LODESTAR ENERGY

CARBON DEBT ANALYSIS

The proposed solar Project is designed to cover approximately 9.88 acres of an approximately 24 acre parcel. The majority of the 9.88 acre footprint of the proposed solar Project is comprised of unforested terrain with only 1.2 acres (24.3 %) of proposed clearing. There are demonstrable net benefits to the construction and operation of the solar Project which significantly offset the proposed 1.2 acres of clearing at the Site.

The United States Environmental Protection Agency ("EPA") provides specific carbon sequestration data and conversion factor data to perform a Carbon Debt Analysis. As set forth in further detail herein, we will calculate and compare two carbon values by applying the prescribed sequestration data and conversion data. The first calculation establishes a baseline value as the "existing condition scenario." This value is established by measuring the carbon sequestration capability of the Site without the proposed solar Project. The second calculation derives a value that is the "solar Project scenario." This value is calculated based on the removal of 1.2 acres of vegetative cover and the installation of the proposed Project. This second value will be representative of the amount of carbon that will not be released from "typical" energy generating means due to the carbon free energy generation of the solar Project.

Existing Condition Scenario: The proposed solar Project requires site work that will result in the removal of 1.2 acres of vegetation. According to the EPA's "conversion factor for carbon sequestered in one year by one acre of average U.S. forest," the amount of carbon sequestered in one year by one acre of forest is 0.85 metric tons of CO2 (MT CO2) (EPA, 2017). This means that the existing condition scenario will offer a "carbon debt" of 1.02 MT CO2 annually (1.2 acres *.85 MT CO2/acre).

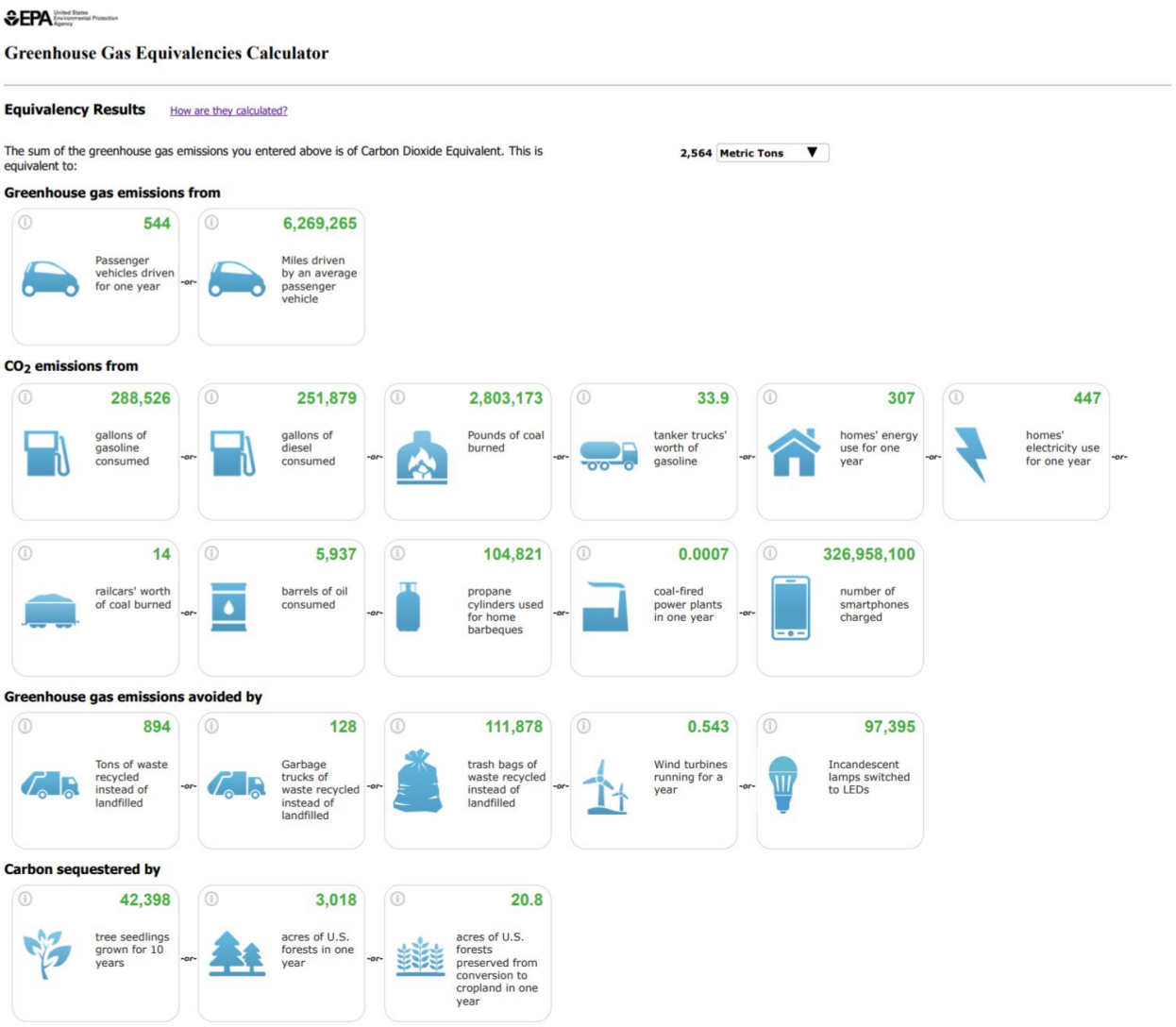
Solar Project Scenario: The proposed solar Project is calculated to produce 3,625 MWh of energy during the first operational year. According to the EPA Greenhouse gas electricity reduction equivalency conversion factor, 1 MWH of electricity is equivalent to a "carbon offset" of 1,559 lbs of CO2. Therefore, the forecasted energy generation of 3,625 MWh is equivalent to a "carbon offset" of 2,564 MT CO2 in the first year ((3625 MWh*1559lbsCO2/MWh)/(2204 lbs/MT)).

Analysis: In comparing the existing condition scenario offering a carbon debt of 1.02 MT and the solar Project scenario offering a carbon offset of 2,564 MT CO2 in the first year of generation, the following can be concluded:

1) The installation of the solar Project will have a carbon offset over 2,000 times greater than the existing condition.

2) The solar Project will offer a net improvement in carbon reduction within 0.14 days of operation.

3) Carbon sequestration by the existing forest over a 20 year period will be recovered by the solar Project within 2.9 days of operation.



References:

United States Environmental Protection Agency. Greenhouse Gases Equivalencies Calculator - Calculations and References. https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references