CAPITAL DISTRICT
Regional
Planning
Commission

CAPITAL REGION COMPREHENSIVE CLIMATE ACTION PLAN

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TABLE OF CONTENTS

Introduction 2

Capital Region Climate Action Collaborative 6

Baseline GHG Emissions & Progress to Date 9

A. 2022 Greenhouse Gas Inventory 9

B. Emissions Reductions 2010 - 2022 10

Quantified Mitigation Measures 13

GHG Reduction Targets 26

Projected GHG Emissions 2022 - 2050 27

A. Near-term (2035) - Potential for 21% Reduction 29

B. Long-term (2050) - Potential for 68% Reduction 30

Benefits Analysis 31

Implementation 34

Monitoring and Tracking Progress 40

Appendix 41

A. GHG Methods 41
B. Benefits Estimates Methods 49
C. Clean Energy Public Input Survey 52
D. Workforce Analysis 56
E. List of Acronyms 66

INTRODUCTION

On August 3, 2023, the Albany-Schenectady-Troy, NY Metro Area, led by the Capital District Regional Planning Commission (CDRPC), was awarded a Climate Pollution Reduction Grant (CPRG) from the U.S. Environmental Protection Agency. This award is one of four awards made to New York State Metropolitan Statistical Areas and one of five grants awarded in the state of New York (New York State secured the 5th award). Through this grant, CDRPC led the development of the first ever climate action plan for the Capital Region, which covers Albany, Schenectady, Saratoga, Rensselaer, Columbia, Warren, Washington, and Greene Counties.

The Capital Region CCAP is the culmination of an extensive engagement process that involved working across multiple levels of government to gather meaningful community input to develop the measures included in this plan. This CCAP provides the Capital Region with an actionable roadmap for voluntary climate action. It establishes near-term and long-term GHG goals and projections, identifies a broad range of GHG reduction measures across all economic sectors, assesses co-benefits for all communities, implementation authority, implementation strategies, and workforce needs.

Professional assistance was provided by Climate Action Associates. Additional assistance was provided by Planning4Places, LLC.

Why mitigate GHG emissions?

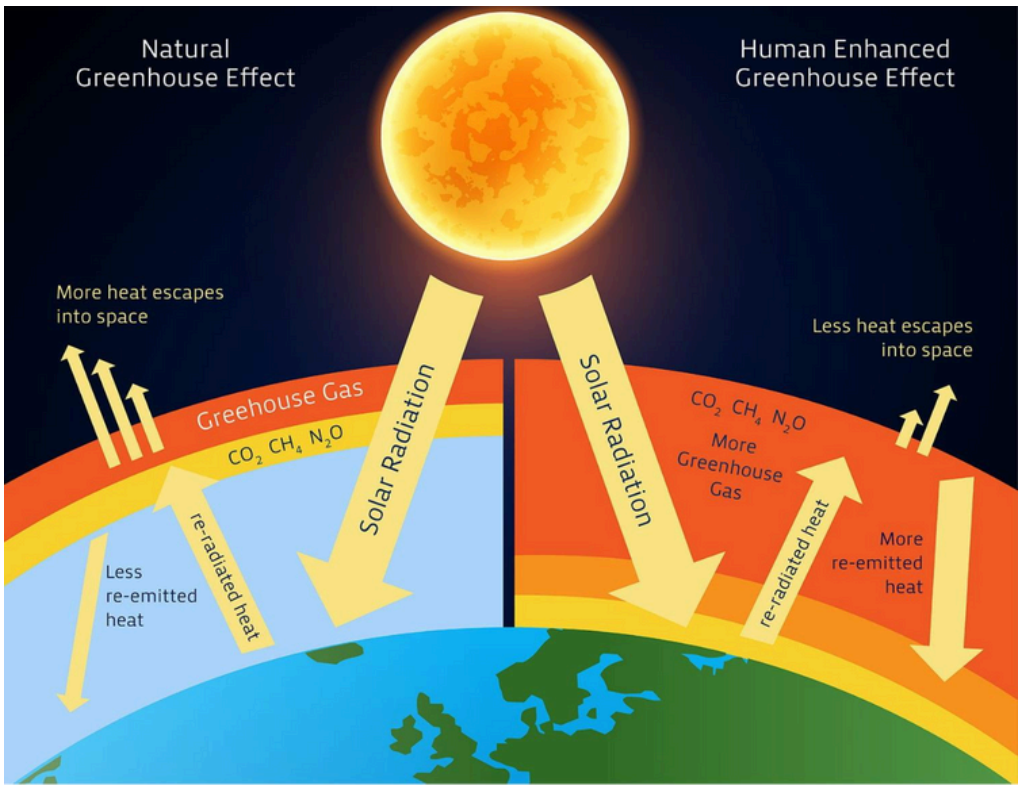


Diagram demonstrating the greenhouse effect
Source: ai, S. "Why Is The World Warming: An Introduction to Climate Change and Impact of Food." What's Up in Science? March 2021

The Earth's atmosphere includes a mix of gases that regulate the Earth's surface temperature. Heat and sunlight pass through these atmospheric gases through shortwave energy (visible and ultraviolet light). The Earth's surface absorbs this energy, warming the surface temperature before re-radiating back into the atmosphere as longwave infrared radiation. Greenhouse gases in the atmosphere trap a portion of this outgoing longwave radiation, re-emitting the energy in all directions, including back toward the surface of the Earth, leading to additional warming of the Earth's surface temperature. This natural process, known as the greenhouse effect, keeps the planet warm enough to support life. However, human activities have significantly increased the concentration of these gases, intensifying the greenhouse effect and contributing to global climate change.

Global Warming Potential (GWP) is a way of measuring how much heat is trapped in the atmosphere compared to carbon dioxide over 100 years. Comparing the GWP of different gases helps understand the contribution to climate change of each gas, often identified as CO_2-equivalent in calculations. The table below outlines the primary greenhouse gases, including their GWP values, atmospheric lifetimes, and typical sources.

Gas	Source	Global Warming Potential (100 years)	Approx Lifetime
Carbon Dioxide (CO_2)	Fossil Fuels (coal, oil, gas), deforestation	1	Centuries
Methane (CH_4)	Agriculture (livestock), landfills, oil and gas operations, wetlands	approx. 25	~12 years
Nitrous Oxide (N_2O)	Agricultural fertilizers, industrial activities, and fossil fuel combustion	approx. 300	>100 years
Water Vapor (H_2O)	Natural evaporation and transpiration	-	Days
Ozone (O_3)	Smog and natural processes in the stratosphere	Variable	Weeks to Months
Fluorinated Gases (HFCs, PFCs, SF_6, NF_3)	Industrial processes, refrigerants, and electronics manufacturing	Hundreds to >10,000	Decades to Millenia

Source: IPCC AR6 2021 Values, 100-Year Time Period

Mitigation refers to the reduction or prevention of excess greenhouse gases into the atmosphere to limit global warming and therefore avoid dangerous environmental effects, such as extreme weather, sea level rise, and ecosystem collapse. Mitigation is important for several reasons. First, more emissions lead to increased warming. Scientific consensus has determined that exceeding 1.5°C of warming above pre-industrial levels will result in irreversible feedback loops and more frequent environmental impacts. These impacts include extreme weather events (hurricanes, wildfires, heat waves, and floods) and sea level rise. Mitigating emissions lessens the intensity of these events. Another reason to mitigate emissions is to protect the Earth's ecosystems and biodiversity. Mitigation helps preserve habitats, prevent species extinction, and maintain natural systems that support human life such as food production, clean water, and fresh air. Economic cost is another motivating reason to mitigate emissions as the long-term economic costs of inaction far exceed the investment required for mitigation. Examples of higher costs that are incurred include rebuilding damaged buildings and infrastructure, medical care, and escalating insurance premiums. Additionally, emissions mitigation improves air quality, thus improving public health from reduced exposure to air pollution.

The Capital Region has experienced extreme weather events such as multi-inch flash flood events, record-breaking heat waves, multi-hazard winter storms, as well as flooding and damage due to severe storms such as Tropical Storm Irene in 2011, Hurricane Sandy in 2012, and Tropical Storm Ida in 2021. While individual weather events cannot be definitively attributed to climate change, global climate data indicates a correlation between increased atmospheric GHG levels and the frequency and intensity of severe weather events. Human activities have significantly contributed to the increased concentrations of greenhouse gases in the atmosphere, largely due to the combustion of fossil fuels, deforestation, and industrial processes. Mitigation seeks to address these root causes by reducing GHG emissions through a transition to clean energy sources, greater efficiencies, and alternative means of production. Because the root cause of warming is actionable and directly related to human activities, these causes can be directly addressed. This report outlines recommended voluntary mitigation measures to help drive this transition and guide the Capital Region toward a more resilient, sustainable, and low-carbon future.

