2024 OPERATIONS AND MAINTENANCE MANUAL & DECOMMISSIONING PLAN

HARTFORD LANDFILL

Operations and Maintenance Manual

Contents

CTEC SOLAR

INTRODUCTION

This manual describes the operation and maintenance of the New Britain Landfill photovoltaic (PV) power generating facility located at 142 Deming Road, New Britain, CT 06037.

Please note that the site “as built” may vary from the initial design below.

Equipment	Quantity	Model	Notes
Modules (solar panels)	+/- 7,956 590W modules	Hanwha Q.Cells Q.Peak Duo XL-G11S	High efficiency panels built for long- term performance.
Transformers	2	TBD, as approved by Eversource	5-Leg Core Pad-Mount Transformer
Inverters	24	Solectria XGI-1500-166kW	Medium Power three phase string inverters designed for high performance and reliability specifically for the North American grid.
Racking	n/a	TBD	Panels are mounted on ballast racking at a tilt angle of 20°

The solar PV facility is comprised of PV modules, associated wiring components and multiple string inverters. In operation, the DC power produced by the solar sub-array is converted to three-phase AC power by the inverters. That power is then supplied into an electrical main utility panelboard, which effectively enables each sub-array to function independently. The sub-arrays are then collectively interconnected to the utility system through a series of step-up transformers.

In the event of a power failure, the PV facility will automatically shut down when a loss of AC power occurs per UL 1741 and IEEE 1547 to protect utility personnel from injury while repairing the utility system.

This manual provides a description of the PV facility, procedures for basic operations, maintenance and troubleshooting of the system and important safety information.

RESPONSIBLE PARTIES

Responsible Parties	Name/Address	Contact (email/phone)
Landowner: City of Hartford	City of Hartford 550 Main Street Hartford, CT 06103	E-mail: paul.drummey@hartford.gov Phone: (860) 757-4946
Operator: DEEP	DEEP 79 Elm Street Hartford, CT 06106	E-mail: Ryan.santos@ct.gov Phone: (860) 424-3371
Lessee: TBD	TBD	STBD

A Ground Lease Agreement will be executed between the Landowner (Lessor) and Operator (Lessee/Site Operator).

_____ is the Operator of the Solar Project at the Site, and is the responsible party for the following solar operations and maintenance activities on the Site:

- Grounds maintenance and maintenance of vegetation within the limits of the leased area, which shall include all solar generation equipment and a buffer surrounding such equipment, to be determined based on topography and site conditions.
- Drainage swales and stormwater controls (if any) within the limits of the leased area
- Access ways within the leased area

USE OF THIS DOCUMENT

This document packet is provided for informational purposes only. No one but the Operator and its Agents should attempt to operate any equipment on site.

This document is not intended to provide comprehensive site safety instructions, nor detailed operational guidance.

SITE SAFETY INFORMATION

FOR SITE EMERGENCIES

- For any life or property-threatening emergencies, **please dial 911**
- To report site issues, or speak to a _____

EMERGENCY PV SHUTDOWN PROCEDURE

The following steps are required to shut the system down in an emergency:

1 Turn the AC Disconnect Switch to the "OFF" position.

2 Turn the DC Disconnect Switch to the "OFF" position.

These steps will power off the inverter; however, AC power from the grid and DC power from the array will still be present in the inverter wire termination section.

The next steps will disconnect power from the array and the utility transformer to the inverters:

1 Open DC PV array disconnect switches located on the inverter pad.

2 Open the main overhead disconnect switch. Or disconnect the individual inverter circuit breakers located inside the switchboards within the site.

Please refer to the as-built drawings or prominently displayed signage for switch location.

IMPORTANT NOTES:

WHILE THE ABOVE STEPS ISOLATE THE PV ARRAY CIRCUITS FROM THE INVERTERS, ALL CIRCUITS BETWEEN THE PV MODULES AND THE DISCONNECT SWITCHES WILL BE ENERGIZED DURING DAYLIGHT HOURS. HIGH VOLTAGE WILL BE PRESENT EVEN AT LOW LEVELS OF SUNLIGHT.

IT IS IMPERATIVE TO FOLLOW SAFE WORK PRACTICES AND USE PROPER SAFETY EQUIPMENT DURING ANY EMERGENCY OPERATIONS, WHICH INVOLVE ANY PORTION OF THE PV ARRAY.

