

ASTGU ANNUAL REPORT

PURPOSE

This Annual Report form is required to be completed and submitted annually for all projects with the MA Department of Energy Resources (DOER) which received qualification as an Agricultural Solar Tariff Generation Unit (ASTGU) under the SMART program. The form is provided to demonstrate conformance with the general provisions required for ASTGUs in 225 CMR 20.00; in particular pertaining to Section 20.06(1)(d) therein as well as associated ASTGU Guidelines; and specifically pertaining to annual reporting requirements.

The completed form will be reviewed by DOER and the MA Department of Agricultural Resources (MDAR) to determine that the farm is in conformance with all ASTGU provisions in general under the SMART Program, although more specifically to the annual production requirements.

BASIC FARM INFORMATION

Farm Contact Person Name: Iain Ward Farm Owner Farm Operator

Farm Name: Soland, LLC

Legal Structure: Sole Proprietor LLC Corporation
 Partnership Other _____

Mailing Address: P.O. Box 41, West Wareham, MA 02576

Street Address (if different): N/A

Contact Phone: 774-687-2010 Contact E-mail: support@solandllc.com

Check all that apply: Solar facility owner Landowner Applicant

Current Type of ASTGU Farm Operation (Check all that apply):

Vegetables Fruit Livestock Poultry Hay
 Nursery Other _____

Total Acreage in ASTGU Farm Production: 30.4 acres

Gross Annual Revenue for ASTGU Farm Production: Total \$6,474 (remaining balance to be grossed over 2026)

Are any major modifications to the farm business expected in the next 5 years? Yes No
(Check all that apply.)

Business Legal Structure Operation Type Expansion Diversification
 Retirement Sale Subdivision Other _____

BASIC SOLAR PROJECT INFORMATION

Solar System Company Owner: Greenbacker Renewable Energy Company, LLC

Solar System Company Address: 230 Park Ave, New York, NY 10169

Solar Company Contact Person/email/tel#: Meg Taylor, Field Operations;
fieldops@greenbackercapital.com; 888-570-6952

ASTGU Project Start-Up/History Information:

Date ASTGU Approved by DOER: Pre-Determination Application approved on 1/22/20

Date Solar Portion of ASTGU Project Commenced Construction: 12/22/23

Date Solar Portion of ASTGU Project was Completed & Operational: 6/9/25

Date Original Agricultural Portion of the ASTGU Project Commenced: Spring 2025

Date Original Agricultural ASTGU Portion of Project Harvested/Sowed Products: Fall 2025

How many complete years, that is both solar and agricultural production, has the ASTGU been in operation? Less than one year, began in June 2025.

SOLAR ARRAY DESIGN – PLEASE PROVIDE AS-BUILT SYSTEM INFORMATION

Please provide the following information regarding the solar array design:

Nameplate capacity AC (in MW): 2 MW (Note: 1 MW=1000 kW)

Expected annual generation AC (MWh): 5,336.68 MWh (Note: 1 MWh=1000 kWh)

Acreage of farmland over which array is to be installed: 45 acres

System type: Fixed Tracking Other _____

Height of lowest panel edge (in feet): 10ft

Height of lowest elevated horizontal mounting (in feet): 10ft

Type of mounting (mono poles, racking, etc.): Single-axis tracking rack supported by driven I-Beam piers.

Description of materials and process to be used for ground penetration: Holes for piles were pre-drilled down 4’ and then piles were driven into the ground so that lighter weight pile driving machines could be used to reduce soil compaction. Plastic matting was used underneath all necessary machinery on the bogs. The torque tubes and solar panels were installed by hand with personnel on ladders to reduce vehicular travel in the vines, avoiding further soil compaction.

Number of panels, capacity per panel, and panel spacing: The array has a total of 8,060 550-watt solar panels with 5,746 panels over one bog and 2,314 panels over the other bog. The racking system is installed in a east/west direction, and the panel rows are spaced 23 feet apart (17.5 panel edge to panel edge spacing).

If you wish to provide additional descriptive information regarding the solar array design, including any system changes since original completion, you may include this information below, or in a typed attachment labeled “Solar Array Design.”

In accordance with the agreement with UMass Cranberry Station, the experimental row spacing of 19', 22' and 25' was installed on two sections of the project. UMass researchers installed sensors and collected data on cranberry development and vine health throughout 2024 and 2025.

AGRICULTURAL PLAN FOR DUAL-USE AREA

Planned agricultural use, Year 1. Check all that apply.

- Vegetable, fruit, grains, for human consumption
- Hay
- Livestock production
- Poultry production
- Horticulture
- Floriculture
- Aquaculture
- Other, please describe: _____

Please fill the Crop Table results following this section for horticulture, flowers, vegetable, fruit, grain, and hay crops for your present year of operation. Fill out one Crop Narrative for each crop, detailing anticipated crop management (planting, irrigation, soil amendments, harvesting) and equipment to be used. **Crop Table – Current Season** follows this section. Also, please also fill out a **Crop Table – Next Season** and corresponding narrative at the end of this section with your best information available.

