

## **Permitting Application by Ecogy Kitchawan Community Solar Farm LLC for Construction of a Ground Mounted Solar System at 716 Kitchawan Road**

### **Solar Energy System Details**

Location: 716 Kitchawan Road, Yorktown, NY 10562

Type of System: Ground-Mounted System in field lot

Size: 2,000 kW AC

The proposed solar system is a Community Solar project interconnected with Con Edison's distribution grid.

### **Contact Information**

#### System Owner and Applicant:

Ecogy Kitchawan Community Solar Farm LLC

c/o Ecogy Energy

Attn: John Bertuzzi and Julia Magliozzo

315 Flatbush Ave #393, Brooklyn, NY 11217

Email: [projectmanagement@ecogyenergy.com](mailto:projectmanagement@ecogyenergy.com)

Phone: 718-304-0945

#### Property Owner:

Van Brunt Cochran, LLC

Attn: Alexander Cochran

716 Kitchawan Road, Yorktown, NY 10562

Email: [alex@kitchawanfarm.com](mailto:alex@kitchawanfarm.com)

Phone: 914-602-4005

## Ecogy Energy Kitchawan Solar Project Narrative

The proposed Ecogy Energy Kitchawan Solar Project is a 2,000 kW AC ground-mounted solar located in the field lot southwest of the main building at 716 Kitchawan Road, Yorktown. The project was developed by Ecogy Energy for Kitchawan Farm as a community solar project, which will allow businesses and residents of Yorktown to subscribe to the solar generation and receive discounted solar electricity credits on their Con Edison utility bills.

The benefits of this solar project also extend to the environment and in meeting New York's Reforming the Energy Vision 2030 Renewable Energy Goals. The proposed system will generate approximately 3,615,000 kWh of clean, renewable energy every year and over 84,678, 838 kWh over its lifetime, which is equivalent to 59,871 metric tons of CO<sub>2</sub> and represents significant environmental benefits as detailed in the following graphic:

**Est. Lifetime Production: 84,678,838 kWh\***

### This is equivalent to the CO<sub>2</sub> emissions from:



**6,736,956 Gallons of gasoline consumed**



**138,615 Barrels of oil consumed**



**10,137 Homes' electricity use for one year**



### This is equivalent to Carbon sequestered



**989,985 Tree seedlings grown for 10 years**



**78,189 Acres of US forests in one year**



**405 Acres of US forests preserved from conversion to cropland in one year**



Source: EPA Greenhouse Gas Equivalencies Calculator

<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator> | **\*Includes 0.5% Annual Panel Degradation**

Ecogy and the Kitchawan Farm are proposing to introduce novel design techniques learned over Ecogy's decade of experience aimed at improving the sustainability and aesthetics of the farm. These include permeable wildlife fencing around the array, a native meadow seed mix planted between rows and vegetative buffers screened around the array including a tree orchard to provide a new farming opportunity for Kitchawan. Ecogy has also agreed in our contract with Kitchawan that we will not use any herbicide, pesticide or other non-organic means on the Farm so as to not affect the Kitchawan Farm operations that plan to continue throughout construction

and operation of the solar energy system. Ecogy has also agreed to introduce bird nesting boxes and bee nesting boxes around the array for pollinator friendliness, which in turn will support the Kitchawan Farm harvest.

## LOW IMPACT DESIGN

There is no “one size fits all” approach to Ecogy’s Solar Ground Mount Design. Each solar facility needs to be evaluated based on natural landform and hydrology, native plant and wildlife species presence, and ecosystem functions.

Ecogy strives to take a comprehensive view of Ground-Mount development including incorporating the following:

- 1) Allow for wildlife connectivity by using wildlife-friendly fencing including creating clearance underneath.
- 2) Integrate planting of native and pollinator vegetation where appropriate to increase biodiversity, require less mowing and herbicide use, minimize erosion issues, and increase soil health and carbon sequestration.
- 3) Provide wildlife habitat and supplemental habitat features including bird nesting boxes, sand piles for native bees.



Comparison of a standard chain-link fence (left) with a wildlife-permeable fence (right). © Liz Kelley/TNC



Tree removal for installation of the proposed solar project will be limited to the area that is necessary to safely and efficiently build and operate the solar system. Hence, Ecogy has contracted a Certified Arborist to identify said trees and to calculate the avoid carbon sequestration from such tree removal. A detailed report is attached below for the Board’s review. Ecogy has also contracted a landscape architect to design a screening plan that is amenable to the Planning Board and the neighboring property owners. Finally, Ecogy has contracted a stormwater engineer that will assess the extent to which the solar project will alter the existing drainage conditions on site and to propose mitigation measures.

