New England Heat Pump Accelerator
EPA Climate Pollution Reduction Grant (CPRG) – Implementation Grant
Appendix B: Technical Appendix (October 26, 2025 Revision)[1]

This Technical Appendix explains the methodology and assumptions used for developing the estimated greenhouse gas (GHG) emissions and co-pollutant emissions reduced for the New England Heat Pump Accelerator (Accelerator).

The first section (a) provides an overview of the methods used to estimate GHG and criteria air pollutant (CAP) emission reductions from the Accelerator. The following sections provide additional details on the models and tools used (b), measure characteristics (c), GHG emission reduction estimate assumptions such as emissions factors (d), reference case scenario (e), measure activity data (f), and GHG emissions reductions results (g).

a. GHG and CAP Emission Reduction Estimate Method

The emissions changes for the Accelerator account for the net effect of decreased emissions from nonelectric, onsite fuel consumption and the increased emissions from the additional grid load from increased heat pump adoption. The emissions results show the net GHG and CAP emission reductions accounting for both sets of impacts.

GHG and CAP Emissions Impacts from Fuel Consumption

The energy savings estimates from reduced onsite fossil fuel consumption are based on modeling the building energy savings associated with installing heat pumps. Modeled savings are based on the National Renewable Energy Laboratory (NREL) ResStock End-Use Savings Shapes dataset.[2] Additional information on the ResStock and additional building upgrade scenarios modeled is provided in Section b: Models/Tools Used. To estimate savings, we calculated the change in energy usage when the heat pump measure is applied to each residential building model, and then filtered and aggregated them for building models which are part of the relevant New England geographies for this analysis (CT, MA, ME, NH, and RI). To calculate the CO_2e and CAP emissions impact of a given building upgrade, we multiplied the change in energy consumption for each fuel type by the fuel-specific emissions factors provided in Section d: Emission Reduction Estimate Assumptions.

GHG and CAP Emissions Impacts from Electricity Consumption

For the increased emissions resulting from the additional load on the New England electricity grid due to building electrification, we estimated the GHG emissions from electricity usage using emissions factors from NREL's Cambium 2023 tool using the Mid-Case scenario that assumes a 95% decarbonized electricity sector by 2050.[3] We used the long-run marginal emission factors for CO_2e for both pre-combustion (upstream methane leakage, emissions during extraction, etc.) and combustion. The long-run marginal emissions factor "is an estimate of the rate of emissions that would be either induced or avoided by a change in electric demand, taking into account how the change could influence both the operation as well as the structure of the grid." It is most appropriate for evaluating the GHG emissions impacts of a long-term intervention, like the installation of heat pumps. Emissions impacts from changes in electricity usage include both increased load on the grid from heat pump uptake, as well as decreases in usage when legacy, inefficient electrical appliances are upgraded with more efficient models. Additional information on

[1] This GHG reduction analysis has standard limitations such as model uncertainties, emissions factors, uncertainties, and activity data assumptions that may vary during implementation. This Technical Appendix was initially submitted March 2024. Updates were made in October 2025 to account for additional program design details and recent policy changes.

[2] NREL. (2022). *ResStock 2022.1 Release*. https://resstock.nrel.gov/.

[3] NREL. (2023). *Scenario viewer: Cambium 2023*. https://scenarioviewer.nrel.gov/.

NREL's Cambium tool is provided in Section b: Models/Tools Used. We also calculated forward-looking CAP emissions factors for electricity generation using historical CAP emissions quantities, historical electricity generation, and NREL's Cambium tool. GHG and CAP emissions factors for electricity and additional details on the calculation methodology are provided in Section d: Emission Reduction Estimate Assumptions.

b. Models/Tools Used

Energy Consumption Impacts

We used NREL's ResStock tool to estimate energy consumption impacts for air-source heat pumps (ASHPs) and heat pump water heaters (HPWHs) installed through the Accelerator. The ResStock tool and dataset consists of 550,000 simulated residential building models that statistically represent every residential housing unit in the contiguous United States. For each simulated building, ResStock uses EnergyPlus, the Department of Energy's open-source building energy modeling tool, to model the energy used by every appliance in the building.