Please fill out the Grazing Table results following this section for livestock and poultry production for your present year of operation. Please also fill out the Grazing Narrative, detailing anticipated pasture and animal management and equipment to be used. **Grazing Table – Current Season** follows the Crop Table section. Also please fill out a **Grazing Table – Next Season** and corresponding narrative at the end of this section with your best information available.

Additional comments regarding agricultural production for Year 1:

How did the Agricultural Production perform versus expectations? Please explain why/why not if you can:

Construction work associated with the solar facility continued throughout the 2025 growing season. It was anticipated in the Pre-Determination Application that there would be no cranberry yield in the first year if construction was not completed by the start of the growing season. Additionally, the extreme cold conditions in February of 2025 caused significant winter injury to the Ring Road vines. The winter injury was so severe that there was no harvestable fruit on the southerly side of Ring Road (Dunham bogs) and only approximately 40% of the northerly side of Ring Road (Correira bogs) were harvestable. In spite of the winter injury and construction, the cranberry crew coordinated activities with the construction crew such that a 325 barrel (32,571 lb) cranberry crop was harvested from the Correira bogs this Fall. The cranberry production

onsite is expected to increase in years two and three as the bogs recover from construction-related impacts and winter injury.

Did you plant the crops/graze the animals as you originally intended when your Pre-Determination Application was approved? If not please explain.

Yes, the ASTGU remained in cranberry production as proposed in the Pre-Determination Application.

Were the products marketable anticipated? Please explain how the production values (weight/bushels etc) were determined.

The bogs at Ring Road yielded 325 barrels this year. Approximately 25 % of the harvested cranberries were marketed as premium quality fresh fruit with the remaining 75% marketed as processed commodity grade fruit.

What occurred during the current season that wasn't anticipated? Positive & Negative.

The months of January and February of 2025 brought extremely low temperatures and caused damage to many bogs across Southeastern Massachusetts, as evidenced by the UMass Amherst Center for Agriculture, Food, and the Environment – Cranberry Station report of April 2nd, 2025. Vines that had undergone stress, such as construction related compaction, were particularly impacted. While the vines are recovering well from the damage and future years harvest is looking promising, this year's yields were substantially reduced. Recognizing that this year's crop was not going to be plentiful, management of bogs turned to vine health and bud development in anticipation for a commercially viable crop in 2026.

What Changes/Modifications do you expect to make to improve on production if needed?

Automation of the two irrigation pumps at Ring Road occurred this year which promoted water conservation efforts. The automation allows irrigation events to take place early in the morning which reduces evapotranspiration. Automation also allows for cycling of the water during flooding events.

Do you expect to grow the same crops on the land in years 2 and 3? Briefly describe your crop rotation plan and what you expect to be growing on the land for the next 5 years Will the same equipment be used? If not, is current array design compatible with future crop management needs and equipment?

Cranberry cultivation will continue for the lifespan of the SMART/ASTGU program. Discussions are ongoing about the method of harvesting and optimizing markets of the harvested fruit grown on the Ring Road bogs. In either event, all necessary equipment and farming activities are compatible with the solar array setup.

Table A: Crop Production – Current Season					
Crop	Area planted (Row length and width or acreage, as appropriate)	Planting date(s) (approximate)	Harvest date(s) (approximate)	Expected productivity, total pounds harvested without dual use	Actual productivity, pounds, with dual use
Cranberries	The existing cranberry vines on the 30.4 acres of bogs remained in place	N/A	Late October to early November	40,000 lbs (400 barrels)	32,571 lb (325 barrels)

CROP NARRATIVE – Current Season

*Please detail the crop management for this past season, including approximate **dates** and **equipment** used. The purpose of this form is to provide empirical data regarding compatible equipment usage and crop management needs. If you need additional space, please include a typed attachment labeled “Crop Narrative.”*

Crop: Cranberry

Planting Plan: The cranberry bogs’ existing vines remained in place.

Soil Amendment Plan: Liquid 8-3-14 fertilizer was applied to the bog via chemigation in early July at a rate of 6 gallons per acre to support vine health. The lower N this year was in response to the winter injury and the anticipation of dry harvesting the bogs.

Cultivation Plan: Cranberry cultivation practices followed UMass Cranberry Station’s best management practices for irrigating, fertilizing, spraying and weeding the bog. The vine canopy was trained through pruning during the dry harvest, and this should increase fruit quality in 2026.

Irrigation Plan: Weekly irrigation of the bog occurred during the growing season to support vine health and fruit maturation. This is consistent with the UMass Cranberry Station recommendation of approximately 1 inch of irrigation water per week depending upon weather events.

Pesticide/Herbicide Plan: Weekly scouting of the bogs throughout the growing season was performed as part of the farm’s Integrated Pest Management program. The pesticides Invertid 2F, Altacor, and Fanfare were applied to control insect pest outbreaks on the bogs. Bravo Weather Stik and Proline were applied to manage fungal fruit diseases. Explorer was applied to manage weed pressure on the bog. All applications were performed by a licensed pesticide applicator and followed respective pesticide label information for the application rates, re-entry intervals and pre-harvest intervals.

