to take approximately 4 months to complete.

Table 1. Gant's Diagram



2.1. Project Site and Control

Selection of the Project Site over other locations is based on several site criteria including:

- Contiguous site with suitable topography of adequate size to host the Solar Facility.
- Proximity to existing Utility electrical grid.
- Availability, lease agreement with current landowner.
- Avoiding sensitive areas, such as rivers, lakes, etc.

- Minimizing visual impact by utilizing the topography and landscaping.
- Good highway access for construction, operation, and maintenance activities.

The Project Site will be leased from the property owners ("**Property Owner**") and is part the Property defined above and is owned by the Property Owners in the Town of Neversink, Sullivan County, New York

The proposed Project Site will be approximately 30 acres located on the Property (See Figure 1 and the Property parcel with purple markers. Project Site access is anticipated to be from Hastings Drive.

Figure 1. Property Location

2.2. General Overview of Solar Facility

A grid-connected photovoltaic ("**PV**") power system is an electricity generating solar system that is connected to the utility electrical grid. A grid-connected system consists of solar modules one or more inverters, a power conditioning unit and grid connection equipment. The proposed installation is composed of a field of photovoltaic generators (See Figure 2).

The Solar Facility is composed of monocrystalline photovoltaic modules. Modules are electrically interconnected in series of strings and can be mounted on racking that can either 1) track the path or the sun (as is expected for racking at this Project) or 2) is fixed at orientation and tilt angle..

To collect all DC output, an inverter station and step-up power transformer will be interconnected, conditioning the electric parameters for feeding energy to the utility electric distribution network. Power generated from the modules will be transferred via shielded cables within underground conduits to switch gear which forms part of the main power generation facility.

The modules are electrically protected, and above-grade wires are both shielded and secured to avoid exposure or accidental contact. All necessary protections for this type of facility and supporting structures for photovoltaic modules are included.

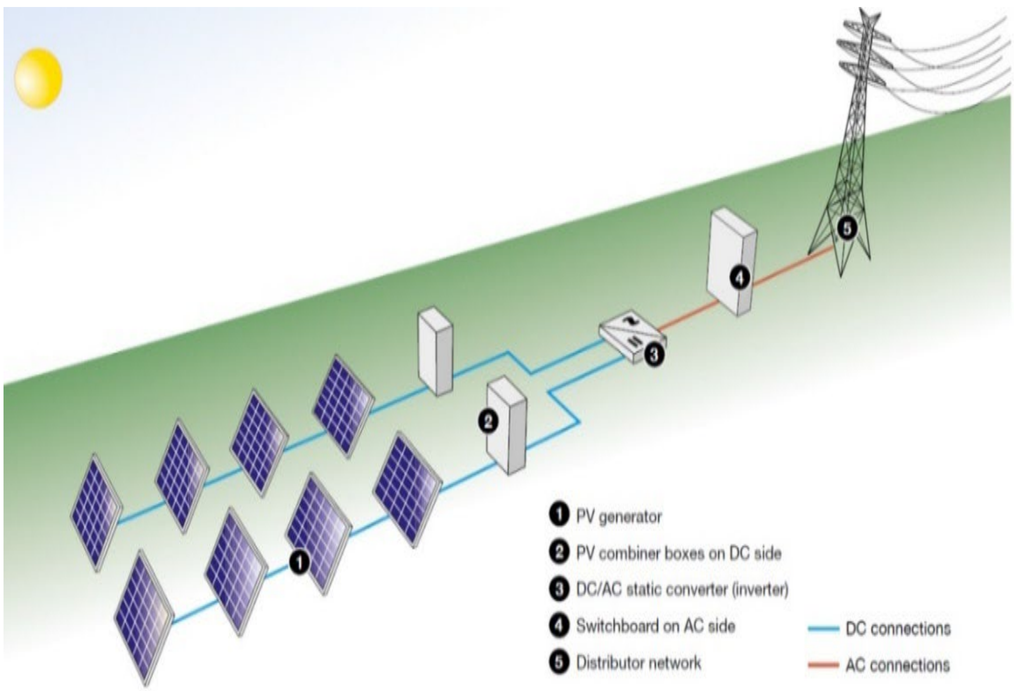


Figure 2. Diagram of a Grid-Connected Photovoltaic Facility

2.3. Acreage and General Dimensions of the Project Site

The total acreage of property owned by the Property Owners is 166.6 acres. The Project Site would be located on approximately 30 acres. The Interconnection Line assumes a maximum of 20 ft of temporary, and 2 ft. permanent wide trench. Table 2 below identifies significant structures and equipment, including dimensions. As per the New York State Department of Environmental Conservation, (i) only the inverter station is considered impermeable surface coverage and (ii) the panel surface area is considered permeable.

Table 2- Summary of Project Site Area

Description	Project
Solar Facility (perimeter fence)	+/-30 Acres
Modules Covered Area	+/-5 Acres
Inverter Station Covered Area	0.02 Acres
Interconnection Line (Permanent) Covered Area	0.11Acres

*The total area inside the perimeter fence (regardless of pervious or impervious designation) is approximately 14% of the total Property acreage.

2.4. Solar Facility

The following sections describe the major components of the Solar Facility. ***Selected manufacturers are not indicated as manufacturers may change during the design and permitting process due to market and economic conditions.*** The final selected equipment is expected to have similar manufactured characteristics to those proposed.

2.4.1. Summary of Project Components

Supporting structures are set considering economic, technical and land conditions for the modules to capture the most amount of solar radiation and obtain the best solar yield possible. The arrays are distributed into rows and consider surrounding shadings in the array design. There are open corridors between the rows of modules to perform construction, maintenance, and landscaping. The inverter station, which contains the transformer, will connect the Solar Facility to the existing Utility distribution network.

2.4.2. Solar Modules

The module manufacturer will depend on the availability of the modules during the procurement period. Manufacturer equipment specification sheets will be provided to the Town prior to issuance of a building permit. The solar modules will meet New York's Uniform Fire Prevention and Building Code Standards. Expected minimum requirements of the modules are:

- Conform with IEC 61215, IEC 61730, IEC 61701, UL 61730 Solar Project Standards and other certificates.
- Project Standards and other certificates.
- High Module Conversion Efficiencies
- Dimensions 2384x1096x35mm
- Cell type: Monocrystalline
- Maximum System Voltage: 1500 Vdc (UL)
- Efficiency up to 21 %
- 30 years power output warranty
- Electrical Characteristics STC
- Values at Standard Test Conditions STC (Air Mass AM1.5, Irradiance 1000W/m^2, Cell Temperature 25º)

2.4.3. Supporting Structures

Evaluation of the structural design of support for the modules shall account for permanent loads, snow and wind loads, seismic design construction, structural calculation and foundations, module sizing, control of connections, geotechnical analysis and effects of temperature changes in accordance with applicable law and building code.

The metallic supporting bases for modules shall be of steel components hot dip galvanized, with a minimum average thickness of 70µm as ISO/EN 1461 or equivalent or by an appropriate anodized aluminum of heavy-duty type and alloy for the better anti-corrosion protection of the construction. All connections including bolts, nuts, shall be of A2 stainless steel or compliant with other industry standard practices appropriate for the application defined.

To minimize ground disturbance, the supporting bases will be pile driven into the ground, considering the results of a geotechnical study. Following are several examples of the potential support structure considered for the Project.