GENERAL PV SAFETY PRECAUTIONS

The system has been designed for safe and reliable operation. However, it is critically important that any personnel who operate or maintain the system observe the proper safety precautions. Listed below are some of the most critical safety considerations:

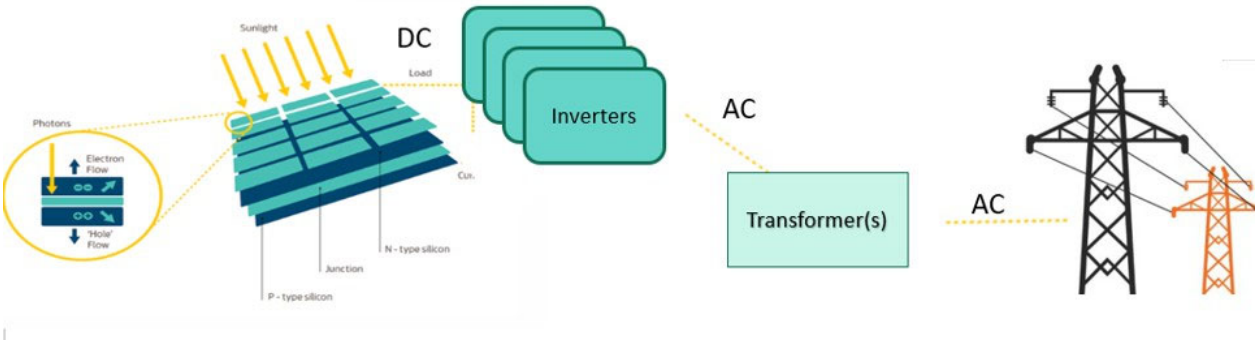
1 ONLY LICENSED, QUALIFIED, EXPERIENCED AND TRAINED PERSONNEL SHOULD PERFORM REPAIR WORK ON ANY ELECTRICAL COMPONENTS OF THE SYSTEMS.

2 DANGEROUS VOLTAGE LEVELS ARE PRESENT IN EACH SYSTEM – VOLTAGES UP TO 1,000 VOLTS DIRECT CURRENT (DC) AND 22,860 VOLTS AC CAN BE FOUND UNDER PARTICULAR OPERATING CONDITIONS. IT SHOULD BE NOTED THAT HIGH VOLTAGE SYSTEMS REQUIRE SPECIAL SAFETY PRECAUTIONS DURING MAINTENANCE OR REPAIR OPERATIONS.

3 PV MODULES PRODUCE VOLTAGE WHENEVER THEY ARE EXPOSED TO SUNLIGHT. AT ANY TIME DURING DAYLIGHT HOURS, (INCLUDING MINIMAL SUNLIGHT CONDITIONS) THERE IS AN ELECTRICAL SHOCK HAZARD IF ANY PERSONNEL SHOULD CONTACT EXPOSED PV ARRAY ELECTRICAL CIRCUIT COMPONENTS.

4 BROKEN OR CRACKED PV MODULE GLASS CAN INCREASE RISK OF SHOCK HAZARD, ESPECIALLY WHEN WET. IMMEDIATELY CONTACT QUALIFIED PERSONNEL FOR REPLACEMENT SERVICES IF ANY BROKEN PV MODULE GLASS IS NOTICED.

SYSTEM DESCRIPTION



PV ARRAY

The ground-mounted photovoltaic arrays consist of PV modules which convert sunlight directly into electricity for utilization by a load such as a utility interconnected inverter. Each module is a sealed, solid-state device with an expected performance life well in excess of 25 years.

Electrically, the PV modules are wired into groups, which are referred to as strings or source circuits. Each source circuit is comprised of individual PV modules wired in a series configuration. Individual source circuits are then grouped together in combiner boxes forming sub-arrays.

For the PV modules to produce their full electrical output, they must be clean and free of shade. Shadows cast by nearby objects such as antennas, air conditioning equipment, trees, overhead wires, etc. will significantly reduce a module's current and voltage output. Because each module is electrically interconnected with other modules, reducing the output of a single module effectively reduces the energy production for the entire source circuit.

The solar modules are mounted using a rack mounting system, with a steel frame to secure the solar array at a uniform tilt angle to minimize shading, while optimizing use of array area.

INVERTERS

The inverters act as a fully automatic power-conditioning interface between the PV array and the utility system. The inverter will utilize solid-state power and control components to maximize power production from the PV array while meeting power quality and safety standards set forth by utilities under Underwriters Laboratories Safety Standards.

An LED display associated with the Ground Fault Detection and Interrupt Circuit (GFDI) on the face of the inverter will indicate the operating status of the unit along with other pertinent data. Please refer to the Inverter O&M manual for more details on the design and operation of the inverter.

To operate efficiently, the inverter circuit components must be kept free of excessive dust and dirt. In addition, the cooling fans and the blower impellers must be kept clean for efficient air movement. Dirt accumulating on circuit boards and electrical equipment leads to higher component operating temperatures and shorter life.

TRANSFORMERS AND ELECTRICAL SYSTEM

Transformers regulate and condition power prior to injection to the grid, and they are often custom- made to meet the specialized electrical requirements of both the array and the grid.