Harvest Plan: The bog was harvested using a combination of water and dry harvest methods this fall. Lessons were learned from this season’s harvest that will be applied to the 2026 harvest with regard to increasing harvest efficiencies.

Table B: Grazing Production – Current Season							
Type(s) of animal grazed	Area grazed (acreage)	Grazing pressure # animals per acre	Purpose (e.g. meat, dairy, eggs)	Grazing period(s)	Harvest date(s) if applicable	Expected productivity with solar array	Actual productivity with solar array
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

GRAZING NARRATIVE – Current Season

*Please detail the past season animal and pasture management, including **dates** and **equipment** used. The purpose of this form is to provide empirical data regarding compatible equipment usage and production needs. If you need additional space, please include a typed attachment labeled “Grazing Narrative.”*

Type(s) of Animals Grazed: N/A

Pasture Management Plan: List any anticipated seeding, soil amendment, irrigation, pesticide, mowing, etc., including approximate dates and equipment used.

Animal Management Plan:

For each type of animal grazed, describe management regarding housing/shelter, water source, fencing, movement, disease treatment, harvest, etc. that was carried out within the solar array area. Describe equipment used in these activities.

Describe any modifications to the solar array design that were made in order to reduce the risk of animal damage to the solar array, or risk of electrocution to animals.

Table A: Crop Production – Next Season					
Crop	Area planted (Row length and width or acreage, as appropriate)	Planting date(s) (approximate)	Harvest date(s) (approximate)	Expected productivity, total pounds harvested without dual use	Expected productivity, total pounds, with dual use
Cranberries	The existing cranberry vines on the 30.4 acres of bog will remain in place	N/A	September/October/November depending on the weather and season.	100,000 lbs (1,000 barrels)	75,000 lbs (750 barrels)

CROP NARRATIVE – Next Season

*Please detail the crop management planned for next season, including approximate **dates** and **equipment** used. The purpose of this form is to provide planned data for the upcoming season regarding compatible equipment usage and crop management needs. If you need additional space, please include a typed attachment labeled “Crop Narrative.”*

Crop: Cranberries

Planting Plan: The existing vines will remain in place. Following the UMass Cranberry Station’s recommendations, the bog will be fertilized to support the vines’ health and cranberry yield. In lieu of sanding, the plan is to mow 1/3 of the bog acreage (+/- 10 acres) next season to reinvigorate vine density and cranberry bud development on that acreage.

Soil Amendment Plan: Sul-Po-Mag is planned to be applied in May at a rate of 100 lbs/acre. An 8-13-4 liquid fertilizer at a rate of 6 gallons/acre is planned to be applied in July. Additional fertilizer may be applied as vine conditions and fruit development dictate.

Cultivation Plan: Agricultural activities for cranberry cultivation occur year-round and follow UMass Cranberry Station’s best management practices. These activities include weeding, irrigating, fertilizing, spraying and harvesting of the bogs throughout the growing season as needed.

Irrigation Plan: The current irrigation infrastructure will remain in place. Weekly irrigation of the bog will occur at an average rate of 1 inch per week during the growing season.

Pesticide/Herbicide Plan: Pesticides and herbicides will be applied in accordance with product labelling and the current UMass Cranberry Station Chart Book. Included in this approach is the use of IPM practices to target specific pests observed in the field. This work generally occurs April - August with timing of applications dependent upon pest threshold, pre-harvest intervals and handler requirements.

Harvest Plan: Dry harvesting will be performed next season using the same equipment as this current season. The 10 acres of bog that are planned to be mowed will not be harvested next season.

Table B: Grazing Production – Next Season							
Type(s) of animal grazed	Area grazed (acreage)	Grazing pressure # animals per acre	Purpose (e.g. meat, dairy, eggs)	Grazing period(s)	Harvest date(s) if applicable	Expected productivity without solar array	Expected productivity with solar array
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

GRAZING NARRATIVE – Next Season

*Please detail the next season animal and pasture management, including **dates** and **equipment** used. The purpose of this form is to provide planned data for the upcoming season regarding compatible equipment usage and production needs. If you need additional space, please include a typed attachment labeled “Grazing Narrative.”*

Type(s) of Animals Grazed: N/A _____

Pasture Management Plan: List any anticipated seeding, soil amendment, irrigation, pesticide, mowing, etc., including approximate dates and equipment used.

Animal Management Plan:

For each type of animal grazed, describe management regarding housing/shelter, water source, fencing, movement, disease treatment, harvest, etc. that was carried out within the solar array area. Describe equipment used in these activities.

Describe any modifications to the solar array design that were made in order to reduce the risk of animal damage to the solar array, or risk of electrocution to animals.

Waiver for Decreased Yield

i. Waiver for Decreased Yield

Due to unforeseen circumstances, such as but not limited to weather events, pests, or change in crops, the projected agricultural yield for any given year may be lower than stated in the agricultural plan or previous year's annual report. In these instances, an applicant can request a waiver to the Department for the decreased yields. The applicant must demonstrate to the satisfaction of the Department, and in consultation with MDAR, that a waiver is warranted for good cause. Waiver requests must be submitted by November 1st of the applicable calendar year and sent to DOER.SMART@mass.gov.