Ecogy has also performed a geotech analysis of the subsurface conditions to ensure proper engineering of the foundations. We have completed a property survey to ensure compliance with lot size and setback requirements. Ecogy will comply with all other requirements as outlined in the Yorktown Solar Code as shown on the site plan, equipment specification sheets, operation and maintenance plan, and decommissioning plan provided with this application.

Due to Ecogy’s background and history of projects serving underserved communities including the largest system for a public housing authority in the U.S., Ecogy Kitchawan Community Solar has partnered with Sustainable Westchester to prioritize Yorktown residents and businesses as

well as Low-Moderate Income households to help support an equitable renewable energy transition. Ecogy intends to focus all marketing efforts in the initial customer acquisition phase towards Yorktown in the hopes of subscribing 100% Yorktown community solar subscribers which we estimate to be roughly 300-350 utility accounts.

Ecogy additionally intends to use bifacial solar modules for this project due to our experience installing these first in 2015 for our project with the Wilmington Housing Authority. Bifacial panels have the added benefit of capturing sunlight from both sides of the panel, have better aesthetics with transparent glass and increased durability and longevity.



Figure 3: This picture denotes the 500 kW bifacial panel expansion on the Western side of this picture. Bifacial panels create a better aesthetic and are more durable panels than monofacial panels.

Ecogy thanks you for your consideration of the proposed Kitchawan Solar Project and hopes to receive all Town approvals as required by the Yorktown Solar Code to be permitted to construct the ground-mounted solar system at 716 Kitchawan Road.

## **Ecogy Kitchawan Solar Project Operation and Maintenance Plan**

Ecogy Energy will partner with a dedicated Operations and Maintenance provider (“Contractor”) for the below services throughout the life of the ground-mounted solar system. Ecogy can submit information about the Operations and Maintenance Contractor to the Town for the record once a contract has been signed with a provider.

### Description of System Services that Contractor will provide on a MONTHLY basis:

- I. Performance Monitoring:
  - A. Contractor shall monitor System production beginning on Commencement Date continuously throughout the Term and shall provide a System performance report on a monthly basis, detailing the following:
    1. Actual vs. expected performance of the System for the prior period expressed in kWh
    2. Any shortfall in System production resulting in less than 85% of expected performance

### Description of System Services that Contractor will provide on a SEMI-ANNUAL basis:

- I. Site and System Inspection:
  - A. Contractor shall perform Site and System inspection on or around a mutually agreed upon date no later than six months after Commencement Date and then on a semi-annual basis thereafter. Results of inspection will be provided to Customer within five business days of inspection and shall include:
    1. Array Inspection
      - a) Inspect PV modules for damage, discoloration or delamination
      - b) Inspect mounting system for damage or corrosion
    2. Site Conditions
      - a) Inspect drainage conditions
      - b) Inspect system site for array shading which may diminish efficiency of the System (i.e. vegetation, construction, etc.)
      - c) Inspect System for fire hazards
      - d) Inspect safety conditions and proper signage
    3. Maintenance Reporting
      - a) Record results of all inspections
      - b) Take photographs of any damage or defects identified
      - c) Inform Customer and warranty providers of all deficiencies identified
      - d) Provide Customer with recommendations for corrective actions
      - e) Take photographs of the System and Site, dated within 30 days of end of semi-annual period

Description of System Services that Contractor will provide on an ANNUAL basis:

I. Performance Monitoring:

A. Contractor will provide, on or around the first anniversary of the Contract and annually thereafter, an annual operations and maintenance report, such report to include:

1. Actual vs. expected production of solar energy by System for the previous year and on a cumulative basis to date, expressed in kWh
2. System Availability percentage
3. Performance Index Measure
4. Operation and Maintenance Records
5. Safety, Accidents and Environmental Reporting
6. Proposal of Recommended Actions
7. Photographs of the System and Premises, dated within 30 days of anniversary period.