Images, from top left:
2011, Flooding along Miller Road in South Bethlehem. (Jordan Carleo-Evangelist/Times Union);

2011, Flooding in Guilderland, NY (Philip Kamrass / Times Union);

2012, Downed traffic light (Teresa Buckley/Times Union);

2011, Downed tree (Philip Kamrass / Times Union)

Sources | **Why mitigate emissions?**

Greenhouse Gas Protocol. IPCC Global Warming Potential Values. https://ghgprotocol.org/sites/default/files/2024-08/Global-Warming-Potential-Values%20%28August%202024%29.pdf

IPCC. "Climate Change 2021: The Physical Science Basis." IPCC, 2021, www.ipcc.ch/report/ar6/wg1/.

US Department of Commerce, NOAA. "ESRL Global Monitoring Laboratory - Education and Outreach." Gml.noaa.gov, gml.noaa.gov/education/carbon_toolkit/.

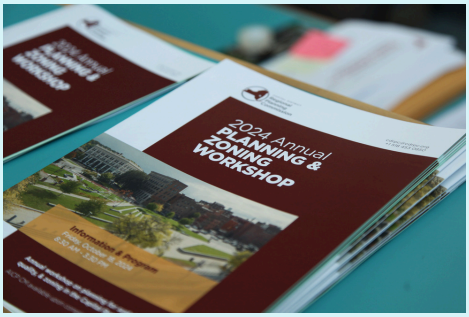
CAPITAL REGION CLIMATE ACTION COLLABORATIVE

Regional Engagement

This CCAP was developed with extensive regional stakeholder engagement. CDRPC assembled a municipal climate leadership team to guide the overall engagement and plan development. Regional sector-specific work groups were created to help develop and review the GHG reduction measures. The CCAP GHG reduction measures were developed by collecting and building off the many GHG reduction measures and policies currently utilized by regional stakeholders. The CCAP is intended to serve as a container for the climate action strategies embraced by the Capital Region. The strategies also support, and are supported by, the New York State's Climate Leadership Protection Act, and NY State programs such as NYSERDA's Clean Energy Communities Program, and NYS Climate Smart Communities Program.

In addition to the sector workgroups, CDRPC held a regional climate action forum at Hudson Valley Community College as part of a daylong municipal planning workshop. An overview of the CCAP process and GHG reduction measures was presented, along with a summary of the key findings of the updated GHG inventory.

Regional Climate Action Forum at the 2024 Annual Planning & Zoning Workshop hosted by CDRPC. Speakers included Todd Fabozzi, Director of Sustainabilty at CDRPC and Jim Yienger, Principal at Climate Action Associates LLC.



Photos: Haley Balcanoff, CDRPC

Also, five county-level workshops were held in which municipalities were invited to presentations of the GHG inventory findings and the draft CCAP mitigation measures. At each workshop, the communities were provided with a municipal input workbook which they could use to comment on the draft CCAP measures, add new measures, and indicate which measures they would like further support to implement. This input was used to refine the measures and to follow up with individual communities to provide support working with them on measures of local interest.

The regional and municipal stakeholders who participated in advisory groups and/or provided feedback using the municipal input workbook, along with the communities that have achieved Clean Energy Communities designation or Climate Smart Communities certification, comprise the Capital Region Climate Action Collaborative. The Collaborative is a voluntary assembly of Capital Region climate leaders undertaking climate action. This plan provides a framework to continue to collaborate regionally, share information among participants, and work together to advance the GHG mitigation measures included in the CCAP

To facilitate municipal and public awareness, a **Capital Region Climate Action Portal** was developed as a companion to this plan, which includes a GHG Inventory Dashboard, GHG Mitigation Measures, and comprehensive visual and spatial documentation of community and municipal climate action to date. The Portal serves as an online clearinghouse for regional climate action data, tools, support, and ongoing implementation and tracking.

Municipal engagement has been key to this plan. This engagement started prior to the commencement of the CCAP through the support CDRPC provided to local municipalities interested in undertaking climate action initiatives. CDRPC's local government outreach and technical assistance, funded through NYSERDA's Clean Energy Communities and NYSDEC's Climate Smart Communities Programs have been instrumental in supporting local clean energy and climate action. Over 60 Capital Region Communities have been provided one-on-one support to become Designated Clean Energy Communities and/or Certified Climate Smart Communities. These same local governments, as part of the Climate Action Collaborative, will continue to play a critical role in the implementation of the GHG Mitigation Measures included in this plan.

The Climate Action Collaborative currently includes:

Regional Agencies	Municipal Partners	Additional Partners
• The Capital Region Transportation Council • The Capital District Transportation Authority (CDTA) • The Affordable Housing Partnership of the Capital Region	Albany County*, City of Albany*, City of Cohoes*, Columbia County*, City of Glens Falls*, Town/Village of Lake George*, City of Saratoga Springs*, Town of Clifton Park*, Schenectady County*, Town of Canaan, Village of Philmont, Town of Taghkanic, City of Hudson, Warren County * Municipal Climate Leadership Steering Committee	Troy Architectural Program, Solarize Capital Region, Capital District Community Energy, South End Community Collaborative, Zero Waste Albany, Center for Economic Growth, Albany County League of Women Voters RADIX Center, Albany County Soil and Water Conservation District, Cornell Cooperative Extensions of Columbia/Greene and Albany Counties.

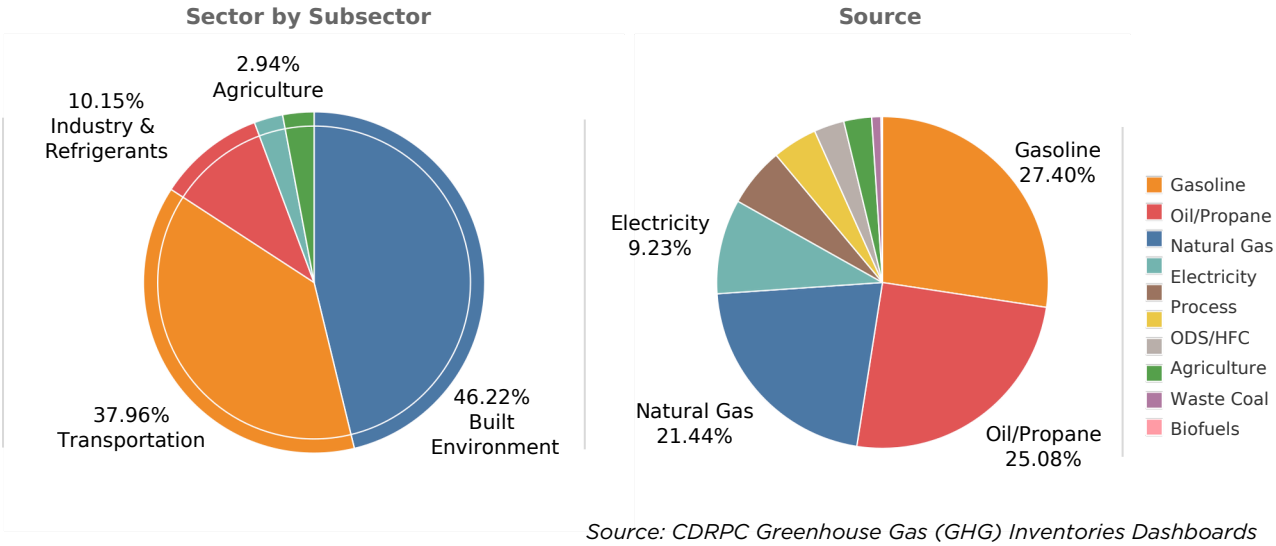
NYSERDA Designation Clean Energy Communities in Capital Region	Albany County, City of Albany, City of Cohoes, City of Glens Falls, City of Hudson, City of Saratoga Springs, City of Schenectady, City of Troy, City of Watervliet, Columbia County, Schenectady County, Town of Ancram, Town of Austerlitz, Town of Ballston, Town of Bethlehem, Town of Canaan, Town of Catskill, Town of Chatham, Town of Claverack, Town of Clifton Park, Town of Colonie, Town of Copake, Town of East Greenbush, Town of Edinburg, Town of Gallatin, Town of Germantown, Town of Ghent, Town of Glenville, Town of Greenville (Greene County), Town of Guilderland, Town of Hebron, Town of Hillsdale, Town of Hunter, Town of Kinderhook, Town of Knox, Town of Lake George, Town of Malta, Town of Nassau, Town of New Lebanon, Town of New Scotland, Town of Niskayuna, Town of Queensbury, Town of Rensselaerville, Town of Saratoga, Town of Stephentown, Town of Stuyvesant, Town of Taghkanic, Town of Westerlo, Village of Altamont, Village of Athens, Village of Castleton-on-Hudson, Village of Catskill, Village of East Nassau, Village of Kinderhook, Village of Lake George, Village of Menands, Village of Philmont, Village of Schuylerville, Village of Valatie, Village of Voorheesville, Warren County
NYS Certified Climate Smart Communities	**Bronze Certified** City of Glens Falls, City of Hudson, City of Saratoga Springs, City of Schenectady, City of Watervliet, County of Albany, County of Columbia, County of Warren, Town of Ancram, Town of Austerlitz, Town of Ballston, Town of Canaan, Town of Chatham, Town of Claverack, Town of Clifton Park, Town of Colonie, Town of Copake, Town of Germantown, Town of Ghent, Town of Hillsdale, Town of Lake George, Town of Queensbury, Town of Taghkanic, Village of Athens, Village of Catskill, Village of Kinderhook, Village of Lake George, Village of Philmont **Silver Certified** City of Albany, Town of Bethlehem, Town of New Lebanon, Schenectady County

BASELINE GHG EMISSIONS & PROGRESS TO DATE

2022 Greenhouse Gas Inventory

To support this plan, CDRPC created a regional GHG inventory at community-scale resolution. The inventory is based on 2022 data and serves as an update and point of comparison with the region's 2010 GHG inventory. A GHG Inventory Dashboard was also created to provide graphic representations of the inventory and the changes that have occurred since the baseline 2010 inventory. The dashboard is available here: CDRPC 2022 Greenhouse Gas Inventory Dashboards (https://cdrpc.org/greenhouse-gas-inventories-dashboards).