With respect to the reporting obligations associated with qualification of this project as an Agricultural Solar Tariff Generation Unit (ASTGU) under the SMART program, we would note that this project was approved in January 2020 and is subject to the ASTGU guidelines in place at that time (Guideline effective date April 26, 2018). Accordingly, the Ring Road Solar, LLC ASTGU project is not subject to this provision.

ii. Failure to Report

If the ASTGU fails to submit an annual report, the Department may declare the project ineligible for the ASTGU adder for one year. If the annual report is not completed for a second year, then the Department may permanently disqualify the ASTGU from continuing to receive the ASTGU Adder for the remainder of the STGU's tariff term.

SIGNATURES AND ATTESTATIONS

Prior to submitting the Pre-Determination Form, please read and sign as directed below.

Landowner

I hereby certify that I have personally examined and am familiar with the information submitted herein, and, based upon my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete.

DocuSigned by:
Jess Roden 11/26/2025

Signature of Landowner Date

Farm Operator and Landowner

I/we hereby certify that the information submitted regarding the current farm conditions and practice and the Agricultural Plan for the Dual-Use Area is accurate and complete to the best of my/our knowledge and intentions, and that I/we have engaged with the University of Massachusetts Amherst Clean Energy Extension and thereby its agricultural extension service to review the Agricultural Plan and its compatibility with the solar array structures and shading. Further, I/we agree, conditional on being provided eligibility to the SMART program as an ASTGU, to submit a report, through a template provided by the University of Massachusetts Clean Energy Extension, annually throughout the duration of the SMART incentive with ASTGU adder, on the operations and productiveness of the solar array and agriculture along with any changes to the Agricultural Plan for the following year. I/we understand that failure to maintain productive agricultural activities and annual reporting may result in the disqualification of the facility as an ASTGU in the SMART program.

Vain Ward 11/26/25

Signature of Farm Operator Date

DocuSigned by:
Jess Roden 11/26/2025

Signature of Landowner Date

Solar Facility Owner

I hereby certify that the information submitted regarding the Solar Array Description and inputs and outputs of the Shading Analysis is accurate and complete to the best of my/our knowledge and intentions.

DocuSigned by:
Jess Roden 11/26/2025

Signature of Solar Facility Owner Date

Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
DEPARTMENT OF ENERGY RESOURCES
FINAL STATEMENT OF QUALIFICATION
Pursuant to the Renewable Energy Portfolio Standard Class I and the Solar
Massachusetts Renewable Target (SMART) Program -
225 CMR 14.00 and 225 CMR 20.00

This Statement of Qualification, provided by the Massachusetts Department of Energy Resources (“Department”), signifies that the Generation Unit identified below, as described in Statement of Qualification Application ID number SMAES_34635, meets the requirements for eligibility as a Solar Tariff Generation Unit, pursuant to the Solar Massachusetts Renewable Target (SMART) Program 225 CMR 20.00, and meets the requirements for eligibility as a RPS Class I Renewable Generation Unit, pursuant to the Renewable Energy Portfolio Standard – Class I, 225 CMR 14.00.

Generation Unit Name, Capacity,
and Location:

BERE0RING02367
2,000 kW AC
0 Ring Road, Plympton MA 02367

Authorized Representative’s Name
and Address:

Donal Mahoney
Greenbacker Capital
230 Park Ave, Suite 1560, New York NY 10169

This Generation Unit’s unique Massachusetts RPS Identification Number is listed below and matches its Application ID number. Please include the ID number on all correspondence with DOER and the Solar Program Administrator.

MA RPS Class I ID #: SMAES_34635

As a Standalone Qualifying Facility Solar Tariff Generation Unit located in Eversource MA East that is eligible under Block 5 as a 2,000 kW AC generation unit, BERE0RING02367 is entitled to a Base Compensation Rate of \$0.14439 with a Greenfield Subtractor of -\$0.00000/a Location Based Adder of \$0.06000/an Off-taker Based Adder of \$0.00000/Solar Tracking Adder of \$0.01000/an Energy Storage Adder of \$0.05012/a Pollinator Adder of \$0.00000 resulting in a Total Compensation Rate of \$0.26451. The final Solar Incentive Payment Rate for Standalone systems is determined by subtracting the Value of Energy from their Total Compensation Rate. The Value of Energy may vary from month to month and will be determined by your Electric Distribution Company based on the Qualifying Facility. The Generation Unit’s qualification as a Solar Tariff Generation Unit will be in effect for 20 years, starting upon the Generation Unit’s Solar Payment Effective Date of 3/13/2025. Following this period, the Generation Unit will remain qualified as an RPS Class I Renewable Generation Unit.