Tracker Racking in Stowed Position (Racking Expected for Project):

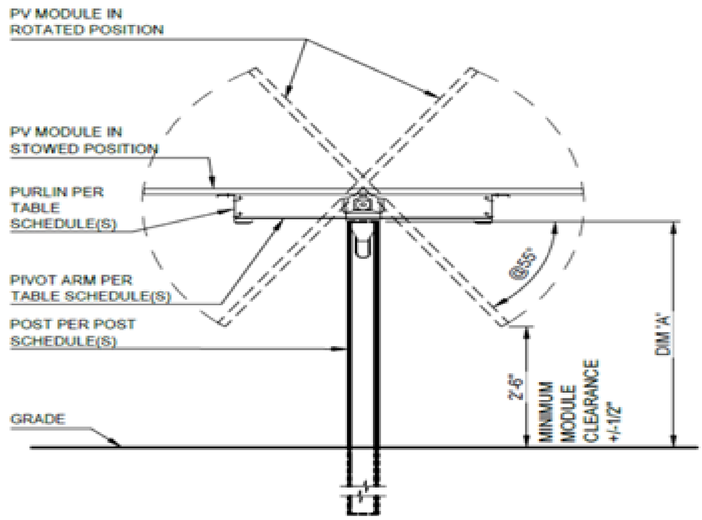


Figure 3. Supporting Structure Overview (Tracker)

Key points of the Supporting Structure:

- Portrait mounting
- Mono-post anchored to the ground
- All connections bolted without welding.
- One tie bar and a crossbar in which the straps are supported

The module height above ground once attached to the tracker racking, is expected to be approximately 3 feet at the low end and 16 feet at the high end.

Fixed-Tilt Racking (other potential support structure configuration):

Figure 3b. Supporting Structure Overview

In the case of fixed-tilt racking, the module height above ground once attached to the racking, is expected to be approximately 3 feet at the low end and 10 feet at the high end.

2.5. Inverter and Transformer Station (MV Station)

The MV Station mainly applies to medium and large-scale PV generation systems. Based on standard-sized outdoor container, the MV Station integrates inverter, transformer, power distribution and monitoring unit to meet with the requirements of modular design. The MV Station converts DC current generated from the PV array into grid-compatible AC current, which can be directly fed into the medium voltage grid.

2.5.1. Inverter

The Inverter, part of a MV Station, shall be installed in an outdoor container protected with weather-proof material to NEMA 4X protection degree. Inverters shall meet at least the following requirements, international standards and tested by:

- UL 1741, UL 1741 SA
- IEEE 1547
- Rule 21
- NEC Code

DC load break switches and AC circuit breakers are provided on inverter.

The DC cabinet of the inverter is shown in the following figure:

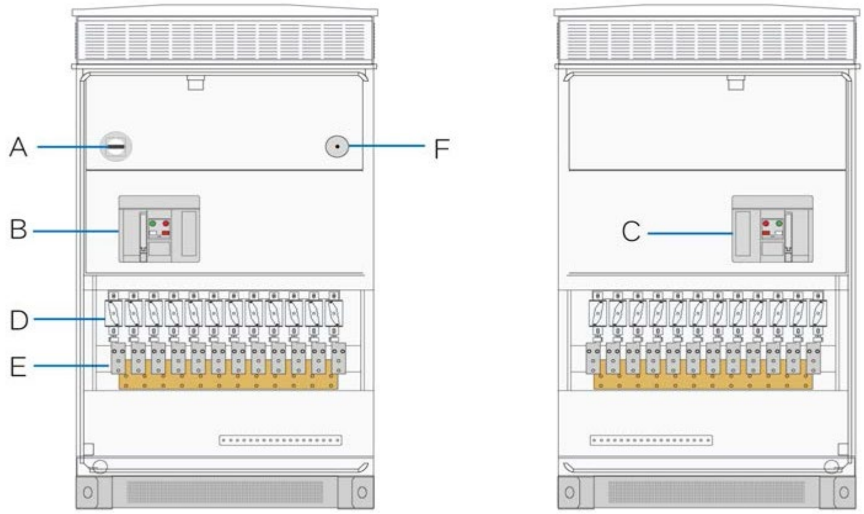


Figure 4. Inverter (Example)

No.	Name	Description
A	AC maintenance switch	Disconnect the switch before maintaining AC cabinet components.
B	QS1, DC load break switch 1	Disconnect the switch before maintaining AC cabinet components.
C	QS2, DC load break switch 2	Connect/disconnect the DC side of the unit 2.
D	Fuse	---
E	DC connection area	The upper part of the copper bar is for positive cable connection area while the lower part is for negative cable connection.
F	DC maintenance switch	Disconnect the switch before maintaining DC cabinet components.

2.5.2. Transformer

The transformer, part of a MV Station, is designed for medium and large-scale utility solar facilities. Critical power connections are completed and tested in a factory environment and the pre-tested unit is shipped to the field ready for the final field connections. Standard MV Stations can reduce installation and commissioning time. The all-in-one solution simplifies the installation, saves space and the visual impact is lower than other options of configuration.

Figure 5. "All-in-one" LV Cabinet, Inverter, & Transformer Station

2.6. Electrical Installation

This section contains the remainder of the electrical devices required in the Solar Facility.

2.6.1. DC Electric Switchboards

Within each array, strings of modules are to be combined in parallel in a combiner box of with a protection rating of NEMA 3R or above. The combiner boxes will have at least the following characteristics:

- Suitable for outdoor installation
- Designed for UV resistance
- Protection isolation
- Grounding copper tape
- Anti-condensation filter
- Mounting lugs and required nuts and bolts for installation
- Self-extinguishing and halogen-free materials
- Cable glands for output DC cable (up to 4x1x300mm² Al XLPE cable; defined per project) and signaling cable input & output
- Cable glands for communication cable and grounding cable
- DC fuse in negative pole per string
- Coverage of electrical items with methacrylate plate
- Disconnecting isolators 1500VDC must comply with applicable standards
- Fitted with surge protection Device, 3pole, 1500Vdc, 40kA
- Fully labeled and color-coded wiring (as per project all strings)
- Appropriate number of string inputs and associated fuse sizing
- In case of armored cable, glands have to be able to earth the aluminum armor

Operational ambient conditions are to be as follows:

- Temperature:77.0°F to + 10.0 °F
- Relative humidity: 15 to 95 %

2.6.2. Wiring

Two types of wiring will be required in the Project, from modules to DC Box, and from DC Box to the general DC Disconnect Switch. Cables will meet the requirements of UL standard 4703, appropriate for solar photovoltaic applications.

Wiring will consist of single conductor, sunlight-resistant, direct burial photovoltaic wire rated 90°C wet or dry, 2000 V for interconnection wiring of grounded and ungrounded photovoltaic power systems with the following features:

- Rated 90°C wet and dry
- Rated for direct burial
- Deformation-resistant at high temperatures
- Excellent moisture resistance, exceeds UL 44
- Stable electrical properties over a broad temperature range
- Increased flexibility
- Excellent resistance to crush and compression cuts
- Resistant to most oils and chemicals
- UV/sunlight-resistant
- Meets cold bend and cold impact tests at -40°C

2.6.3. Grounding

Metal enclosures containing electrical conductors or other electrical components may become energized as a result of insulation or mechanical failures. Energized metal surfaces, including the metal frames of modules, can present electrical shock and fire hazards.

By properly bonding exposed metal surfaces together and to the earth, the potential difference between earth and the conductive surface during a fault condition is reduced to near zero, reducing electric shock potential. The proper bonding to earth by the equipment grounding system is essential, because most of the environment (including most conductive surfaces and the earth itself) is at earth potential. The conductors used to bond the various exposed metal surfaces together are known as equipment grounding conductors (EGCs).

The metallic device used to make contact with the earth is the *grounding electrode*. The conductor that connects the central grounding point (where the equipment grounding system is connected to the grounded circuit conductor on grounded systems) and a grounding electrode that is in contact with the earth is known as the *grounding electrode conductor* (GEC).

Combined Direct-Current Grounding-Electrode Conductor and Alternating-Current Equipment Grounding Conductor: An unspliced, or irreversibly spliced, combined grounding conductor shall be run from the marked dc grounding electrode conductor connection point along with the ac circuit conductors to the grounding busbar in the associated ac equipment. See Figure 6.

