LIGHTSTAR RENEWABLES

COMMUNITY SOLAR PROGRAM YEAR 1 COMMENTS

OF LIGHTSTAR RENEWABLES

August 10, 2020

New Jersey Community Solar Energy Pilot Program Year 1 Lessons Learned

BPU Docket No. QO18060646
Response to Request for Comments and Stakeholder Meeting Notice

Lightstar Renewables, LLC ("Lightstar") respectfully submits these comments to the New Jersey Board of Public Utilities ("Board") in response to the Board's July 9, 2020, Public Notice requesting comments regarding Year 1 of the New Jersey Community Solar Energy Pilot Program Lessons Learned. Lightstar thanks the Board for the opportunity to submit these comments and looks forward to participating in the burgeoning New Jersey Community Solar Program.

While the Board in its Public Notice has identified several issues for which it is seeking comments from stakeholders, the comments submitted herewith by Lightstar are limited to *Topic 2, Questions 13(b) and (c), i.e.*, should the Board modify the evaluation criteria for Program Year 2.

TOPIC 2, Question 13: Please provide feedback on Appendix C: Evaluation Criteria from the PY1 Application Form. In particular, please discuss:

> b) Should the Board modify the evaluation criteria for PY2? For example, should the Board give more or less weight to certain evaluation criteria in PY2?
>
> c) Are there criteria that were not considered in PY1 that should be considered in PY2? If yes, how would the Board evaluate, score, and verify these criteria?

Lightstar Comments: Introduction

Lightstar is a solar developer that is interested in utilizing dual-use techniques to preserve New Jersey farmland while advancing the State's renewable energy goals.

We recommend that the BPU amend the evaluation criteria in the Community Solar (CS) program to award siting points to solar projects that are dual-use solar projects on marginalized farmland.

More specifically, we recommend that the Board's CS evaluation process award siting points to projects installed on non-preserved farmland property provided that portions of the property remain available for agricultural use and it can be demonstrated that the non-preserved

farmland property is marginal farmland that is likely to be subject to development if it is not used for solar/agricultural functions.

In recognition that the entirety of a non-preserved farmland property would be subject to development absent the property's participation in the CS program, the Board, in its CS project review process, should confer siting points for these properties comparable to the points conferred for Brownfields or rooftops, as a means to (1) protect open space and non-preserved farmland in New Jersey, and (2) preserve the existing use and economic viability of farm properties.

Non-Preserved Farmland Solar Under NJ Master Plan

The 2019 New Jersey Energy Master Plan ("EMP") specifically supports development of solar resources on marginalized farmland.

Specifically, Goal 2.1.8, *"Coordinate permitting and siting processes for renewable energy development"* encourages the siting of solar facilities on marginalized sites, defining 'marginalized' as areas of "constrained social and economic value," and further identifying marginalized farmland by "poor soil conditions" or underutilization. The goal goes on to state "**there are areas of non-preserved farmland that may have poor soil conditions, or non-pristine open spaces that are underutilized, both of which could potentially serve as host sites for solar projects while not compromising the state's commitment to preserve open space"**[1]

[1] Goal 2.1.8: Coordinate permitting and siting processes for renewable energy development:

> In order to enhance smart siting of solar, the state should better define areas that are considered marginalized, such that they have constrained economic or social value. **For example, there are areas of non-preserved farmland that may have poor soil conditions, or non-pristine open spaces that are underutilized, both of which could potentially serve as host sites for solar projects while not compromising the state's commitment to preserve open space**. Dual-use opportunities may exist for siting solar on areas of open space or non-preserved farmland, but they must be examined carefully for environmental impacts. NJDEP and NJBPU will coordinate landuse policy for solar siting with the New Jersey Department of Agriculture to identify sites that could be used to expand New Jersey's commitment to renewable energy while still protecting the state's farmland and open spaces.
>
> These policy initiatives, as well as other locational analysis, should be evaluated for potential inclusion as part of an upgraded transparent and predictable interconnection process. Proper incentives consistent with EMP goals will maximize ratepayer value and ensure appropriate compensation

2019 NEW JERSEY ENERGY MASTER PLAN, *Pathway to 2050*, pages 112-113 (emphasis supplied)

Thus, the EMP itself confronts the somewhat false dichotomy of the farm v. solar debate. While there are tradeoffs, and while solar sites should not displace prime farmland and pristine open space, solar can be developed on marginalized farmland while conforming to, and potentially supporting, New Jersey's long-term goal of open space preservation. A BPU decision supporting preferential siting of dual-use solar as part of the CS program supports the implementation of the goals of the EMP.