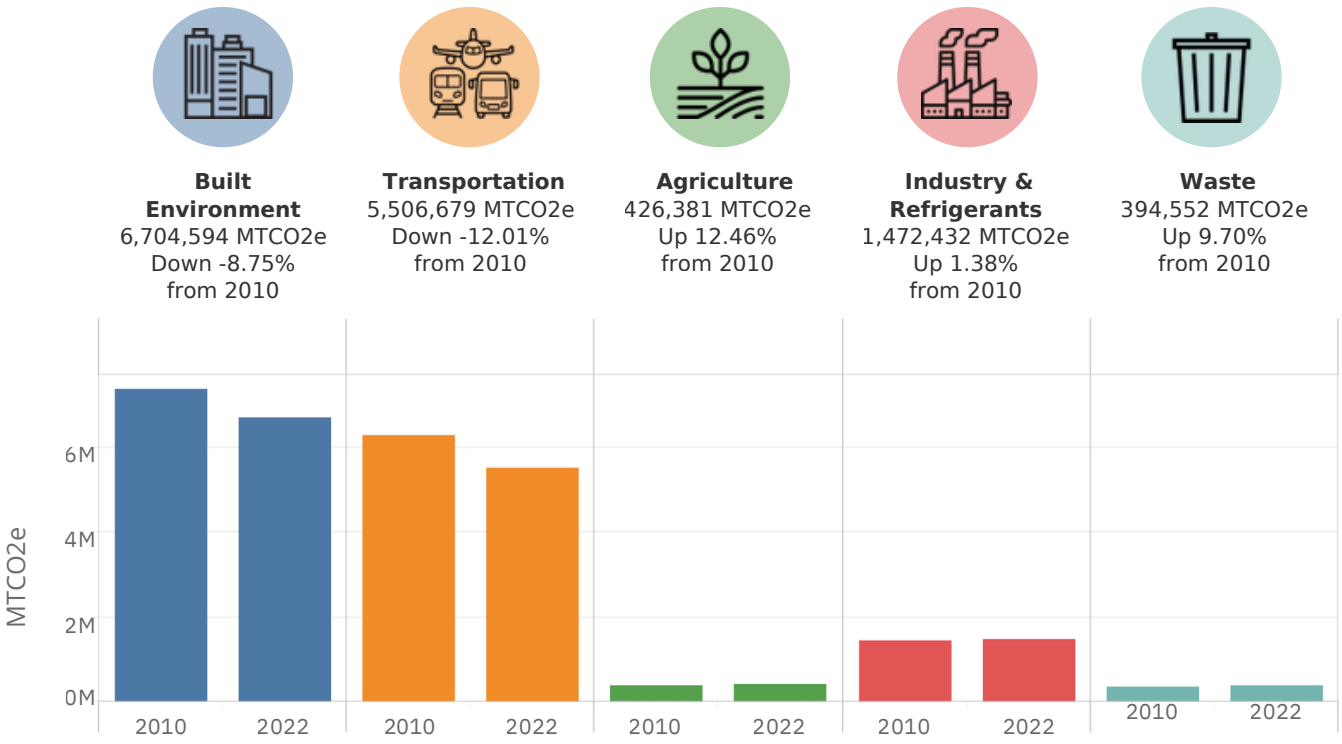
Total GHG Emissions for the 8-County Capital Region: 14,504,638 MTCO2e



Source: CDRPC Greenhouse Gas (GHG) Inventories Dashboards

Emissions Reductions 2010-2022

Change in GHG Emissions from 2010 to 2022 for the 8-County Capital Region



Source: CDRPC Greenhouse Gas (GHG) Inventories Dashboards

In 2010, Capital Region emissions were on an upward trajectory, reaching 15.8 million metric tons of carbon dioxide equivalent (MTCO2e). Under a business-as-usual (BAU) scenario that assumed no major changes in energy-related technologies, vehicle usage, and land use patterns, emissions were projected to rise to 16.3 million MTCO2e by 2050. This plan updates regional progress and reevaluates emissions with 2022 data.

Findings show that total regional emissions declined by 8% between 2010 and 2022, demonstrating that local actions, policy changes, and shifts in energy and transportation trends are beginning to have a measurable impact.

By 2022 GHG emissions fell 8% to 14.5 million MTCO2e. The main driver is "beneficial electrification" (BE) which means replacing fossil fuels with clean electricity-powered technologies such as heat pumps, electric vehicles, and outdoor battery equipment. Although metered electricity use rose by approximately 12.5% during this period, GHG emissions from electricity consumption dropped by 30%. This improvement is largely attributed to New York's Renewable Portfolio Standard and NYSERDA's efforts to add renewable energy sources to the electric grid. Higher electricity demand stems from society's transformation towards power-intensive technologies, the adoption of heat pumps, and to a lesser extent for now, electric vehicles.

This decrease in emissions also took place despite the Capital Region's modest population growth of approximately 33,650 or 3.04% between 2010 and 2022[1], which can place additional pressure on energy use, transportation systems, and waste generation. As for fossil fuels, natural gas usage remained steady, despite some population and economic growth suggesting that alternatives are being considered. Natural gas remained the dominant building energy source because it is convenient and cost effective, and no other alternatives developed during this period were competitive. In contrast, fuel oil and propane declined 10% as electric heat pumps became cost advantageous over oil. This trend has likely increased since 2022 because of more widespread promotion and adoption of heat pumps, especially in markets previously reliant on delivered fuels for heating.

Transportation emissions declined by 12%, driven primarily by improved fleet-average fuel economy of vehicles, according to state and federal data sources. This study did not consider community-by-community differences in vehicle choices, so it is possible that communities and cities with higher-than-average uptake of electric vehicles (EVs) and hybrids will have lower emissions. According to the Capital Region Transportation Council, transportation demand, measured as vehicle-miles-traveled (VMT), grew from 2010-2020. VMT declined sharply during the COVID-19 pandemic to below 2010 levels but has since been rebounding. Although remote work offers potential to reduce VMT permanently, it is not clear if these policies and subsequent reductions will persist or revert to pre-pandemic commuting patterns.

The industrial sector is an important part of the regional economy, representing 15% of emissions, which are approximately the same as in 2010. Emissions in this sector are highly concentrated, with the majority coming from 38 public and private entities that report to state and federal environmental programs. Certain industries, such as cement production, saw a decline in emissions due to industry consolidation and use of cleaner fuels, whereas other industries, like semiconductor manufacturing, grew significantly. In general, the Capital Region industries support energy efficiency initiatives and are retooling for the clean energy economy.

The region's fossil-fuel grid power stations, such as the Bethlehem Energy Center, Athens Generating, and the Empire Power Plant, among others, which generate electricity to send to the grid, saw emissions decline between 2010-2020. However, emissions from these plants have increased in recent years, consistent with statewide energy trends. This rise suggests that the growing demand driven by electrification efforts is outpacing the state's current capacity to integrate clean energy sources into the grid.

The state will need to intensify its efforts to add clean energy capacity, including renewable resources and nuclear power, to continue the electrification benefits documented to date.

Agricultural emissions contribute 3% of emissions regionwide and have remained largely stable since 2010. In agricultural counties and communities, such as parts of Saratoga, Washington, and Columbia Counties, agriculture can represent a significantly higher share of local emissions, ranging from 10% to 30%.

Waste emissions remain at 3% overall, but increased by 10% from 2010 due to increasing waste, per-capita, sent to landfills and population growth. Recycling declined by 15% according to NYSDEC's 2023 New York Solid Waste Management Plan despite efforts to expand recycling, organics diversion, and landfill gas capture. Additional factors that limited progress may include economic growth, higher volumes of consumer and packaging waste, delays in implementing large-scale composting programs and inconsistent participation in waste diversion initiatives across municipalities.

