BORREGO SOLAR

October 20, 2020

Commissioner Patrick Woodcock
Massachusetts Department of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114

Re: Borrego Comments on Agricultural Solar Tariff Generation Units (ASTGU) Guideline Straw Proposal

Dear Commissioner Woodcock:

Borrego Solar Systems, Inc. (Borrego) appreciates the opportunity to provide comments on the ASTGU Guideline Straw Proposal. Borrego largely supports the comments of the American Farmland Trust (AFT), the Coalition for Community Solar Access (CCSA), the Northeast Clean Energy Council (NECEC), and the Solar Energy Business Association of New England (SEBANE) on the straw proposal and offers the following additional comments.

Borrego appreciates DOER's efforts to improve the dual use agricultural system (ASTGU) provisions in the SMART Program. A few modest adjustments to the ASTGU program could unlock its potential to provide an alternative to traditional ground-mounted arrays that can support the Administration's goals of accelerating our path toward decarbonization and allowing for continued productive use of agricultural land. As described below, the Straw Proposal includes welcome changes that make the ASTGU qualification process more workable. However, other proposed changes would harm the viability of the program and will materially hamper the ability of ASTGUs to provide a real alternative to traditional ground-mounted systems. For that reason, we recommend a handful of key improvements that will increase the historically low number of ground-mounted projects in the SMART program that are approved as ASTGUs, and will enable more farmers to benefit from the program. Our recommendations are as follows:

- DOER should remove the 125% DC to AC ratio cap, and instead limit the DC size directly at a reasonable level;
- DOER should maintain the proposed structure of the size cap, but limit the size in DC instead of AC. Specifically, the project cap should be the larger of 4 MW DC, or no more than 50% of eligible farmland, up to 10 MW DC;

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- DOER should clarify that the area taken up by ASTGUs should be defined in the same way as the area for the SMART program's greenfield subtractor, i.e., based on the total square footage of the panels;
- DOER should clarify that "all eligible farmland" can include non-contiguous parcels owned or leased by the farmer;
- DOER should ensure that the proposed third-party certification process can serve as a viable alternative to reduce the administrative burden on DOER, MDAR, the Agricultural Extension, and developers, rather than creating a process that will introduce additional inefficiencies and risk into the program.

Borrego strongly supports the goals of the ASTGU program and looks forward to working with DOER and MDAR to make it a success. Our detailed recommendations are below.

1. **DOER should remove the 125% DC to AC ratio requirement, and instead cap the DC size directly.**

Borrego recognizes that DOER has made a judgement that it should limit the size of dual-use projects to minimize the impact of these projects on the rural landscape and to reduce the potential for community opposition. However, limiting project size by constraining the AC-DC ratio of these projects will result in a number of unintended consequences that will hamper the viability of this program.

For example, developers in Massachusetts typically design projects with DC to AC ratios (also called "Inverter Loading Ratios" or "ILRs") higher than 125% in order to optimize the use of increasingly limited and expensive interconnection capacity. As DOER is well aware, the distribution grid in many parts of the commonwealth is highly constrained due to significant distributed generation deployment and regrettable under-investment by the state's investor-owned utilities. A higher ILR increases the capacity factor of ASTGU projects, which not only enables these projects to produce more clean energy for every unit of interconnection capacity they use, but also results in more consistent generation profiles across the day, which benefits both utilities and ratepayers by reducing peak energy and capacity costs and enhancing local reliability. For these reasons, PV-only projects in Massachusetts--including most of those that have received SOQs under the first phase of the program--are typically designed to have a 140-150% ILR. If forced to limit the ratio to 125%, many potential ASTGU projects would incur prohibitive interconnection costs, and weakened economics--especially relative to traditional ground-mounted systems, which are not hampered by this artificial constraint on good engineering practices.

Furthermore, the proposed 125% DC to AC ratio appears to be at odds with the SMART Program requirement that all projects over 500 kW include storage, as well as with the state's new Clean Peak program, which encourages storage to be co-located with sources of clean generation. For technical and economic reasons, PV plus storage projects in Massachusetts are increasingly being built with ILRs that are significantly higher than 1.5--with some exceeding 2.0. This is because the benefits of pairing PV with storage diminish rapidly at DC-AC ratios below

approximately 200%. In other words, not only will the proposed AC-DC ratio significantly hamper the economics of these solar plus storage systems, making them less competitive relative to other systems under the SMART program; it will also result in inefficient, wasteful designs that will provide significantly fewer benefits to the system and to ratepayers.