Compensation Rate Component	Value (\$/kWh)
Base Compensation Rate	\$0.14439
Agriculture Adder	\$0.06000
Off-Taker Adder	\$0.00000
Solar Tracking Adder	\$0.01000
Energy Storage Adder	\$0.05012
Pollinator Adder	\$0.00000
Greenfield Subtractor	\$0.00000
Total Compensation Rate:	\$0.26451

The Qualification of this Generation Unit is subject to all applicable provisions in 225 CMR 14.00, including but not limited to the following. Pursuant to 225 CMR 14.06(5) and (6), the Owner or Operator of the Unit is obligated to notify the Department of any changes in the characteristics of the Unit that could affect its eligibility status, as well as any changes in the Unit's owner, operator, generation capacity, or contact information, including the Authorized Representative.

The Qualification of this Generation Unit is subject to all applicable provisions in 225 CMR 20.00, including but not limited to the following. Pursuant to 225 CMR 20.06(5) and (6), the Owner or Authorized Agent of a Solar Tariff Generation Unit shall notify the Solar Program Administrator of any changes that may affect the continued eligibility of the Generation Unit as a Solar Tariff Generation Unit, as well as any changes in ownership, capacity, or contact information for the Solar Tariff Generation Unit, no later than five days following the end of the month during which such changes were implemented.

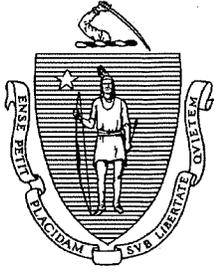
The continued Qualification of this Generation Unit is subject to the Generation Unit meeting all applicable provisions in 225 CMR 14.00, 225 CMR 20.00, and the SMART Tariff as approved by the Department of Public Utilities. The Department may suspend or revoke this Statement of Qualification if the Owner or Operator fails to comply with 225 CMR 14.00, 225 CMR 20.00, or a SMART Tariff approved by the Department of Public Utilities, including the provisions and conditions of this Statement of Qualification.



Date: 6/9/2025*

Elizabeth Mahony
Commissioner
Department of Energy Resources

*Please note that the date displayed on this document represents the date of original issuance of the Statement of Qualification. Updated versions of a Statement of Qualification that are issued by the Department will retain the original issuance date.



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF
ENERGY AND ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENERGY RESOURCES
100 CAMBRIDGE ST., SUITE 1020
BOSTON, MA 02114
Telephone: 617-626-7300
Facsimile: 617-727-0030

Charles D. Baker
Governor

Kathleen A. Theoharides
Secretary

Karyn E. Polito
Lt. Governor

Patrick Woodcock
Acting Commissioner

January 22, 2020

Via Electronic Mail

Adam Schumaker
NextSun Energy LLC
97 Main Street E206
Edwards, CO 81632

Dear Mr. Schumaker:

The purpose of this letter is to respond to NextSun Energy LLC/BE RE, LLC's ("Applicant") Pre-Determination Application submitted November 25, 2019, as well as the accompanying Addendum dated November 22, 2019, concerning the potential qualification of a proposed solar photovoltaic installation at Correira Ring Road Bog in Kingston/Plympton, MA ("Project") as an Agricultural Solar Tariff Generation Unit ("ASTGU") under 225 CMR 20.00. The Department of Energy Resources ("Department"), acting in consultation with the Massachusetts Department of Agricultural Resources ("MDAR"), has reviewed your request.

Special provisions for ASTGUs are detailed in both 225 CMR 20.06(1)(d), and the *Guideline Regarding the Definition of Agricultural Solar Tariff Generation Units*.

The regulatory guidance is as follows:

In order to qualify as an Agricultural Solar Tariff Generation Unit, a Solar Tariff Generation Unit must submit documentation itemized in 225 CMR 20.06(1)(d). All final determinations regarding the eligibility of such facilities will be made by the Department, in consultation with MDAR. An Agricultural Solar Tariff Generation Unit must also submit satisfactory documentation to the Department as detailed in the Department's Guideline Regarding the Definition of Agricultural Solar Tariff Generation Units.

- 1. the Solar Tariff Generation Unit will not interfere with the continued use of the land beneath the canopy for agricultural purposes;*
- 2. the Solar Tariff Generation Unit is designed to optimize a balance between the generation of electricity and the agricultural productive capacity of the soils beneath;*
- 3. the Solar Tariff Generation Unit is a raised structure allowing for continuous growth of crops underneath the solar photovoltaic modules, with height enough for labor and/or machinery as it relates to tilling, cultivating, soil amendments, harvesting, etc. and grazing animals;*
- 4. crop(s) to be grown to be provided by the farmer or farm agronomist in conjunction with UMass Amherst agricultural extension services, including compatibility with the design of the agricultural solar system for such factors as crop selection, sunlight percentage, etc.;*

5. annual reporting to the Department and MDAR of the productivity of the crop(s) and herd, including pounds harvested and/or grazed, herd size growth, success of the crop, potential changes, etc., shall be provided after project implementation and throughout the SMART incentive period; and
6. other system design information, which shall include, but not be limited to:
 - a. dual-use type, e.g., ground mount racking, pole towers, tracking, etc.;
 - b. total gross acres of open farmland to be integrated with the project;
 - c. type of crop(s) to be grown, including grazing crops;
 - d. pounds of crop(s) projected to be grown and harvested, or grazed;
 - e. animals to be grazed with herd size(s); and
 - f. design drawing including mounting system type (fixed, tracking), panel tilt, panel row spacing, individual panel spacing, for pole tower spacing and mounting height, etc.

