



# STATE OF CONNECTICUT

## CONNECTICUT SITING COUNCIL

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VIA ELECTRONIC MAIL

August 2, 2016

Brad N. Mondschein, Esq.  
Pullman & Comley LLC  
90 State House Square  
Hartford, CT 06103-3702

RE: **PETITION NO. 1247** – C-TEC Solar, LLC petition for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for the proposed construction, maintenance, and operation of a 3.75 MW solar photovoltaic electric generating facility located at 1 Ballard Road, Thompson, Connecticut.

Dear Attorney Mondschein:

The Connecticut Siting Council (Council) requests your responses to the enclosed questions no later than August 16, 2016. To help expedite the Council's review, please file individual responses as soon as they are available.

Please forward an original and 15 copies to this office, as well as a copy via electronic mail. In accordance with the State Solid Waste Management Plan, the Council is requesting that all filings be submitted on recyclable paper, primarily regular weight white office paper. Please avoid using heavy stock paper, colored paper, and metal or plastic binders and separators. Fewer copies of bulk material may be provided as appropriate.

Any request for an extension of time to submit responses to interrogatories shall be submitted to the Council in writing pursuant to §16-50j-22a of the Regulations of Connecticut State Agencies.

Yours very truly,

Melanie A. Bachman  
Acting Executive Director

MB/MP/lm

c: Council Members

**Petition No. 1247**  
**Interrogatories**  
**Set One**  
**August 2, 2016**

**Solar Equipment and Energy Production Questions**

1. C-TEC Solar LLC's (C-TEC or Petitioner) proposed photovoltaic facility would have a power output of up to 3.75 megawatts (MW). Is this output based on direct current (DC) or alternating current (AC)? If this is based on DC MW, provide the number of MW based on AC.
2. Page 3 of the Petition notes that, "The storage shed will consume a portion of the Project's electrical output while the remaining electrical output will be delivered to the electrical grid and produce virtual net metering credits which will be sold to other municipalities in the state." Roughly what portion of the output would the storage shed consume in kilowatts?
3. Page 28 of the Petition states that, "The solar panels and appurtenances will not exceed a height of six (6) feet above ground." Page 31 of the Environmental Assessment dated July 2016 states that, "The solar panels and appurtenances will not exceed a height of approximately eight (+/-8) feet above ground." Provide the correct maximum height to the top of the solar panels. Would the bottom of the solar panels be approximately two feet above grade per Sheet DN-1?
4. Provide the specifications sheets for a) proposed inverters and b) solar photovoltaic panels.
5. In general, in the case of fixed solar panels, does orienting your solar panels to the south provide a sort of balance (in terms of sun exposure) between the sun rising in the east and setting in the west and ultimately result in optimizing (or attempting to maximize) your total annual energy production (in kilowatt-hours) and your capacity factor? Is it correct to say that the objective of the project, as proposed, is to maximize annual energy production in kilowatt-hours for economic and environmental benefits (e.g. reducing carbon emissions by causing traditional generation including fossil-fueled plants to "ramp down" as renewable power is added to the grid) as opposed to a solar plant designed for peak load shaving?
6. The solar panels are proposed to be facing the south and at a 25 degree angle from the horizontal. Did the Petitioner choose this orientation and angle to maximize its capacity factor and total annual electrical energy production?
7. Is a System Impact Study required by the electrical distribution company for the interconnection process? Does the Petitioner have an Interconnection Agreement with Eversource?
8. What is the efficiency of the photovoltaic module technology of the proposed project?
9. Would the solar plant have a protection system to shut the plant down in the event of a fault in the feeder(s) that connect the solar plant to the local electrical distribution system?
10. Provide a decommissioning plan to summarize the plans to remove equipment and restore the site after the operational life has been reached and/or the project is removed from service.

11. Is a battery or other type of energy storage system proposed? If so, describe the function of lithium-ion battery or other type of storage system. What prediction methods and reports has the Petitioner used to assess total capacity and annual energy production in kilowatt-hours for this project, and how are the proposed batteries or other type of energy storage incorporated into those predictions? Are the batteries or other type of energy storage used to "even out" the energy production, charging during the day and discharging at night, or are they charged during off-peak hours to grant more output during peak hours? Are they simply used to function as a power supply backup?

