

**EXHIBIT E**

Carbon Debt Analysis

## I. Introduction

This exhibit analyzes the total amount of greenhouse gas (“GHG”) emissions, or carbon footprint, of the 0.999MW solar generation project (“Project”) located at 37 Hunters Lane in Southington, Connecticut including all aspects of the project over its twenty (20) year life span.

## II. Electricity Generated from Project

The Project will produce about 2,125 MWh of electricity during its first year of operation. In total, using the industry standard degradation value of 0.5%, the Project will produce roughly 42,254 MWh of electricity during its lifespan.

## III. GHG Emissions of Project

According to the National Renewable Energy Laboratory (“NREL”), solar PV projects on average produce 43 grams of carbon dioxide equivalent per kilowatt-hour (“g CO<sub>2</sub>e/kWh”) of electricity produced. *See Life Cycle Greenhouse Gas Emissions from Electricity Generation: Update*, National Renewable Energy Laboratory, p.3 (Sept. 2021). This is a cradle-to-grave average, accumulating all factors from resource extraction and construction to decommissioning and recycling. Using this average, the Project will produce roughly 1,817 metric tons of CO<sub>2</sub>e during its 20-year life span.

## IV. Comparing Project GHG Emissions to Natural Gas

The Project will most likely replace natural gas because natural gas is the largest energy resource in the State, making up 56% of Connecticut’s energy resource mix. (Solar power is 0.6% of the State’s energy resource mix.) *See Emission & Generation Resource Integrated Database (“eGRID”): Data Explorer*, US Environmental Protection Agency (“EPA”), <https://www.epa.gov/egrid/data-explorer> (last updated on Sept. 26, 2023). The U.S. Environmental Protection Agency states that the CO<sub>2</sub>e emission rate for natural gas in Connecticut was 821.72lb/MWh in 2021, meaning that for every megawatt hour of electricity produced by natural gas, there were 821.72 pounds of CO<sub>2</sub>e emitted. *Id.* At this rate, the average natural gas generator needs to emit 15,749 metric tons of CO<sub>2</sub>e to produce the same amount of electricity as the Project (42,254 MWh). In other words, constructing the Project will create an 88.5% reduction in CO<sub>2</sub>e emissions because the Project would only produce 1,817 metric tons of CO<sub>2</sub>e versus the 15,749 metric tons from natural gas.

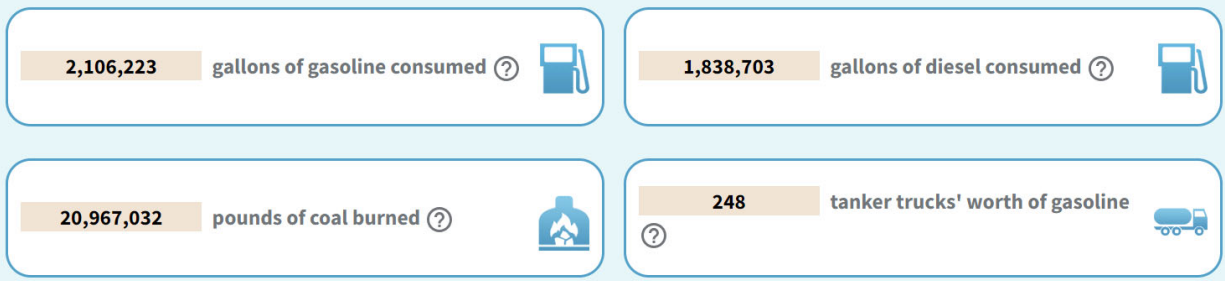
This reduction increases to 91% under a cradle-to-grave analysis. When including resource extraction, construction, decommissioning, and the entire project life cycle, an equally sized natural gas generator emits an additional 4,786 metric tons of CO<sub>2</sub>e for a total of 20,535 metric tons of CO<sub>2</sub>e. *See Life Cycle Greenhouse Gas Emissions from Electricity Generation: Update*, NREL, p.3 (Sept. 2021). The images below portray the GHG equivalencies of the Project, provided by using the US Environmental Protection Agency’s (EPA) Greenhouse Gas Equivalencies Calculator. *See Greenhouse Gas Equivalencies Calculator*, US Environmental Protection Agency, <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator> (last updated July 2023). Again, the Project replaces about 18,718 metric tons of CO<sub>2</sub>e, and in doing so, replaces the equivalent amount of CO<sub>2</sub>e from the following:

18,718 Metric Tons of Carbon Dioxide (CO<sub>2</sub>) equivalent

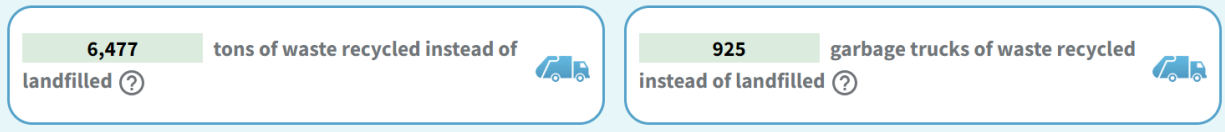
This is equivalent to greenhouse gas emissions from:



This is equivalent to CO<sub>2</sub> emissions from:



This is equivalent to greenhouse gas emissions avoided by:



This is equivalent to carbon sequestered by:



## V. Conclusion

Overall, the net amount of GHG emissions avoided through solar production vastly outweigh the GHG emitted during the initial construction or eventual decommission of the Project, especially when compared to natural gas, the current largest source of electricity generation in Connecticut. This Project would emit roughly 1/10<sup>th</sup> of the CO<sub>2</sub>e produced by an equivalent natural gas plant. In other words, a natural gas plant would emit over 11 times the CO<sub>2</sub>e levels as the proposed Project to generate the same amount of electricity. As the EPA GHG Equivalencies Calculator illustrates, this reduction of CO<sub>2</sub>e is equal to over 20 million pounds of coal, 4,000 gas-powered vehicles, and preserving more than 22,000 acres of US forests. This Project would replace natural gas production in Connecticut and reduce over 18,700 metric tons of CO<sub>2</sub>e in the process.