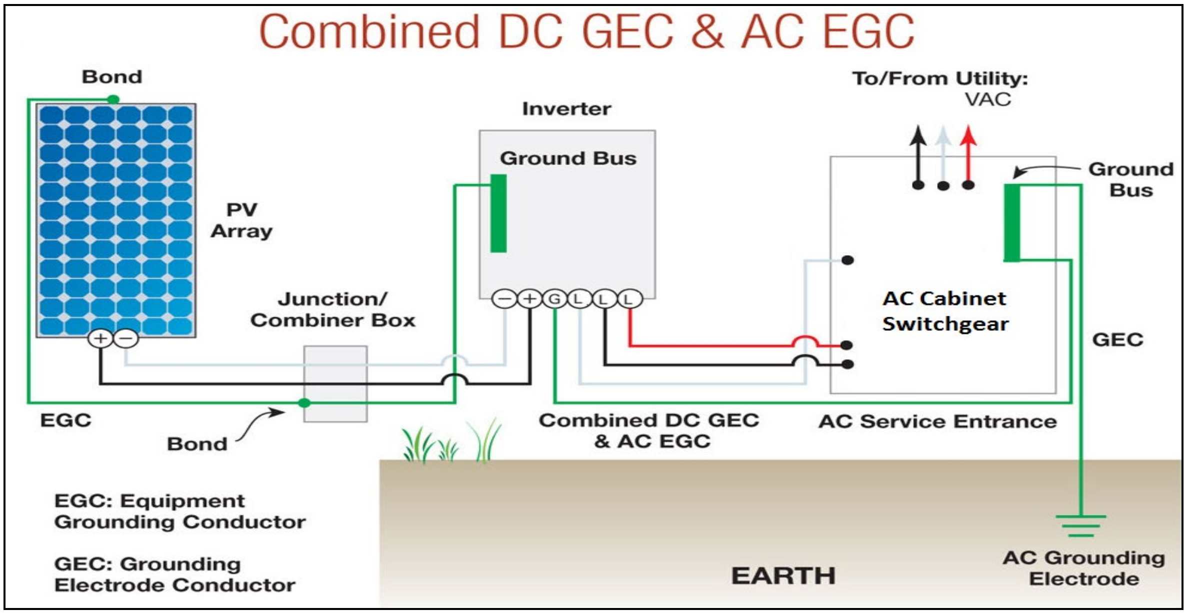


Figure 6. Combined EGC/GEC grounding routing Solar Facility

2.7. Monitoring

Sensors include:

- Combiner Box temperature
- Ambient temperature
- Solar irradiation
- Wind speed
- Panel temperature

All sensors such as the weather station and pyranometers must use dedicated Modbus Channels for the collection of measurements. The MODBUS channels cannot exceed a maximum of 16 devices (pyranometers, temperature sensors, wind sensors, weather stations) with no other devices such as string monitors, inverters or relays are to be connected to the dedicated Modbus channel for the weather sensors and pyrometer. All data sent to the Industrial PC (Supervisor software) must be received using Modbus TCP protocol.

The monitoring system considered is centralized. This becomes possible by using the Inverter Station as a core data collection through a basic set of equipment. It is first necessary to obtain the values of the different variables to monitor. The monitoring system can monitor the AC installation and the DC installation (panels). For monitoring smaller parts of the DC installation at the inverter level there are more Combiner Boxer of lesser strings.

The best way to capture inverter information is using a system to provide communication with a PC, as thus used the inverter own hardware for measurement, hardware that is already included with the central inverter, so the price is usually lower than other solutions. Measuring switchboards have the advantage that they can monitor multiple system parameters, such as level of harmonics, phase equilibrium, etc.

The inverter station is a central monitoring system of the Solar Facility with these features:

- Grid visualization
- Generator visualization
- Inverter visualization
- Clearly visible external warning signals concerning voltage at the base of pad-mounted transformer and substation
- Registers
- Fault history visualization
- Warning history visualization
- Status visualization
- Internal debug
- * SI visualization menu

2.8. Mid Voltage Connection

The Solar Facility will satisfy Utility technical interconnection requirements in order to work in parallel with the utility distribution system. The Project will meet the following requirements:

- Voltage response range
- Frequency response range
- Inverters certified
- Protective function requirements
- Metering
- Operating requirements
- Dedicated transformer
- Disconnect switch
- Power quality
- Power factor
- Islanding
- Equipment certification
- Verification testing
- Interconnection inventory

2.8.1. Mid Voltage Interconnection Line

The proposed Interconnection Lines would be designed for 12.5 kV three-phase Wye-grounded (three conductors) circuits. The Interconnection Line will connect the transformer to the existing electrical grid on Hastings Drive on the Utility's Neversink Substation Circuit #3091 connecting to the Utility substation bank. The Interconnection Line will be underground until required by the Utility to interconnect to the Utility electrical grid.

The Interconnection Line would be by underground duct, conductors rated at 15 kV, backfilled with select and native backfill, and compacted. The main characteristics of the wire are:

- EPR/Copper Tape Shield with overall LSZH
- Conductor 1350 Aluminum Compact Class B strand
- Three conductor and grounding wire in contact with metallic shielding cape
- Medium-Voltage Power
- Shielded 15 kV
- UL Type MV-105, 133%
- Ins. Level, 220 Mils
- Rated at 105˚C
- For use in aerial, conduit, open tray and underground duct installations
- Electrical stability under stress
- Chemical-resistant
- Meets cold bend test at -35˚C
- 105°C rating for continuous operation
- 140°C rating for emergency overload conditions
- 250°C rating for short circuit conditions
- RoHS Compliant

- Excellent heat and moisture resistance
- Excellent flame resistance
- Flexibility for easy handling
- Low friction for easy pulling
- According to National Electrical Code (NEC), UL 1072 and more compliances

2.8.2. Point of Common Coupling (PCC)

The PCC is the point where the Project interconnects with the electric utility grid.

Table 3. PCC Configuration Summary

Line Voltage at PCC (kV)	13.2
PCC Line Type	3 phase
PCC Line Configuration	Wye-grounded

2.8.3. AC Generator Disconnect Switch

In order to isolate and protect the Solar Facility from the utility electrical grid, a load break disconnecting switch is necessary. The disconnect switch 3-phase located between the generating equipment and interconnection at the PCC, must be manual, visible, lockable and gang-operated. The Project Owner will have 24-hour/7-day unlimited access and control of this isolation switch.

The disconnect switch must be rated for the voltage and current requirements of the installation. Disconnecting means shall be rated to interrupt the maximum generator output; meet applicable Underwriters Laboratories (UL), American National Standards Institute (ANSI), and IEEE standards; and shall be installed to meet the NEC and all applicable local, state, and federal codes. It will be clearly marked with permanent larger letters: "Generator Disconnect Switch".

In accordance with the Project Owner's safety rules and practices, this isolation device must be used to establish a visually open, working clearance boundary when performing maintenance and repair work. The designated generator disconnect also must be accessible and lockable in the open position and have provisions for both Project Owner and Utility padlocks and be capable of being tagged and grounded on the Project Owner side by Project Owner personnel.

The visible generator disconnect switch shall be a gang-operated, blade-type switch (knife switch) meeting the requirements of the NEC and nationally recognized product standards. Installation will also require a recloser with remote control and data access to be installed to:

- Monitor voltage current
- Provide for remote disconnect
- Act as a utility controlled redundant protection system

2.9. Operation and Maintenance

The property operation and maintenance plan for a Large-Scale Solar Energy System describes continuing photovoltaic maintenance and property upkeep, such as mowing and trimming.