#### Carbon Debt Analysis Question

12. Provide the carbon debt payback period. Specifically, as an estimate, you may utilize the U.S. Environmental Protection Agency (EPA) number of 1.06 metric tons of carbon dioxide sequestered by one acre of average U.S. forest in one year. That number can be multiplied by the number of acres of trees to be cleared to estimate the annual loss of carbon dioxide sequestration in metric tons per year for the project. Then the total projected annual electrical production in kilowatt-hours for the solar facility can be multiplied by the EPA estimate of  $7.03 \times 10^{-4}$  metric tons of carbon dioxide displaced per kilowatt-hour in order to provide the annual carbon dioxide emissions avoided by the operation of solar plant. Based on this or a different analysis, compute the number of months or years it would take to "break even" with carbon dioxide or when the carbon dioxide emissions reductions would equal the sequestration loss. The carbon emissions associated with manufacturing the solar panels and equipment could be included in the analysis if desired, or it may be neglected/omitted as a "sunk cost" for simplicity. (Data source: <http://www.epa.gov/energy/ghg-equivalencies-calculator-calculations-and-references>)

#### Environmental Questions

13. Would the proposed project adversely impact groundwater presumed suitable for human consumption as identified by the Department of Energy and Environmental Protection (DEEP) as "GA"? Would the proposed project adversely impact any nearby DEEP Class A surface water bodies?
14. Does the proposed host property contain any Connecticut Prime and Important Farmland Soils? If so, what acreage of Prime and Important Farmland Soils would the solar panels and associated equipment be located on? You may review the response to interrogatory 56 (Set 3) in (approved) Petition No. 1222 as a sample.
15. Has the State of Connecticut Department of Agriculture purchased any development rights for the proposed site as part of the State Program for the Preservation of Agricultural Land?
16. Would any glare from the panels be expected to adversely impact aviation and/or nearby properties?
17. Is the total tree clearing area for the proposed project about 0.84 acres? Would all tree clearing occur within upland areas? Is the proposed tree clearing to accommodate the footprint of the project or because of shading issues or a combination of both?
18. Describe the visibility of the proposed solar facility from the Airline Trail to the west. Are there any other hiking trails in the vicinity of the project? Would the proposed solar facility be visible from such trails?
19. Where is the nearest residence from the proposed solar facility located? Provide the distance and direction. Would the proposed solar facility be visible from such location?

20. Is the proposed project located near any Important Bird Areas designated by the Connecticut Audubon Society?
21. Would the solar panels "heat" rainwater and potentially thermally pollute wetlands?

#### **Construction Questions**

22. A fence is not proposed around the solar facility itself. Is the Petitioner aware of any code requirements that require fences around solar facilities? Or are there code requirements or recommendations for fencing around the high voltage electrical equipment (e.g. solar facility's equipment pad)? If yes, please cite the applicable code(s) that require or recommend fences. Notwithstanding, has the Petitioner considered installing a fence around the electrical equipment pad as a safety measure? If yes, would the Petitioner utilize an anti-climb mesh of less than two inches to prevent unauthorized entry by personnel and a height of at least eight feet to prevent entry by deer?
23. Estimate the amounts of cut and fill in cubic yards for the proposed project.
24. How would the piles (that support the racking system) be driven into the ground? In the event that ledge is encountered, would mechanical chipping or re-location of the piles be utilized in lieu of blasting?

#### **Maintenance Questions**

25. How would the Petitioner handle potential snow accumulation on the panels and its effects of blocking the sunlight?
26. Has any analysis been conducted to determine structural limits of snow accumulation on the solar panels and steel support structures, assuming heavy, wet snow and or ice? What accumulation of snow could the structures handle? Would the Petitioner clear snow from the panels when it approached the limit?
27. Would the installed solar panels require regular cleaning or other, similar, maintenance? How would this be accomplished?