

Climate Pollution Reduction Grants – Implementation Grants
Utah Department of Environmental Quality
Appendix 1: Technical Appendix

GHG Reduction Estimate Method

The Utah Department of Environmental Quality (UDAQ) used a variety of methods and tools to arrive at measure-related activity data or outputs and GHG emission reduction estimates, including publicly available tools, calculators, and data sets and engineering estimates. UDAQ also used its own experience and that of its partners in implementing existing programs to establish a reasonable scope and scale for each measure, including the use of past performance data. To the extent possible, estimated emission reductions for measures included in this grant application are net of any increases in emissions that may be associated with a given measure. For example, emission reductions for projects that replace direct fossil fuel combustion with equipment electrification (e.g., electric vehicles and electric vehicle chargers) have been adjusted or “netted” to account for the increase in electricity generation emissions associated with the project in question using recognized quantification tools such as the AVoided Emissions and geneRation Tool (AVERT) or the Emissions & Generation Resource Integrated Database (eGRID) tool. The specific approaches and tools used vary by emission reduction measure and are further detailed in Table 1 and are more thoroughly documented in the included *Optional GHG Emission Reduction Calculations Spreadsheet (GHGcalcs_Utah Department of Environmental Quality)*.

Models/Tools Used

UDAQ used the following publicly available tools, calculators, and data sets to develop the GHG emission reduction estimates for the measures and activities included in this application. All such tools incorporate key assumptions in estimating GHG emission reductions (e.g., emission rates; emission factors; etc).

Environmental Protection Agency (EPA) AVERT Web Edition

The AVoided Emissions and geneRation Tool (AVERT) “evaluates how energy policies and programs such as energy efficiency, renewable energy, and electric vehicles lead to changes in emissions of particulate matter (PM_{2.5}), nitrogen oxides (NO_x), sulfur dioxide (SO₂), carbon dioxide (CO₂), volatile organic compounds (VOC), and ammonia (NH₃) from electric power plants at a county, state, or regional level.” AVERT Web Edition completes analyses using 2022 power sector emissions and generation data and AVERT Main Module v4.2. (Source: <https://www.epa.gov/avert/avert-web-edition>)

EPA eGRID Power Profiler

The Emissions & Generation Resource Integrated Database (eGRID) “is a comprehensive source of data from EPA’s Clean Air Markets DiThe data includes emissions, emission rates, generation, heat input, resource mix, and many other attributes. eGRID is typically used for greenhouse gas registries and inventories, carbon footprints, consumer information disclosure, emission inventories and standards, power market changes, and avoided emission estimates.vision on the environmental characteristics of almost all electric power generated in the United States.” Data source: 2021 data from the eGRID released January 30, 2023. (Source: <https://www.epa.gov/egrid/power-profiler#/>)

EPA Diesel Emission Quantifier (DEQ)

The Diesel Emissions Quantifier (DEQ) “provides an interactive, web-based tool for users with little or no modeling experience; evaluates clean diesel projects and upgrade options for medium-heavy and heavy-heavy duty diesel engines”; and “estimates baseline emissions, reduced emissions, cost effectiveness for NO_x, PM_{2.5}, HC, CO and CO₂, and PM-related health benefits.” Version: DEQ version 9.1 released May 2, 2022. (Source: <https://cfpub.epa.gov/quantifier/index.cfm?action=main.home>)

Bureau of Transportation Statistics (BTS) Estimated U.S. Average Vehicle Emissions Rates

This BTS data provides estimates by calendar year for light-duty vehicles (passenger cars); light-duty trucks (two axle, four tire); heavy-duty vehicles (trucks with more than two axles or four tires); motorcycle (highway only). Emissions factors are averages based on the national average age distributions, vehicle activity (speeds, operating modes, vehicle-miles traveled fractions, starts and idling), temperatures, inspection/maintenance and anti-tampering programs, and average gasoline fuel properties in that calendar year. Total HC includes exhaust and evaporative emissions. Average emissions per vehicle rates assume a fleet comprised exclusively of gasoline and diesel vehicles. Gasoline-electric hybrids are accounted for in the values for gasoline vehicles. This table was generated using MOVES3, the U.S. Environmental Protection Agency's (EPA) mobile source emissions model. (Source: https://www.bts.gov/sites/bts.dot.gov/files/2023-11/table_04_43_102623.xlsx)