Additionally, the *Guideline Regarding the Definition of Agricultural Solar Tariff Generation Units* sets forth the following System Design Parameters for eligible projects:

1. Panel Height Requirements

- a. For fixed tilt ASTGUs, the minimum height of the lowest panel point shall be eight (8) feet above ground;
- b. For tracking ASTGUs, the minimum height of the panel at its horizontal position shall be 10 feet above ground;

2. Maximum Direct Sunlight Reduction Requirements

All ASTGUs must demonstrate that the maximum sunlight reduction from the panel shading on every square foot of land directly beneath, behind and in the areas adjacent to and within the ASTGU's design shall not be more than 50% of baseline field conditions;

3. Growing Season/Time of Day Considerations

The typical growing season shall be considered to be March through October, with sunlight hour conditions with maximum 50% sunlight reduction to be between 10AM and 5PM for March and October, and from 9AM to 6PM from April through September;

4. Maximum Size

The maximum AC rated capacity of an ASTGU shall be two MW in the first two Capacity Blocks of each Distribution Company's service territory. The Department, in consultation with MDAR, will make an evaluation as to whether or not this provision shall be adjusted in subsequent Capacity Blocks.

Acting in accordance with 225 CMR 20.00 and applicable Guidelines, the Department, in consultation with MDAR, hereby determines that the Project as proposed has demonstrated that it likely satisfies all criteria set forth in 225 CMR 20.00 to be considered an ASTGU.

Please be advised that this pre-determination of ASTGU eligibility letter is not a final Department decision, is not binding on the Department or MDAR, and does not give rise to any appeal right under M.G.L. c. 30A, or any other law. The Department, in consultation with MDAR, will make a final determination on the eligibility of the Project's status as an Agricultural Solar Tariff Generation Unit at the time it issues a Statement of Qualification under 225 CMR 20.06. Such final determination may be different from the pre-determination contained in this letter if information provided by you in connection with your Pre-Determination Request Form is materially inaccurate or incomplete.

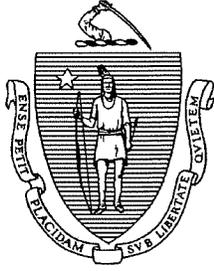
If you have any questions regarding this pre-determination of eligibility, please contact Jonathan Held at jonathan.a.held@mass.gov or (617) 626-7336.

Sincerely,



Eric Steltzer
Director, Renewable and Alternative Energy Development

cc: MDAR



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF
ENERGY AND ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENERGY RESOURCES
100 CAMBRIDGE ST., SUITE 1020
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Facsimile: 617-727-0030

Charles D. Baker
Governor

Kathleen A. Theoharides
Secretary

Karyn E. Polito
Lt. Governor

Patrick Woodcock
Acting Commissioner

January 22, 2020

Via Electronic Mail

Adam Schumaker
NextSun Energy LLC
97 Main Street E206
Edwards, CO 81632

Dear Mr. Schumaker:

The purpose of this letter is to respond to NextSun Energy LLC/BE RE, LLC's ("Applicant") Pre-Determination Application submitted November 25, 2019, as well as the accompanying Addendum dated December 17, 2019, concerning the potential qualification of a proposed solar photovoltaic installation at Dunham Ring Road Farm in Kingston/Plympton, MA ("Project") as an Agricultural Solar Tariff Generation Unit ("ASTGU") under 225 CMR 20.00. The Department of Energy Resources ("Department"), acting in consultation with the Massachusetts Department of Agricultural Resources ("MDAR"), has reviewed your request.

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- 1. the Solar Tariff Generation Unit will not interfere with the continued use of the land beneath the canopy for agricultural purposes;*
- 2. the Solar Tariff Generation Unit is designed to optimize a balance between the generation of electricity and the agricultural productive capacity of the soils beneath;*
- 3. the Solar Tariff Generation Unit is a raised structure allowing for continuous growth of crops underneath the solar photovoltaic modules, with height enough for labor and/or machinery as it relates to tilling, cultivating, soil amendments, harvesting, etc. and grazing animals;*
- 4. crop(s) to be grown to be provided by the farmer or farm agronomist in conjunction with UMass Amherst agricultural extension services, including compatibility with the design of the agricultural solar system for such factors as crop selection, sunlight percentage, etc.;*

5. *annual reporting to the Department and MDAR of the productivity of the crop(s) and herd, including pounds harvested and/or grazed, herd size growth, success of the crop, potential changes, etc., shall be provided after project implementation and throughout the SMART incentive period; and*
6. *other system design information, which shall include, but not be limited to:*
 - a. *dual-use type, e.g., ground mount racking, pole towers, tracking, etc.;*
 - b. *total gross acres of open farmland to be integrated with the project;*
 - c. *type of crop(s) to be grown, including grazing crops;*
 - d. *pounds of crop(s) projected to be grown and harvested, or grazed;*
 - e. *animals to be grazed with herd size(s); and*
 - f. *design drawing including mounting system type (fixed, tracking), panel tilt, panel row spacing, individual panel spacing, for pole tower spacing and mounting height, etc.*

