LODESTAR ENERGY

CARBON DEBT ANALYSIS

The proposed solar project area (including panels, electrical equipment, access roads, and related ground clearing) is designed to cover approximately 18.6 acres of an approximately 180.2-acre parcel. About a 12.1-acre footprint of the proposed solar project is comprised of unforested terrain. In total, the project calls for 6.5 acres of clearing for placement of the array and shade mitigation in select areas within the vicinity of the array. There are demonstrable net benefits to the construction and operation of the solar Project which significantly offset the proposed 6.5 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 a maximum of 6.5 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 6.5 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 0.84 metric tons of CO2 (MT CO2) (EPA 2020). This means that the existing condition scenario will offer a "carbon debt" of 5.5 MT CO2 annually (6.5 acres * 0.84 MT CO2/acre).

Solar Project Scenario: The proposed solar project is calculated to produce 6,002.5 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 1,562.4 lbs. of CO2. Therefore, the forecasted energy generation of 6,002.5 MWh is equivalent to a "carbon offset" of 4,254 MT CO2 in the first year ((6,002.5 MWh * 1,562.4lbs CO2/MWh)/(2,204.6 lbs/MT)).

Analysis: In comparing the existing condition scenario offering a carbon debt of 5.5 MT and the solar Project scenario offering a carbon offset of 4,254 MT CO2 in the first year of generation, the following can be concluded:

(1) The installation of the solar project will have a net carbon offset of 4,249 MT CO2 annually.

4,254 MT CO2 - 5.5 CO2 = 4,249 MT CO2

(2) The solar project will offer a net improvement in carbon reduction within 1 day of operation.

(5.5 MT CO2/4,254 MT CO2) * 365 days = 0.47 days

(3) The carbon offset from the solar project in a year is the equivalent of 5,034 acres of U.S. forests, which is over 750x the acres of forest that will be removed for this project.

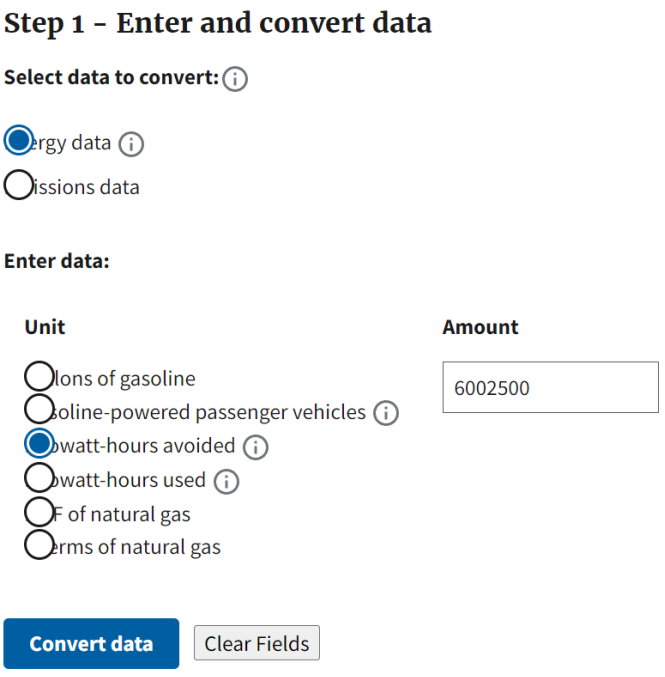
5,034 acres U.S. forest/6.5 acres U.S. forest = 774x

(4) It would take approximately 9.4 days to recover the loss of carbon sequestration by the 6.5 acres of cleared trees over 20 years.

Carbon debt over 20 years = 6.5 MT CO2 per year * 20 years = 109.2 MT CO2

Carbon offset over 20 years = 4254 MT CO2 per year * 20 years = 8,5079.4 MT CO2

109.2 MT CO2 / 85079.4 MT CO2 * 20 years * 365 days = 9.4 days



Step 2 - View results

4,254 Metric Tons **of Carbon Dioxide (CO_2) equivalent**

This is equivalent to greenhouse gas emissions from:

917 gasoline-powered passenger vehicles driven for one year	**10,558,971** miles driven by an average gasoline-powered passenger vehicle

This is equivalent to CO_2 emissions from:

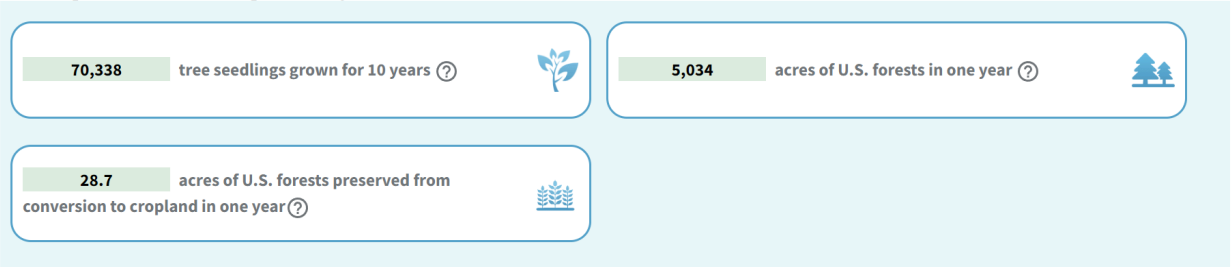
478,662 gallons of gasoline consumed	**417,865** gallons of diesel consumed
4,706,517 pounds of coal burned	**56.3** tanker trucks' worth of gasoline
536 homes' energy use for one year	**828** homes' electricity use for one year
23.5 railcars' worth of coal burned	**9,849** barrels of oil consumed

173,706 propane cylinders used for home barbeques	**0.001** coal-fired power plants in one year
0.011 natural gas-fired power plants in one year	**517,451,587** number of smartphones charged

This is equivalent to greenhouse gas emissions avoided by:

1,472 tons of waste recycled instead of landfilled	**210** garbage trucks of waste recycled instead of landfilled
184,131 trash bags of waste recycled instead of landfilled	**1.2** wind turbines running for a year
161,226 incandescent lamps switched to LEDs	

This is equivalent to carbon sequestered by:



References:

U.S. Environmental Protection Agency (EPA) 2020. Greenhouse Gases Equivalencies Calculator - Calculations and References. https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references

https://www.nrel.gov/docs/fy13osti/56487.pdf