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November 6, 2019

Comments on the Guideline Regarding the Definition of Agricultural Solar Tariff Generation Units (SMART Program Proposal)

Please accept the following comments to DOER from No Fracked Gas in Mass & the Berkshire Environmental Action Team (BEAT). BEAT works to protect the environment for wildlife in support of the natural world that sustains us all. No Fracked Gas in Mass works to stop the expansion of fossil fuel infrastructure in the Northeast states and to promote energy efficiency and sustainable, renewable sources of energy and local, permanent jobs in a clean energy economy.

There are many beneficial aspects to the proposed Guidelines. Consultation with UMass Agricultural Extension Service on crop selection, shading effects, site feasibility, analysis of micro-climate effects, etc.; system allowances for crop heights and farm equipment; flexibility for farmers to change crops and land use during the life of the solar array; and the Department's tracking of system and crop performance data are all positive steps that will help assure that farmland and photovoltaic installations can co-exist and are mutually beneficial.

There are some interesting studies showing that, if employed correctly, photovoltaics can have beneficial effects on agricultural lands by providing intermittent shade or filtered sunlight, aiding yields in some shade-tolerant crops.

"Agrivoltaic systems leverage the superposition of energy and food production for mutual benefit. Crops are grown in the intermittent shade cast by the PV panels in agrivoltaic systems. The shade does not necessarily diminish agricultural yield. Researchers have successfully grown aloe vera, tomatoes, biogas maize, pasture grass, and lettuce in agrivoltaic experiments. Some varieties of lettuce produce greater yields in shade than under full sunlight; other varieties produce essentially the same yield under an open sky and under PV panels. Semi-transparent PV panels open additional opportunities for colocation and greenhouse production.¹"

¹ Adeh, E.H., Good, S.P., Calaf, M. *et al.* Solar PV Power Potential is Greatest Over Croplands. Sci Rep **9**, 11442 (2019) doi:10.1038/s41598-019-47803-3, <https://rdcu.be/bVQqt>

They are also proving to help moderate soil temperature swings by lowering daytime temperatures and helping retain some soil heat at night.²

MAXIMUM ASTGU RATED CAPACITY

At a time when the state is struggling to meet its own mandated Global Warming Solutions Act goals, it's difficult to understand the need to cap the size of any ASTGU to only 2.5 MW³. The Department should raise this cap significantly or remove it altogether.

MINIMUM AGRICULTURAL YIELDS

While it's understandable that the Department is interested in making sure that the ASTGU be applied to actual, functioning agricultural operations, demanding a minimum yield⁴ seems problematic in cases of unforeseeable catastrophic crop failure, catastrophic crop damage from extreme weather events, or the intermittent need for letting fields go fallow. If these cases are allowed within the Waivers covered in Section B.⁵, then it may be an acceptable guideline. If not, cases of unforeseeable crop failure or need for fallow field cycles need to be taken into consideration.

COMMENT PERIOD FOR FURTHER GUIDELINE CHANGES

The department should also extend any future Guideline modification comment periods beyond the currently stated goal of two weeks⁶. These guidelines affect farmers, who have many other professional obligations, and whose schedules are sometimes inflexible during certain times of years. Two weeks is not a very long time for someone

² Office of Energy Efficiency and Renewable Energy, USDOE, *Farmers' Guide to Going Solar*, <https://www.energy.gov/eere/solar/farmers-guide-going-solar>

³ "The maximum AC rated capacity of an ASTGU shall be two MW with a corresponding maximum DC rated capacity of 2.5 MW.", Section A, part 5, ASTGU Guideline Draft, <https://www.mass.gov/files/documents/2019/10/15/ASTGU%20Guideline%20DRAFT%20101519.pdf>

⁴ "Base System Design Requirements shall be 1.40 using the land equivalent ratio (LER) method which is equivalent to a minimum 70% projected crop yield/acre with an ASTGU compared to the base agricultural yield without an ASTGU.", Section A, part 6, ASTGU Guideline Draft, <https://www.mass.gov/files/documents/2019/10/15/ASTGU%20Guideline%20DRAFT%20101519.pdf>

⁵ "DOER recognizes the variety and, in some cases, the uniqueness of farming operations where some of the A. Base System Design Requirements for an ASTGU may not be required to achieve the objectives of the ASTGU. To address this issue, an applicant may request that DOER, in consultation with MDAR, issue a waiver from certain requirements under A. Base System Design Parameters above..." Section B, ASTGU Guideline Draft, <https://www.mass.gov/files/documents/2019/10/15/ASTGU%20Guideline%20DRAFT%20101519.pdf>

⁶ "Any modifications to this Guideline will only be made following an opportunity for public comment that shall remain open for at least two weeks." ASTGU Guideline Draft, <https://www.mass.gov/files/documents/2019/10/15/ASTGU%20Guideline%20DRAFT%20101519.pdf>

not in the photovoltaics industry or a regulatory body to review and determine the impacts of changed to the Guidelines.

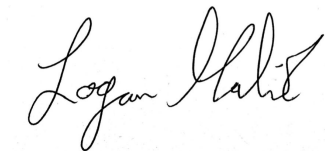
While the proposed changes in these guidelines have some elements that seem beneficial to the integration of photovoltaics with agricultural operations, we still emphasize that the primary focus of the SMART program, and any other clean energy buildout guidelines and incentives. should be solar installation on already developed spaces like rooftops, parking lots and brownfield properties first. Additionally, the proximity of energy generation to energy demand must be taken into consideration. It is far more economical to generate energy close to the location of highest demand as it reduces loss from transmission and eliminates the need to develop High-Voltage Direct Current (HVDC) infrastructure⁷. Consideration of proximity to energy demand would further justify the prioritization of solar installation on previously developed infrastructure.

Thank you for considering our comments.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Rosemary Wessel".

Rosemary Wessel, *Program Director*
No Fracked Gas in Mass

A handwritten signature in black ink, appearing to read "Logan Malik".

Logan Malik, *Advocacy Coordinator*
Berkshire Environmental Action Team

⁷ Cara Marcy, primary author, US Energy Information Administration, *EIA study examines the role of high-voltage power lines in integrating renewables*, June 28, 2018.
<https://www.eia.gov/todayinenergy/detail.php?id=36393>