B. Preventative Maintenance, Inspections & Testing:

1. Array
  - a) Inspect PV modules for damage, discoloration or delamination
  - b) Inspect mounting system for damage or corrosion
2. Inverter
  - a) Torque checks on critical electrical terminations
  - b) Clean all filters and fans
  - c) Inspect inverter pad and container
3. Electrical Balance of System (BOS)
  - a) Inspect ground braids, electrodes and conductors for damage
  - b) Perform thermo-graphic analysis of combiner boxes, inverters, transformers, and conductor connections to buses, breakers or disconnects
4. Premises Conditions
  - a) Inspect drainage conditions
  - b) Inspect site for array shading which may diminish efficiency of the System (i.e. vegetation, construction, etc.)
  - c) Inspect System for fire hazards
  - d) Inspect safety conditions and proper signage
5. Maintenance Reporting
  - a) Record results of all inspections
  - b) Take photographs of any damage or defects identified
  - c) Inform Customer and warranty providers of all deficiencies identified
  - d) Provide Customer with recommendations for corrective actions

Description of System Services that Contractor will provide on an AS-NEEDED basis at an additional cost:

- I. Corrective Maintenance, including:
  - A. Module cleaning, to include surface washing of all modules with pressure washing settings not to exceed 1,500 PSI. Contractor will provide before and after photographs of System.
  - B. On-site troubleshooting & diagnostics of all system components (service included at no additional cost for systems under Contractor Warranty)
  - C. Inverter and Data Acquisition System resets: (service included at no additional cost for systems under Contractor Warranty):
    1. Remote resets (if capability enabled and connection available)
    2. On-site resets
  - D. Processing of warranty claims on behalf of Customer and verification of replaced equipment (service included at no additional cost for systems under Contractor Warranty)
  - E. Management of repair and replacement for equipment out of warranty (service included at no additional cost for systems under Contractor Warranty).
  - F. Ongoing warranty support and representation of Customer's interest with System equipment manufacturers (service included at no additional cost for systems under Contractor Warranty).
  - G. All repair and replacement services beyond the installation and workmanship warranty as outlined in Section 3.1.
  - H. Repair and replacement of equipment covered by the Manufacturer's warranties as listed in Attachment D.

If the system is performing at or above 100% of the expected system production for the prior six month period, Contractor may elect to forgo the scheduled semi-annual site inspection, maintenance and testing.

## Ecogy Kitchawan Solar Project Decommissioning Plan

### 1. Executive Summary:

As stated in the Yorktown Solar Code, a decommissioning plan for the solar energy system shall be submitted by the applicant. Below is a full report of Ecogy’s decommissioning plan for the Kitchawan Solar Project, including costs and timeline.

This report includes an analysis of the estimated decommissioning costs broken down by system components, as well as a description of the associated time required to perform the decommissioning tasks. In addition, we describe each component’s salvage value, the time required to decommission and remove the solar energy system and any ancillary structures, and the time required to repair any damage caused to the property on which the solar energy system is located by the removal of the system. Future costs projected in the model escalate 2% annually due to estimated inflation over the next 25 years.

It is worth noting that Ecogy has agreed separately with the Kitchawan Farm to decommission and remove the system at a faster schedule than required by the Town of Yorktown. This includes removal within 120 days of the end of our term or else significant liquidated damages are assessed onto Ecogy.

### 2. Methodology

Throughout this report, assumptions are based on current market values, assessments of labor costs, and our professional development experience. Table 2 below shows the proposed ground mount solar system’s technical specifications as submitted with this application.

#### 2.1 Proposed PV System Details

*Table 1. Kitchawan Solar Project Technical Details*

Proposed Solar System Technical Details	
AC System Size	2,000 kW AC
Racking Type	Ground Mounted

Component	Type	Quantity	Warranty
PV Module	TBD		30-Year Linear Power Output Warranty

Inverter	SolarEdge SolarEdge P860 Optimizer		15-Year Standard Warranty Extendable to 20 Years w/ Inverter Replacement Fund incorporated into proforma
Transformer	Utility Owned	1	Utility is responsible for maintenance and replacement.
Racking System	TBD	1	25-Year Warranty

## 2.2 Solar PV Decommissioning Tasks and Costs

Through Ecogy’s decade of experience and additional research, we have created a list of solar system equipment and its associated decommissioning tasks and timelines. This list forms the basis of Ecogy’s decommissioning plan and outlines the steps Ecogy would take to remove the solar system from the property. The equipment and steps are as follows:

1. Modules: The modules’ frame and surface would be mechanically separated. The glass and aluminum frames would be sold as recycled material.
2. Inverters: Inverters would be properly disposed of at an electronic waste facility.
3. Racking: Racking would be consolidated and sold as recycled scrap steel.
4. Wiring: All wiring would be disconnected and sold as recycled insulated cable.
5. Foundations: Foundations would be broken up on site and either removed or recycled as ABC material. Remediation on site would restore the site to its original condition per our agreement with the Kitchawan Farm.
6. Power Poles: Grid connection wiring and utility owned transformer would be removed or kept depending on preference of the Landowner.