ResStock includes 10 energy efficiency and electrification scenarios,[4] simulating upgrades to each building model, with upgrades such as weatherization packages and swapping out fossil fuel appliances for efficient electric alternatives. These scenarios include:

1. Basic Enclosure Package
2. Enhanced Enclosure Package
3. Heat Pumps, Min-Efficiency, Electric Back-Up (SEER 15, HSPF 9)
4. Heat Pumps, High-Efficiency, Electric Back-Up (SEER 24, HSPF 13 for ducted heat pumps; SEER 29.3, HSPF 14 for ductless heat pumps)
5. Heat Pumps, Min-Efficiency, Existing Heating as Back-Up
6. Heat Pump Water Heaters
7. Whole-Home Electrification, Min Efficiency
8. Whole-Home Electrification, Max Efficiency
9. Whole-Home Electrification, High Efficiency + Basic Enclosure Package
10. Whole-Home Electrification, High Efficiency + Enhanced Enclosure Package

The upgrade packages for High-Efficiency Heat Pumps and Heat Pump Water Heaters were used to simulate electrification retrofits in existing single-family and mobile-home homes in the five participating New England states.

Electricity Generation Emissions Impacts

As described in Section a, NREL's Cambium 2023 tool[5] was used to estimate the GHG emissions impacts from electricity usage using long-run marginal emissions factors for CO_2e for both pre-combustion (upstream methane leakage, emissions during extraction, etc.) and combustion. NREL's long-run marginal emissions factors are based on a 95% decarbonized electricity sector by 2050. The long-run marginal emissions factor "is an estimate of the rate of emissions that would be either induced or avoided by a change in electric demand, taking into account how the change could influence both the operation as well as the structure of the grid."[6] It is most appropriate for evaluating the GHG emissions impacts of a long-term intervention, like the installation of heat pumps. Emissions impacts from changes in electricity usage

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[4] NREL. (2021). *End-Use Savings Shapes: Residential Round 1: Technical Documentation and Measure Applicability Logic*. NREL. https://oedi-data-lake.s3.amazonaws.com/nrel-pds-building-stock/end-use-load-profiles-for-us-building-stock/2022/EUSS_ResRound1_Technical_Documentation.pdf.

[5] NREL, *Scenario Viewer*.

[6] Gagnon, P., Cowiestoll, B., & Schwarz, M. (2023). *Long-run marginal emission rates for electricity - Workbooks for 2022 cambium data | NREL data catalog*. NREL Data Catalog l NREL. https://data.nrel.gov/submissions/206.

include both increased load on the grid from heat pump uptake, as well as decreases in usage when legacy, inefficient electrical appliances are upgraded with more efficient models. Emissions factors for electricity are provided in the GHG Reduction Estimate Assumptions section below.

Emissions Factors

Sources and methods used for calculating GHG and CAP emission factors for onsite fuel consumption are provided in Section d: Emission Reduction Estimate Assumptions.

Health Benefits Analysis

Health impacts were analyzed using EPA's CO-Benefits Risk Assessment (COBRA) screening model.[7] COBRA takes sector-specific changes in emissions of primary fine particulate matter ($PM_{2.5}$) and precursors of ozone and secondary $PM_{2.5}$, nitrogen oxides (NO_x), sulfur dioxide (SO_2), and volatile organic compounds (VOCs) and conducts multiple modeling steps to translate changes in emissions to changes in health effects. First, COBRA uses a simplified air quality model, the Source Receptor (S-R) Matrix, to estimate changes in total annual ambient concentrations of $PM_{2.5}$ and ozone, including the formation of secondary $PM_{2.5}$ and ozone from precursor pollutants. COBRA then uses a series of health impact functions, taken from peer-reviewed epidemiological literature, to estimate how changes in outdoor air quality result in changes in the incidence of a variety of health outcomes (e.g., premature mortality, heart attacks, asthma exacerbation, lost work days). Finally, COBRA multiplies the change in incidence for each health outcome by a monetary value specific to that outcome (e.g., the average cost of going to the emergency room for asthma symptoms or the cost of a lost work day) to determine the monetized health impacts.