The system electrical circuitry transfers electrical energy from the PV arrays to the inverters and then from the inverters to the transformer and finally, to the point of utility interconnection. The components utilized in the system design are standard electrical components and can be serviced by any qualified electrical contractor who is thoroughly familiar with photovoltaic power systems.

DATA ACQUISITION SYSTEM

This Photovoltaic power system is equipped with a Data Acquisition System (DAS) manufactured by Also Energy (The global leader in Energy DAS) to monitor the energy production of the system.

The DAS consists of an environmental weather monitoring system, and various energy measurement components, which are both connected to an Internet Broadcast Device. The central DAS components and environmental components are located together within the site.

An environmental instrument package measures solar insolation, wind speed, and ambient temperature while the energy monitoring system measures power and the electrical energy produced by the system.

Information gathered by the DAS is broadcast to a web site for processing and monitoring purposes. This service not only gathers energy production data, but also issues alerts to system administrators when the system's projected performance falls below expected values.

In some cases the DAS can be configured to allow remote site diagnostics and operational control. Please contact the Site Operator for additional information.

SYSTEM COMPONENT SAFETY

PV ARRAYS – REPAIR BY SITE OPERATOR ONLY

PV Array

The solid-state nature of the PV array greatly reduces the amount of maintenance required when compared to traditional mechanical generating systems. Unless a portion of the PV array becomes physically damaged, the system will be safe and reliable for its service life. In the event that repair or maintenance work must be undertaken, please be aware of the following precautions:

- Only qualified personnel should be allowed access to the internal or energized components of the PV array junction boxes, inverters, panelboards, transformers, disconnect switches or field wiring.
- The PV array will always be electrically energized during all daylight conditions; so proper training, experience and precautions are required to ensure personnel safety.
- Before attempting any maintenance or washing operations, carefully inspect the entire PV array for modules with broken glass. A qualified contractor must replace broken PV Modules before any array washing or other maintenance work is attempted.
- In order to disconnect the entire PV array from the inverters, secure the operating handles of all mounted PV Array disconnect switches in the "Off" position.
- To disconnect a single PV array source circuit from the inverter, secure the operating handle of its associated PV Array disconnect switch in the "Off" position.
- Verify that all components undergoing maintenance or repair are disconnected from the inverter before servicing.
- Do not remove any fuses, or disconnect any PV module wiring while the array is electrically connected to the inverter.
- Physical damage to components and hazardous conditions will result if any individual PV Array component is opened under load.
- Do not attempt to access the junction boxes on the back of the PV modules. There are no user serviceable components in the module junction boxes.
- Always follow safe work practices and use proper safety equipment during maintenance or repair operations on the PV array.

INVERTERS – REPAIR BY SITE OPERATOR ONLY

When compared to historical rotary inverter technology, the solid-state design utilized in the Inverters greatly reduces maintenance requirements while maximizing system-operating efficiency. Before undertaking any routine maintenance or repair work, please read the Inverter manual and pay close attention to the following precautions:

- To shut down an inverter, turn the AC and DC Disconnect Switches, on the front of the inverter, to the "OFF" position. These switches can be used to shut down an inverter whenever there is a question regarding personal safety or the operation of either inverter.
- The appropriate AC breaker in the main panelboard for the respective inverter must be secured in the "OFF" position in order to ensure that the inverter is not energized by utility during routine maintenance operations.
- Only qualified, experienced and trained personnel should perform repairs on the electronic and electrically energized components inside the inverters.
- Because the interior of the inverter cabinet contains exposed high voltage components, the cabinet door should remain closed at all times. Qualified, maintenance or repair personnel should only open the cabinet to perform maintenance or service work after the inverter has been completely disconnected from all electrical energy sources and the capacitors have fully discharged.
- To reduce the risk of electric shock, do not perform any maintenance work other than that specified in the Inverter manual.
- Only Solectria or otherwise qualified personnel or their designated agents should perform any service work on the inverter's power conditioning or control components.
- Do not open the inverter cabinet doors during wet or inclement weather conditions. Introducing rain or moisture into the cabinet interior could result in hazardous conditions or damage to electrical components. For further information on the inverter, please refer to the appropriate inverter manual.
- Be sure to follow safe work practices and use proper safety equipment during maintenance or repair operations on the inverters.

SYSTEM OPERATION – REPAIR BY SITE OPERATOR ONLY

During normal operation, the inverters will act as fully automatic power-conditioning devices. The inverter will start to process power whenever there is sufficient energy available from the PV array. During the generation process, the inverter will utilize peak power tracking technology to maximize the energy production from the array. This function is achieved by varying the peak

voltage and current point on the power curve for the photovoltaic array as operating conditions vary throughout the day.