UDAQ Yard Equipment White Paper

UDAQ developed this white paper in support of potential rulemaking to limit the use of two-stroke small off-road engines in yard care activities for the Northern Wasatch Front (NWF) marginal nonattainment areas for the 2015 National Ambient Air Quality Standard (NAAQS) for 8-hour ozone concentrations. The white paper includes 2023 emissions for yard equipment, equipment capital costs, lifetime costs, hours of use, and population data, among other information. For this application, UDAQ focused on 2-stroke residential leaf blowers as a representative piece of equipment for comparison with zero-emission alternatives. (Source: https://docs.google.com/document/d/1vopB24jO_EAJLXscepeZ6cHKsD-BmnSjSKoX3db2zY/edit#heading=h.54c33qx2hlrl)

UDAQ Uinta Basin Composition Study: Comprehensive Final Report

The Uinta Basin Composition Study was designed to gain a better understanding of the chemical components that make up air emissions from oil and gas production facilities. Oil and gas emissions contain volatile organic compounds (VOC) which are precursors to ozone. The speciation profiles developed in this study will have an impact on photochemical modeling exercises, the triennial oil and gas emissions inventory, and oil and gas permit application processes. (Source: <https://documents.deq.utah.gov/air-quality/planning/technical-analysis/DAQ-2020-004826.pdf>)

National Renewable Energy Laboratory (NREL) ResStock: Detailed Annual Impacts from Residential Energy Efficiency Measures Dataset

The Annual Impacts from Residential Energy Efficiency Measures dataset “complements and builds upon the existing public datasets with annual energy consumption, carbon emission, energy bill, and energy burden data for the baseline U.S. housing stock as well as the U.S. housing stock with 260 “what-if” energy measure packages applied.” The Detailed Annual Total Savings per Dwelling Unit tab “shows annual total savings (USD \$) for energy bills, CO₂ equivalent emissions, and energy consumption, and also includes specific savings for electricity, natural gas, propane, and fuel oil. Hover over a number in a cell to see the 5-95th percentile range of the data.” Release: 2022.1. (Source: <https://public.tableau.com/app/profile/nrel.buildingstock/viz/StateLevelResidentialBuildingStockandEnergyEfficiencyElectrificationPackagesAnalysis/Introduction>)

Measure Implementation Assumptions

The Measure Implementation Assumptions used in this application – including the assumed rate of implementation, milestones, measure lifetime, and incentive costs – vary by emission reduction measure and are detailed by measure in Table 1. These assumptions are reasonable as they are based on successful past performance, data and information from operators and vendors, and related research or third-party studies.

GHG Reduction Estimate Assumptions

The GHG Reduction Estimate Assumptions used for estimating GHG emission reductions for measures included in this application include the underlying assumptions of the tools summarized in the Models/Tools Used section above. One or more of these tools are used for each measure as identified in Table 1.

Reference Case Scenario (GHG Emissions or Activity Level)

UDAQ employed an “activity-level” reference scenario approach that includes a reference level of energy efficiency for a type of energy use equipment or GHG emission intensity under standard market practice for a type of activity, application, or equipment. Energy efficiency levels, GHG emission intensities, and related metrics were derived using the tools summarized in the Models/Tools Used section above to arrive at a “bottom up” estimate of emission reductions associated with each measure included in this application. These tools used recent actual or estimated energy and emissions data and are, therefore, suitable for this application, which focuses on implementation-ready measures to be deployed over a five-year period of performance beginning in October 2024 to yield both near- (2025-2030) and medium-term emission reductions (2025-2050).

Measure-Specific Activity Data

Measure-Specific Activity used to estimate emission reductions in this application vary by measure and are further detailed by measure in Table 1.

GHG Emissions Reduced

Measure-specific cumulative GHG emission reductions for the periods 2025-2030 and 2025-2050 are summarized in Table 1 below. Measure-specific estimated annual reductions are detailed in Table 2 below.

