

January 7, 2022

Mr. Charlie Roberts  
 Operations Project Manager  
 Islander Solar, LLC  
 396 Springfield Avenue, 2nd Floor  
 Summit, NJ 07901

**Re: Carbon Sequestration Evaluation - Pomham Solar**  
**Off Iron Mine Hill Road**  
**AP 16 Lot 19**  
**North Smithfield, RI**  
**ESS Project No. P322-001**

Dear Mr. Charlie Roberts,

ESS Group, Inc. (ESS) has completed a Carbon Sequestration Evaluation of the proposed Pomham Solar project. The proposed project involves clearing an estimated 12.3 acres of trees for the installation of a ground mounted solar array and access road. The solar arrays are anticipated to operate for a minimum of twenty years. This Carbon Sequestration Evaluation assesses the quantity of carbon dioxide equivalent (CO<sub>2</sub>e) sequestered by the existing forested land as compared to CO<sub>2</sub>e offset by the proposed solar power generation. The evaluation provides an estimate for net gain or loss of atmospheric carbon dioxide to be achieved by the project compared to pre-existing conditions.

#### CO<sub>2</sub> Emissions Avoided by Proposed Solar Array

The United States Environmental Protection Agency (EPA) provides electricity generation emissions data via the Emissions & Generation Resource Integrated Database (eGRID). The eGRID provides emission estimates by state and subregion. This project is sited within the Northeast Power Coordinating Council New England (NEWE) subregion and, per the most recent data available (2019), the NEWE total output emission rate for CO<sub>2</sub> is 488.9 lbs/MWh.<sup>1</sup> Based on the size of the solar array, anticipated output, and operational lifetime, it is estimated that 18,632 tons of CO<sub>2</sub> emissions will be avoided through solar generation of electricity at this site, see Table 1 below.

**Table 1 - CO<sub>2</sub> Avoidance**

Rated Power (MW)	Annual Output (MWh)	Years of Operation	NEWE CO <sub>2</sub> emissions (lbs/MWh)	Avoided CO <sub>2</sub> Emissions (tons/year)	Total Avoided CO <sub>2</sub> Emissions (tons)
2.8	3,811	20	488.9	931.6	18,632

#### CO<sub>2</sub> Sequestered by Existing Trees

Table 2 provides a summary of the current status of the forested upland stand that will be subject to the solar arrays. The wooded area of the site that will need to be cut consists of approximately 12.3 acres. A

<sup>1</sup> <https://www.epa.gov/egrid/data-explorer>



tree survey was conducted in August 2020, which identified oak as the dominant tree type. As all trees within the proposed limits of disturbance are smaller than 20 inches Diameter at Breast Height (dbh), the average age of the trees was conservatively estimated utilizing an assumed dbh of 19 inches and a typical growth rate of 4 inches/year.

**Table 2 - Forest Data**

Acres	Type	Approx. Age
12.3	Primarily oak	75 years

The amount of CO<sub>2</sub> that could potentially be sequestered by the existing trees was estimated using the United States Department of Agriculture (USDA) General Technical Report (GTR) NE-343 "Methods for Calculating Forest Ecosystem and Harvested Carbon with Standard Estimates for Forest Types of the United States".<sup>2</sup> Table A3, "Regional estimates of timber volume and carbon stocks for oak-hickory stands on forest land after clearcut harvest in the Northeast," was used to estimate the tons of CO<sub>2</sub> per acre that would be sequestered over the next twenty years. The predicted carbon sequestration over the twenty-year project life was calculated by subtracting the tons sequestered based on the current average age of the trees from that sequestered by trees twenty years older. The total estimated tons of carbon sequestered was converted to equivalent tons of CO<sub>2</sub>. The results of the analysis are summarized in Table 3 below. Refer to Attachment A for detailed calculations.

**Table 3 - Carbon Sequestration (USDA GTR NE-343)**

Stand	Total Carbon Sequestered (tons/acre)	Total CO <sub>2</sub> Sequestered (tons)
Stand 1	13.2	597

### Conclusions

The results of this evaluation indicate that the 18,632± tons of CO<sub>2</sub> emissions avoided by the proposed solar array far exceeds the 597± tons that would be sequestered by the existing trees over the same twenty-year period. The estimated amount of CO<sub>2</sub> emissions that would be sequestered by the existing trees is 3% of the estimated CO<sub>2</sub> emissions that would be avoided throughout the lifetime of the solar array project. See Table 4 below.

**Table 4 - Summary**

Total Avoided CO <sub>2</sub> Emissions (tons)	Total Sequestered CO <sub>2</sub> (tons)	Average Sequestered as Percentage of Avoided Emissions
18,632	597	3%

<sup>2</sup> [https://www.nrs.fs.fed.us/pubs/gtr/ne\\_gtr343.pdf](https://www.nrs.fs.fed.us/pubs/gtr/ne_gtr343.pdf)



Mr. Charlie Roberts  
January 7, 2022

Sincerely,  
**ESS GROUP, INC.**

A handwritten signature in black ink that reads "Jason Gold".

Jason M. Gold, P.E.  
Manager, Civil/Site Engineering Services

Attachments: Attachment A - Carbon Sequestration Calculations

## Attachment A - Carbon Sequestration Calculations

### Solar Array

Table - 1 CO<sub>2</sub> Avoidance

Rated Power (MW)	Annual Output (MWh)	Years of Operation	NEWE CO <sub>2</sub> emissions (lbs/MWh)	Avoided CO <sub>2</sub> Emissions (tons/year)	Total Avoided CO <sub>2</sub> Emissions (tons)
2.8	3,811	20	488.9	931.6	18,632

### Forest

Table - 2 Forest Data

Acres	Type	Assumed Age
12.3	Primarily Oak	75 years

Table - 3 Carbon Sequestration (USDA GTR NE-343)

Stand	Acres	Type	Average Age	Mean Carbon Density at 75 Years (tonnes carbon/acre)	Average Age at End of Project	Mean Carbon Density at 95 Years (tonnes carbon/acre)	Total Carbon Sequestered (tonnes/acre)	Total Carbon Sequestered (tons)	Total CO <sub>2</sub> Sequestered (tons)	Comments
Stand 1	12.3	Oak-Hickory	75	69.1	95	81.1	12.0	13.2	163	597

### Summary

Table - 4 Summary

Total Avoided CO <sub>2</sub> Emissions (tons)	Total Sequestered CO <sub>2</sub> - USDA (tons)	Average Percentage of Avoided Emissions
18,632	597	3%