Under basic operation, the PV array generates direct current (DC) and supplies it to the inverter. The inverter processes and conditions the direct current obtained from the PV array into 480 volt three- phase alternating current (AC), which is then stepped up to 22,860 volts via the transformer to the utility voltage at the site. In addition, the inverter synchronizes the phase characteristics and frequency to match that of the utility system.

In the event that the quality of the utility power momentarily falls outside a set of pre-specified parameters, the inverter will automatically shut down in a fault mode. After stable utility power becomes available again, the inverters will automatically restart and continue to process power. In the total absence of utility power, the inverter will not operate.

Whenever the PV array produces insufficient energy to efficiently operate the inverter, the inverter will automatically go into a low power "sleep" mode. The inverter will then sample the PV array for available power and resume power processing functions when sufficient levels of electrical energy are once again available from the array.

The inverter will also shut down whenever an operating problem is detected with the PV array, utility power quality or an internal operating parameter. Under such conditions, a fault code will be displayed on the front user interface panel. The fault code can then be matched to a detailed list of fault codes found in the Inverter O&M manual.

ACTIVATING OR STARTING THE SYSTEM – BY SITE OPERATOR ONLY

Before attempting to operate the inverters, refer to the Inverter O&M manual for initial turn-on procedures. The O&M manual also contains a detailed list of inverter fault codes, safety procedures, and other pertinent information.

The following describes normal steps taken to turn the inverter on or off. Refer to the as-built drawings for identification of components.

The start-up operations listed below should be followed in the sequence listed (for each inverter):

1 Remove any lockout devices on the disconnect switches after confirming that any repairs or maintenance operations have been completed and that no personnel are still working on the system.

2 Make sure that the inverter cabinet doors and DC disconnect doors are all closed and locked.

3 Turn on the dedicated 3-phase (dedicated) circuit breaker on the electrical panel.

4 Verify the proper clockwise phase sequence at the "line" side terminals (top) of the AC disconnect. Do not turn on until clockwise phase sequence has been verified.

5 Turn on the Inverter's 3-phase AC disconnect.

6 Turn on the Inverter's DC disconnect.

7 Watch the LED indicators for initialization (green and red LEDs on), then slow blinking green LED followed by faster blinking green LED. Watch the LCD display for prompts and system status.

8 Listen for contactor clunk (inverter on-line).

9 Listen for slight 60Hz hum (transformer on-line).

10 Following the blinking green LED and high frequency switching sound you should see a solid green LED (inverter on-line and beginning to feed power into 3-phase circuit). This confirms that the inverter is operating normally. The LCD display will show the AC Power, Energy, current and voltage as well as DC voltage.

11 If the unit fails to power on, use the troubleshooting information provided in the user manual. If those steps do not resolve the problem, contact the Site Operator or Inverter Manufacturer.

MAINTENANCE

MAINTENANCE PRECAUTIONS

The Site Operator and its highly trained Agents are the only parties who should undertake any maintenance or repair to the system. Before doing so, Site Operator staff will follow the shutdown procedure described in the previous sections.

1 Review and understand all safety precautions and maintenance operations described in both this document and the Inverter Manual.

2 Only qualified individuals should perform or supervise any maintenance procedures.

3 Install appropriate lock out devices on all system disconnecting means to protect personnel performing maintenance operations on the system from electrical shock hazards.

4 Do not open the inverter cabinet door for any reason, only [inverter manufacturer] personnel are permitted to perform maintenance or inspections.

5 Contact Site Operator if there are any questions regarding operation or maintenance procedure for the PV array.

Note: The PV array circuits, array combiner boxes, the array disconnect switches and all associated wiring will remain energized as long as there is sunlight. Hazardous DC voltage levels will be present in all these components even during very low daylight conditions.

DAILY AND PERIODIC REMOTE OPERATIONS AND MONITORING

The Operator's Asset Management staff have the ability to monitor site equipment remotely, performing a suite of daily operational checks to verify site status and performance. In some cases, real time remote diagnostics allow O&M staff to analyze and correct common equipment issues through the same on-line interface. Comprehensive remote diagnostics and operations are fairly new to solar, and have allowed Operators to perform deeper analysis and understand fairly subtle performance issues without visiting the site.

On site cameras allow Asset Management staff to get a real time and historical view of site conditions, to assess vegetation, soiling, weather, and major equipment housings.

Web based performance monitoring mini sites can be provided to municipalities interested in following solar performance in real time.