To estimate the associated costs for major tasks needed to decommission a PV system, Ecogy used the NYSERDA “*Decommissioning Solar Panel Systems; Information for local governments and landowners on the decommissioning of large-scale solar panel systems - 2016*”, which provides estimates of potential decommissioning costs for a ground-mounted 2,000 kW solar panel system over 20-years. It is estimated that many components could be salvaged to offset the labor cost. This analysis is shown in Table 2 below. Ecogy has revised this analysis to incorporate the 25-year Term as afforded by the Value of Distributed Energy Resources Term.

Ecogy analyzed the decommissioning costs and salvage values with a 2.5% escalator over the lifetime of the solar system of 25 years due to inflation and to correspond with NYSERDA’s guidance. Ecogy has determined decommissioning costs to be approximately \$50,119.10 but a

\$49,129.52 salvage value would offset this cost. Lastly, decommissioning would take approximately 4-10 weeks.

*Table 2: Summary of Cost Assumptions for Proposed Solar PV System*

Component	Est. Cost for NYSERDA 2,000 kW System	Est. Salvage Value	Est. Net Cost of Decommissioning	Est. Timeline
Remove Rack Wiring	\$2,459.00	\$4,500.00	(\$2,041.00)	1-5 Days
Remove Panels	\$2,450.00	\$8,500.00	(\$6,050.00)	5-10 Days
Dismantle Racks	\$12,350.00	\$10,000.00	\$2,350.00	5-10 Days
Remove Electrical Equipment	\$1,850.00	\$3,500.00	(\$1,650.00)	5-10 Days
Breakup and Remove Concrete Pads	\$1,500.00	\$0.00	\$1,500.00	1-5 Days
Remove Racks	\$7,800.00	\$0.00	\$7,800.00	1-5 Days
Remove Cable	\$6,500.00	\$0.00	\$6,500.00	1-5 Days
Remove Power Poles	\$13,850.00	\$0.00	\$13,850.00	5-10 Days
Remove Fence	\$4,950.00	\$0.00	\$4,950.00	1-3 Days
Grading	\$4,000.00	\$0.00	\$4,000.00	5-10 Days
Seed Disturbed Areas	\$250.00	\$0.00	\$250.00	1-3 Days
Truck to Recycling Center	\$2,250.00	\$0.00	\$2,250.00	1-5 Days
Current Total Cost	\$60,200	\$26,500.00	\$33,709.00	32-81 Days

*Table 4: 25 Year Decommissioning Plan*

<b>25 Year Decommissioning Plan with 2.5% Annual Inflation</b>			
Year	Est. Decommissioning Cost	Value of Salvage Material	Net Cost of Decommissioning
0	\$60,200.00	\$26,500.00	\$33,700.00
1	\$61,705.00	\$27,162.50	\$34,542.50
2	\$62,939.10	\$27,841.56	\$35,097.54
3	\$64,197.88	\$28,537.60	\$35,660.28
4	\$65,481.84	\$29,251.04	\$36,230.80
5	\$66,791.48	\$29,982.32	\$36,809.16

6	\$68,127.31	\$30,731.88	\$37,395.43
7	\$69,489.85	\$31,500.17	\$37,989.68
8	\$70,879.65	\$32,287.68	\$38,591.97
9	\$72,297.24	\$33,094.87	\$39,202.37
10	\$73,743.19	\$33,922.24	\$39,820.95
11	\$75,218.05	\$34,770.30	\$40,447.75
12	\$76,722.41	\$35,639.55	\$41,082.86
13	\$78,256.86	\$36,530.54	\$41,726.32
14	\$79,822.00	\$37,443.81	\$42,378.19
15	\$81,418.44	\$38,379.90	\$43,038.54
16	\$83,046.81	\$39,339.40	\$43,707.41
17	\$84,707.74	\$40,322.88	\$44,384.86
18	\$86,401.90	\$41,330.96	\$45,070.94
19	\$88,129.93	\$42,364.23	\$45,765.70
20	\$89,892.53	\$43,423.34	\$46,469.20
21	\$91,690.38	\$44,508.92	\$47,181.47
22	\$93,524.19	\$45,621.64	\$47,902.55
23	\$95,394.68	\$46,762.18	\$48,632.49
24	\$97,302.57	\$47,931.24	\$49,371.33
25	\$99,248.62	\$49,129.52	\$50,119.10