c. Measure Implementation Assumptions

Implementation Measure Uptake

We assumed that $353 million of the $450 million requested for the Accelerator will be used to directly support heat pump measure installation through Market Hub midstream incentives and Innovation Hub pilot projects over a four-year period. We made the following assumptions related to measure implementation:

- The program will invest $270 million in midstream incentives to distributors and contractors to drive heat pump adoption through the Market Hub and $83 million on Innovation Hub projects. We assume that 20% of Market Hub budget will go to low- and moderate-income (LMI) households and communities. LMI households make up more than half of the households in the region,[8] and the Market Hub will also attempt to target incentives to heat pump equipment types needed in housing types occupied by lower income households, such as multifamily buildings.
- We assume incentive levels for midstream distributor incentives will be $1,000 per unit for ASHPs and $500 per unit for HPWHs.[9] Based on a review of successful midstream programs in other states, we determined that these incentive levels would be sufficient to drive increased market uptake through the supply chain, in tandem with rebates already available to end-use customers in the five states. We assumed that heat pump installations are spread evenly across each of the four years of program implementation. However, this is a simplifying assumption because program setup will occur during year 1, and deployment (and resultant emissions reductions) will

[7] *COBRA Health Impacts Screening and Mapping Tool*. (n.d.). U.S. EPA. https://cobra.epa.gov/.

[8] Census Reporter, *New England Division*, https://censusreporter.org/profiles/03000US1-new-england-division/.

[9] We assumed a $500 per unit HPWH incentive for all states but Maine, which will offer a $1,400 incentive. We also modeled an additional $200 per HPWH of non-incentive implementation costs for Maine HPWH.

likely be lower in the first year than the following years. Once deployment begins, emissions reductions will begin immediately.

- We adjust program costs to reflect measures and households that are more expensive to serve. Innovation Hub projects are likely to include programs targeting manufactured/mobile homes, geothermal networks, heat pumps for large multifamily buildings, and emergency replacement programs. Many Innovation Hub projects are likely to be aimed at overcoming persistent barriers to heat pump adoption for LMI households and communities. Higher incentive levels may be needed to reach LMI households and communities (for example, through an incentive adder for distributors and contractors serving LMI households and communities). Given this, we assume that Market Hub LMI sector costs are 25% higher than non-LMI costs and Innovation Hub costs are double Market Hub non-LMI costs.
- In New England, residential heating costs for households using fuel oil and propane are significantly higher than households using natural gas for heating.[10] We therefore expect the heat pump adoption rate for households using delivered fuels to be about double that of households using natural gas. Households using electric resistance heating will also achieve significant cost savings by adopting heat pumps. Therefore, we assume that, in combination with targeted program messaging about cost-effectiveness of heat pumps as compared to delivered fuels and electric resistance, a natural market result of the program's incentives is that households currently using fuel oil, propane, or electric resistance for heating will adopt ASHPs at twice the rate as households using natural gas.
- Maine will exclusively offer HPWH incentives through the Market Hub. For all other states, we base the ratio of ASHP to HPWH units incentivized through the Accelerator on the current measure ratio in utility incentive programs: 22% HPWH and 78% ASHP.