A separate "stand alone" Operations and Maintenance Plan ("O&M Plan") is being submitted to the Town as part of the application for a special use permit and application for site plan approval. The O&M Plan is submitted separately for ease of tracking the Solar Law requirements. **The following is a summary of general operation and maintenance activities.**

During operation, maintenance activities will focus on the scheduled preventive maintenance and repairs of the solar generating equipment. The maintenance and repair of Project components is expected to be coordinated through monitoring, on-site inspections, and technical support from the various warranty services of the original equipment manufacturers. Unsafe, inoperable, and/or abandoned equipment, shall be removed by the Project Owner.

The Solar Facility will operate 7 days per week, generating electricity during daylight hours. Preventive maintenance activities will occur during normal working hours, generally twice per year, with the occasional need to conduct corrective maintenance to certain equipment or facilities during non-scheduled or weekend hours.

The solar generating equipment will be continuously monitored and controlled from the central control room during normal working hours with 24-hour monitoring from a remote source. The generation units, auxiliary systems and balance of the Solar Facility will be connected to the SCADA system.

Standard maintenance for the Solar Facility will include:

- **Modules Cleaning**: Module cleaning will be performed during preventive maintenance hours or extraordinary snowstorms, with no use of chemicals.
- **Scheduled Project Maintenance**: There will be the need to periodically inspect the modules (snow, ice, grass, vegetation) and make necessary alignment adjustments (i.e. tighten fasteners) or replace damaged modules to prevent breakdowns and production losses. Project components will go through maintenance checklist once or twice per year.

  The checklist shall include such items as:
    - Checking wire connections
    - Confirming settings on the inverter

- Testing voltage/current at any part
- Inspecting components for moisture
- Transformer maintenance
- Resealing of system components

- **Corrective Maintenance**: Corrective maintenance will occasionally be required due to uncontrollable circumstances such as severe weather or premature failure of components. These unscheduled repairs will be undertaken in a manner to minimize impacts to the continued operation of the Solar Facility.
- **Monitoring Management:** uses real-time data to oversee Project parameters.

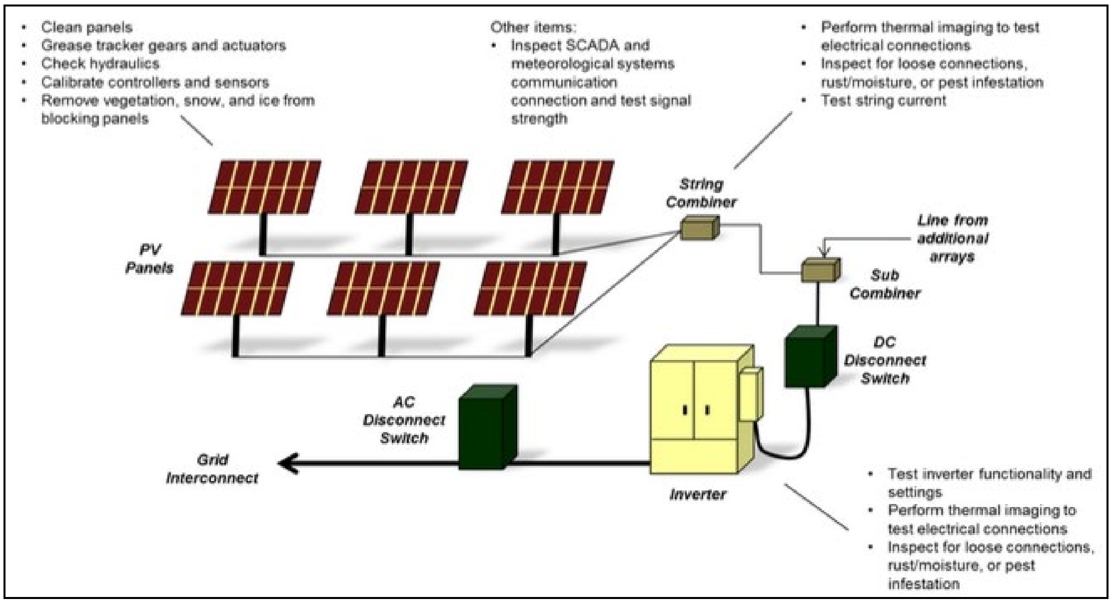


Figure 7. Highlights of the Solar Facility Maintenance

Typical equipment required to support operation and maintenance of the Solar Facility includes:

- Cleaning systems
- Standard electrical tools
- Building support systems
- Transport vehicles (pick-up truck, ATV, etc.)
- Standard machinist tools

Project Site Maintenance: Frequency of site visits shall be determined based on season (more in summer, less in winter), but no less than quarterly to monitor vegetation. Any required corrective actions will be taken as soon as practical or warranted by the circumstances. Typical activities include:

- Visually inspect and report on all fencing for signs of damage, intrusion, and overgrowth of vegetation.
- Inspect signage to ensure all originally installed signs are present and legible.
- Maintenance of access road, including snow removal as needed.
- Vegetation may need to be trimmed or cut back to avoid shading of the solar modules. Shading inspections will be done semi-annually, and trimming will occur as needed. This would include

ground cover, existing vegetation, and screening vegetation. Ground cover will be either mowed, as needed, or sheep may be utilized to graze the array area.

- Adherence to any Storm Water Pollution Prevention Plan practices, if any

2.10. Site Security

Limiting access to the Project Site to non-authorized personnel is necessary both to ensure the safety of the public and to protect equipment from potential theft and vandalism.

The perimeter of the Solar Facility will be fenced with an approximately eight-foot-high fence to facilitate Project and equipment security (see Figure 8 for proposed fencing type). Surveillance methods such as security cameras or motion detectors may be installed at locations along the Project Site boundary. There is no lighting proposed on the Project Site. Warning signs with the Project Owner's phone number will appear on signs placed at the entrance and perimeter of the of the Solar Facility.

Figure 8. Fencing

2.11. Temporary Construction

Temporary construction staging areas would be required for temporary construction offices, construction parking, material laydown and storage areas, an equipment assembly area, construction trailers, and portable toilet facilities. These areas will be located on the Project Site and used throughout the Project construction period and then decommissioned. The exact location of the temporary construction staging areas will be defined in the Drawings.

Graded all-weather roads may be required in selected locations on the Project Site during construction to bring equipment and materials from the staging areas to the construction work areas. These roads may not be decommissioned after construction and may be utilized for long-term Project operation and maintenance.

2.12. Water Uses and Sources

The Project will not use any utility water for electrical power generation.

2.13. Erosion Control and Storm Water Drainage

A storm water pollution prevention plan ("**SWPPP**") study will be conducted if necessary.

2.14. Vegetation Treatment and Management

The Project Site consists of open fields. Native vegetation (low growing grasses) will be planted after construction to grow amongst the solar panels.

2.15. Waste Materials Management

The Project will generate a variety of non-hazardous wastes during construction and operation. These waste items may include the materials listed in Table 4:

Table 4: Waste and Hazardous Materials Management

Item	Description
PVC Cement	Adhesive used for underground PVC conduit and sleeve ground.
Cardboard	General packaging
Plastic	General packaging, wiring
Cold Galv	Anti-rust galvanizing spray used when cutting material to prevent rust.
Copper & Aluminum	Used wiring systems

Material Safety Data Sheets will be provided at the time of installation and will be maintained at the Project Site as they are specific to the components purchased. All waste shall be disposed according to what is specified in its Material Safety Data Sheets.

2.15.1. Construction Waste Management

During construction, inert solid wastes may include recyclable items such as paper, cardboard, solid concrete, metals and wire, Type 1 to 4 plastics, drywall, and wood. Non-recyclable items include insulation, other plastics, food waste, packing materials, and other construction wastes. Management of wastes will be the responsibility of the Project Owner. Typical management practices required for contractor waste include recycling, when possible, proper storage of waste and debris to prevent wind dispersion, and weekly disposal of waste at the local landfill. A waste management plan will be implemented during construction.

