

Kaitlyn Kelly
Renewable Energy Program Coordinator
Department of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114

RE: Sun₂O Partners and Ciel et Terre USA comments to DOER Next Generation Solar Incentive Straw Proposal

Dear Ms. Kelly,

Sun₂O Partners (“Sun₂O”) and Ciel et Terre USA, Inc (“Ciel et Terre”) would like to thank the Department of Energy Resources (“DOER”) for the opportunity to provide comments on the Next Generation Solar Incentive Straw Proposal. Sun₂O is a solar development company focused on unconventional commercial, municipal and industrial projects in the northeastern United States. Ciel et Terre is the floating solar technology pioneer and has developed the Hydrelia© system which has been used for floating solar installations around the world.

With regards to the Next Generation Solar Incentive Program, Sun₂O and Ciel et Terre would like to comment on how floating solar installations should be included under the definition of a Solar Canopy and, when applicable, qualify for all other incentive adders. Including floating solar in these categories would allow for the growth of an installation type which directly furthers the DOER objectives of addressing land use concerns, expanding access to incentives and maintaining robust growth of installations across all sectors.

Floating Solar Should be Included Under the Definition of Solar Canopy

The floating solar installation type provides the unique ability to deploy solar while completely maintaining the function of the area beneath the canopy. This is especially true since floating solar installations make use of an otherwise vacant space, while leaving the water body ecosystem and function unaffected. In addition to this, floating solar provides opportunities to deploy various sized arrays in a diverse range of locations across the state to otherwise unserved clients. These projects would directly benefit the energy offtakers, water body owners and municipalities who wish to increase their solar presence yet lack the available space to do so with traditional roof or ground installations.

Sun₂O believes that, as written, floating solar installations fall under the existing definition of Solar Canopy, because floating solar leaves the area beneath undisturbed.

Thus, Sun₂O would suggest that the “Solar Canopy” definition makes the following inclusion: “...on top of a parking surface, pedestrian walkway, agricultural land, canal **or water body** in a manner that maintains the function of the area beneath the canopy”. It should be included on the basis that a floating PV system does not alter the primary function of the water body (water storage for irrigation or treatment, cooling processes, rain water control reservoir, etc.) and can even improve this primary function by reducing evaporation due to the shading effect on the water and limiting algal blooms that can lead to water quality degradation. It is also compatible with aquaculture activities.

Sun₂O believes it is crucial that manmade, non-recreational water bodies should be formally included as eligible sites for floating solar and not assimilated to “MassDEP Wetlands” that will be prohibited for traditional ground mounted systems.

Sun₂O would like to note that without the ‘Canopy’ designation many of the potential installations would not be possible, thus limiting the potential for many previously unserved clients to access solar.

Floating Solar Overview

The floating PV market is emerging within the solar energy market as an alternative to traditional PV systems.

Floating solar refers to solutions installed on water that produce solar energy in the same manner as ground mounted or rooftop systems. Nevertheless, it is important to differentiate between *floating PV* and *floating PV offshore*.

The former concerns installations on inland compounded and unused bodies of water, e.g. ponds, lakes, reservoirs owned by industries, water utility companies or agricultural companies. While the latter indicates installations on seas and oceans that vary enormously in characteristics, e.g. salt water, strong currents, complicated anchoring system, etc. Our focus here is only on floating PV solutions.

A floating PV installation is a standard PV array with a unique mounting system. Typically, installations are made up of three main components; the array, the transmission system and the anchoring system. The array includes the Hydrelío technology which is what enables the installation to float and then industry standard PV panels and electrical collection equipment. The Hydrelío is a well-established technology with over 40 MW of operational projects in countries including the United States, the U.K. and Japan with another 100 MW in development. The transmission system is made up of a small Hydrelío bridge carrying DC cables to shore, and then to an on-shore centralized inverter. The system is anchored using either plates or helix

screws along the embankment or bed of the water body, both of which have very minimal impact. All major PV components are IEEE and UL Standard compliant and the installation of the system leaves no permanent impact to the project site.

