

**Commonwealth of Massachusetts**  
**Executive Office of Energy and Environmental Affairs**  
**DEPARTMENT OF ENERGY RESOURCES**  
**DEPARTMENT OF AGRICULTURAL RESOURCES**

**SOLAR MASSACHUSETTS RENEWABLE TARGET PROGRAM**  
**(225 CMR 20.00)**

**GUIDELINE**

**Guideline Regarding the Definition of Agricultural Solar Tariff Generation Units**

**Effective Date: April 26, 2018**

**Revised: April 12, 2022**

1) Purpose and Background

The Department of Energy Resources (Department), in consultation with the Massachusetts Department of Agricultural Resources (MDAR), has developed this document to provide additional guidance regarding the manner in which a Solar Tariff Generation Unit (STGU) may qualify as an Agricultural Solar Tariff Generation Unit (ASTGU) under the Department's Solar Massachusetts Renewable Target (SMART) Program. The goal of the SMART Program is to reach 80 MW AC capacity of ASTGU systems. The Department plans to review the ASTGU program once the goal of 80 MW AC capacity is reached and may adjust the ASTGU requirements following the review if necessary.

Adopting additional provisions via this Guideline was requested by many commenters in the initial stakeholder process of the SMART Regulation. Such adoption, in consultation with MDAR, will provide the necessary flexibility for the Department to make modifications to key eligibility criteria as lessons are learned in constructing and operating an ASTGU.

All capitalized terms in this Guideline are defined in 225 CMR 20.02.

2) 225 CMR 20.00 Regulatory Provisions Specific to ASTGUs

Under the SMART program, STGUs are eligible to qualify as an ASTGU, which is defined under 225 CMR 20.02 as follows:

Agricultural Solar Tariff Generation Unit. A Solar Tariff Generation Unit located on Land in Agricultural Use or Important Agricultural Farmland that allows the continued use of the land for agriculture.

Additionally, 225 CMR 20.06(1)(d) contains special provisions pertaining to the eligibility of ASTGUs:

(d) Special Provisions for Agricultural Solar Tariff Generation Units. 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 towers tower spacing and mounting height, *etc.*
- 3) Additional Provisions for ASTGUs

Provided an STGU meets all program eligibility criteria in 225 CMR 20.00, an ASTGU must also satisfy the following provisions to qualify. Note that these provisions take into account the entire useful life of the solar photovoltaic array with consideration for the variety of possible agricultural activities and crops that could take place on farmland over that timeframe. In other words, they do not simply consider present use.

The system design parameters defined below will allow for the variety and flexibility of potential farming operations throughout the life of the solar photovoltaic array. These parameters provide farms the flexibility to adjust agricultural activities over time due to a variety of reasons, including different crops and machinery requirements.

a) **Shading Analysis Tool**

Applicants must use the shading analysis tool (SMART Tool) developed by the Department to apply as an ASTGU in the SMART Program. The SMART Tool:

i) assists in the design of an ASTGU by understanding the shading impact on all the land beneath, behind, and throughout the farmed area, of various dual-use array system designs and layouts; and

ii) provides a farm plan template to be used by the landowner to propose their active agricultural production plan consistent with the array configuration and shading profile.

b) System Design Parameters

i. Panel Height Requirements:

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

ii. 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 as calculated by the SMART Tool.

iii. Compatible Sunlight Needs:

Per SMART Regulations 225 CMR 20.06(1)(d)(4), applicant shall provide documentation that the project's proposed solar design's sunlight amount and sunlight reduction is based upon the compatibility with the proposed agricultural crops and productivity, utilizing best available information as indicators, such as photosynthetic active radiation (PAR) and light saturation data; and qualitative information, e.g., sun-loving, partial sunlight, shade tolerant.

iv. Growing Season/Time of Day Considerations:

The typical growing season shall 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.

v. Maximum ASTGU Rated Capacity:

The maximum AC rated capacity of an ASTGU shall be five (5) MW. The maximum DC rating shall be 2:1 DC to AC ratio and shall not exceed 7.5 MW DC.

c) Exception from System Design Parameters

The Department recognizes the variety and, in some cases, the uniqueness of farming operations where some of the ASTGU system design parameters may not be required to achieve the objectives of the ASTGU. To address these such specific cases, an applicant may request that the Department, in consultation with MDAR, issue an exception from any of the system design parameters, for an ASTGU in Section 3b) above. All exception requests should be submitted to [DOER.SMART@mass.gov](mailto:DOER.SMART@mass.gov). In no case will an exception be approved by the Department if it is contrary to the intent of the regulations.