Table 1 - Measure-Specific Summary

Measure	Activity	GHG Reduction Estimate Method	Models/ Tools Used	Measure Implementation Assumptions	GHG Reduction Estimate Assumptions	Reference Case Scenario	Measure-Specific Activity Data	Cumulative GHG Emission Reductions (metric tons CO ₂ e)	
								2025-2030	2025- 2050
Light-Duty Zero-Emission Vehicle LIDAC Incentives	EVRAP	publically available tool/calculator	AVERT Web Edition	1,370 units; 5 performance years; 274 units per performance year; 12-year unit life; \$7,000 incentive per unit	Underlying AVERT Web Edition assumptions for Northwest Region	Activity-level	AVERT Assumptions: 10,000 units; deployed in Utah; 2024 EV model year; replace existing vehicles; resulting emission reductions then unitized and distributed based on Measure Implementation Assumptions	12,174.9	36,524.7
Light-, Medium-, and-Heavy-Duty Zero-Emission Vehicle Fleet Incentives	Electric Transit Bus	publically available tool/calculator	AVERT Web Edition	7 units; 1 performance year (all units deployed in year 2); 7 units per performance year; 15-year unit life, \$1,300,000 incentive per unit	Underlying AVERT Web Edition assumptions for Northwest Region	Activity-level	AVERT Assumptions: 7 units; deployed in Utah; 2025 EV model year; replace existing vehicles; resulting emission reductions then distributed based on Measure Implementation Assumptions	408.2	1,224.7
Light-, Medium-, and-Heavy-Duty Zero-Emission Vehicle Fleet Incentives	Electric Light-Duty Fleet Vehicles	publically available tool/calculator	AVERT Web Edition	400 units; 4 performance years (units deployed years 2-5); 100 units per performance year; 12-year unit life; \$5,000 incentive per unit	Underlying AVERT Web Edition assumptions for Northwest Region	Activity-level	AVERT Assumptions: 10,000 units; deployed in Utah; 2024 EV model year; replace new vehicles; resulting emission reductions then unitized and distributed based on Measure Implementation Assumptions	2,024.5	6,941.1
Light-, Medium-, and-Heavy-Duty Zero-Emission Vehicle Fleet Incentives	Electric Delivery Vehicles	publically available tool/calculator, engineering estimates	DEQ, eGRID	40 units; 4 performance years (units deployed years 2-5); 10 units per performance year; 10-year unit life; \$50,000 incentive per unit	Underlying DEQ tool assumptions ; underlying eGRID assumptions for Northwest Power Pool (WECC Northwest)	Activity-level	DEQ Assumptions: 1 unit; deployed in Utah, 2024 model year for EV; baseline EMY 2024; new diesel vehicle replaced; short haul single unit (class 4-5); annual fuel = 1,463; annual miles traveled = 14,962; annual idling hours = 30; upgrade year 2024 eGRID Assumptions: annual miles = 14,962; kWh/mile = 0.9; kWh/year = 13,465.8; kWh/month = 1,122	1,528.0	4,365.7