PV Array Monitoring Procedures

Description	Action
1. Daily and intraday review of site alerts and equipment notifications	**Daily: Coordinate O&M team site visits as necessary, and ensure that issues are corrected expeditiously**
2. Review site video camera as necessary to establish real-time site conditions	**Daily: Review**
3. Verify inverter and meter performance to expected	**Daily: Coordinate investigation of any unexplained variance to expected**
4. Verify total site output to expected	**Daily: Coordinate investigation of any variance to expected**
5. Verify storage battery performance and equipment status, if applicable	**Daily: Coordinate response to variance**
6. Periodically analyze string, combiner, and inverter performance on a comparative basis, site-wide to identify underperformance related to blown fuses and other subtle performance issues	**Periodically: Coordinate investigation of any variance to expected**

PROCEDURES FOR ALL SITE VISITS

Remote monitoring and diagnostics do not displace on-site maintenance. From time to time Operations and Maintenance staff will be on site to investigate and correct issues. These visits are irregular but represent an opportunity to conduct a routine inspection and validate site conditions as thoroughly as possible. On average, Operations and Maintenance staff visit sites monthly to attend to on-site maintenance issues.

PV Procedures at all Site Visits

Description	Action
1. Validate integrity of fencing	Coordinate O&M team site visits as necessary, and assure that issues are corrected expeditiously
2. Evaluate general condition of vegetation, shading	Recommend maintenance
3. Verify the integrity of major drainage features/erosion/settling	Recommend maintenance/additional evaluation
4. Verify the integrity and check soil levels of visible panels	Recommend maintenance
5. Note obvious wire maintenance issues, if any	Recommend maintenance
6. Perform equipment-specific or site-specific checks as necessary	As required

ANNUAL MAINTENANCE PROCEDURES FOR THE PV ARRAY

At least once annually (more often if conditions warrant) Operations and Maintenance staff will conduct a thorough walk-through of the site, to perform preventative maintenance and diagnostics on all major equipment. This generally takes place in spring.

Thermal imaging of major equipment, including a sample of panels, is conducted annually in addition to the below visual inspection. This data is collected and analyzed to uncover issues prior to equipment failure and/or degraded performance. Some array components may require more frequent cleaning depending on age and model; the elements below represent minimum annual activity.

Site inspection and video photography via drone is also performed on an annual or bi-annual basis.

Annual Maintenance Procedures

Components & Equipment	Description	Action
PV Modules	Check for dust & debris on module surface	Wash or wipe clean with water
	Check for physical damage on all PV modules	Replace damaged PV modules
	Check for loose or disconnected cable terminations between PV module wiring	Retighten or reconnect wiring
	Check cable condition	Replace worn cables if necessary
	Check for shading obstructions on all PV modules	Identify source and remove
	Check for fading/discoloration, burn marks, seal condition, frame damage or rust	Log and report conditions to Site Operator
PV Inverters	Check functionality – e.g. auto disconnect upon loss of grid power supply, error & ground fault LED indicators	Consult inverter manufacturer for repair or replacement parts
	Check ventilation condition	Clear dirt, dust or debris from ventilation system
	Check for abnormal operating temperature	Consult inverter manufacturer for repair or replacement parts
	Check for abnormal noises – i.e. irregular humming or rattling	Consult inverter manufacturer for repair
	Inspect inverter structure(s) and enclosure(s) (seals, rust, damage, door condition, switch/handle condition, locks)	Log and report conditions to Site Operator
Cables	Check for cable conditions – i.e. wear and tear	Replace worn cables if necessary
	Check cable terminals for burnt marks, hot spots or loose connections	Tighten connections or replace if necessary
Combiner Boxes	Check cable terminals – e.g. wear and tear, loose connections or burn marks	Tighten or replace if necessary
	Check for placards and signage	Replace if necessary
	Check for physical damage	Replace if necessary
	Check for blown fuses inside the Combiner Box	Replace blown fuses
	Check for water leaks inside the Combiner Box	Replace combiner box or repair to prevent future water leaks
Bonding & Grounding	Check grounding cable and bonding connection conditions	Replace worn cables if necessary
	Check the physical grounding/bonding connection	Retighten connection if necessary
	Check continuity of grounding and bonding conductors	Troubleshoot or replace if necessary
Disconnect Switches	Check functionality	Replace or repair as necessary
	Check for corrosion	Treat corroded areas or consult racking manufacturer/installer

PV Module Racking System	Check for damage to racking system	Replace or repair damaged parts
	Check for settlement	If settlement is detected within the solar array area it will be assessed in conjunction with the Owner, as applicable, and an

Components & Equipment	Description	Action
		appropriate response action will be selected
Pole Mounted Equipment	Check for damage or irregularities – e.g. damage from weather related incidents, blown fuses, lightning marks, etc.	Replace or repair damaged equipment
Transformers	Operator will be responsible for attending the site to check the terminations, etc. for the main transformer Any alarms raised by the public or the DAS should be immediately forwarded directly to Site Operator for action Check fluid levels	Log and report conditions to Site Operator
General/ Vegetation	Check vegetation control to maintain optimal performance of PV system Check fence/gate security Check internal access-ways/signage integrity Check for erosion	Mowing of grassy areas as necessary to maintain solar generation efficiency Pruning of trees/bushes on property, or overhanging property that cause shading of the PV panels or potential damage to fencing/equipment in compliance with any conditions of the land lease Site Operator to carry out repair/replacement of fence and security systems as appropriate, as well as general erosion control.