Footnotes | **Emissions Reductions 2010-2022**

[1] U.S. Census Bureau. "Total Population." American Community Survey, ACS 5-Year Estimates Detailed Tables, Table B01003, https://data.census.gov/table/ACSDT5Y2022.B01003?q=b01003&g=050XX00US36001,36021,36039,36083,36091,36093,36113,36115. Accessed Jul 2025.

QUANTIFIED MITIGATION MEASURES

A series of 67 sector-based GHG mitigation measures have been developed for this plan with input from a broad spectrum of regional stakeholders and sector experts. The measures included are primarily existing measures currently embraced within the region. They represent a variety of best practices that may be effective in reducing greenhouse gas emissions. Not all measures are suitable at every scale or for every community. Therefore, local governments, organizations, businesses, and individuals will need to evaluate and select the measures that are most viable and appropriate for their specific circumstances.

Built Environment

Measure	Description	Authority to Implement	Potential GHG Reductions (MTCO2e/year)	
			By 2035	By 2050
Efficient Equipment & Weatherization	Incentivize building envelope insulation efforts and energy efficient purchases by supporting investments in certified energy-efficient appliances, heating and cooling equipment, lighting, and building products to replace older less efficient equipment. Support programs for end-use energy efficiency measures such as building envelope insulating, mold abatement, asbestos removal, and hazard remediation in existing government-owned, educational, commercial, industrial, and residential buildings.	State and Local Governments	233,299	1,166,494
Transition to Clean Heating and Cooling Systems	Install air and ground source heat pumps in residential and commercial buildings to reduce demand for natural gas and fuel oil. Invest in low emissions refrigerant alternatives in industries such as hospitals, grocery stores and ice rinks.	State and Local Governments, and Communities	311,220	1,649,321
Electrification Readiness	Prepare for implementation of clean energy through investments in insulation and envelope improvements, and electric service upgrades for air and ground source heat pumps, on-site renewables, battery storage, and EV charging.	State and Local Governments, and Communities	62,034	466,598

Built Environment

Measure	Description	Authority to Implement	Potential GHG Reductions (MTCO2e/year)	
			By 2035	By 2050
Expand Local Renewable Generation through Land Use & Energy Planning	Identify and expand renewable power generation opportunities such as solar, energy storage, and anaerobic power generation through enhanced coordination with utility companies, NYSERDA, and municipalities, land use and zoning policies that support solar and energy storage systems.	Local Governments, Developers, Commercial Sector	78,067	312,268
Clean Energy Supply Access	Promote clean Energy Policies and Programs such as Community Choice Aggregation and cost-effective clean energy supply choices.	Local Governments	22,339	55,849
Energy Performance, Standards and Codes	Adopt and enforce advanced energy codes.	Local Governments	9,332	18,664
Microgrids and Thermal Loops	Identify and implement thermal loop systems to leverage ground source geothermal and heat recovery from municipal wastewater and steam systems.	Local Governments	9	61
Rental Housing Energy Initiative	Develop a comprehensive program in partnership with housing advocates, developers, landlords, and municipalities to build or upgrade rental housing that provides tenants with clean, healthy, and affordable energy.	Local Government, NYSERDA, Housing Authorities	27	84
Expand Grid Capacity & Enhance Utility Partnerships	Perform local energy capacity studies and encourage utilities, New York State, and the PSC to create funding mechanisms for interconnection costs and substation upgrades for renewable energy.	State and Local Government, Utilities, and the PSC	not quantified	not quantified
Increasing Local Climate Action Planning	Engage municipalities, ports, airports, and other public entities to develop community and government climate action plans.	Local Governments	not quantified	not quantified

Built Environment

Measure	Description	Authority to Implement	Potential GHG Reductions (MTCO2e/year)	
			By 2035	By 2050
Education and Training Initiatives	Increase land use, zoning, and building literacy through targeted education on issues such as energy, building science, smart land use planning, and on-the-job training programs/workforce development.	Local Governments, Universities, Businesses	not quantified	not quantified

Transportation

Measure	Description	Authority to Implement	Potential GHG Reductions (MTCO2e/year)	
			By 2035	By 2050
Shift to Zero Emission Vehicles in Communities	Provide support to consumers and fleet operators to purchase or lease new medium- and heavy-duty zero-emissions vehicles and/or fueling infrastructure. Encourage municipal-led planning that supports electric vehicles.	Local Governments, Community Groups, Businesses	287,480	2,643,805
Enhance Optimized Application of Zero Emissions Transit Services	Invest in zero-emissions transit vehicles, power sources and storage strategies, in-field/ on-route transit vehicle charging infrastructure, and other support investments needed to eliminate emissions from transit services.	CDTA	29,045	64,240
Invest in Zero Emissions Municipal Fleets	Transition light, medium, and heavy-duty fleets to appropriate zero-emission platforms and prepare to replace vehicles as options become available on the market.	Local Governments, CDTA	29,354	67,523
Support Ridesharing & Carpooling	Reduce single occupancy vehicles on the road by providing financial incentives to encourage travelers to commute using shared rides/carpooling and taxi services to reduce VMT in the region.	CDTA, Transportation Council, Local Governments, Businesses	136,322	340,805

Transportation

Measure	Description	Authority to Implement	Potential GHG Reductions (MTCO2e/year)	
			By 2035	By 2050
Shift Off-Road Vehicles and Equipment to Alternative Fuels	Create incentives for alternative fuel and advanced vehicle technologies for off-road vehicles and equipment.	Local Governments, Transportation Council, Community Groups, Businesses	29,794	184,802
Shift Single Occupancy Vehicle Trips to CDTA Through Increased and Improved Services	Fund projects and plans to expand CDTA services to lower-polluting modes and reduce single occupancy vehicle dependency. Current service options include fixed route and commuter bus services, CDPHP Cycle! bikeshare, DRIVE zero-emission carshare, Flex micro transit, and vanpool.	CDTA, Transportation Council, Employers, Residents.	34,081	85,201
Support Electric Micro-Mobility Adoption in Communities	Encourage increased implementation of e-bikes, e-scooters and the support infrastructure through incentives and appropriate policy. Introducing options for direct purchase or reimbursements to local governments and mobility operators to build and install charging infrastructure, including mobility assistance devices.	CDTA, Transportation Council, Local Governments, Residents	20,448	51,121
Encourage Smart Growth	Plan future development and implement land use codes to encourage infill, compact development, transit-oriented and transit-supportive development, and new paved trails throughout the region. Plan for and support non-vehicular infrastructure investments in road projects that add, or enhance the safety of, pedestrian and bicycle infrastructure.	Local Governments, Community Groups, Residents	56,233	281,164
Implement Advanced Traffic Management Technologies	Use advanced data-driven management and monitoring technologies such as real time travel information and optimization to improve traffic flow, reduce idling, and efficient parking options.	CDTA and Transportation Council	49,606	248,029

Transportation

Measure	Description	Authority to Implement	Potential GHG Reductions (MTCO2e/year)	
			By 2035	By 2050
Shift to Low Emission Port & Airport Operations	Provide incentives for the development and purchase of alternative fuel and advanced vehicle technologies for off-road port vehicles and marine vessels, airport operations vehicles and aircraft.	Port of Albany, Albany County Airport Authority	500	1,500
Support Mobility Hubs for People and Goods	Invest in multi-modal transportation hubs to improve accessibility and efficiency for transit, bicycle/pedestrian, and shared mobility services and modes. Improve freight connectivity through the development of new intermodal freight facilities throughout the region.	CDTA	not quantified	not quantified
Invest in Training to Support Zero-Emission Technologies	Invest in workforce training, such as an educational facility for transit and public fleet maintenance and operations education, as well as battery fire and other new technology safety training needs.	CDTA, Transportation Council, Local Colleges and Universities	not quantified	not quantified
Increase Grid Capacity and Energy Supplies	Coordinate with utilities, NYSERDA, and the Public Service Commission to invest in local transmission capacity upgrades necessary to electrify planned public sector fleet electrification initiatives and bring about broader adoption of EVs.	Utilities	not quantified	not quantified

Waste

Measure	Description	Authority to Implement	Potential GHG Reductions (MTCO2e/year)	
			By 2035	By 2050
Increase Organic Waste Composting and Diversion	Reduce solid waste by creating community and government programs to promote residential, commercial, and industrial composting, including food scraps.	Local Governments, Businesses, Community Groups, Residents	76,440	203,841