Permissible Solar Sites – Marginalized versus Prime Farmland

To begin, and in conformance to the policy laid out in the EMP, an ideal site for a dual-use solar project is a non-preserved farmland property that has been marginalized (due to property location, property characteristics, soil and moisture physical characteristics and quality, etc.) and is underperforming. Such non-preserved farmland properties are likely to be lost to commercial or residential development. In order to determine whether a non-preserved farmland property is "marginal" and thus, a well-suited dual-use candidate for participation in the CS pilot program, the following should be evaluated:

- the location of the property and the type of the properties in the area;
- the likelihood that the property is a target for development;
- the physical characteristics of the property and how they affect farming the property;
- the current agricultural use of the property;
- the soil conditions of the property

Importantly, marginalized farmland is defined in the negative, largely by what it is not: "Prime Farmland," "Unique Farmland," "Important Farmland," "Farmland of statewide importance," or a variety of other terms of art found in the Code of Federal Regulations, guidance from the US Department of Agriculture and the New Jersey Resource Conservation Service, and other state conservation and land use documents. These definitions, like the above list of criteria, focus on soil quality, growing season, moisture supply, slope, acidity, permeability, and climate, as well as use in the production of high-quality food, fiber and unique crops.

Appended is a list of publicly available resources that discuss some of the characteristics used in the determination of whether a property should be considered prime farmland, which should have heightened protections and emphasized for continued conservation, or marginal farmland, where dual-use solar should be permitted, if not encouraged, as discussed in the next section.

Dual-Use Solar

The core idea behind "dual use" solar is that agricultural and solar operations can be be actively and independently undertaken on the same property.

Dual-use solar covers a wide spectrum of solar installations. On one end of the spectrum a portion of the farm is dedicated to solar development, while the majority remains arable farmland. Examples include (1.) *Pollinator Habitat*: the development of a pollination habitat installed with the panels to support pollination in the geographic area where the project is located, or (2.) *Farmland Sharing*: developing solar projects that require use of the majority portion of the farmland to continue to be available for agricultural purposes while a part of the property is dedicated to ground-mount panels. Here, a portion of the farm property is put to generation use, to preserve the whole.

At the other end of the spectrum, "*Agrivoltaics*" involves the full and seamless integration of comprehensive agricultural functions and solar panel installation. An example would be the installation of elevated panels that permit farmers to plant and grow crops or animals to graze under the panels. Due to the increased expense of installation and ongoing operations and maintenance, Agrivoltaics are more commonly implemented on higher value (prime, non-marginal) agricultural land and where heavily subsidized.

Regardless of the level of solar/agricultural integration, the syllogism behind dual-use solar policy is simple: (1.) a landowner will switch from a dis-economic land use to an economic land use given the opportunity, (2.) over the next decade many marginal farmland owners in New Jersey will be approached to develop commercial/residential structures on their property, and (3.) these landowners wish to preserve their non-preserved farmland, but absent increased economics or additional revenue, they will be forced to sell or change properties to a higher economic value use. The economic benefit from the dual-use property (namely the rent paid to landowners) will act as an economic bulwark, and enable the preservation of non-preserved farmland that would otherwise be lost to development. The revenue that a property owner can derive from the generation of solar electricity can make the difference between needing to sell an underperforming non-preserved farmland property for development and maintaining a portion of the property for farming or as open space.

Additional Project Costs Due to Dual Use

Dual use solar projects are generally more costly to develop than single use facilities. The increased costs vary dependent upon the extent of the integration of the agricultural aspects of the project.

Farmland Sharing: For a project involving the simple cordoning off of part of a property, while leaving the majority untouched and usable as agricultural land, additional costs are somewhat minimal, and would largely be comprised of limited cost increases to engineering and design, and additional costs related to soil and other types of studies.

Pollinator Habitat: For a project involving the creation of a pollinator habitat, the increased costs are attributable to (i) developing a robust pollination habitat, (ii) maintaining the habitat, and (iii) ongoing performance monitoring. We estimate that these functions will increase a solar project's costs by about $0.01/W-dc to $0.03/W-dc (~$10,000 - $25,000 per MW-dc, depending on layout and site conditions). We estimate that the increase to ongoing operating expenses for a 3 MW project that includes the creation and monitoring of a pollination habitat would be low, an approximately 1-2% above normal O&M, or roughly $500 per MW-dc per annum.

Agrivoltaics: For a fully integrated project that involves crop growth or grazing under solar panels, it will generally be necessary for the panels to be elevated several feet above the ground. The increased costs associated with the purchase and installation of elevated structures is significant, as is the increased cost with operating and maintaining these structures. Further, the cost to obtain project funding (i.e. cost of capital) is likely to be higher for a dual-use project due to the limited experience that both debt and equity/tax-equity investors have with dual-use projects. Also, additional project costs are likely to include increased irrigation equipment costs, equipment needed to facilitate tilling and harvesting under the panels, and additional labor for crop maintenance and harvesting.

We estimate that the construction of a fully integrated dual use Agrivoltaics project can increase total project costs by up to 50%, sometimes more. The actual additional costs for any particular project will vary based upon the circumstances of the project, and there have been few such installations, making generalized capex and ongoing costs assumptions difficult to establish for this class of installation.

What is known is that costs of Agrivolatics are significant, requiring fulsome incentives to encourage their development. While there is limited experience in the US with Agrivoltaic projects, there are certain states that have addressed increased project costs. For example, the Massachusetts Department of Energy Resources SMART program confers an incentive "adder" for Agrivoltaic projects. The agricultural "adder" under the SMART program is $0.06 per kWh. This equates to almost $1.5mm of performance-based incentives per MW-dc or $700,000-$900,000 on a present value basis, or $0.70 - $0.90/W-dc,[2] versus an assumed EPC cost of $1.2-$1.4/W-dc in Massachusetts.