SITE ACCESS

Site perimeter fence gate(s) are to remain locked at all times personnel is not present on site.

LOCK-INS

Anyone operating in and around the solar site needs to be cognizant of lock-ins, and the danger they pose.

When maintenance staff enter the site they will leave the gate unlocked in the unlikely event that first responders and emergency vehicles need to respond to an accident quickly. For this reason, the site should not be locked if it appears to be unlocked.

Please contact Asset Management at _____before locking a gate that appears to have been left open. _____will verify that O&M staff are not inside before the gate should be secured.

COMMON MAINTENANCE PROCEDURES

The following section outlines basic maintenance procedures, for the reader's information. No procedure should be attempted by anyone but the Operator or its Agents.

PV MODULE REPLACEMENT PROCEDURE

> WARNING: ONLY QUALIFIED PERSONNEL SHOULD WORK ON THIS SYSTEM. PHOTOVOLTAIC MODULES ARE ALWAYS ENERGIZED WHEN EXPOSED TO LIGHT.

Perform module replacement operations in the order described below:

- Refer to the string wiring diagram to locate which inverter and DC disconnect the module is associated with.
- Put in the OFF position and lock out all PV Array Disconnect (inverter DC disconnect and panelboard AC disconnect) switches associated with the inverter prior to starting replacement operation.
- Open all circuit fuses that the module is associated with.
- WARNING: Do not open fuses until the DC disconnects have been turned off. Pulling fuses under load is an unsafe practice and a fire hazard, doing so could cause damage to PV wire, fuse holder, and combiner box.
- Cover the module with a blank out mat with steel spring clamp.
- Use PV disconnect tool to disconnect positive and negative leads of the broken module.
- WARNING: Do not disconnect modules until the fuses have been pulled. Disconnecting modules under load is an unsafe practice and a fire hazard, doing so could cause damage to PV module, connector, and wire.
- Loosen the four 5/16" bolts that attach PV module to racking.
- Replace broken module with new module.
- Replace the four 5/16" bolts and torque to 12 ft-lbs.
- Check module leads for any damage, and then connect positive and negative leads.
- Replace tie wraps for wire management.
- Close all fuses that the module is associated with.

INVERTER IS NOT OPERATING

In the event that the inverter is not running as expected during daylight hours with a clear sky and strong sunlight, please check the following:

1 Contact the Site Operator.

2 Verify that the facility is receiving power from the utility connection and that an electrical outage has not occurred within the last 10 minutes.

3 Make sure that the inverter doors are all closed and locked.

If the inverter does not begin countdown to operation after a 300 second delay once step three is complete, look for lockout devices on the disconnect switches listed below.

Important Note: The switches listed below may also be found unlocked in the "OFF" position for a specific reason. Do not close any switches without first verifying that no personnel or property are at risk if the switch is closed.

1 Utility AC Disconnect.

2 Inverter AC Disconnect.

3 Array Disconnects.

After establishing that it is safe to do so, close the switches in the following sequence:

1 Close the DC Disconnect switches.

2 Close the main disconnect switch and close the individual inverter specific breakers in the panelboard cabinets.

3 Close the DC PV array disconnect switches located on the panelboard pad.

If the inverter still does not operate after completing the sequence described above, then a Fault condition likely exists. Please refer to the following section for recommendations on further actions.

INVERTER IS IN FAULT MODE

The inverters have a set of internally monitored operating conditions that must be met for safe and reliable operation. If any of these conditions is not met, the inverter shuts down and goes into what is known as a "Fault" mode. The inverter will remain in off in the Fault mode until the condition is corrected.

Many operating conditions may change temporarily during normal system operation. Temporary fault conditions such as momentary sags in utility line frequency or voltages are transient, so the inverter will automatically restart after the operating conditions return to normal.

If the fault condition is not temporary the inverter will remain out of operation until the fault condition is corrected. In the event that an inverter has been off for several hours with uninterrupted electric utility service and clear sunny skies, then a more prevalent type of fault condition is likely preventing the inverter from operating.

To identify the fault condition, please refer to the Inverter Installation and Operation manual for a description of how to identify fault codes and how to do a soft restart as well as a hard restart of the inverter. The menu will indicate the present fault condition, which should recorded, be reported to facility operations manager for evaluation and correction.