Measure	Activity	GHG Reduction Estimate Method	Models/ Tools Used	Measure Implementation Assumptions	GHG Reduction Estimate Assumptions	Reference Case Scenario	Measure-Specific Activity Data	Cumulative GHG Emission Reductions (metric tons CO ₂ e)	
								2025-2030	2025- 2050
Light-, Medium-, and-Heavy-Duty Zero-Emission Vehicle Fleet Incentives	Electric Refuse Hauler	publically available tool/calculator, engineering estimates	DEQ, eGRID	20 units; 1 performance year (all units deployed in year 2); 20 units per performance year; 10-year unit life; \$250,000 incentive per unit	Underlying DEQ tool assumptions ; underlying eGRID assumptions for Northwest Power Pool (WECC Northwest)	Activity-level	DEQ Assumptions: 1 unit; deployed in Utah, 2024 model year for EV; baseline EMY 2024; new diesel vehicle replaced; short haul single unit (class 8); annual fuel = 3,993; annual miles traveled = 23,646; ; upgrade year 2024 eGRID Assumptions: annual miles = 23,646; kWh/mile = 2.58; kWh/year = 60,990.92; kWh/month = 5,083	2,236.7	4,473.3
Light-, Medium-, and-Heavy-Duty Zero-Emission Vehicle Fleet Incentives	Electric School Bus Program including School Bus Ready	publically available tool/calculator	AVERT Web Edition	30 units; 4 performance years (units deployed years 2-5); average of 7.5 units per performance year; 20-year unit life; \$405,000 incentive per unit (includes incremental cost and estimated support expenses)	Underlying AVERT Web Edition assumptions for Northwest Region	Activity-level	AVERT Assumptions: 1,000 units; deployed in Utah; 2024 EV model year; replace new vehicles; resulting emission reductions then unitized and distributed based on Measure Implementation Assumptions	350.5	2,003.1
Zero-Emission Vehicle Charging/ Refueling Incentives	Electric Fleet Charger	publically available tool/calculator, engineering estimates	eGRID, BTS MOVES emission factors	400 units; 4 performance years (units deployed years 2-5); 100 units per performance year; 10-year unit life; \$7,000 incentive per unit	Underlying eGRID assumptions for Northwest Power Pool (WECC Northwest); underlying BTS MOVES3 assumptions	Activity-level	Charger Assumptions: annual kWh = 3,179.2 (Salt Lake City historical fleet charger data); kWh/month = 265; kWh/mile = 3; annual miles = 9,538; Vehicle Emissions: BTS MOVES (P) 2023 emissions factors for light-duty cars and trucks (averaged); Resulting emission reductions then distributed based on Measure Implementation Assumptions	3,931.9	11,234.0

Measure	Activity	GHG Reduction Estimate Method	Models/ Tools Used	Measure Implementation Assumptions	GHG Reduction Estimate Assumptions	Reference Case Scenario	Measure-Specific Activity Data	Cumulative GHG Emission Reductions (metric tons CO ₂ e)	
								2025-2030	2025- 2050
Zero-Emission Vehicle Charging/ Refueling Incentives	Workplace and Multi-Family Dwelling EV Chargers	publically available tool/calculator, engineering estimates	eGRID, BTS MOVES emission factors	700 units; 4 performance years (units deployed years 2-5); 175 units per performance year; 10-year unit life; \$7,000 incentive per unit	Underlying eGRID assumptions for Northwest Power Pool (WECC Northwest); underlying BTS MOVES3 assumptions	Activity-level	Charger Assumptions: annual kWh = 6,757.7 (Salt Lake City historical public-facing charger data); kWh/month = 563; kWh/mile = 3; annual miles = 20,273; Vehicle Emissions: BTS MOVES (P) 2023 emissions factors for light-duty cars and trucks (averaged); Resulting emission reductions then distributed based on Measure Implementation Assumptions	14,628.3	41,795.3
Mode-Shifting/ Reducing Vehicle Miles Traveled	E-Bike Incentive Program	publically available tool/calculator, engineering estimates	eGRID, BTS MOVES emission factors	2,000 units; 5 performance years; 400 units per performance year; 10-year unit life; \$600 incentive per unit	Underlying eGRID assumptions for Northwest Power Pool (WECC Northwest); underlying BTS MOVES3 assumptions	Activity-level	Charging Assumptions: 15,516 average annual VMT in Utah; reduction in VMT from E-bike use = 5%; annual miles = 775.8; E-bike kWh/miles = 0.02; annual kWh = 15.5; Vehicle Emissions: BTS MOVES (P) 2023 emissions factors for light-duty cars and trucks (averaged); Resulting emission reductions then distributed based on Measure Implementation Assumptions	2,413.3	6,033.3
Zero-Emission Nonroad Incentives	Electric Yard Equipment Incentives	engineering estimates	UDAQ Yard Equipment White Paper	15,000 units, 5 performance years; 3,000 units per performance year; 5-year unit life; \$200 incentive per unit	Assumptions outlined in UDAQ Yard Equipment White Paper; underlying eGRID assumptions for Northwest Power Pool (WECC Northwest)	Activity-level	eGRID Assumptions: kWh/hour = 0.48; hours/year = 10; kWh/year = 4.8; Gasoline Assumptions:gallons/hour = gallons/year = 5 Emission factors from UDAQ White Paper: NOx = 2.09 TPY; VOC = 59.47 TPY; unit population = 46,223 Resulting emission reductions then distributed based on Measure Implementation Assumptions	2,450.4	3,224.2