Distinction from the Massachusetts SMART Program

While various states are in the process of evaluating dual-use solar, the Massachusetts Department of Energy Resources (DOER) has established a solar incentive program that enables solar facilities to qualify as an "Agricultural Solar Tariff Generation Unit" ("ASTGU") under the Solar Massachusetts Renewable Target (SMART) Program.

[2] 1.00 MW-dc, 1300 kWH/kWP, 20-year SMART TARIFF, 0.5% Degradation, 6-9% discount rate.

Under the SMART program legislation, DOER was directed to "differentiate incentive levels to support diverse installation types and sizes that provide unique benefits." In developing the SMART Program, DOER established six types of location based "Compensation Rate Adders", one of which is provided for ASTGUs. Projects eligible for participation in the SMART Program receive a fixed "Base Compensation" amount per kWh subject to "rate adders" or "subtractors" based upon the characteristics of the project. The Base Compensation is set either based upon a competitive bidding process or by the SMART Program.

Solar projects are eligible to qualify as an ASTGU, which is defined under 225 CMR 20.02 as "a Solar Tariff Generation Unit located on Land in Agricultural Use or Prime Agricultural Farmland that allows the continued use of the land for agriculture."

In order to be an eligible ASTGU, the solar facility must, among other things:

- not interfere with the continued use of the land beneath the canopy for agricultural purposes;
- be designed to optimize a balance between the generation of electricity and the agricultural productive capacity of the soils beneath;
- be a raised structure with a minimum height of 8 feet above ground allowing for continuous growth of crops underneath the solar photovoltaic modules;
- demonstrate that the maximum sunlight reduction from the panel shading on land directly beneath, shall not be more than 50% of baseline field conditions, and
- AC rated capacity not greater than 2 MWs.

As mentioned above, projects qualifying as an ASTGU receive a compensation adder of $0.06 per kWh. Projects which are not ASTGU, but which act as pollinators, receive between $0.0025-$0.0015 per kWh

Massachusetts is instructive, and its lead should be followed in encouraging the responsible installation of solar projects on certain farm properties. However, Massachusetts can be distinguished from New Jersey in two (2) fundamental ways:

1. **Focus on Important / Prime Agricultural Land:** The SMART program focuses on the integration of solar onto prime agricultural land, hence the necessity to preserve the underlying property to the greatest degree possible, and the stringent in ASTGU canopy requirements. This stands in contrast to New Jersey policy which disallows solar on prime land, but which encourages the use of solar on desultory non-preserved farmland.

2. **Fulsome Incentives to Build ASTGUs on Prime Land**: Massachusetts, as discussed before, provides an extremely generous incentive to ASTGUs, necessitated by their increased costs. Such an incentive, and its effect on ratepayers, is far more tolerable from a societal cost-benefit perspective when preserving key agricultural locations, than when preserving marginalized farmland. The benefit tradeoff in New Jersey requiring

Agrivoltaics becomes far more uncertain than in Massachusetts, given the differing land qualities intended to be integrated with solar.

Community Solar Pilot Program

In view of the above, we recommend that the Board consider implementing and supporting moderate forms of dual-use solar (Farm Sharing, Pollinator Habitat) in connection with the use of non-preserved farmland property within the Community Solar (CS) program.

In summary we recommend that the Board's CS evaluation process award siting points to projects installed on farmland property provided that portions of the property remain available to an agricultural use and it can be demonstrated that the non-preserved farmland property is marginal farmland that is likely to be subject to development if it is not used for solar/agricultural functions. In recognition that the entirety of a non-preserved farmland property would be subject to development absent the property's participation in the CS program, the Board, in its CS project review process, should confer siting points for these properties comparable to the points conferred for Brownfields or rooftops, other uses which only indirectly support the preservation of open space.

We hope that as the Board continues to improve the CS Pilot Program, that the Board will consider revising its CS application review process to award high preference siting points to award CS projects that involve dual-use. We appreciate you and the Board Staff's consideration of this recommendation.

Sources related to the categorization of farmland quality:

7 CFR § 657.5 - Identification of Important Farmlands. *Legal Information Institute*, Legal Information Institute, www.law.cornell.edu/cfr/text/7/657.5.

NRCS Prime and Other Important Farmlands, www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcseprd1338623.html.

Identification of Important Farmland. August 4, 2020. https://prod.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_010970.pdf

Natural Resources Conservation Service. *New Jersey Important Farmlands Inventory | NRCS New Jersey*, www.nrcs.usda.gov/wps/portal/nrcs/detail/nj/soils/?cid=nrcs141p2_018875.

Natural Resources Conservation Service. *Prime Farmland*, www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_014052.

Guideline Regarding the Definition of Agricultural Solar Tariff Generation Units. April 26, 2018. https://www.mass.gov/doc/agricultural-solar-tariff-generation-units-guideline-final/download

Land Types for Solar Development. August 4, 2020. https://www.mass.gov/files/documents/2016/10/sm/solar-land-use-guidance-and-information.pdf