



CARBON DEBT ANALYSIS

June 15, 2016

SolarCity Corporation
c/o Brightfields Development, LLC
40 Walnut Street, Suite 301
Wellesley, MA 02481

APT Project No.: CT478120

Re: Proposed 2.78 Megawatt Solar Facility
7 Grace Way
North Canaan, Connecticut

On behalf of SolarCity, All-Points Technology Corporation, P.C. ("APT") assisted in the analysis to determine whether the proposed solar array installation ("Project") at the referenced site ("Subject Property") has the ability to produce a net improvement in carbon reduction compared to the loss of approximately nine (9) acres of forests/woodland. This analysis accounts for the loss of the trees and the carbon associated with both the manufacture of the solar panels and the installation activities.

The Project requires the removal of $\pm 1,818$ trees primarily consisting of a mix of oak and hemlock. The results of this analysis demonstrate that the Project would begin to have a measurable net improvement in carbon reduction in less than three years. Consider the accounting of "carbon debt" in the following table - which includes the energy used and CO₂ released during the manufacturing and installation of the solar arrays, as well as the existing and future carbon reduction derived from the trees to be displaced by the solar array¹ - and the subsequent payback analysis².

¹ The calculations used in determining amount of energy used and CO₂e created in manufacture and installation of solar array uses industry standard data sourced from: The Environmental Protection Agency (EPA) CO₂ emissions calculator; Franklin Life Cycle Analysis Database; NREL US Life Cycle Inventory; Aluminum Association Life Cycle Inventory; Ecoinvent Life Cycle Inventory; Annual Energy Review, EIA; DOE Life Cycle Inventory.

² Tree CO₂E calcs are based off volumetric equations by McClure, J. and Cost, N. (2010) and the component ratio method by Health et al. 2009. This estimation method is adopted by US Forest Service Forest Inventory Analysis (FIA) program and California's pre-compliance market (AB 32), is peer-reviewed and widely considered to be the standard methodology for calculating carbon sequestration. USDA/Forestry Service/ Northern Research Station: "Measurement guidelines for the sequestration of forest carbon." Pearson, Timothy R.H. Brown, Sandra L. Birdsey, Richard A. 2007.

North Canaan Solar Facility - Carbon Debt Analysis³

Carbon Debt & Payback of Solar Array	Energy (GJ) used in Production	CO ² e (Metric Tons)
PV Modules	34524	4362
Racking	862	269
Module Interconnection	65	5
Junction Boxes	63	12
Conduits and Fittings	404	58
Wire and Grounding Devices	948	100
Inverters and Transformers	1629	158
Grid Connections	157	14
Office Facilities Concrete	111	23
Concrete	81	28
Trees Removed (Current Stock)	0	223
Trees (Future Lost Carbon Reduction - 20 Years)	0	520
Total CO²e to Payback		5770
Annual PV Production Benefits (- CO²e)	5725	2305
Carbon Payback of Solar Array (Yrs)		2.5

System Size (W)	2,780,000
System Size (MW)	2.8
Acres Cleared (Estimated)	9

³ Data and calculations provided by SolarCity on June 9, 2016.