Measure Lifetime

We assume a 15-year average measure lifetime for both ASHPs and HPWHs.[11] We assume that heat pumps installed during program implementation from 2026 through 2029 will continue to operate and deliver GHG reductions for 15 years. Therefore, no savings are assumed past 2043.[12]

Performance Data: Heat Pump and Building Characteristics

Performance characteristics, including heat pump efficiency levels and building distribution systems and weatherization, are incorporated into the building upgrade packages we modeled using ResStock. For ducted heat pump units, efficiency ratings of Seasonal Energy Efficiency Ratio (SEER) 24 and 13 Heating Seasonal Performance Factor (HSPF) are modeled, and for ductless units the assumed efficiency is SEER 29.3, 14 HSPF. For homes with existing ductwork, heat pumps are sized using Air Conditioning Contractors of America (ACCA) Manual S, which sizes heat pumps based on cooling load with an oversizing allowance to meet higher heating loads. An oversizing allowance of 30% is added in cold climates that are not dry (climate zones 5A, 6A, and 7A), which applies to New England. Electric resistance heating is assumed when the heat pump alone is not able to meet the load. These upgrades apply to dwelling units with ducts and either no heat pump or a less efficient heat pump (SEERs < 24; HSPFs < 13). For homes without ducts, the heat pumps modeled are ductless heat pumps sized to the larger of the cooling and heating load. These

[10] Gabriel, N. (2023, April 3). *Fuel Oil and Propane Space Heating Across The United States*. Atlas Buildings Hub. https://atlasbuildingshub.com/2023/04/03/fuel-oil-and-propane-space-heating-across-the-united-states/.

[11] InterNACHI. (n.d.). *InterNACHI's standard estimated life expectancy chart for homes*. https://www.nachi.org/life-expectancy.htm; Jacobs, A. (2022, September 14). *How long do water heaters last? (Water heater lifespans)*. Jacobs Heating & Air Conditioning. https://jacobsheating.com/blog/how-long-do-water-heaters-last/.

[12] Note that this is a simplifying assumption because the 15-year measure lifetime is for an average system.

are applied to dwelling units without ducts and no heat pump or a less-efficient heat pump (multisource heat pump (MSHP) SEER 14.5, 8.2 HSPF or MSHP SEER 29.3, 14 HSPF not sized to max load).

Attribution of Savings to the Accelerator

Coalition states currently have access to other funding sources to support heat pump adoption, such as utility rebates for heat pumps. The Accelerator is thoughtfully designed to complement these existing customer-facing rebates by targeting incentives to distributors, thereby filling a critical gap in the program landscape. To quantify the savings attributable solely to CPRG implementation grant funding, we estimated the number of households participating in the Accelerator that would also be expected to participate in each state's existing heat pump programs. GHG emissions impacts for these customers were reduced to the proportion attributable to the Accelerator, per EPA's guidance.

To account for attributable impacts, we used the following methodology:

- We examined the number of heat pump installations that existing programs in the five coalition states reached annually in 2024. We also examined the funding level for these existing state programs, which varies by state.
- We then calculated the percentage of households that would take advantage of the various state and utility incentives and applied percentages to derive an allocation factor for the entire program.
- Note that we assumed no participants would be eligible for the Department of Energy (DOE) Home Energy Rebates program for heat pump rebates because that program does not allow stacking two sources of federal grants for the same equipment.
- We also accounted for the market effects, sometimes referred to as market lift, for the Accelerator. Market effects are the additional energy savings that occur because of a change in the market structure that leads to increased adoption of energy efficiency measure, services, or behavior and can be attributed to the program market intervention.[13] In many jurisdictions with large-scale energy efficiency programs that are designed to transform market, regulators stipulate an "adder" to the calculated value of attributable savings, e.g., 5% in Hawaii and California, where net-to-gross values are adjusted upward by 5 percentage points.[14] Following those approaches approved by utility regulators for efficiency programs, we assumed a 5% market lift applied to the analysis of the New England Heat Pump Accelerator.