Instead of limiting overall system sizes by imposing an AC-DC ratio limit, DOER could achieve the same goals by simply capping the overall DC size of ASTGU projects. This approach would allow developers to design the most efficient, economic systems possible for each site, while achieving DOER's goal of limiting the overall footprint of ASTGU projects.

2. **Borrego understands the goal of the two-tiered structure of DOER's proposed project size cap, and recommends that it be revised to a cap of a) 4 MW DC or b) 50% of eligible farmland up to 10 MW DC, whichever is larger.**

Borrego agrees with the American Farmland Trust and our trade association partners that removing the limit of 50% of eligible farmland would make the ASTGU program more flexible and allow more farmers to participate. However, we also understand that it is important to DOER and MDAR that dual-use solar systems do not dominate the farms that host them--i.e., that farms remain primarily devoted to mono-use farming. In the event that DOER decides to maintain the 50% of farmland rule, we would support maintaining the proposed two-tiered size cap for the ASTGU program. This two-tiered approach avoids penalizing small farms while applying DOER's preferences for farmland use to larger farms that can better accommodate the impact to system economics that this rule imposes. According to the 2017 Agricultural Census, one third of farms in Massachusetts are under 10 acres.[1] As DOER has learned with the low adoption rates for ASTGUs so far, it is very difficult for customers to finance dual-use systems if they are too small to result in the economies of scale that are needed to overcome high fixed interconnection and construction costs. Therefore, if DOER's guidelines are too restrictive with respect to land area usage, small farms will be de facto precluded from participating in the program and prevented from realizing its valuable benefits. We do not believe this is DOER's intent, but suggest that preventing this outcome requires either eliminating this 50% rule or maintaining a two-tiered approach that recognizes the adverse impacts on small farms. Maintaining the two-tiered size cap provides additional design flexibility for small farms, while at the same time addressing DOER's desire to preserve a significant portion of the farmland on larger parcels for single-use farming.

In addition, while we support the two-tiered structure of the size cap, we recommend (as detailed above) that the size cap be denominated in DC, without restricting the inverter load ratio. Given that new projects will be required to pair with energy storage, and that design considerations typically drive these designs to DC-AC ratios above 200%, we recommend that DOER cap ASTGU projects at the larger of:

- 4 MW DC (roughly equivalent to 2 MW AC), or

[1]https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_1_State_Level/Massachusetts/mav1.pdf

- 50% of eligible farmland, up to 10 MW DC (roughly equivalent to the SMART program limit of 5 MW AC)

These alternative limits would allow landowners and developers the flexibility to incorporate optimal design principles for solar and storage projects that will minimize the inefficiencies that would otherwise arise in projects designed for this program.

We recognize that other stakeholders have suggested that DOER eliminate the 50% rule entirely and cap all projects at 7.5 MW DC. While we feel that our recommendations, above, would better balance DOER's desires and the practicalities of developing these complex projects, we would support a limit of 7.5 MW DC provided this limit is applied only to solar-only projects. In the event DOER adopts this lower limit for the program, we recommend that the agency also consider adopting a higher DC cap for projects that are paired with storage, in recognition of the unique technical considerations that make solar plus storage projects with low inverter-loading ratios less beneficial for the grid and to customers than those with higher ILRs.

3. **Borrego recommends that DOER clarify that the area of ASTGUs is defined in the same way as the area for the SMART program's greenfield subtractor, i.e., based on the total square footage of the panels.**

We understand that the rules limiting dual-use installations to no more than 50% of eligible farmland and limiting shading to 50% are intended to ensure that farms remain primarily for farming and that the land underneath these installations remains productive for farming purposes. In practice, however, these two provisions are in conflict with one another. Limiting the overall size of a solar installation, if it is defined by the area within the fenceline, would encourage developers to space solar panels as closely as possible, reducing the amount of sunlight that would reach the farmland beneath. Conversely, limiting the shaded area under the panels requires developers to space panels farther apart, which results in more spread out designs that take up more land area. In order to avoid these contradictory design signals and to adhere as closely to other components of the SMART program as possible, we recommend that the total area taken up by an ASTGU for calculation of the 50% of farmland threshold (assuming it is retained) be defined as the total square footage of the panels themselves, not the area within the fenceline. This would be consistent with how the SMART program determines the level of the greenfield subtractor.[2]