Waste

Measure	Description	Authority to Implement	Potential GHG Reductions (MTCO2e/year)	
			By 2035	By 2050
Recover Climate-Harmful Refrigerants (benefits rolled up under Industrial Sector)	Implement measures to reduce leakage and ensure recovery and recycling of hydrofluorocarbon (HFC) based refrigerants. Manage and track refrigerants in GHG inventories.	Local Governments, Businesses	21,299	340,785
Recover Energy from Managed Waste Streams (benefits rolled up under Built Environment Sector)	Develop energy source waste streams from farms, industrial food facilities, and wood products industries. Consider anaerobic digestion or other clean technologies to generate power, or to create energy products such as renewable natural gas or wood pellets.	Industry, Agriculture, Commercial Food Businesses	41,375	165,498
Reduce Emissions from Open and Closed Landfills	Increase emissions reductions through improved landfill management, gas recovery, flaring, and energy generation at open landfills. Evaluate the region's numerous closed landfills and reduce passive methane emissions from vents. Repurpose closed landfills for solar development or for other public benefit.	Local Governments	24,480	48,959
Promote Low-Emissions Wastewater Treatment Plant Operations	Promote fully aerobic treatment processes to reduce methane emissions and consider using dried contaminant-free biosolids for fertilizer applications. When using aerobic digestion to reduce sludge volume, recover methane as an energy source or flare it.	Local Governments	10,485	26,212
Promote Waste-Smart Clean Energy Development	Eliminate harmful forever-chemicals in clean energy products and projects and consider lifecycle emission impacts. Include decommissioning and recycling strategies in all energy projects to avoid stranded assets and environmental hazards in the future.	Local Governments, Community Groups, Businesses	not quantified	not quantified

Waste

Measure	Description	Authority to Implement	Potential GHG Reductions (MTCO2e/year)	
			By 2035	By 2050
Move Toward a Zero-Waste Economy	Create integrated sustainable supply chains that reduce GHG emissions and waste. Evaluate all product consumption streams and replace disposable products with those designed to be reusable.	Local governments, Industry, Businesses, Agriculture, Community Groups	not quantified	not quantified
Leverage Waste to Create Carbon Sequestration	Use industrial wood waste and other suitable feedstock to produce biochar as a sustainable soil amendment to increase permanent carbon sequestration.	Wood products Industries	not quantified	not quantified
Reduce Emissions from Septic Systems	Inventory and evaluate methane emissions from septic systems and develop strategies to reduce them such as connecting to public sewers or introducing aeration into tanks.	Local Governments, Community Groups	not quantified	not quantified

Agriculture

Measure	Description	Authority to Implement	Potential GHG Reductions (MTCO2e/year)	
			By 2035	By 2050
Use Anaerobic Digestion to Generate Energy from Methane	Coordinate a centralized digester to manage manure from the region's larger dairy operations.	Industrial / Large Farms	4,140	12,420
Nutrient Management - Manure	Apply manure to promote aerobic decomposition and avoid methane generation while in storage.	Industrial / Large Farms	26,055	65,137

Agriculture

Measure	Description	Authority to Implement	Potential GHG Reductions (MTCO2e/year)	
			By 2035	By 2050
Fertilizer Alternatives / Efficiency / Crop Rotation / Production Efficiency	Use alternatives to nitrogen fertilizers with cover cropping and crop rotation. Increase productivity per acre, while simultaneously improving soil health and increasing sequestration.	Industrial / Large Farms	11,859	23,718
Energy Production in Agriculture Land (benefits rolled up under Built Environment Sector)	Optimize use of low-productivity farmland for solar and wind. Use techniques to integrate crops and commodities on land with solar.	Industrial / Large Farm	13,800	27,601
Energy Efficient Farm Operations	Utilize government and utility incentives and programs to increase energy efficiency of farm buildings and vehicles.	All Sizes Farms	4,140	20,701
Alternative Proteins Production	Develop commodity crops that provide an alternative to animal protein.	Industrial / Large Farms	2,605	5,211
Methane Emissions Reduction from Livestock Operations	Reduce lagoon emissions by flaring and coverage during storage. Use feedstock supplements to reduce enteric fermentation in livestock.	All Sizes Farms	1,215	3,038
Cover Crops	Use select cover crops to hold soil, sequester carbon, and add nitrogen to the soil.	Small / Medium Farms	2,372	5,929
Local Food Networks, Local Agricultural Land Protection	Reduce dependency on imported food with local food networks. Promote community supported agriculture (CSA) and foster local connectivity with farmers markets, logistics businesses, and technology that connects customers to farms. Coordinate with institutions and schools to pilot healthy local foods.	Associations / Collaboratives	not quantified	not quantified

Agriculture

Measure	Description	Authority to Implement	Potential GHG Reductions (MTCO2e/year)	
			By 2035	By 2050
Farmland Protection	Protect farmland to ensure local food supplies using policy tools such as tax credits, conservation easements, open space purchases and smart growth development.	County and Local Governments	not quantified	not quantified
Enhance Agricultural Soil Sequestration	Add biochar to soils to increase permeability, drainage, and sequestered carbon.	All Sizes Farms	not quantified	not quantified
Agroforestry	Integrate trees and shrubs with crops and/or livestock. Utilize Alley Cropping (growing crops between rows of trees), Silvo-pasture (integrating trees with livestock and pasture) Forest Farming (cultivating shade-tolerant crops under a forest canopy) Riparian Buffers (planting trees and shrubs along waterways to protect water quality and provide habitat) and Windbreaks (using trees and shrubs to reduce wind speed and protect crops and livestock).	All Sizes Farms	not quantified	not quantified
Urban Agriculture	Encourage community gardens in urban settings, including urban food forests.	Local Governments, Community Groups, Residents	not quantified	not quantified

Industry

Measure	Description	Authority to Implement	Potential GHG Reductions (MTCO2e/year)	
			By 2035	By 2050
Energy Efficiency - Operations	Implement energy efficiency measures to reduce GHG emissions in facilities and operations	Businesses	35,855	71,710

Industry

Measure	Description	Authority to Implement	Potential GHG Reductions (MTCO2e/year)	
			By 2035	By 2050
Energy Efficiency - Manufacturing	Implement energyefficiency measures to reduce GHG emissions in manufacturing processes	Businesses	53,782	161,347
GHG Management Policy	Developing GHG inventories and reducing carbon as company policy	Businesses	2,151	4,303
Carbon Disclosure Policy	Participation in state, federal, or international carbon disclosure and management networks	Businesses	24,607	49,213
Alternative / Low Carbon Fuels	Replace fossil fuels with low carbon biofuels, hydrogen, mixed fuels, clean waste to energy, etc.	Businesses	215,129	430,258
Electrification	Replacing fossil fuels energy with electricity for both heating and cooling, but also for process and industrial manufacturing.	Businesses	36,309	72,618
Intelligent / Smart Industrial Systems	Use data driven, technology, and artificial intelligence (AI) to improve existing processes, or develop new ones.	Businesses	13,189	26,378
Logistics Efficiency	Study and reduce GHG emissions across industry, transport and logistics.	Businesses	25,769	51,539
Clean Energy Systems	Implement thermal energy networks, geothermal, solar, and other renewables in building and industrial parks.	Businesses	10,756	43,026
Product Lifecycle GHG Emissions	Analyze and implement ways to reduce GHG emissions associated with products, processes, or services throughout the entire life cycle, from raw material extraction to product creations to disposal or recycling.	Businesses	not quantified	not quantified
Energy Efficiency Industries	Expand and develop industries to supply additional energy efficient products and services to meet regional climate plan goals.	Businesses	not quantified	not quantified
Renewable Energy Industry	Expand and develop industries to supply low carbon biofuels, hydrogen, mixed fuels, clean waste to energy.	Businesses	not quantified	not quantified

Industry

Measure	Description	Authority to Implement	Potential GHG Reductions (MTCO2e/year)	
			By 2035	By 2050
Electrification Industry	Expand and develop industries to support and supply electrification products and services to meet regional climate goals.	Businesses	not quantified	not quantified

Land Sequestration

Measure	Description	Authority to Implement	Potential GHG Reductions (MTCO2e/year)	
			By 2035	By 2050
Natural Resource Conservation	Encourage forest and wetland management. Implement programs to encourage public and private landowners to protect, manage and expand natural lands to enhance sequestration.	Local and State Governments	not quantified	not quantified
Reforestation	Inventory and evaluate land uses and encourage conversion of unused lands or marginal lands to forests.	Local and State Governments	not quantified	not quantified
Urban Forestry	Develop tree inventories and master plans and increase tree planting in communities.	Local Governments	not quantified	not quantified
Carbon Stock Inventory and Planning	Add carbon stock as a component of Natural Resources Inventories to understand how much carbon is held in lands relative to annual emissions and to further understand the value of land conservation.	Local and State Governments	not quantified	not quantified
Sequestration-Smart Land Use Development	Adopt cluster-style development and conservation subdivision techniques in rural areas to protect natural resources and preserve agricultural and forested lands. Utilize green infrastructure practices to reduce sequestration loss, protect water quality and reduce flooding in settlements.	Local Governments	not quantified	not quantified

Land Sequestration

Measure	Description	Authority to Implement	Potential GHG Reductions (MTCO2e/year)	
			By 2035	By 2050
Sustainable Land Use	Develop smart growth land use plans that create compact, connected settlement patterns. Focus development in and around existing infrastructure, employment centers and services. Develop natural resource inventories, open space plans, farmland protection and forest master plans that protect undeveloped areas around urban centers.	Local Governments	not quantified	not quantified

Sustainable Land Use Planning

Many of the measures identified in this plan involve technological solutions, such as heat pumps, solar photovoltaics, electric vehicles and battery storage. However, local governments also have the authority to shape their physical form over time into more sustainable patterns through comprehensive planning, subdivision and zoning regulations. There are various approaches to development that are less carbon-intensive and can be addressed with these tools. Municipalities can create sidewalk and bikeway plans and require new development to contribute towards their implementation. Communities are often more desirable, healthier, and have higher real estate values and higher appreciation rates when people can safely walk and bike. Local governments can plan for and create other public spaces such as nature trails, community parks, ballparks, and neighborhood "pocket parks". Municipalities and developers can create public plazas where people can comfortably congregate. Plazas can be publicly owned and managed, managed through a Business Improvement District (BID), or they can be required with new development over a certain threshold, in which a percentage of the space is accessible to the public.

