

**STATE OF VERMONT
PUBLIC UTILITY COMMISSION**

Petition of Chelsea Solar LLC, pursuant to)
30 V.S.A. § 248, for a certificate of public)
good authorizing the installation and)
operation of the “Chelsea Solar Project,” a)
2.0 MW solar electric generation facility)
located off Willow Road in Bennington,)
Vermont)

Docket No. 17-5024-PET

**PREFILED DIRECT TESTIMONY
OF HARNOOR DHALIWAL
ON BEHALF OF PETITIONER**

November 27, 2017

EXHIBITS

Exhibit CS-HD-1

Resume of Harnoor Dhaliwal

Exhibit CS-HD-2

Life Cycle Greenhouse Gas Assessment

Q1. Please state your name, occupation, and business address.

A1. My name is Harnoor Dhaliwal. I am a Senior Sustainability Analyst at EarthShift Global LLC (“EarthShift”). My business address is 37 Route 236, Suite 112, Kittery, Maine, 03904.

Q2. Please describe your educational background and work experience.

A2. A copy of my resume and an EarthShift Global company description are included as *Exhibit CS-HD-1*.

Q3. Have you previously testified before the Public Utility Commission or in other judicial or administrative proceedings?

A3. Yes. I have submitted testimony in the Public Utility Commission (“PUC”) docket for the Battle Creek 1 Solar Project (PUC Docket # 17-3727-PET). In 2016 and 2017, EarthShift supplied responses to questions raised by the testimony of Brian Woods and Sandy Wilmot (of the Vermont Agency of Natural Resources), under PUC dockets numbered 8586, 8685, 8797, and 8798.

Q4. What is the purpose of your testimony?

A4. My testimony introduces a life cycle greenhouse gas (“GHG”) assessment prepared by EarthShift under my direction for the Chelsea Solar Project (the “Project”), and it summarizes the conclusions of that assessment. My testimony also applies the conclusions of the assessment to the GHG component of 30 V.S.A. § 248(b)(5).

Q5. What work have you performed with respect to the Project?

A5. EarthShift reviewed the site plans and design details for the Project and also researched life cycle greenhouse gas values for the manufacturing, installation, maintenance, and disposal of a similar solar facility type. EarthShift researched GHG sequestration rates and stock values associated with forested lands in Vermont as well as GHG emissions associated with various types of electricity generation in the region. EarthShift worked directly with a representative from the Vermont Agency of Natural Resources (“ANR”) to confirm that the methodology used for the analysis would be acceptable to ANR. EarthShift prepared a report that details the results of the life cycle GHG assessment; that report is included as *Exhibit CS-HD-2*.

Q6. Please summarize the results of the life cycle greenhouse gas analysis.

A6. The primary objective of this analysis was to determine the potential change in GHG emissions to the atmosphere (in metric tons of carbon dioxide equivalent) that could result from the proposed Chelsea Solar Project in Bennington, Vermont. The proposed site for the Project is a partially forested area that has not historically been managed for forest products (e.g. firewood) and is not projected to be a managed, working forest at the time of Project construction. The Project is being proposed as a means to add electricity generation capacity to the local grid from a renewable source, rather than adding generation capacity via conventional feedstocks such as natural gas. As such, the primary focus of this assessment was to model these two alternative means of adding capacity to the grid to determine the relative life cycle GHG emissions of each option and to quantify the potential GHG emission benefits and impacts of the Project. In addition, we have compared the relative GHG emissions of generating electricity from the Project to the

1 2015 ISO-NE, which could be another source of electricity for the grid; 2015 Vermont Ownload,
2 and 2016 Green Mountain Power (“GMP”) grid mixes. To calculate the potential GHG benefits
3 or impacts of the Project, we quantified the change in GHG emissions to the atmosphere over the
4 study period associated with: 1) leaving the existing vegetation and wetlands at the site and adding
5 conventional electricity generation capacity equivalent to the Project to the grid (baseline
6 scenario); and 2) converting the site to the Project to supply additional generation capacity to the
7 grid (Project scenario). The difference between these two values is an estimate of the life cycle
8 GHG benefits that the Project can be expected to achieve, and the benefits are substantial. The
9 study period for this assessment was 25 years, which is the expected minimum service life of the
10 Project. This facility lifetime was extended to 40 years for a sensitivity analysis. The results of
11 the assessment showed that significant reductions in GHG emissions can be achieved with the
12 Project despite the proposed land use change for the 9.64 acres of land. Results show that the
13 potential GHG emissions associated with converting this land to solar electricity production are
14 orders of magnitude smaller than the life cycle GHG emissions associated with electricity from
15 average U.S. natural gas generation or from current ISO-NE, Vermont Ownload, and Vermont
16 GMP grids.

17
18 **Q7. Will the Project result in an undue adverse effect on greenhouse gas impacts? (30**
19 **V.S.A. § 248(b)(5))**

20 A7. No. As stated in the results of the lifecycle greenhouse gas analysis, the Project will result
21 in a net benefit regarding greenhouse gases when compared to the current baseload scenario.

1 **Q8. Does this conclude your testimony?**

2 A8. Yes.