This clarification would create important flexibility for farmers. For example, a farmer may prefer to plant or graze an area that is larger than the area of the solar installation, with additional acreage within the fenceline, or she may prefer to space panels more widely to reduce shading on crops. Unless the 50% of farmland rule is determined based on panel area, these important flexibilities will be unavailable, to the detriment of the farmer and the state's desire to maintain flexible and productive working lands. Conversely, were DOER to define the total area based on

[2]SMART Guideline Regarding Land Use, Siting, and Project Segmentation, Section 4.b: "Pursuant to 225 CMR 20.07(4)(g), the value of the total Greenfield Subtractor applied to a STGU is measured as the acreage of land that a STGU occupies, which is calculated by measuring the square footage of the solar photovoltaic modules." https://www.mass.gov/doc/land-use-and-siting-guideline-october-2020/download

the square footage of the panels, it would allow developers and farmers to work together to design systems that are optimized for both solar system operations and farming, while still limiting the total amount of farmland on a parcel that is maintained beneath a dual-use system.

4. **DOER should clarify that "all eligible farmland" can include non-contiguous parcels owned or leased by the farmer.**

DOER's Straw Proposal limits ASTGU projects larger than 2 MW AC to those that take up no more than 50% of eligible farmland, and defines "all eligible farmland" as follows:

"...all land that is owned by the owner or leased by a lessee, and:
- *land defined under 61A or has been enrolled in 61A in the last 5 years, or*
- *prime farmland, unique farmland and additional land of statewide importance."*

Borrego recommends that DOER clarify that "all eligible farmland" would include any non-contiguous parcels owned or leased by the same farmer. In practice, farms are often comprised of a handful of related parcels that, for historical reasons, may not be physically contained within a single lot line, but which for practical purposes are being farmed by a single family or entity. Defining total farmland in this way would maximize the opportunity for farmers to participate, without requiring them to undertake the administratively wasteful and costly process of joining real estate parcels that for all practical purposes comprise part of the same farm.

5. **Borrego supports DOER's inclusion of an alternative approval process through third-party certification.**

A significant challenge for developers who have attempted to participate in the ASTGU program to date has been the lack of clear, consistent, timely design guidance and approval from DOER and MDAR for ASTGU projects. Delays and changes in interpretations of requirements can cause developers to miss interconnection, permitting, and financing milestones, undercutting the attractiveness of the incentive available through the ASTGU program relative to more straightforward ground, carport, and roof-mounted projects. Borrego has had to abandon several potentially viable ASTGU projects due to these challenges. We understand that the ASTGU program requires a much greater level of administrative resources, given the complex factors that must be evaluated on a case-by-case basis by DOER, MDAR, and Agricultural Extension, and these added steps can cause significant delays and costly design rework. We have no doubt that the need to respond to developer interest in this program has also strained the state's limited human resources. For this reason, Borrego supports DOER's proposal to allow a third-party certifier to verify that projects applying to the ASTGU program meet the requirements of the program. Third party-certifications are already well-established components of the SMART program. For example, the Pollinator Adder requires that a solar system obtain a certification from the University of Massachusetts Clean Energy Extension Pollinator-Friendly Certification Program, and projects on agricultural land or other pervious open space require certifications from a professional engineer under SMART.

DOER's proposed alternative approval process through third-party certification could provide a streamlined process that reduces administrative burden, makes the ASTGU program more attractive, and benefits multiple stakeholders. The American Farmland Trust and the Massachusetts Farm Bureau would both be good candidates to review site plans for completeness and compatibility and to issue letters of approval for new ASTGU projects, thus relieving the Agricultural Extension, MDAR, and DOER from significant administrative burden. However, such a third-party certification process would only benefit the program and the agencies if it is designed to be a true alternative to the current process, rather than an additional requirement or a preliminary approval that simply increases the administrative hurdles that projects must overcome to receive approval.

Borrego appreciates the opportunity to work with DOER and MDAR to further improve the ASTGU program. We are excited about this program's potential to sensibly balance the needs of working farmers, state and local goals for land conservation, and the need to rapidly decarbonize, while providing an alternative source of income that can help bolster the well-being of both individual farms and the Commonwealth's food system as a whole.

Sincerely,

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