
Analysis of Environmental Benefits

Proposed Solar Facility
4 Alwardt Way, Oak Bluffs, MA

OAK BLUFFS EMISSIONS REDUCTIONS

Oak Bluffs System Size = 1.46 MWDC = **1,460 kWDC**

Amount of time the system will generate power annually:	$8760 \frac{\text{hours}}{\text{year}} * 12.7\% \text{ Capacity factor}$	$\approx 1112.5 \frac{\text{hours}}{\text{year}}$
Amount of electricity the system will generate:	$1460 \text{ kWDC} * 1112.5 \frac{\text{hours}}{\text{year}}$	$\approx 1,625,000 \frac{\text{kWh}}{\text{year}}$
Amount of carbon sequestered annually:	$0.000703 \frac{\text{metric tons CO}_2}{\text{kWh}} * 1,625,000 \frac{\text{kWh}}{\text{year}}$	= 1,141 metric tons CO₂

Emission Factor
 7.03×10^{-4} metric tons CO₂ / kWh
 (eGRID, U.S. annual non-baseload CO₂ output emission rate, year 2012 data)

<https://www.epa.gov/energy/ghg-equivalencies-calculator-calculations-and-references>

1,141 metric tons of CO₂ is equivalent to the following:

Carbon Sequestered by:



Greenhouse Gas Emissions from:



<https://www.epa.gov/energy/ghg-equivalencies-calculator-calculations-and-references>

Equivalent CO₂ Sequestration:

1.4 MW Solar Project = 1,141 metric tons of CO₂ = 1,081 acres of forest

Comparison to Tree Clearing:

1,081 acres (sequestered) / 10 acres (to be cleared) = **108 times** more carbon sequestered by project than existing forest

Measuring CO₂ Emissions Reductions

The Greenhouse Gas Equivalencies Calculator uses the **Emissions & Generation Resource Integrated Database (eGRID) U.S. annual non-baseload CO₂ output emission rate** to convert reductions of kilowatt-hours into avoided units of carbon dioxide emissions. Most users of the Equivalencies Calculator who seek equivalencies for electricity-related emissions want to know equivalencies for **emissions reductions** from energy efficiency or renewable energy programs. These programs are not generally assumed to affect baseload emissions (the emissions from power plants that run all the time), but rather non-baseload generation (power plants that are brought online as necessary to meet demand). For that reason, the Equivalencies Calculator uses a non-baseload emission rate.

Emission Factor

7.03×10^{-4} metric tons CO₂ / kWh

(eGRID, U.S. annual non-baseload CO₂ output emission rate, year 2012 data)

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