Additionally, the *Guideline Regarding the Definition of Agricultural Solar Tariff Generation Units* sets forth the following System Design Parameters for eligible projects:

1. *Panel Height Requirements*

- a. *For fixed tilt ASTGUs, the minimum height of the lowest panel point shall be eight (8) feet above ground;*
- b. *For tracking ASTGUs, the minimum height of the panel at its horizontal position shall be 10 feet above ground;*

2. *Maximum Direct Sunlight Reduction Requirements*

All ASTGUs must demonstrate that the maximum sunlight reduction from the panel shading on every square foot of land directly beneath, behind and in the areas adjacent to and within the ASTGU's design shall not be more than 50% of baseline field conditions;

3. *Growing Season/Time of Day Considerations*

The typical growing season shall be considered to be March through October, with sunlight hour conditions with maximum 50% sunlight reduction to be between 10AM and 5PM for March and October, and from 9AM to 6PM from April through September;

4. *Maximum Size*

The maximum AC rated capacity of an ASTGU shall be two MW in the first two Capacity Blocks of each Distribution Company's service territory. The Department, in consultation with MDAR, will make an evaluation as to whether or not this provision shall be adjusted in subsequent Capacity Blocks.

Acting in accordance with 225 CMR 20.00 and applicable Guidelines, the Department, in consultation with MDAR, hereby determines that the Project as proposed has demonstrated that it likely satisfies all criteria set forth in 225 CMR 20.00 to be considered an ASTGU.

Please be advised that this pre-determination of ASTGU eligibility letter is not a final Department decision, is not binding on the Department or MDAR, and does not give rise to any appeal right under M.G.L. c. 30A, or any other law. The Department, in consultation with MDAR, will make a final determination on the eligibility of the Project's status as an Agricultural Solar Tariff Generation Unit at the time it issues a Statement of Qualification under 225 CMR 20.06. Such final determination may be different from the pre-determination contained in this letter if information provided by you in connection with your Pre-Determination Request Form is materially inaccurate or incomplete.

If you have any questions regarding this pre-determination of eligibility, please contact Jonathan Held at jonathan.a.held@mass.gov or (617) 626-7336.

Sincerely,



Eric Steltzer
Director, Renewable and Alternative Energy Development

cc: MDAR

ALERT! Winter Injury Appearing on Beds This Spring

By Katie Ghantous with input from Peter Jeranyama

It has come to our attention that there are widespread reports of winter injury showing up on MA cranberry bogs this spring as both winterkill (desiccated uprights) and injury to cranberry buds on non-desiccated uprights. Reports range from mild to severe and are being seen in all areas including the Cape. In some areas the winterkill injury is extensive, and it is increasingly appearing that the MA crop yield will be impacted. Some growers have been estimating that they will be down by as much as 30% this year.

We experienced a very cold period this winter. While it provided a rare opportunity for some ice sanding, it also created a potentially injurious time for the cranberry vines. The evening temperatures averaged 18.6°F in January and 20.2°F in February. January had 5 nights with temperatures below 9 degrees and February 11 and 12 had low night temperatures of 2 °F.

To make matters more complicated, there were freeze and thaw cycles. The cold snaps were followed by some days of thawing and then followed by MORE cold and windy days. Some beds that were flooded for the first cold period lost some ice/water and vines were then exposed for the second cold period. We are hearing that many growers feel that the injury happened during the second cold period. There are some beds that cannot hold water, and it is expected that those sites could have incurred more extensive injury (most likely from both cold periods).

During the Crop Summit held at the Cranberry Station in December 2024, there was a lot of discussion about the drought conditions during harvest and whether that would impact the vines for next year. One grower stated that in his many years of experience, vines can tolerate one major stress per



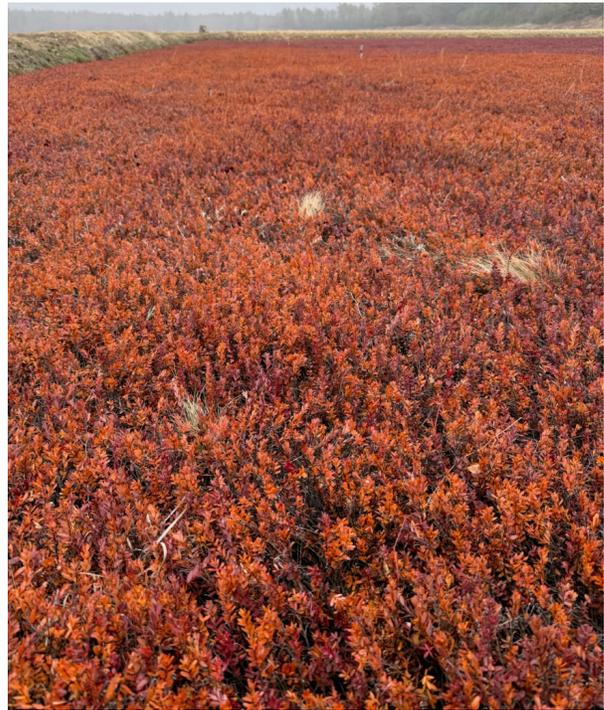
Desiccated uprights, showing damaged leaves and buds. Photo courtesy of Krystal DeMoranville.