These approaches are most successful when communities have compact and connected cores and relatively undeveloped peripheries. Most older cities and villages are compact and connected with a mix of land uses, and the successful ones have continued to nurture the vibrancy that comes from these attributes. The challenge in newly developing areas is to apply land use practices that create key nodes with these characteristics. This may include targeting development in existing hamlets so they transition into villages, shaping suburban patterns through connections and infill development, purchasing and/or protecting undeveloped areas on the periphery of developed areas to create greenbelts and forest preserves (which sequester carbon) and protect and maintain farming and rural character outside targeted growth areas, and upzoning in key development areas to allow for more intensive development and more efficient infrastructure investments.

Land Sequestration

Measure	Description	Authority to Implement	Potential GHG Reductions (MTCO2e/year)	
			By 2035	By 2050
Sequestration-Smart Energy Development	Focus renewable energy projects on marginal lands to minimize loss of green spaces that provide carbon sequestration. Utilize agri-voltaic techniques that sustainably coexist with active farming.	Local Governments	not quantified	not quantified
Develop Sequestration Industries	Develop agriculture and forestry businesses that support sequestration processes and techniques. Examples include biochar, wood products, and wood energy products.	Local Business	not quantified	not quantified

GHG Reduction Targets

This plan includes the following aspirational GHG reduction targets from 2010 levels:

Short-Term Reduction Target

20% by 2035

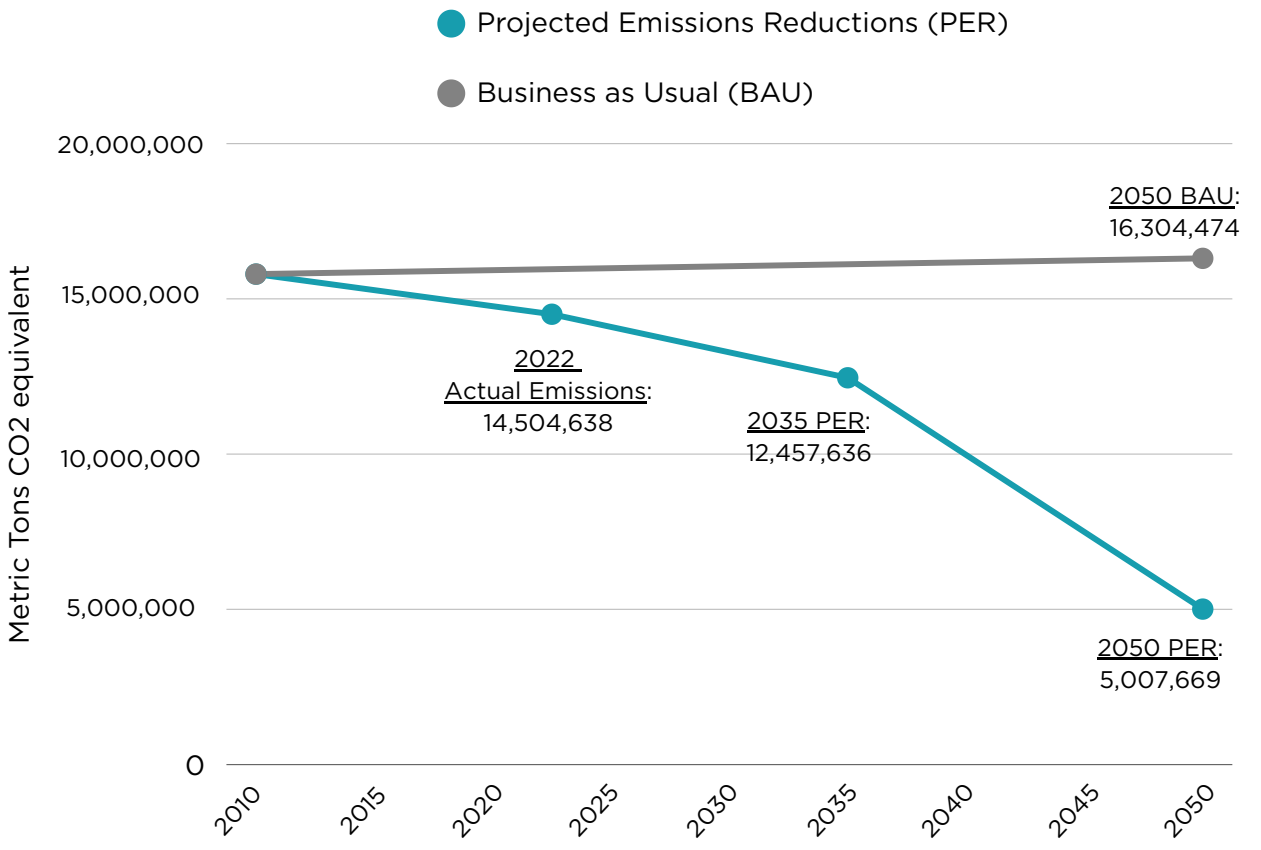
Long-Term Reduction Target

65% by 2050

PROJECTED GHG EMISSIONS 2022-2050

Voluntary implementation can create significant climate progress to meet the 2035 and 2050 targets. The 2035 projection (21% decline) is based on historical climate action trends and realistic expectations for measure adoption. The 2050 projection (68% decline) illustrates the potential for deep emissions reductions, assuming widespread implementation of the GHG mitigation measures included in this plan, along with the continued addition of clean energy sources to the electric grid.

GHG Emissions Projections



PROJECTED GHG EMISSIONS 2022-2050

GHG Reduction Target Scorecard		
	Emissions (MTCO2e)	**Reduction**
GHG Inventory Baseline	15,797,146	-
Current Emissions (2022)	14,504,638	8%
Projected (2035) - Feasible	12,457,636	21%
Projected (2050) - Ambitious	5,007,669	68%

Near-term (2035) - Potential for 21% reduction

The 2035 emissions forecast is achievable and realistic, as it continues the trend of proven emission reductions from 2010-2022 and anticipates a modest acceleration moving forward. There has been a significant increase in interest in sustainability by state and local governments, educational and medical institutions, and industries. Many local governments participate in NYS DEC's Climate Smart Communities and in NYSERDA's Clean Energy Communities programs and are now shifting focus to community-wide solutions and awareness campaigns.

Since 2022 there has been a clear momentum towards wider adoption of heat pumps and electric vehicles. While natural gas usage is expected to continue growing awareness of indoor air quality impacts from fine particulate matters ($PM_{2.5}$) and state policies aimed at reducing hidden gas subsidies are increasing pressure to reduce reliance on fossil fuels. Affordable housing projects are starting to incorporate high efficiency, net zero-emission buildings utilizing heat pumps. Communities are implementing weatherization programs and electrification readiness efforts to prepare buildings for heat pumps, and cities such as Albany and Troy are exploring thermal energy networks (TENs) as a natural gas alternative.

In the agriculture sector, there is strong interest in not only reducing emissions, but increasing carbon sequestration in agricultural and natural soils as a climate solution. Some local collaborations, such as the Columbia County Climate Smart Communities Task Force, are highly focused on agriculture and are working with research institutions such as Bard College to improve agricultural emissions accounting. This team is developing models to simulate carbon sequestration from land management practices that promises to scale region-wide.

Local manufacturing industries are investing in carbon capture and storage, green hydrogen, and low carbon fuels, and are adopting international Environmental and Social Governance (ESG) commitments.

Projected greenhouse gas (GHG) savings from the Waste Management sector in New York are expected to be driven by a combination of state and federal policies, infrastructure investments, and regulatory shifts. At the state level, key initiatives include the Food Donation and Food Scraps Recycling Law (2022), the New York State Solid Waste Management Plan (2023–2032), and the Climate Leadership and Community Protection Act (CLCPA). These efforts collectively support the expansion of organics diversion, composting, landfill methane capture, and—critically—waste reduction at the source. Preventing waste from being generated in the first place delivers the greatest climate benefit, avoiding upstream emissions from material extraction, production, and transportation. Additionally, the U.S. Environmental Protection Agency (EPA) is implementing stricter landfill methane regulations, further targeting emissions reductions at their source.