The following calculations show how we applied this attribution methodology:

([% households receiving Accelerator incentives but no utility/incentives]
+ [$1000 Accelerator incentive / total incentives[15] * % households receiving state and Accelerator incentives]
+ [5% market effects adder])
= Allocation factor (%)

This allocation factor is estimated for each state and heat pump type (HPWH or ASHP), ranging from 14% to 105%, and applied as a discount factor for emissions reductions in each state. In aggregate, the attribution analysis finds that about 51% of emissions reductions from applicable heat pump adoptions across the coalition states would be attributable to the Accelerator. These factors are then applied to the

[13] DOE's Uniform Methods project: https://www.energy.gov/sites/prod/files/2015/01/f19/UMPChapter17-Estimating-Net-Savings.pdf

[14] CA PUC. (2020, April). *Energy Efficiency Policy Manual*. California Public Utilities Commission. https://www.cpuc. ca.gov/-/media/cpuc-website/files/legacyfiles/e/6442465683-eepolicymanualrevised-march-20-2020-b.pdf.

[15] Total incentives include Accelerator incentives and additional state or utility program incentives that vary by state and measure, ranging from $0-$750 for HPWH and $900-$10,000 for ASHP.

impacts in each state to discount all emissions reductions and derive the attributable GHG and CAP emissions reductions for the Accelerator.

d. Emission Reduction Estimate Assumptions

GHG Emission Factors

Table 1 shows the CO_2e emission factors used to calculate GHG emission reductions for changes in residential onsite fossil fuel combustion due to heat pump installation. These values are static and do not change over time.

Table 1 CO_2e Emission Factors

CO_2e Emission Factors	
Natural gas	147.3 lb CO_2e/MMBtu (228.0 kg/MWh)
Propane	177.8 lb CO_2e/MMBtu (182.3 kg/MWh)
Fuel oil	195.9 lb CO_2e/MMBtu (303.2 kg/MWh)

The emission factors for fuels include both the combustion and pre-combustion (e.g., methane leakage for natural gas) CO_2e emissions. These values are from Table 7.1.2(1) National Average Emissions Factors for Household Fuels from draft ANSI/RESNET/ICCC 301 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index. The original source for the emissions factors is the EPA's Compilation of Air Pollutant Emissions Factors from Stationary Sources (AP-42),[16] supplemented with additional lifecycle analysis to model the pre-combustion emission factors from the U.S. Life Cycle Inventory Database.[17]

CO_2e emission factors for electricity were modeled using NREL's electric grid forecasting model Cambium and vary by year and by state, depending on the electricity generation mix.

CAP Emission Factors

Table 2 shows the average CAP emissions factors for each fuel type and pollutant for the states included in this analysis, expressed in lb/MMBtu. CAP emissions quantities are reported by the 2020 National Emissions Inventory (NEI).[18] Emissions factors are taken from the EPA's Compilation of Air Pollutant Emissions Factors from Stationary Sources (AP-42),[19] supplemented with additional lifecycle analysis to model the pre-combustion emission factors from the U.S. Life Cycle Inventory Database.[20]

[16] *AP-42: Compilation of air emissions factors from stationary sources*. (2024, February 29). U.S. EPA. https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors-stationary-sources.

[17] *U.S. life cycle inventory database*. NREL. https://www.nrel.gov/analysis/lci.html.

[18] *2020 National Emissions Inventory (NEI) data*. (2023, May 31). U.S. EPA. https://www.epa.gov/air-emissions-inventories/2020-national-emissions-inventory-nei-data

[19] *AP-42: Compilation of air emissions factors from stationary sources*. (2024, February 29). EPA. https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors-stationary-sources.

[20] *U.S. life cycle inventory database*. NREL. https://www.nrel.gov/analysis/lci.html.

