Climate Pollution Reduction Grants – Implementation Grants

**City of Concord** **Climate Pollution Reduction Solar Project**

Technical Appendix

GHG Reduction Estimate Method:

GHG reduction estimates were calculated using the EPA Greenhouse Gas Equivalencies Calculator. The project’s estimates are using National Renewable Energy Laboratory (“NREL”) PVWatts Calculator with a DC Capacity Factor of 19%.

Model/Tools Used:

The EPA’s Greenhouse Gas Equivalencies calculator allows you to convert emissions or energy data to the equivalent amount of carbon dioxide (CO2) emissions from using that amount.

Measure Implementation Assumptions:

The cumulative annual generations are based on the estimated solar array’s commissioning and generation timeline per the stated project schedule. The project schedules the installation of one micro-grid at the Public Works Corporation Yard in 2025, two micro-grids at the Senior Citizens Center and the Police Complex in 2026, and one micro-grid at the Civic Center Complex in 2027. The on-time installation and commissioning of the micro-grids directly impact the reduction of GHG. The project estimates the micro-grids’ lifecycle of 26 years. The grant provides funding for the installation while the cost savings provides and funds the on-going maintenance needs.

GHG Reduction Assumptions (key assumptions used in estimation method, such as emission rates; emission factors; input assumptions for modeling):

GHG reduction was based on the following:

1. Project solar arrays on-time installation and commissioning per proposed schedule.
2. Solar arrays’ production meets the manufacturer's specifications.
3. No unusual weather patterns that could adversely impacting the solar arrays’ generation.
4. EPA’s Greenhouse Gas Equivalencies calculator provided accurate numbers.
5. No other activities or events that could adversely impacting the solar arrays’ generation.

Reference Case Scenario (GHG emissions or activity level):

The GHG emission reference was based on Base Year GHG emissions for sector where the GHG reduction measure will be implemented in the absence of the implemented GHG reduction measure. The Base Year period was identified as 12/28/2023 – 01/28/2024.

Measure-Specific Activity Data (e.g., energy savings, electrical output, vehicle miles traveled, units of equipment installed, or other metrics used to track implementation and/or effects of a GHG reduction measure):

The measurements of activity data are based on electrical output, energy savings, and the California Public Utilities Commission (“CPUC”) authorized net metering, or NEM 3.0.

GHG Emissions Reduced:

GHG reduction estimates were calculated using the EPA Greenhouse Gas Equivalencies Calculator.

The GWP has become the default metric for transferring emissions of different gases to a common scale; often called CO2 equivalent emissions. GHG emission metrics are used to express emissions of different GHGs in a common unit. Aggregated GHG emissions in IPCC AR6 report are stated in CO2-equivalents (CO2-eq) using the Global Warming Potential with a time horizon of 100 years (GWP100) with values based on the contribution of Working Group I to the AR6 (<https://report.ipcc.ch/ar6syr/pdf/IPCC_AR6_SYR_LongerReport.pdf>).

City of Concord’s Climate Pollution Reduction Solar Project Method of Calculations:

1. Use the EPA’s NREL PVWatts Calculator to calculate the electricity generation based on the proposed wattage of the solar arrays at each facility/location.
2. Use EPA’s Greenhouse Gas Equivalencies Calculator to calculate the GHG (CO2) emissions.
3. Calculate the annual energy production using the proposed installation schedule.
4. Calculate the per site and total project electricity generation and annual GHG reduction (in metric tons).
5. Calculate the total project energy generation and GHG reduction from 2025-2030.
6. Calculate the total project energy generation and GHG reduction from 2025-2050.
7. Use 0.80% degradation rate in energy production’s calculations.
8. Use DC capacity factor of 19% in production’s calculations.

Chart, bar chart, histogram

Description automatically generated

Diagram

Description automatically generated with low confidence

Table

Description automatically generated

Table

Description automatically generated

Table

Description automatically generated <https://ghgprotocol.org/sites/default/files/ghgp/Global-Warming-Potential-Values%20%28Feb%2016%202016%29_1.pdf>

City of Concord Public Works Corporation Yard

Table

Description automatically generated

City of Concord Civic Center Complex

Table

Description automatically generated

City of Concord Police Department Complex

Table

Description automatically generated

City of Concord Senior Citizens Center

Table

Description automatically generated