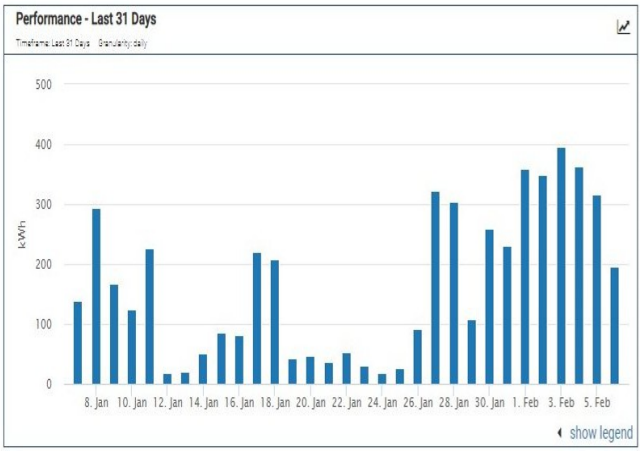
LOW ENERGY PRODUCTION REPORTED BY THE DAS

Some common causes of system underperformance are:

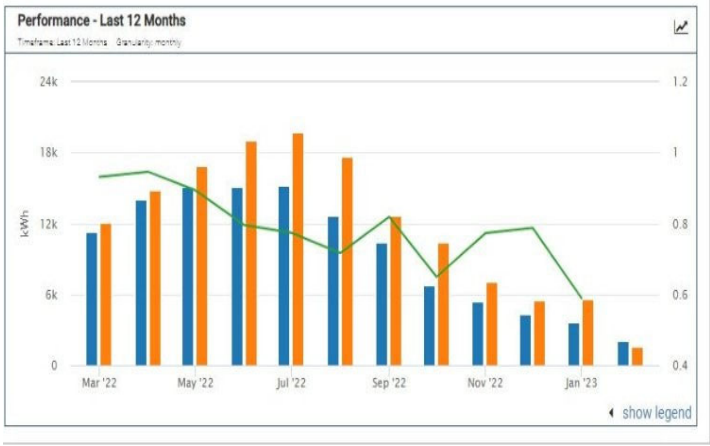
- Heavy dirt, debris, dust accumulation, or shading on the PV array.
- Damaged PV modules.
- Compromised electrical system components such as damaged conduit or wiring.
- Open fuses in the PV array combiner boxes or open disconnect switches.

How are sites managed?

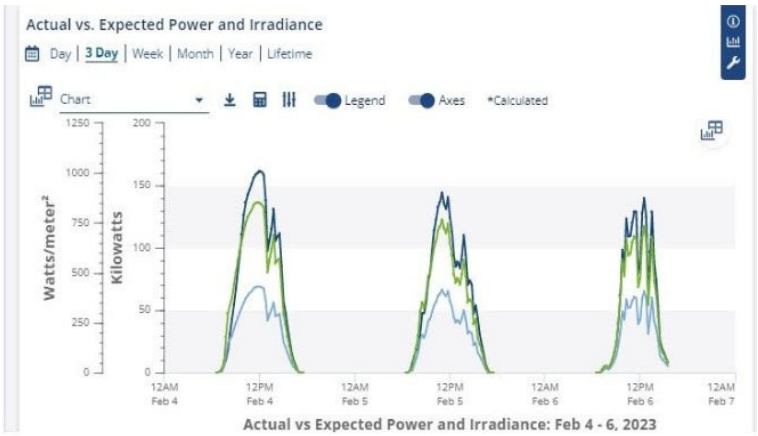
- Cameras allow remote staff to see the site for security purposes, as well as to confirm snow and other debris.



- Weather equipment tracks how strong the sun is at minute intervals; other tools track electrical generation down to the inverter and string level.



How do seasons and weather affect solar production?



- Snow covered panels don't operate well. Snow typically slides off quickly
- Although snow and ice reduce productivity in the short term, they provide a valuable "scouring" effect that removes grime and dust
- High ambient temperatures reduce solar production; hot August days are less productive than cool May days, even with the same amount of sun
- Solar produces twice as much in June as in January due to the length of the day and the angle of the sun
- When the utility loses power, (counterintuitively), solar arrays stop producing as a safety measure; when the utility is down, so are we.

CTEC SOLAR

DECOMMISSIOING PLAN

Parcel 323077002
Pursuant to Petition 1615

The purpose of this plan is to provide an outline of necessary steps to decommission the solar array to be constructed at 180 Leibert Road, Hartford, CT, (the "Site") and to restore the Site following the conclusion of the useful life of the system.

Decommissioning Plan

This Decommissioning Plan describes the approach for removal and/or proper abandonment of facilities and equipment associated with the project and describes anticipated land restoration activities to take place following the end of the project's useful life. The array y is intended to operate for 25 or more years.