Measure	Activity	GHG Reduction Estimate Method	Models/ Tools Used	Measure Implementation Assumptions	GHG Reduction Estimate Assumptions	Reference Case Scenario	Measure-Specific Activity Data	Cumulative GHG Emission Reductions (metric tons CO ₂ e)	
								2025-2030	2025- 2050
Facility Energy Efficiency	Intermountain Industrial Assessment Center (IIAC) StepWise Program	publically available tool/calculator, engineering estimates	AVERT, eGRID, IIAC program data, engineering assessment	Service provided over 5 performance years; 8-year weighted average project life; \$750,000 per year of service	Underlying AVERT and eGRID assumptions for the Northwest Region; IIAC energy efficiency project data; Lawrence Berkley National Laboratory <i>Energy Savings Lifetimes and Persistence: Practices, Issues, and Data</i>	Activity-level	Capital Projects = 60%; Operating Projects = 40%; 12-year capital project life; 1-year operating project life; 8-year weighted average project life; gas savings = 97,825.81 MMBTU over 2 years; electric savings = 7,095,087 kWh over 2 years; resulting emission reductions then distributed based on Measure Implementation Assumptions	152,185.5	304,371.0
Oil/Gas Methane Emission Reductions	Thief Hatch Replacements	engineering estimates	UDAQ Uinta Basin Engine White Paper, engineering assessment	Oil: 600 facilities; 3.4 units per facility (average); 4 performance years (deployed years 2-5); 150 facilities per performance year; 10-year unit life; \$4,080 incentive per facility Gas: 200 facilities; 2.0 units per facility (average); 4 performance years (deployed years 2-5); 50 facilities per performance year; 10-year unit life: \$2,400 incentive per facility	UDAQ Uinta Basin Composition Study; UDAQ compliance data	Activity-level	Oil emission factors from UDAQ Uinta Basin Engine White Paper: annual VOC reduction = 7.67 tons per facility; annual CO ₂ e = 49.405 (both scaled in half to conservatively estimate program efficacy); Gas emission factors from UDAQ Uinta Basin Engine White Paper: annual VOC reduction = 1.66 tons per facility; annual CO ₂ e = 96.969 (both scaled in half to conservatively estimate program efficacy); resulting emission reductions then distributed based on Measure Implementation Assumptions	85,814.4	245,184.0
Promote Renewable Energy for Homes and Businesses	Rooftop Solar Rebates	publically available tool/calculator	AVERT Web Edition	5,000 units; 5 performance years; 1,000 units per performance year; 20-year unit life; \$1,000 incentive per unit	Underlying AVERT Web Edition assumptions for Northwest Region	Activity-level	AVERT Assumptions: 6.1 MW distributed rooftop solar PV deployed; resulting emission reductions then distributed based on Measure Implementation Assumptions	145,693.9	728,469.6

Measure	Activity	GHG Reduction Estimate Method	Models/ Tools Used	Measure Implementation Assumptions	GHG Reduction Estimate Assumptions	Reference Case Scenario	Measure-Specific Activity Data	Cumulative GHG Emission Reductions (metric tons CO ₂ e)	
								2025-2030	2025- 2050
Outreach, Education, and Workforce Training Related to Emission Reduction Efforts	Demonstration and Assistance Program	publically available tool/calculator, engineering estimates	NREL ResStock Dwelling Unit Savings, eGRID, BTS MOVES emission factors	Energy coaching service provided in each of 5 performance years with targets for several energy projects, including: Heat Pumps: 48 units; 4 performance years (deployed years 2-5); 12 units per performance year; 20-year unit life Enclosure Upgrades: 180 units; 4 performance years (deployed years 2-5); 45 units per performance year; 20-year unit life E-Bikes: 60 units; 4 performance years (deployed years 2-5); 15 units per performance year; 10-year unit life	Underlying data and assumptions for NREL ResStock Dwelling Unit Savings; underlying eGRID assumptions for Northwest Power Pool (WECC Northwest); underlying BTS MOVES3 assumptions	Activity-level	Heat Pumps: annual average net emissions reduction (metric tons CO ₂ e) = 0.676 ; annual average energy savings (therms) = 121; NO _x per therm (lbs) = 0.007; annual average emissions reduction (metric tons NO _x) = 0.00038; Enclosure Upgrades: annual average net emissions reduction (metric tons CO ₂ e) = 1.225; annual average energy savings (therms) = 168; NO _x per therm (lbs) = 0.007; annual average emissions reduction (metric tons NO _x) = 0.00053; Charging Assumptions: 15,516 average annual VMT in Utah; reduction in VMT from E-bike use = 5%; annual miles = 775.8; E-bike kWh/mile = 0.02; annual kWh = 15.5; Vehicle Emissions: BTS MOVES (P) 2023 emissions factors for light-duty cars and trucks (averaged); Resulting emission reductions then distributed based on Measure Implementation Assumptions	948.7	5,240.0
Cumulative Total GHG Emission Reductions:								426,789.2	1,401,083.8