Federal shifts in priorities and incentives may create headwinds, though New York has shown no signs of slowing incentives for climate action. It is possible that the region will exceed the forecast, especially if heat pumps become cost-competitive with natural gas and if electric vehicles (EVs) exceed 25% of sales. This forecast assumes that the state can add enough renewable energy to the grid to keep carbon intensity unchanged.

Long-term (2050) - Potential for 68% reduction

By 2050, local and regional actions have the potential to reduce emissions by 68% below 2010 levels to 5 million MTCO2e/year. This level of reduction helps support New York State's goal of achieving 80% reduction of gross emissions by 2050. This goal is ambitious and assumes widespread adoption of the 67 mitigation measures in this plan. It also requires state-level leadership and coordination, particularly through partnerships with the Public Service Commission and utilities to develop carbon-free sources for electricity generation. In addition, natural gas use in households and most businesses would have to transition to electric heat pumps, and zero-emission vehicles would have to replace combustion engines for most uses.

Beyond reducing emissions, achieving 68% reduction will also require increased carbon sequestration. This plan identifies eight land-based sequestration measures that enhance soil and ecosystem health while storing carbon. These include practices such as land preservation, reforestation, improved soil management, and sustainable land use planning, which also support climate resilience and regional economic efficiency. Looking forward, carbon stock management – the idea that communities should count sequestered carbon and manage it as an asset – will become as important for climate planning as tracking emissions.

BENEFITS ANALYSIS

GHG Savings Since 2010 (MTCO2e/year)				
Sectors	Measures	Current-2022	By 2035	By 2050
Built Environment	11	643,411	771,502	3,862,436
Transportation	13	751,898	672,862	3,968,191
Industry	13	(20,653)	438,847	1,251,176
Waste Management	9	(34,904)	111,405	279,012
Agriculture	13	(47,245)	52,386	136,154
Sequestration - Removals	8	643,411	-	-
Total	67	751,898	2,047,002	9,496,969

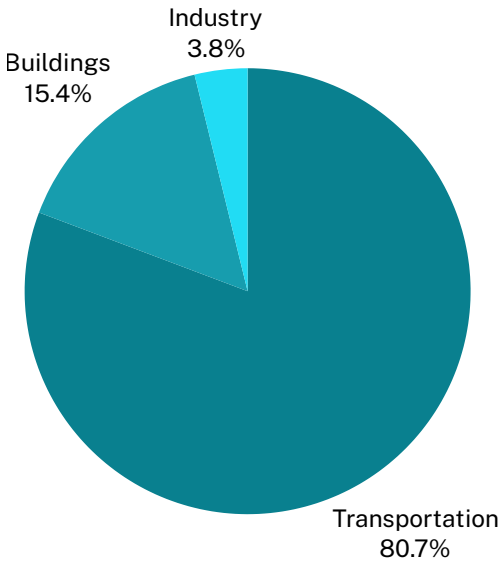
Co-Benefits

Climate Action improves air quality by reducing air pollution emissions from fossil fuel use in the transportation and built environment sectors. There are two types: Criteria Air Pollutants (CAPs), which creates smog and acid rain, whereas Hazardous Air Pollutants (HAPs) are human-toxic emissions such as lead and mercury.

To estimate CCAP co-benefits, total CAP and HAP emissions reported by EPA's National Emissions Inventory from fossil fuels were compared to regional GHG emissions from the same fuels and sectors. Applying these ratios to GHG benefits of reduction measures provides a reasonable approach for estimating air pollution co-benefits. (For detailed Criteria Air Pollution Methodology and data, see Appendix B.)

The analysis finds that the majority of air pollution co-benefits will be realized by reducing emissions from the on-road and off-road transportation sectors.

Criteria Air Pollutants (CAPs): Co-Benefits by Sector



	Criteria Air Pollutants (tons)								HAPs
CCAP Measures Sector	**All**	**NOx**	**SOx**	**VOC**	**CO**	**PM10**	**PM2.5**	**AM**	**All**
Transportation	27,345	3,513	21	1,724	21,308	451	148	180	659,581
Buildings	5,225.93	299	14	2,063	1,290	1,033	338	189	12,400
Industry	1,296.59	74	3	512	320	256	84	47	3,076

Co-Benefits Summary			
	Current-2022	**By 2035**	**By 2050**
CAP* Exposure Avoided (tons)	3,947	6,252	33,867
HAPs* Exposure Avoided (lbs.)	73,038	115,673	675,057
Energy Savings (MMBTU)	127,975,972	4,957,827,015	7,851,927,043
Energy Cost Savings ($)	$367,915,385	$582,683,654	$2,756,756,286

**Criteria Air Pollutants (CAPs)* are a group of air pollutants that the U.S. Environmental Protection Agency (EPA) has identified as common, widespread, and harmful to public health and the environment. They include Particulate Matter (PM10 and PM2.5), Ground-Level Ozone (O_3), Carbon Monoxide (CO), Sulfur Dioxide (SO_2), Nitrogen Dioxide (NO_2), Lead (Pb)[1]*

**Hazardous Air Pollutants (HAPs)*, are toxic air pollutants known or suspected to cause serious health effects such as cancer, reproductive effects, birth defects, or adverse environmental impacts. There are currently 147 HAPs listed under the Clean Air Act.[2]*

Footnotes | **Co-Benefits Chart**

[1] EPA. "Criteria Air Pollutants | US EPA." US EPA, 29 Jan. 2019, www.epa.gov/criteria-air-pollutants.

[2] US EPA. "Initial List of Hazardous Air Pollutants with Modifications." US EPA, 16 Dec. 2015, www.epa.gov/haps/initial-list-hazardous-air-pollutants-modifications.

IMPLEMENTATION

The GHG mitigation measures identified in this plan offer a variety of climate actions that can be undertaken by Capital Region stakeholders to reduce emissions and potentially lower costs. Businesses, including farms, often benefit financially by implementing their own efficiencies, and introducing products and processes that are better for their bottom line and better for the environment. A key constituent of CDRPC, and the central focus of this plan, are local governments. These entities play a dual role: they can take direct action to reduce emissions from their own operations and adopt policies, regulations, and programs that influence emissions from residents, businesses, and institutions within their jurisdictions. In addition, local governments are uniquely positioned to educate and support their communities, fostering climate literacy and participation. Examples of direct municipal actions include upgrading to LED streetlights, adding electric vehicles to municipal fleets, installing heat pumps in public buildings, expanding solar energy generation, and improving energy efficiency in facilities and infrastructure. Local governments can influence community-wide emissions by supporting community campaigns that promote heat pumps, solar, and electric vehicles. Communities can also invest in EV infrastructure and adopt climate smart building and land use codes.

This plan offers a toolbox of voluntary actions that individuals, businesses, organizations and municipalities may choose to undertake. It embraces ingenuity and the technological evolution that will help implement better energy, heat and cooling, and transportation options. A clean utility grid is critical to this plan and to the functioning of our modern society. New energy demands brought on by data centers, cryptocurrency, advanced microchip manufacturing and artificial intelligence call for the diversified and resilient energy portfolio, including nuclear power, to ensure energy is always available at reasonable cost. While solar energy is the fastest-growing energy source, it cannot meet the region's needs alone. This plan supports an all-of-the-above option. And over time, market forces, policy leadership, and community values will guide the adoption of the most effective and sustainable technologies.

Sources, from Left: Chris Reohr (NYSERDA), Haley Balcanoff (CDRPC), Village of Kinderhook

Local Government Implementation Support

Regional municipalities can participate in grant and recognition programs that help them adopt clean energy technologies, reduce greenhouse gas emissions, lower operational costs, and contribute to broader climate goals. Two key programs supporting this work are **NYSERDA's Clean Energy Communities (CEC) Program** and **DEC's Climate Smart Communities (CSC) Program**. The Climate Smart Communities Program, coordinated by the NYS Department of Environmental Conservation, supports municipalities in reducing greenhouse gas emissions and building climate resilience. Communities progress through certification levels—Bronze and Silver—by completing a wide range of actions related to mitigation, adaptation, and climate justice. Administered by NYSERDA, the CEC Program was launched in 2016 to incentivize municipal climate leadership through match-free grants. Municipalities earn points and funding by completing High-Impact Actions such as upgrading to LED streetlights, purchasing electric vehicles, electrifying municipal fleets, and improving building energy performance. Since its launch, over $9 million in match-free CEC grants have been awarded to Capital Region communities.

CDRPC will utilize the framework of the NYSERDA Clean Energy Communities and NYSDEC Climate Smart Communities programs, along with funding support from the EPA CPRG program, to provide outreach and technical support to Capital Region municipalities seeking to advance climate action. CDRPC outreach coordinators will contact all Capital Region municipalities to raise awareness of the CCAP and the support services available. Upon request, the coordinators will provide one-on-one assistance to help communities understand their emissions profiles, develop local climate action plans and/or undertake individual mitigation measures.

In addition, our coordinator team will conduct an analysis of CSC certification actions undertaken across the region. This assessment will be used to track regional progress, identify gaps, and serves as a tool to encourage additional community participation.