The Decommissioning Plan covers the following elements.

1. Removal of solar module structures and all appurtenant above ground equipment;
2. Removal of overhead poles and above ground electrical lines within the Project site;
3. Removal of the on-site switchgear, as applicable;
4. Restoration of disturbed soil on the site to a condition consistent with the pre- development conditions;
5. Restoration or reclamation of Project roads to their pre-construction condition unless the landowner requests to retain the improved roads for access throughout the landowner's property;

Documentation of the pre-construction condition of the project site, including photographic record, will be collected by the property owner.

Summary of the Solar Facility

The proposed Project includes the installation of PV modules which will convert sunlight into DC electricity. The PV-generated DC power will be collected from each of the multiple rows of PV modules and conveyed to inverters. The inverters will convert the DC power to AC power, which will then flow to a medium-voltage transformer that converts the output of the inverter to 23 kV where the power will be delivered to the regional electrical grid.

The facility will consist of an approximately +/- 4.6MW (DC) solar power generating facility secured within a fence, surrounding the solar panels and equipment, and accessed through locked gates along the frontage to the site. The facility will include the following features:

- Racking supporting the photovoltaic modules supported on ballast block
- Two transformers and 24 inverters
- Above ground conduit and wires
- Approximately 4 above ground wooden utility poles

- Overhead wires
- Security gates providing access

Site preparation will be conducted in accordance with the approved plans.

Project Decommissioning and Recycling

In general, decommissioning will maximize the recycling of all facility components. Certain facility equipment and features are assumed to be left in place for future uses, including roads and fences. The individual array components to be decommissioned will be recycled to the maximum extent practicable or removed from the site and disposed of at an appropriately licensed disposal facility.

Decommissioning Preparation

The first step in the decommissioning process would be to assess existing site conditions and prepare the site for demolition.

Site decommissioning and equipment removal is anticipated to require 2-3 weeks. 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 temporary onsite storage area(s) pending final transportation and disposal and/or recycling according to the procedures listed below.

Permits and Approvals

Depending on the regulatory requirements at the time of decommissioning, permits or approvals may be required for the decommissioning activities. These approvals will likely at a minimum require demolition/building permit from the City. Appropriate applications for approvals and permits would be submitted and approved issued prior to decommissioning activities.

Erosion Control

Prior to commencement of decommissioning activities, erosion control measures would be implemented. The type and extent of these measures would be dictated by the regulatory requirements at the time of decommissioning.

Health and Safety

A Health and Safety Plan will be developed prior to decommissioning activities. The plan will be designed to ensure worker and public safety during decommissioning. A Health and Safety Manager will be assigned to the decommissioning activities to provide worker training and health and safety monitoring.

PV Equipment Removal and Recycling

During decommissioning, Project components that are no longer needed would be removed from the site and recycled or disposed of at an appropriately licensed disposal facility. Above ground portions of the PV module supports will be removed. Below ground portions of the PV module supports will be removed entirely where practical. Those supports that are more firmly anchored (e.g., such as embedded in bedrock) and

cannot be pulled with a typical backhoe (John Deere 310 or similar) may be cut off and the remaining support left in place. The demolition debris and removed equipment may be cut or dismantled into pieces that can be safely lifted or carried with the onsite equipment being used. The debris and equipment will be processed for transportation and delivery to an appropriately licensed disposal facility or recycling center. Modules will be recycled in accordance with the current recycling program. No hazardous materials or waste will be used during operation of the solar facility, and disposal of hazardous materials or waste will not be required during decommissioning.

Power components

The inverters, transformers, and switch gear will be dismantled and recycled. The cast-in-place concrete foundation will be broken up, removed and recycled unless requested to remain in place by the property owner. The overhead and underground equipment and conductors of the system will be removed, and the poles and pole foundations will be removed. Aluminum and copper from the conductors will be recycled or removed from the site to an appropriately licensed disposal facility. After removal of the conductor, the underground conduit will be cut off three feet below the ground surface and will remain in place.

Roads

Access roads will remain in place to accomplish decommissioning at the end of the Project's life. At the time of decommissioning, if the property owner determines that some of these roads will be beneficial for future use of the site; those roads may remain after decommissioning.
Roads that will not be used will be restored to be similar to pre-construction conditions.

Fencing

To the extent the perimeter fence remains in good repair, it will be left in place at the end of the decommissioning project.

Site Restoration

Once removal of all Project equipment is complete, the vegetative cover of array will be left in place and allowed to grow to natural, unmaintained conditions.

Future Land Use

The decommissioning plan is based upon the site being returned to a condition consistent with preconstruction use. Property owner may seek alternate uses subsequent to decommissioning of the array.