Table 2 - Annual GHG Emission Reductions by Measure (metric tons CO₂e)

Measure/ Activity	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Light-Duty Zero-Emission Vehicle LIDAC Incentives	608.7	1,217.5	1,826.2	2,435.0	3,043.7	3,043.7	3,043.7	3,043.7	3,043.7	3,043.7	3,043.7	3,043.7	2,435.0	1,826.2	1,217.5	608.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fleet - Electric Light-Duty Vehicles	0.0	144.6	289.2	433.8	578.4	578.4	578.4	578.4	578.4	578.4	578.4	578.4	578.4	433.8	289.2	144.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fleet - Electric Refuse Haulers	0.0	447.3	447.3	447.3	447.3	447.3	447.3	447.3	447.3	447.3	447.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fleet - Electric Delivery Vehicles	0.0	109.1	218.3	327.4	436.6	436.6	436.6	436.6	436.6	436.6	436.6	327.4	218.3	109.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fleet - Electric Transit Buses	0.0	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fleet - Electric School Bus Pilot Program (Includes School Bus Ready)	0.0	25.0	50.1	75.1	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	75.1	50.1	25.0	0.0	0.0
Charger - Electric Fleet Charger Incentives	0.0	280.8	561.7	842.5	1,123.4	1,123.4	1,123.4	1,123.4	1,123.4	1,123.4	1,123.4	842.5	561.7	280.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Charger - Multi-Family Dwelling Electric Vehicle Charger Incentives	0.0	1,044.9	2,089.8	3,134.6	4,179.5	4,179.5	4,179.5	4,179.5	4,179.5	4,179.5	4,179.5	3,134.6	2,089.8	1,044.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E-Bike Incentives	120.7	241.3	362.0	482.7	603.3	603.3	603.3	603.3	603.3	603.3	482.7	362.0	241.3	120.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Electric Yard Equipment Incentives	129.0	257.9	386.9	515.9	644.8	515.9	386.9	257.9	129.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IIAC StepWise Energy Efficiency Assessment Program	7,609.3	15,218.5	22,827.8	30,437.1	38,046.4	38,046.4	38,046.4	38,046.4	30,437.1	22,827.8	15,218.5	7,609.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Thief Hatch Replacement	0.0	6,129.6	12,259.2	18,388.8	24,518.4	24,518.4	24,518.4	24,518.4	24,518.4	24,518.4	24,518.4	18,388.8	12,259.2	6,129.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Measure/ Activity	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Residential Rooftop Solar Incentives	7,284.7	14,569.4	21,854.1	29,138.8	36,423.5	36,423.5	36,423.5	36,423.5	36,423.5	36,423.5	36,423.5	36,423.5	36,423.5	36,423.5	36,423.5	36,423.5	36,423.5	36,423.5	36,423.5	36,423.5	29,138.8	21,854.1	14,569.4	7,284.7	0.0	0.0
Demonstration Assistance Program	0.0	67.8	135.5	203.3	271.0	271.0	271.0	271.0	271.0	271.0	271.0	266.5	262.0	257.5	252.9	252.9	252.9	252.9	252.9	252.9	252.9	189.7	126.5	63.2	0.0	0.0
Cumulative CO ₂ e Reductions 2025-2030: 426,789.2							Cumulative CO ₂ e Reductions 2025-2050: 1,401,083.8																			