An exception request shall include the following:

i. An Alternative Plan that:

1. details how the applicant will integrate the ASTGU into their farming operation;
2. demonstrates that the Alternative Plan does not result in a diminishment in the agricultural production capacity of the land; and
3. demonstrates that the primary use of the land is for agricultural or horticultural production, as defined by M.G. L. c. 61A.

ii. Justification and Substantiation

An applicant must provide justification as to why an the alternative ASTGU design is necessary for the proposed agricultural operations on the relevant parcel of land.

iii. Additional Documentation

An applicant must provide documentation for each specific aspect of the system design parameters set forth below for which the ASTGU is requesting an exception:

1. Panel Height Requirements:

Provide documentation demonstrating how the proposed design will allow for the variety and flexibility of a variety of potential farming operations at the farm throughout the entire SMART tariff term.

2. Maximum Direct Sunlight Reduction Requirements

- a. demonstrate how the proposed dual-use design will provide equal or greater total agricultural yields than if both the agricultural crop and solar array were grown and installed separately, utilizing the same amount of total land area for the comparison;
- b. demonstrate how each square foot of land will be used for agriculture production; and

- c. demonstrate how the design will be able to accommodate a variety of potential agricultural products throughout the SMART tariff term.

3. Growing Season/Time of Day Considerations:

Provide documentation on how the time of season and time of day data in the system design parameters is not relevant to the farming practice and operation, currently, and for the term of the SMART Tariff.

4. Other:

For all other requirements for which an exception is being sought, please describe the exception(s) requested, why the proposed alternatives require an exception, and how these alternatives will meet the intent of the ASTGU requirements in the SMART Regulation and Guideline.

4) Eligible Farmland

- i. All eligible farmland shall be measured as all land that is owned or leased by a farmer that is at a minimum currently enrolled in M.G.L. c. 61A or has been enrolled in Chapter 61A in the past five years OR is classified as Important Agricultural Farmland, *e.g.*, prime farmland, unique farmland, or additional land of statewide importance.
- ii. All land intended to be newly created farmland shall be deemed eligible farmland if it has established agricultural production prior to the date when an application is submitted to the SMART program.
  - (1) Fallow farmland, which is defined as open arable land that has not been cultivated or used in agriculture for a period of one to five years preceding the date of application, shall be considered existing farmland.
  - (2) No newly created farmland footprint shall be a result of the clearing or conversion of forest land.
  - (3) Soils tests shall be provided from the UMass Amherst Soils Testing Laboratory or equivalent, demonstrating pH and macronutrients are within optimum ranges for the crops proposed. In general, the pH should not be lower than 6.0 unless it is a specific crop requirement.

## 5) Agricultural Plan

- i. Pursuant to 225 CMR 20.06(1)(d)4. and 6., applicants must complete an agriculture plan detailing the crop(s) to be grown on the project site. The template for the agricultural plan is included in the Pre-Determination Application posted on the DOER website.
- ii. For ASTGUs on land in agricultural production on Important Agricultural Farmland, newly proposed grazing of animals or production of hay projects must submit a plan that meets the following requirements:
  - (1) Demonstrates that the production of hay or grazing of animals will be in combination with concurrent growing of crops comparable to the existing operation for the first five years of the ASTGU operation.
    - (a) For grazing projects, a rotational plan should be included with at least 33% of the ASTGU footprint devoted to comparable crops.
    - (b) For hay projects at least 50% of the ASTGU footprint must be devoted to comparable crops.
  - (2) Projects may propose transitioning to new commodities from crops comparable to the existing operation for above provided the plans include the applicant's previous experience with or a working knowledge of the new commodity, an estimate or other information detailing the market viability for the new product, and provides a comparison of the economic value of the planned commodity relative to current production.

## 6) Annual Report

Each year, an Annual Report must be provided to the Department and MDAR pursuant to 225 CMR 20.06(1)(d)5. that demonstrates it continues to engage in commercial agricultural to retain and use the land primarily and directly for agricultural purposes pursuant to M.G.L. c. 61A §§1 and 2.

The annual report is due to the Department and MDAR by December 31<sup>st</sup> of each calendar year for the life of the ASTGU. The annual report should be emailed to [DOER.SMART@mass.gov](mailto:DOER.SMART@mass.gov). The Annual Report template will be posted on the Department website. All Annual Reports will be published on the Department website.

### 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 1<sup>st</sup> of the applicable calendar year and sent to [DOER.SMART@mass.gov](mailto:DOER.SMART@mass.gov).

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.

7) Effective Date

The provisions of this *Guideline Regarding the Definition of Agricultural Solar Tariff Generation Units* issued on April 12, 2022 will take effect on May 15, 2022 and apply to all ASTGUs submitting an initial request for pre-determination on or after May 15, 2022.