It is expected that a 40-cubic-yard container would be emptied weekly during the first month of construction and monthly thereafter. Construction waste is not expected to have an impact on public health or cause adverse effects on local landfill capacity. No hazardous wastes are expected.

2.15.2. Operations Waste Management

During operations, inert solid wastes generated would be predominantly routine maintenance wastes, such as scrap metal, wood, and plastic from surplus and deactivated equipment. Scrap materials such as paper, packing materials, glass, metals, and plastics will be segregated for recycling. Non-recyclable inert wastes would be stored in covered trash bins in accordance with local ordinances and picked up by an authorized local trash hauler for transport and disposal.

2.16. Fire Protection

Fire protection at the Project Site will include safety measures to ensure the safeguarding of human life, prevent personnel injury, and preserving property. The Project Owner will meet with the local fire department(s) to provide them with information related to the Project.

2.17. Health and Safety

A "Health and Safety" plan will be in effect during construction with regular inspections. Workers will be instructed to use required personal protective equipment (PPE) during construction activities. Required PPE will be approved for use, distinctly marked to facilitate identification, and be used in accordance with the manufacturer's instructions. The PPE will be of such design, fit, and durability as to provide adequate protection against the hazards for which it is designed. The use of PPE for site activities includes but is not limited to safety glasses or goggles, hardhat, earplugs, dust mask, leather and/or insulated gloves, safety-toe and/or metatarsal shoes, apron, and safety belt.

During construction, a first aid station, complete with all emergency medical supplies, will be provided in the operation and administration building near the break room.

3.0. CONSTRUCTION OF THE SOLAR FACILITY

The following section generally describes the activities that are anticipated to occur before and during Project construction and throughout operation and maintenance of the Project.

3.1. Solar Field Design, Layout, Installation and Construction Processes

The site plan for the Solar Facility is shown in Figure 9. The Solar Facility consists of arrays anchored to the ground. Arrays may be reconfigured as required by site characteristics such as boundaries, roads, topography or similar constraints.

The arrays are installed in a block configuration. Modules are attached to horizontal steel shafts supported by vertical steel posts. All panels will be approximately, on average, sixteen (16) feet in height maximum and the minimum height in relation to the ground will be approximately 3 ft. All mechanical equipment will be completely enclosed by an approximately 8' high fence.

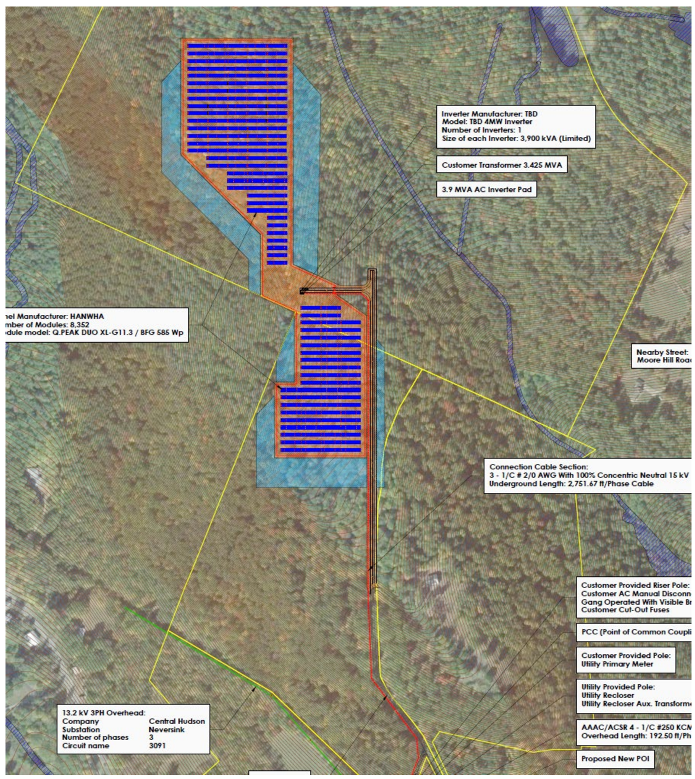


Figure 9. Project Site Layout

3.2. Access and Transportation System, Component Delivery, Worker Access

The Project Site access for general construction traffic will be from Hastings Drive by an access road. Traffic will come from there onto the main access drive to the Project Site where all deliveries will occur. The main access road will also be the primary route for workers to access the Project Site.

Parking will be provided at the Project Site. It is not expected, but if necessary, a traffic and transportation plan will be developed to address flagging and traffic management along public roads during the construction phase. Construction traffic would continue for approximately four months from the start of construction.

3.3. Construction Work Force Numbers, Vehicles, Equipment, Timeframes

Construction activities would include road and access construction, solar installation, operation and maintenance facility construction, Interconnection Line trenching, installation of a direct buried rated Interconnection Line, cleanup, and site reclamation. The anticipated number of workers and type of equipment to construct the Project are provided in Table 5.

Table 5: Typical construction estimated personnel and equipment required

Item:	# of Personnel	Equipment
Survey	3	2 pickup trucks
Solar Installation	12	1 piling and drilling machine 1 fork lift 2 trucks
Temporary Road Construction	6	1 excavator 1 road grader 2 trucks
Trench and backfill	4	1 excavator 1 compactor 2 trucks
Interconnection Line	4	1 spool truck 1 trencher 1 truck
Clean-up	4	1 truck
Rehabilitation	2	1 truck
Estimated personnel	35	

3.4. Site Preparation, Surveying and Staking

A detailed land survey will be performed to establish local benchmarks and Project Site boundaries. A topographic survey has been performed to establish the Project Site's grading and drainage plans for the arrays, roadways, and other Project features. Detailed maps with GPS coordinates will be supplied to proper authorities having jurisdiction as required for permitting.

A licensed survey team, prior to commencement of construction, will properly stake the Project Site physical boundaries and construction footprints. The survey team will additionally stake the path through any right of ways ("**ROWs**") for the Interconnection Lines or provide a detailed map using GPS coordinates.

3.5. Site Preparation and Vegetation Removal

Vegetation will only be removed in disturbed areas as required for placement of electrical equipment or shading events. Vegetation removal will be minimized as much as possible.

The Project Site is expected to require grading. To the extent possible, the racking system will be adapted to the existing topography required for installation. Grading may be required for the inverter and transformer pad.

3.6. Solar Facility Construction

Prior to installation of the modules, the supporting steel posts would be installed, generally pile driven to minimize ground disturbance. The modules would be mounted by hand to the steel posts and all necessary electrical, communications, and other connections will be made. All significant assembly and erection will be conducted on site.

3.7. Project Construction

The construction schedule is anticipated to be four months.

3.8. Gravel Needs and Sources

Gravel needs would be moderate. The main access road, if needed, would use compacted, crushed gravel imported from offsite. Materials will be locally sourced to the extent possible.

3.9. Electrical Construction Activities

Power generated by the modules will be collected through a power collection system. The collection system will direct the output from the modules to the on-site transformer to be transmitted through the Interconnection Line.

3.10. Interconnection Line Construction Sequence

The Interconnection Line from the Solar Facility to the Utility required poles will be underground. The construction of the Interconnection Line is a several step process. The initial step will be clearly surveying the ROW boundaries and marking any existing underground utilities. After the ROW has been staked, excavation equipment can be used to dig the trench. The excavated soil will be used for backfilling or hauled off-site for disposal as appropriate. When the trench is prepared, the conduit installation process can begin, utilizing the proper backfill around the conduit, if required. Above the conduit placement, the previously excavated native soil can be used to fill in the remaining trench depth.