Table 2 CAP Emission Factors

Fuel	CAP Emission Factors (lb/MMBtu)				
	NH_3	NO_X	$PM_{2.5}$	SO_2	VOCs
Fuel Oil	0.0073	0.1313	0.0155	0.0016	0.0052
Natural Gas	0.0194	0.0910	0.0004	0.0006	0.0053
Propane	0.0005	0.1465	0.0004	0.0006	0.0057
Electricity	0.0011	0.0317	0.0031	0.0110	0.0041

To estimate CAP emissions associated with changes in residential fossil fuel combustion due to heat pump installation, we first estimated CAP emissions at a high spatial granularity using a combination of American Community Survey (ACS) data published by the U.S. Census Bureau,[21] NEI data published by EPA,[22] and state-level energy consumption estimates for the residential sector published by EIA.[23] To calculate the CAP emissions factors specific to each onsite fossil fuel combustion type, we divided NEI-reported total CAP emissions quantities from the residential sector for each fuel type at the state-level by EIA-reported state-level energy consumption of each fuel type by the residential sector. NEI data was used to calculate the fuel emissions factors, rather than using AP-42 factors directly, because using the AP-42 factors did not align with pollutant volumes published by NEI. Using NEI data to calculate fuel emissions factors is also preferred by the EPA in its eGRID analysis.[24] We then applied these emission factors, represented as tons of pollutant per unit of energy consumption for each fuel type, to the energy savings impacts we modeled using ResStock.

To estimate the CAP emissions from changes in residential electricity consumption due to heat pump installation, we employed a similar process. First, we calculated forward-looking CAP emissions factors for electricity generation using CAP emissions quantities reported by the 2020 NEI, annual electricity generation figures reported by the EIA, and NREL's electric grid forecasting model Cambium. The NEI reports CAP emissions quantities associated with different fuel types from electricity generation locations throughout the U.S. We summarized these at the state, fuel source, and pollutant level. We divided these totals by the total annual electricity generation figures published by EIA. The baseline emissions factors represent the tons of pollutants associated with each kWh of generation in the present day.

Then, to adequately capture the impact that a decarbonizing electricity sector will have on CAP emissions, we used grid forecast scenarios from Cambium. We chose the grid forecast associated with a 95% carbon-free grid by 2050, which models an increase in solar and wind electricity production and an associated fall in both greenhouse gases and CAPs. Cambium publishes the estimated generation by energy source per state through the year 2050. We used this generation forecast to calculate how the emissions factor for each state would change through 2038 (representing the approximate life span of a heat pump that is installed in 2023). We calculated the adjusted emissions factor by weighting each fuel's emissions factor by the forecasted electricity generation from that fuel in each year, to arrive at an aggregate emissions factor for electricity generation in each state. Finally, we translated state level emissions factors to EPA's eGRID subregions, which were developed to minimize the import and export of electricity outside state

[21] US Census Bureau. (2023, August 16). *American community survey data*. Census.gov. https://www.census.gov/programs-surveys/acs/data.html.

[22] *National emissions inventory (NEI)*. (2023, May 26). U.S. EPA. https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei.

[23] *RECS (Residential Energy Consumption Survey)*. (n.d.). U.S. Energy Information Administration (EIA). https://www.eia.gov/consumption/residential/reports.php.

[24] *Estimating Particulate Matter Emissions for eGRID*. (2020). eGRID. https://www.epa.gov/sites/default/files/2020-07/documents/draft_egrid_pm_white_paper_7-20-20.pdf.

boundaries to reflect the fact that electricity demand in one state may not be fully met by generation within that state.

e. Reference Case Scenario

Program emissions reductions are calculated as incremental reductions resulting from deployment of heat pumps. This bottom-up analysis did not use a top-down reference case scenario for fossil fuel residential space heating and water heating emissions in the New England states. However, the analysis used NREL's Cambium as a reference case to model electricity-sector emissions impacts from heat pump deployment. Another source that could be used for reference case scenario analysis is NREL's SLOPE Scenario Planner, which gives estimates in a business-as-usual case projection for electricity supply and energy demand sectors, incorporating the potential impacts of the Inflation Reduction Act. The electricity generation mix evolves over time based on existing policies and default market and technology assumptions. From this modeling, the residential sector across the five states in the coalition would emit 116 MMTCO_2e annually in 2030, and 84 MMTCO_2e annually in 2050 (for the entire residential sector). However, this estimate was not used for modeling the projected emissions reductions of the Accelerator.