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season, but a second stress causes major problems. This week, more than one grower has mentioned to me that they think the dry fall may have played into the vines being more prone to winter injury.

WHAT IS WINTERKILL?

Cranberry vines may be injured or killed by severe winter weather. The most common injury, referred to as “winterkill”, is classified as a physiological drought. This can occur when the root zone is frozen. Unlike deciduous woody plants, cranberry plants hold onto their leaves all year long which makes them vulnerable to winterkill. Water in leaf and bud tissues is lost from the vines due to wind and evaporation and it cannot be replaced because the water in the soil is frozen and unavailable to be taken up by the cranberry roots. According to the 2008 Cranberry Production Guide, in addition to direct damage to buds the “desiccation may result in leaf loss in the spring. Since cranberries accumulate nonstructural carbohydrates (the fuel for metabolism and growth) in the spring, the loss of leaf tissue may have a significant impact on subsequent production of new growth and fruit.”



A cranberry bed that was unable to be flooded showing extensive and severe injury.

Winter floods are used to protect the vines when winterkill conditions are predicted (root zone is frozen to a depth of 4 inches, air temperature is below freezing, and strong winds (10 mph or greater) are expected to occur). To be optimally effective, the flood should be deep enough to cover *all* vine tips. In many cases, this is not possible if the bed is out of grade, has tufty spots, or other circumstances where some vines are not fully protected by the flood. Inherent varietal differences may influence the severity of the winter injury.

In most cases where winterkill symptoms show up, the uprights are affected but the plant itself is still alive and will recover. Most of the plant was protected, and the desiccation has not been severe enough to kill down to the roots.

WHAT DO I DO IF I HAVE SYMPTOMS ON MY BOG?

After reaching out to colleagues in other regions that experience winterkill conditions like New Jersey and Quebec, it turns out that there are no formal recommendations for how to deal with winterkill anywhere! Most of the research focuses on preventing winterkill, and there is not much research focused on how to manage beds with winterkill injury.

The Chart Book states that for winter injury:

- **Start fertilizer early.** If leaf drop occurs after withdrawal of winter flood, early spring fertilizer applications will aid in recovery by encouraging rapid, early production of new leaves. Do not skip spring fertilizer. Note that the Chart Book recommendation is that you can apply up to 20% of the *total N* between roughneck and hook. If you do not usually apply fertilizer that early but have winterkill you may want to consider incorporating that timing into your program this year.

- **SulPoMag.** SulPoMag (or similar material) at 100-200 lb/A may also aid recovery. If your injury is severe you may want to select the higher end of the rate range.

We have had growers question whether or not to alter their fertilizer programs (either increase or decrease N amounts, add in other fertilizers like Sul-po-mag, etc.) to compensate for injury and help vines recover. It is important to consider adjusting the *total amount* of Nitrogen you plan to apply this year. Just as you would add more N if you expect a large crop, if you expect your crop to be smaller than usual you should think about adjusting the amount of N down so as not to encourage excessive vegetative growth.

WINTER INJURY TO CRANBERRY BUDS ON NON-DESICCATED UPRIGHTS.

On State Bog, we have been seeing some uprights (not obviously showing signs of winterkill) present with buds that are damaged. Cranberry buds that will grow into flowering uprights contain multiple floral initials. Not every flower will result in a fruit. If some of those floral initials are damaged from winter or spring frost, that upright can still go on to successfully bear fruit. Some injury does not necessarily translate into a loss in yield. Peter's research shows that a cranberry bud typically has four to six floral initials and damage to two floral initials means the remaining two to four initials will produce flowers and result in fruit production. So, moving into the frost season with *some* preexisting winter injury to buds is not a doom scenario. If the winter damage to buds was more extensive than one or two floral initials per bud, yield could be impacted.

To check a bud for injury, create a cross section to examine it. Remove the leaves around the bud, lay the upright on a flat surface, and cut through the bud half-way between the top of the bud and the point where the bud joins the stem. Use a sharp, thin blade - a razor blade works well. See the [Frost Protection Guide](#) for more information or reach out to us at the Cranberry Station for assistance!



Cranberry buds sliced horizontally. The picture on the left shows damage to one floral initial, leaving the bud with potential to set a normal amount of fruit despite the loss of a flower. The picture in the middle shows injury to all floral initials, likely resulting in no flowers or fruit. The vegetative portion appears unaffected. The picture on the right showing extensive damage to the entire bud. Photos courtesy of Krystal DeMoranville.