The Engineering, Procurement and Construction contractor ("EPC Contractor") shall provide a compilation of all user manuals, guarantees and warranties to the Project Owner and O&M Contractor including a data sheet for each item of equipment.

4.0. ENVIRONMENTAL CONSIDERATIONS

4.1. Description of Project Site and Potential Environmental Issues

4.1.1. Special or Sensitive Species and Habitats

The Project Site consists of mostly wooded areas. The Property is bounded on all sides by wooded private property.

General locations where rare animals, rare plants, and significant natural communities (such as forests, wetlands, and other habitat types) are already documented in New York State. The Project Site is located within an area designated as having the potential for habitat for rare plants and/or endangered animals via the NYSDEC Environmental Resource Mapper Rare Plants and Animals Overlay Map ("**DEC Mapper**"). The Project Site does not fall within lands known or expected to be near critical habitat protected under the U.S. Fish and Wildlife Service (USFWS).

Based on the information in the DEC Mapper, P.W. Grosser Consulting, Inc. will send a Project Screening Request Form on behalf of the Project Owner to the New York Natural Heritage Program (NYNHP), and a NYSDEC Region 3 Wildlife Office consultation request. The responses from both the NYNHP and the NYSDEC Region 3 Wildlife Office are pending with scheduled response in 2023.

4.1.2. Visual

Current visual characteristics of the Project Site consist mainly of wooded areas.

North, East, South, and West: The trees surrounding the Project Site will mitigate views of the Solar Facility from neighboring structures.

See Figure 10 on the following page for the location of nearby residences and structures.

Figure 10. Nearby Residences / Buildings

4.1.3. Glare

In solar panels are designed to not reflect sunlight. In general, solar panels absorb as much sunlight as possible while reflecting as little light as possible. standard solar panels produce less glare and reflectance than standard home window glass. Solar panels use “high-transmission, low-iron” glass, which absorbs more light, producing smaller amounts of glare and reflectance than normal glass. Research has shown that they reflect less light than snow, white concrete, and energy-efficient white rooftops.

Glint is typically defined as a momentary flash of bright light, often caused by a reflection off a moving source. A typical example of glint is a momentary solar reflection from a moving car, or “catching” something bright out of the corner of your eye.

Glare is defined as a continuous source of bright light. Glare is generally associated with stationary objects, which, due to the slow relative movement of the sun, reflect sunlight for a longer duration. The difference between glint and glare is duration. Industry-standard glare analysis tools evaluate the occurrence of glare on a minute-by-minute basis; accordingly, they generally refer to solar hazards as ‘glare.’

The ocular impact of solar glare is quantified into three categories (Ho, 2011):

1. Green – Unproblematic shine. Low potential to cause after-image. This type of glare can be compared to noticing something shiny in the distance.

2. Yellow - Potential to cause temporary afterimage (flash blindness). This type of glare is much like sunrise and sunset glare for drivers who struggle to find the perfect angle for car visors so they can continue to operate their vehicle safely while traveling through areas of such glare.

a. Standard levels of yellow glare can, for the most part, be handled with relative ease utilizing slatted fencing or local foliage landscape mitigation measures.

b. Only extremely high levels of this type of glare (in the area of the chart labeled as "direct viewing of the sun" which is uncommon to find with PV installations) would be considered an insurmountable hurdle to a PV installation of any size.

c. High levels/intensities and long durations are different factors.

3. Red - Potential to cause retinal burn (permanent eye damage). PV modules do not focus reflected sunlight and therefore retinal burn (RED glare) is typically not possible.

d. This is the ONLY type of glare that would be considered an insurmountable hurdle to a PV installation of any size.

These categories assume a typical blink response in the observer.

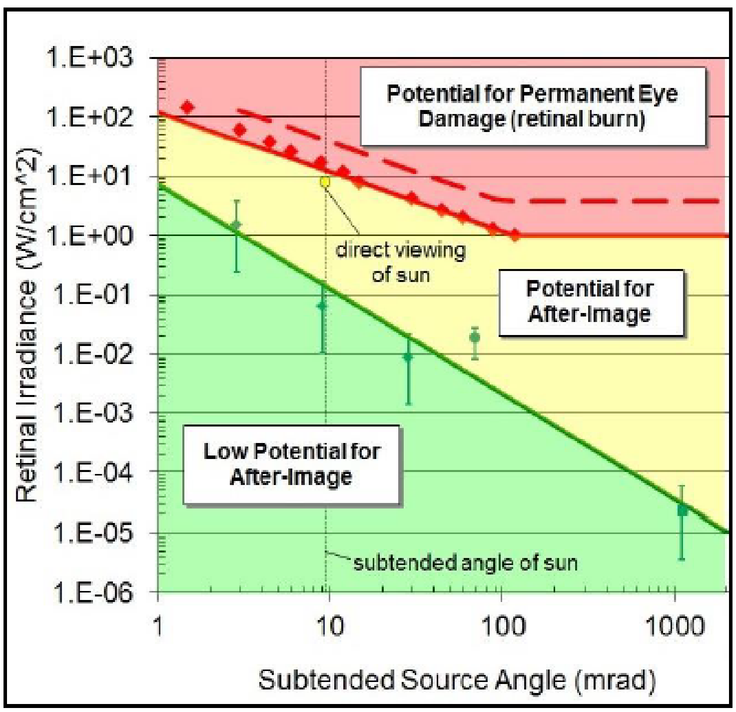


Figure 1 – From *ForgeSolar* website (sample glare hazard plot defining ocular impact as function of retinal irradiance and subtended source angle *(Ho, 2011)*)

To further put glare into perspective, the following is presented.

YELLOW glare such as in the graphic below could only be seen when standing directly next to project panels at the perfect angle when the sun is in a perfect place—indeed the point of a photographer standing directly by these panels and waiting for the perfect moment to capture this image. It is also possible that the panels in the picture shown do not have an anti-reflective coating.

Solar panel showing solar glare

GREEN glare, as illustrated below, is the more common occurrence with solar projects—a noticeable shiny area (in the northwest area) as compared to panels where the sun is not quite in perfect alignment yet.

Even so, the effect of this noticeable shine to certain areas of the project area is still seen from a relatively close up vantage point and at the optimal height this image was captured, possibly by a drone. A similarly sized project in the distance, closer to the horizon of the photo would be unlikely to show even the levels of green glare that the system in the foreground reflects.

US patent # 6359212 (method for testing solar cell assemblies and second surface mirrors by ultraviolet reflectometry for susceptibility to ultraviolet degradation) explains the differences in the refraction and reflection of solar panel glass versus standard window glass.

When a ray of light falls on a piece of glass, some of the light is reflected from the glass surface, some of the light passes through the glass (transmitted), and some (very little) is absorbed by the glass. Following are parameters to consider when considering glare from solar panels:

- The measure of the proportion of light reflected from surface is called reflectance (reflection): R
- The measure of the proportion transmitted is the transmittance (this is where the term high light transmission glass comes from because the glass is formulated to allow more sunlight to pass through its surface than would pass through a standard glass surface): T
- The measure of the proportion absorbed is absorptance (absorption) (this amount is very small for clear glass, much smaller proportionately, than the other two components): A

  Each quantity is expressed as a fraction of the total intensity (quantity) of a ray of light. Intensity may be expressed as follows: $R + A + T = 1$.

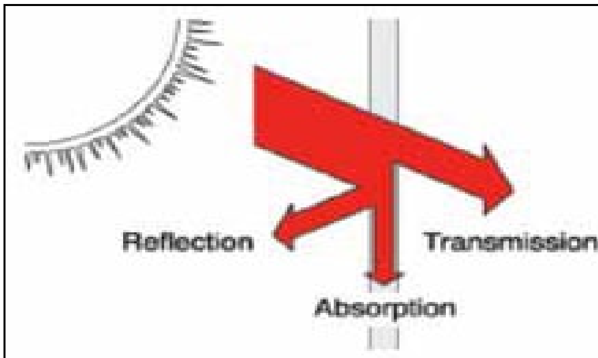


Figure 2-2. Solar radiation through a glazing material is either reflected, transmitted or absorbed

Table 6. Solar Radiation through Glazing Material

The reflection/refraction behavior of a medium is directly related to its index of refraction. Lower the index of refraction is suitable because the medium is allowing more of the incident ray to pass directly through.