f. Measure-Specific Activity Data and Implementation Tracking Metrics

Through reporting from contractors and distributors, and collaboration with local community groups and governments, the regional implementer will track installations incentivized by the midstream program that are completed across the region, in each state and in LMI households and communities. The implementer will also track measure installations through the Innovation Hub and participation in workforce development programs.

g. GHG and Co-Pollutant Emissions Reduced

Based on the methods and assumptions provided throughout this Technical Appendix, implementation of the New England Heat Pump Accelerator is estimated to reduce **2,221,128** MTCO_2e cumulatively from 2025-2030, and **10,450,512** MTCO_2e cumulatively from 2025-2050. Table 3 shows the cumulative GHG emission reductions for both 2025-2030 and 2025-2050 in total and by Hub. Table 4 shows the cumulative GHG emission reductions for 2025-2030 and 2025-2050 by state and in total across the coalition.

Table 3 Cumulative GHG Emission Reductions for Market and Innovation Hubs

Priority Measure	Cumulative GHG Emission Reductions (MTCO_2e)	
	2025-2030	2025-2050
New England Heat Pump Accelerator	2,221,128	10,450,513
Market Hub	1,700,577	8,001,299
Innovation Hub	520,550	2,449,214

Table 4 Cumulative GHG Emission Reductions for New England Heat Pump Accelerator by State

State	Cumulative CO_2e Savings (2025-2030, MT)	Cumulative CO_2e Savings (2025-2050, MT)
CT	459,821	2,111,152
MA	238,586	1,084,709
ME	86,514	369,719
NH	735,428	3,558,355
RI	700,779	3,326,578
Total	2,221,128	10,450,513

Table 5 shows the average annual criteria air pollutant (CAP) and hazardous air pollutant (HAP) reductions estimated for the 2025-2030 period by state and across the coalition.

Table 5 Average Annual CAP and HAP Reductions for New England Heat Pump Accelerator by State, 2025-2030

State	Average Annual Emissions Reductions Per Year, 2025-2030 (kg)				
	NH_3	NO_x	$PM_{2.5}$	SO_2	VOCs
CT	4,758	63,234	5,633	280	2,457
MA	3,164	26,806	1,960	-1,325	750
ME	671	9,650	730	104	415
NH	6,752	116,658	9,922	-604	4,660
RI	8,948	89,156	6,999	747	3,917
Total	24,294	305,504	25,244	-799	12,199

Table 6 shows the monetized health impacts savings from reducing CAP emissions across the coalition, calculated as described in Section b.