Floating solar has several additional benefits in comparison to ground or roof mounted systems including:

- Preservation of valuable lands for other uses such as agriculture
- Ability to convert otherwise unused space into a renewable energy generation space
- Reduce water evaporation by covering a portion of the surface area of the water body, which can also limit algae growth and risk of eutrophication
- Increased system efficiency due to the natural cooling effect of the water on the PV panels
- Environmentally friendly - recyclable drinking water compliant materials with no harm to local ecosystem

Solar Achieved with Minimal Environmental Impact

The environmental impact caused by a floating solar installation is limited, and can largely be addressed in the design and site selection phase. A recent broad study titled “Statewide Ecological Report for the Implementation of Hydrelia Floating Photovoltaic Arrays” conducted by WRA Environmental Consultants, found that:

“Potential adverse effects associated with the installation, maintenance and eventual removal of a Hydrelia PV Solar Array to wildlife species at manmade operational waterbodies within California are limited. Assembly and deployment of each array is very fast and is generally completed by hand in previously disturbed areas. Ground disturbance, use of heavy equipment and vegetation removal are typically not required in order to install or service an array. The material that the array is constructed from is considered inert and does not leak any chemicals into the environment. Furthermore, maintenance is straight-forward, infrequent, and requires no detergents or chemicals. The Hydrelia arrays therefore poses very little risk to wildlife.”

The two principle factors in assessing any potential impact of a floating system on a given water body are the size of the array and the type of water body. To the former, Sun₂O targets installations with a total water area coverage ratio of less than 50%, significantly reducing any risk to the ecology of the water body. To the latter, as explained previously, ideal installation areas are manmade water bodies with limited to no present biota. The combination of an under 50% coverage ratio and manmade water

bodies results in little to no impact on the surrounding environment. Site-specific environmental impact analysis will also be completed as necessary.

Prior Regulatory Recognitions of Floating Solar

In the United Kingdom, there are different subsidies for PV installations: a Feed in Tariff and Renewable Obligation Certificate (ROC). The ROC is a subsidy based on the value of a tradable certificate created for each MWh generated by the renewable energy generator. Each technology generates a different number of ROCs per MWh for 20-years – the government uses this rate to control its capital spend.

OFGEM, the government regulator for gas and electricity markets in Great Britain, formally accredited floating PV projects for the higher "Building Mounted" ROC band (e.g. 1.6) rather than the lower "Ground Mounted" (e.g. 1.4) ROC band as they recognize the non-conflict use of land for floating PV projects.

In France, the last national public tender for solar PV installations, "CRE 4," included specifically the eligibility of "tous plans d'eau" which translate as all water bodies.

Value of Floating Solar

Sun₂O believes that it is important for the DOER to incentivize solar development that does not jeopardize the Greenfields or the pristine farmland of Massachusetts. Solar development is currently viewed by many within the land conservation and agricultural community as a threat and Sun₂O supports the DOER decision to add siting criteria for ground mounted systems that address these concerns. Floating solar advances the DOER's objective by deploying solar arrays on otherwise vacant space, leaving the surrounding land and the function of the water body unaffected. Floating solar is also able to reach clients with insufficient roof or ground space to pursue solar development in the past, thus advancing the DOER's objective of ensuring widespread and equitable access to solar.

Unlike a traditional ground mounted solar array, a floating solar array maintains the function of the area beneath the system. When a floating solar array is installed on an irrigation pond, for example, the water body's function is not altered or diminished. The pond can still be used for crop irrigation and the floating solar array provides the extra benefit of reducing water evaporation. The land owner can reap the benefits solar provides without sacrificing valuable farmland. Whether installed on stormwater drainage basins, reservoirs or irrigations ponds, the function of the area beneath the system is maintained, if not augmented. Accordingly, floating solar should be included in the DOER's definition of Solar Canopy.

Incentive Design for Floating Solar

Sun₂O would like to suggest that as floating solar should be under the definition of a Solar Canopy, it should thus be fully qualified for the Solar Canopy incentive adder. Additionally, when applicable, floating solar should qualify for all other incentive adders. Qualifying floating solar arrays as eligible for these incentives would make such developments bankable with local financing institutions, and thus greatly expand the equitable access for solar across the state. Without the inclusion of these adders, many floating solar developments would not be possible.

Thank you for your interest and consideration of these comments. Sun₂O and Ciel et Terre are available to help in any way we can to develop the incentive program in a way that best furthers Massachusetts renewable energy goals.

Sincerely,

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