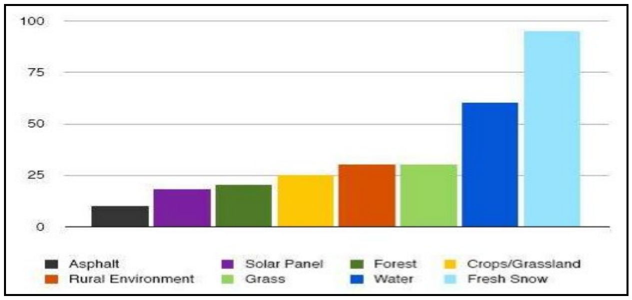


Table 7. Common Reflective Surfaces

It should be noted from the graph and the table below, that the reflected energy, in percentage, of solar glass is much lower than water and even below that of forest reflection.

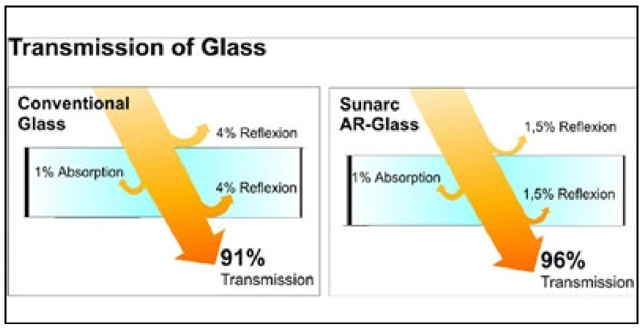


Table 8. Anti-Reflective Coating reflect a lower percentage of light than smooth water.

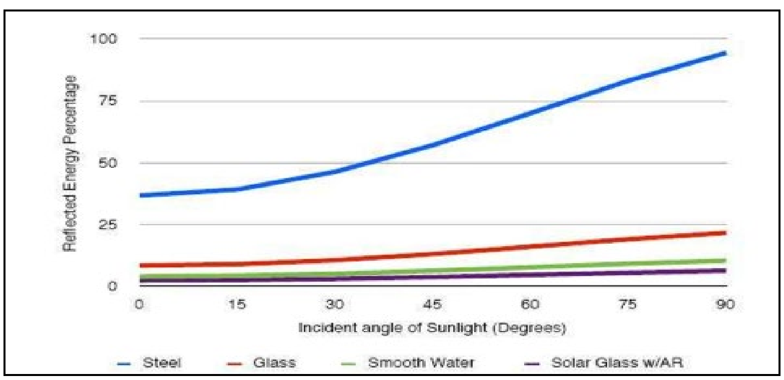


Table 9. Analysis of typical Material Reflectivity with sunlight angle (from normal).

Steel, a common building material, reflects far more incident sunlight than a solar panel.

The percentage of the incoming sunlight that is reflected is very low for high sun angles (most of the day) and increases for a very low sun angles (near sunrise and sunset when the intensity of the sun is already substantially lower than at mid-day.).

Taking into account landscaping and distance from the road as well as the aforementioned information regarding glare off the solar modules, roadways, buildings and flights paths will not be impacted by glare from the panels.

4.1.4. Storm Water Drainage

4.1.4.1 Storm Water Drainage off Modules

The storm water impacts of a solar installation will depend upon the project design, site conditions and characteristics, as well as topographic conditions. A SWPPP determines the impact, if any, of the existing runoff conditions and remediation actions, if needed, for the proposed runoff conditions. The Solar Facility is a fixed structure mounted and is installed with minimal impact to the current topography and groundcover conditions. Also, the Solar Facility is arranged with sufficient distance between the modules to allow rainfall to infiltrate between each module and flow between arrays, allowing any runoff to naturally infiltrate and drain over all ground surfaces.

The conceptual design of the Project has been arranged, to the maximum extent practicable, to mimic natural hydrology. Rainwater falling on the modules will not channel or accumulate in large volumes as it will run-off the modules using the gap between each module, about 1 inch. Rainwater will fall off each module within a few feet of where it would naturally fall. Additionally, the site has full grass ground cover, minimizing erosive actions.

Figure 11. Module Spacing Gaps

Elements of the Solar Facility that alter natural infiltration, such as steel poles driven into the ground and any other racking components, will always be treated as impervious. Other impervious elements would include concrete pads or foundations for racks or inverter cabinets.

The following factors have been considered during the design process:

- Runoff to flow onto and across vegetated areas to maintain the disconnection
- Disconnecting impervious surfaces works best in undisturbed soils.
- Minimizing ground disturbance.

The rows of solar panels will be installed according to Figure 12 below. In this scenario, the disconnection length is the same as the distance between rows and is at least 80% of the width of each row. Therefore, each row of modules is adequately disconnected between modules and between rows.

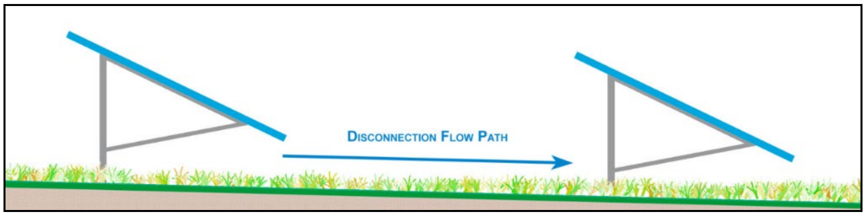


Figure 12. Array Spacing - disconnection flow path between arrays

4.1.4.2 Vegetation under Modules

The modules will reduce direct sunlight under each module in direct proportion to its total collection area; this may reduce plant coverage and density under the modules. In contrast, this shading will increase the moisture of the ground providing an extra water source for vegetation.

Based on the proposed array layout, there will be a maximum of 11-17 feet of shading underneath each module (varies based on sun position). Within this area there will be reduced sunlight intensity. Recordings made in similar conditions reduced the sunlight intensity to less than 600 Lx. Sunlight intensity is reduced but still enough intensity remains in the area allowing grass to persist under the shaded area. The growing pattern will be slower than the conditions associated with full open environments but good enough to allow grass to endure. Generally, the measurements made in the various light regimes indicate native grasses grows best when light values exceed 600 Lx but the growing patters will be reduced to a level where the grass will have a thinner cover and resulting a slower growing path for the grass. Other contiguous grasses may actually benefit from some shading providing a slightly moister substrate that could be utilized by the grasses. (Source: proposed solar panels vegetation impacts, prepared by Joseph Arsenault, July 2010)
Based on the studies and research there will be limited impacts to the existing grass vegetation. and there should not be an adverse impact to existing ground cover.

4.1.5. Noise

Very minimal low-level noise is generated from the electrical inverter and distribution transformer. Inverters are tested and do not generate disturbing noise levels, and noise from equipment will not be audible at the property boundary. Central inverters are usually surrounded by the solar panel arrays whose electricity they manage–further distancing them from anyone who might happen to be nearby. At a distance of 1m, central inverters have a sound pressure level of less than 70dB. Furthermore, because solar modules produce power only when the sun is shining, inverters will be completely silent at night.

Trackers are proposed for the Solar Facility, which will move slowly following the sun. This tracker movement is slow and will not create any perceptible noise.