Table 6 Annual Monetized Health Impacts from CAP Emissions Reductions, 2025-2030

		Cases, Annual		Dollars, Annual	
Health Endpoint	**Pollutant**	**Low**	**High**	**Low**	**High**
Total Mortality	$PM_{2.5}$ | O_3	1.61	2.57	$23,483,181	$37,513,604
Infant Mortality	$PM_{2.5}$	0.005	0.005	$74,274	$74,274
Hospital Admits, All Respiratory	$PM_{2.5}$ | O_3	0.17	0.17	$4,119	$4,119
Emergency Room Visits, Respiratory	$PM_{2.5}$ | O_3	2.27	2.27	$3,689	$3,689
Emergency Room Visits, Asthma	O_3	0.01	0.01	$10	$10
Asthma Onset	$PM_{2.5}$ | O_3	6.44	6.44	$491,072	$491,072
Asthma Symptoms	$PM_{2.5}$ | O_3	1,046	1,046	$264,514	$264,514
Lung Cancer Incidence	$PM_{2.5}$	0.06	0.06	$2,881	$2,881
Nonfatal Heart Attacks	$PM_{2.5}$	0.62	0.62	$52,375	$52,375
Cardiac Arrest, Out of Hospital	$PM_{2.5}$	0.01	0.01	$792	$792
Emergency Room Visits, All Cardiac	$PM_{2.5}$	0.24	0.24	$517	$517
Hospital Admits, Cardio-Vascular Disease	$PM_{2.5}$	0.13	0.13	$3,645	$3,645
Hospital Admits, Alzheimer's Disease	$PM_{2.5}$	0.83	0.83	$18,667	$18,667
Hospital Admits, Parkinsons Disease	$PM_{2.5}$	0.07	0.07	$1,754	$1,754
Stroke Incidence	$PM_{2.5}$	0.05	0.05	$3,452	$3,452
Hay Fever/Rhinitis Incidence	$PM_{2.5}$ | O_3	41.7	41.7	$46,412	$46,412
Minor Restricted Activity Days	$PM_{2.5}$	661	661	$83,060	$83,060
School Loss Days	O_3	432	432	$733,406	$733,406
Work Loss Days	$PM_{2.5}$	112	112	$35,295	$35,295
Total Health Effects from $PM_{2.5}$				$13,085,864	$27,116,288
Total Health Effects from O_3				$12,142,978	$12,142,978
Total Health Effects				**$25,228,841**	**$39,259,265**

Table 7 provides annual GHG emission reductions estimated by state in the coalition for the 2025-2050 period. Due to the assumed average measure lifetime of 15 years, annual emissions reductions from the Accelerator peak in 2040 and then are assumed scale down to zero by 2044.

Table 7 Annual MTCO2e Emissions Reductions by State

State	2025	2026	2027	2028	2029	2030
CT	0.00	31,675.43	64,189.35	97,651.94	132,275.99	134,027.81
MA	0.00	15,893.46	32,804.95	50,644.98	68,997.35	70,245.02
ME	0.00	6,225.69	12,388.84	18,529.42	24,695.95	24,673.93
NH	0.00	49,403.28	100,539.50	153,452.78	211,502.28	220,530.54
RI	0.00	44,726.31	93,247.71	145,562.63	204,394.63	212,847.86
Total	0.00	147,924.18	303,170.36	465,841.75	641,866.21	662,325.16

State	2031	2032	2033	2034	2035	2036	2037
CT	135,331.54	136,575.47	137,945.29	139,390.31	140,785.48	142,966.11	144,908.88
MA	70,745.02	71,209.88	71,685.99	72,256.09	72,731.11	73,273.90	73,897.67
ME	24,669.54	24,665.62	24,659.68	24,655.01	24,650.15	24,641.92	24,633.76
NH	225,516.74	228,822.07	233,234.38	237,044.58	240,413.17	243,953.57	248,559.46
RI	215,937.38	218,893.46	221,717.43	224,695.93	226,979.86	228,817.04	230,856.85
Total	672,200.22	680,166.50	689,242.78	698,041.92	705,559.76	713,652.54	722,856.62

State	2038	2039	2040	2041	2042	2043	2044
CT	146,549.96	148,206.98	150,011.74	113,630.17	76,463.41	38,566.10	0.00
MA	74,453.51	75,024.04	75,686.41	57,254.12	38,493.35	19,412.05	0.00
ME	24,623.04	24,612.33	24,595.94	18,417.02	12,260.94	6,120.50	0.00
NH	252,119.80	255,628.50	259,655.25	197,135.55	133,360.01	67,483.39	0.00
RI	232,571.89	234,601.80	236,279.26	177,218.11	118,151.18	59,078.48	0.00
Total	730,318.20	738,073.64	746,228.61	563,654.96	378,728.89	190,660.51	0.00

State	2045	2046	2047	2048	2049	2050	2045
CT	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ME	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NH	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RI	0.00	0.00	0.00	0.00	0.00	0.00	0.00