4.1.6. Dust and Waste

The inclination of the modules allows water to flow freely through them and clean the surface when it is raining. No dust will be generated during operations. Modules after use (20 or 30 years) are 95% recyclable. The equipment will be designed for a 30-year lifespan, and end-of-life site remediation and equipment replacement options will be discussed.

4.1.7. Safety

A health and safety plan will be implemented during construction. All equipment installed will comply with safety rules. Warning signs (visible, in good condition and permanent) will be posted. Perimeter fencing (See Plan 11) and surveillance system will be considered. All the equipment will be tested and in warranty. Equipment must comply with Federal, State and local regulations and applicable laws.

The electrical safety for workers will be designed and evaluated in detail. The hot parts will be isolated, and general equipment or switching devices will be mechanically interlocked. The electrical installations are equipped with protection against abnormal operating conditions, providing compliance with safety rules.

4.1.8. Impacts During Construction

It is expected that some noise will be generated during construction activities. All actions involving risk will be considered: civil engineering, machinery, transportation, etc. Impacts due to construction will be investigated, and mitigation measures will be proposed. The contingency provision for the Solar Facility consists of a detailed analysis of the possible occurrence of an incident while under construction; the purpose is to have a response to maintain the safety of people, environment, and property.

4.1.9. Cultural and Historic Resource Sites and Values

The historic and archeological map will be utilized to identify if any cultural or historical significance exist on site. Any cultural resource that would be directly or indirectly impacted, if any, would be subject to further evaluation.

4.1.10 Solar Facilities Classified as Non-Hazardous Materials

Solar photovoltaic systems have a life expectancy of 30 years. Photovoltaic panels are designed to last more than 25 years, and many manufacturers back their products with performance guarantees backed by warranties. Many SEIA (Solar Energy Industry Association) members already operate take-back and recycling programs for their products. They are committed to guiding both state and federal regulations that support safe and effective collection and recycling of modules models.

End-of-life disposal of solar products in the US is governed by the Federal Resource Conservation and Recovery Act (RCRA) (http://www.epa.gov/lawsregs/laws/rcra.html), and state policies that govern waste. To be governed by RCRA, panels must be classified as hazardous waste.

To be classified as hazardous, panels must fail the Toxicity Characteristics Leach Procedure test (TCLP test). Most panels pass the TCLP test, and thus are classified as nonhazardous and are not regulated. Numerous companies make available to its customers modules that do not contain toxic heavy metals (no more lead or cadmium than allowed under RoHS).

Because panel materials are enclosed, and don't mix with water or vaporize into the air, there is little, if any, risk of chemical releases to the environment during normal use. The most common type of panel is made of tempered glass, which is quite strong. They pass hail tests. Most residential fires are not hot enough to melt components and systems must conform to state and federal fire safety, electrical and building codes. Potential for emissions derived from components during typical fires is limited given the relatively short duration of most fires and the high melting point (>1000 degrees Celsius) of materials compared to the roof level temperatures typically observed during residential fires (800-900 degrees Celsius).

All solar panel materials are contained in a solid matrix, insoluble and non-volatile at ambient conditions, and enclosed. Therefore, releases to the ground from leaching to the air from volatilization during use, or from panel breakage, are not a concern. Ground-mounted arrays are typically made up of panels of silicon solar cells covered by a thin layer of protective glass, which is attached to an inert solid underlying substance (or "substrate").

The main component of most modules is silicon, which isn't intrinsically harmful, but parts of the manufacturing process do involve hazardous chemicals and these need to be carefully controlled and regulated to prevent environmental damage. It is important to note that the same materials are in other electronic goods such as computers and TVs.

Generally, companies participate in a fully funded collection and recycling system for end-of-life modules produced globally; has written a letter to the Solar Energy Industry Association (SEIA) urging it to support EPR laws and regulations; supports public EPR policies in the regions where the company manufactures and sells modules and takes responsibility for recycling by including the "crossed out garbage bin" symbol on module name plates, including a PV Cycle link on the company website; and clearly describing on the website how customers can responsibly return modules for recycling.

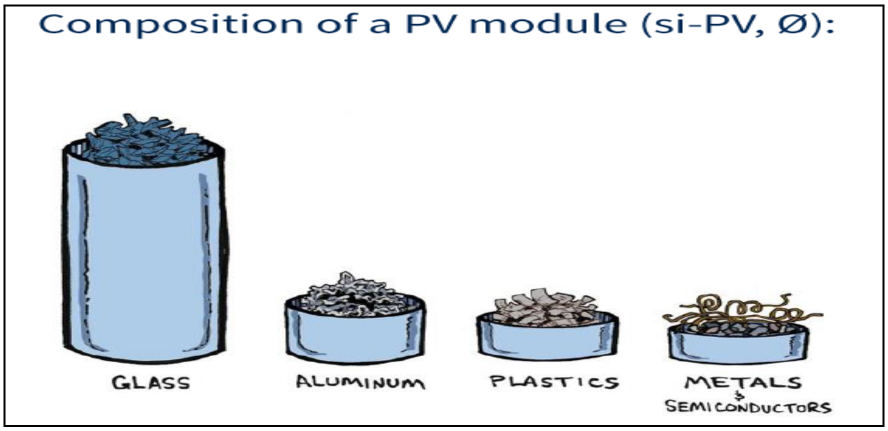


Figure 13. PV Module Composition - Source: PV Cycle

Transformers used at solar installations are similar to the ones used throughout the electricity distribution system in cities and towns. Modern transformers typically use non-toxic coolants, such as mineral oils. Potential releases from transformers using these coolants at solar installations are not expected to present a risk to human health. Release of any toxic materials from solid state inverters is also unlikely provided appropriate electrical and installation requirements are followed.

4.1.11 Decommissioning Plan

The decommissioning Plan for a Large-Scale Solar Energy System is provided as a separate "stand alone" Decommissioning Plan ("**Decommissioning Plan**") as part of the application for a special use permit and application for site plan approval. The Decommissioning Plan is submitted separately for ease of tracking the Solar Law requirements. **The following is a summary of general Decommissioning Plan activities.**

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

- Photovoltaic (PV) modules, module racking and supports.
- Inverter units, substation, transformers, and other electrical equipment
- Access roads, wiring cables, perimeter fence.

- Inverter pad concrete foundations.

Generally, 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 of at an approved solar module recycler or reused / resold on the market.
3. All aboveground and underground electrical interconnection and distribution cables shall be removed and disposed off-site at an approved facility.
4. Galvanized steel PV module support and racking system support posts shall be removed and disposed off-site at an approved facility.
5. Electrical and electronic devices, including transformers and inverters shall be removed and disposed off-site by at approved facility.
6. Concrete foundations shall be removed and disposed off-site at an approved facility.
7. Fencing shall be removed and will be disposed off-site by at an approved facility.

Site decommissioning and equipment removal can take a month or more. Therefore, access roads, fencing, electrical power, and other facilities will temporarily remain in place for use by the decommissioning workers until no longer needed. Demolition debris will be placed in a temporary onsite storage area pending final transportation and disposal and/or recycling according to procedures. No hazardous materials or waste will be used during operation of the Solar Facility; disposal of hazardous materials or waste will not be required at decommissioning.

The piling for support structures is without concrete foundation, so removing piles will not be onerous. The diameter of the holes in the ground are small in terms of impacted area and will be refilled accordingly. Excavations will be backfilled and restored with native onsite material. No significant grading or rework of the site will be performed.

Most materials of the Solar Facility have value: steel, copper, aluminum, and others. The quantity and value of recycled and reusable materials could vary according to markets value, facility conditions and lifespan.

4.1.12. Other Environmental Considerations

Visual resources in the Project area have been affected by past and present actions, including the construction of highways and roads, utility lines, sewerage, water utility lines, and limited commercial and residential development, but the existing vegetation allows direct view of the solar project from nearby buildings and highways to be avoided.

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