CDRPC has been assisting local governments with climate actions since 2012 through its support of both the CSC and CEC Programs. In this way, implementation of the CCAP has been underway even prior to its formal development, rooted in local actions taken under these state-supported programs. This CCAP builds on the region's existing foundation of climate action with an integrated climate action plan framework. The 67 comprehensive mitigation measures included in the plan provide local governments with a ready-to-use menu of best practices to choose from as well as a GHG inventory dashboard that allows communities to easily understand and extract their baseline emissions data.

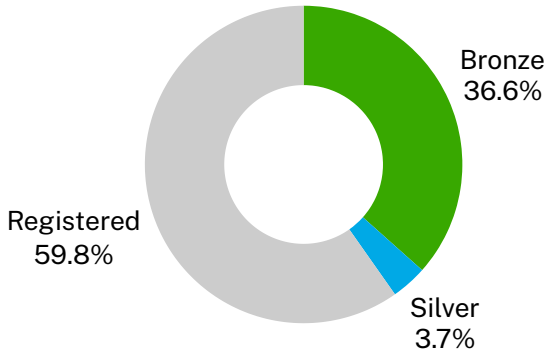
The Capital Region has proven to be a leader in addressing the critical issues associated with climate change. We are a region made up of forward-thinking communities, the majority of which have already taken significant steps to reduce emissions and build a more sustainable future. 61 communities are Designated Clean Energy Communities, 32 are Registered Climate Smart Communities, and 32 are Certified Climate Smart Communities. This represents 47% of the region's communities engaged in at least one state climate program. Our ongoing collaboration with communities in voluntary climate action is what the CCAP implementation is built on.

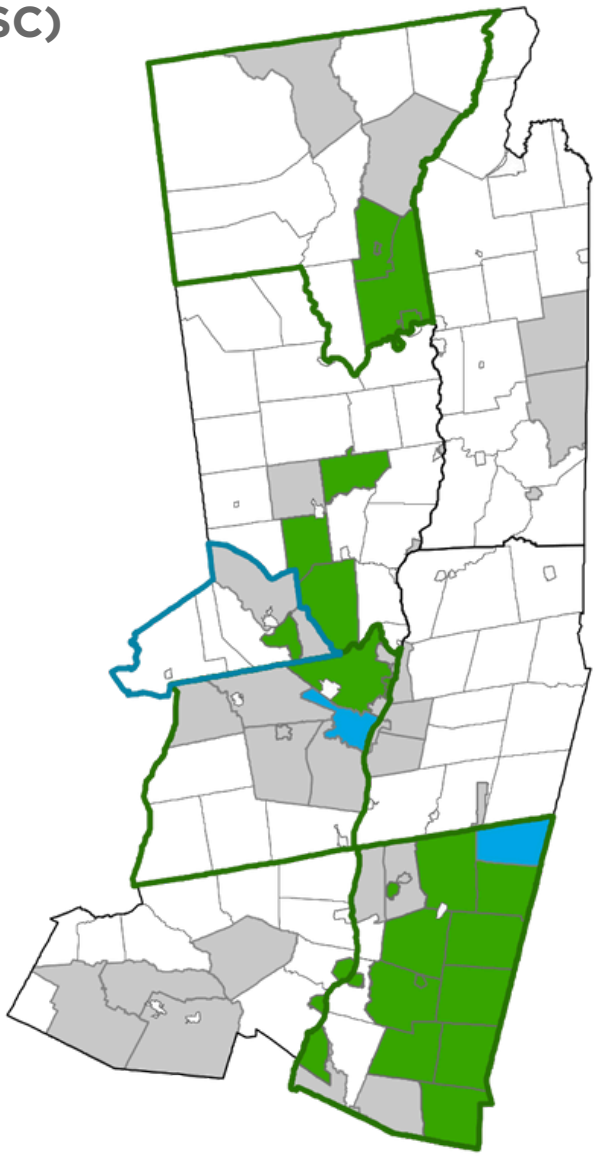
Climate Smart Communities (CSC) Registrations and Certifications

2025

82

Communities Participating in CSC





County

- Bronze Certified
- Silver Certified
- Registered

City/Town/Village

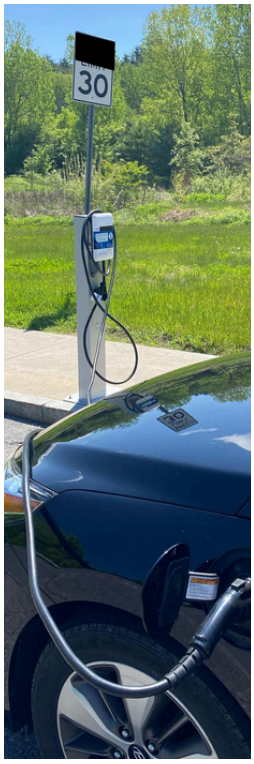
- Bronze Certified
- Silver Certified
- Registered

NEW YORK STATE | Climate Smart Communities

Source: NYS DEC, as of May 2025

The City of Albany earned Silver Certification in 2025. Photo of Jason West, City of Albany, Dazzle Ekblad and Grace Brennan of NYS DEC, and Tara Donadio of CDRPC. *Photo: Mara-Louise Shea (NYS DEC)*

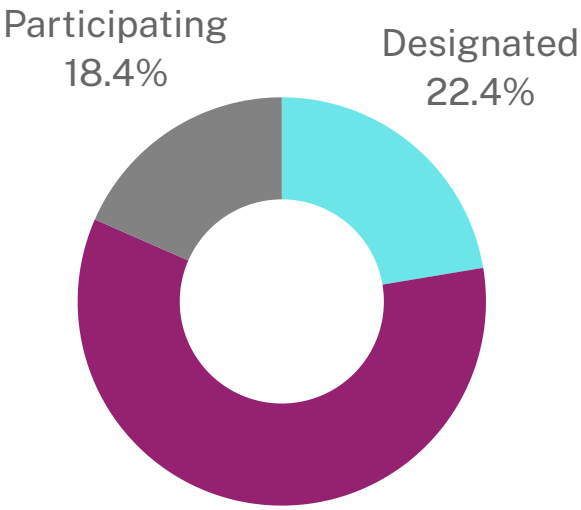
Clean Energy Communities (CEC)
2025



$9,082,150

Total Grants Awarded for Clean Energy Projects

County	Grants Awarded
Albany	$2,999,650
Columbia	$3,482,500
Greene	$230,000
Rensselaer	$317,500
Saratoga	$545,000
Schenectady	$1,045,000
Warren	$432,500
Washington	$30,000



76 Communities Participating in CEC

619 Actions Completed

NEW YORK STATE | Clean Energy Communities

Photos:
Town of Lake George Charging Station, Town of New Lebanon Battery Backup System, Town of Austerlitz Heat Pumps, Columbia County Solar Array

Community-Wide Implementation Support

Achieving the Capital Region's climate goals depends on empowering individuals, families, small businesses, farms, and nonprofits to take action. A wide range of New York State and federal programs now provide the tools, funding, and support needed to help residents and business owners reduce emissions, improve energy efficiency, and transition to clean energy.

The Capital Region Clean Energy Hub, coordinated by community-based partners and supported by NYSERDA, serves as a central, trusted resource to connect residents and small businesses with available clean energy programs and services. The Hub offers free, personalized assistance to help people understand their options for improving home energy efficiency, installing solar panels, switching to heat pumps, accessing electric vehicle incentives, and more. Special attention is given to ensuring equity and access for underserved households and small businesses that may otherwise face barriers to participation.

For homeowners and renters, the EmPower+ Program provides no-cost energy assessments and upgrades—including air sealing, insulation, and high-efficiency heat pumps—for income-qualified households. Additional state programs, such as Solar for All, NY-Sun solar incentives, and Clean Heat rebates help reduce upfront costs and expand access to renewable and efficient energy. Meanwhile, EV adoption is supported through NYSERDA's Drive Clean Rebate, which offers up to $2,000 off the purchase or lease of a new electric vehicle, and through funding for home and public EV charging infrastructure.

Small businesses and farms can benefit from NYSERDA's Small Business Financing Program, which helps fund energy-saving upgrades and clean technology installations. Rural enterprises may also qualify for the USDA's Rural Energy for America Program (REAP), which offers grants and guaranteed loans for renewable energy systems and energy efficiency improvements. In addition, Property Assessed Clean Energy (PACE) financing is available in parts of the region, enabling property owners to finance upgrades through long-term, low-interest property tax assessments. The City of Glens Falls, City of Saratoga Springs, City of Schenectady, City of Troy, City of Hudson, Columbia County, Albany County and Schenectady County have all adopted Open C-PACE.

Federal programs significantly expanded under the Inflation Reduction Act (IRA) of 2022 have offered robust support for energy upgrades, including tax credits for solar, battery storage, heat pumps, and rebates of up to $14,000 for eligible households. For electric vehicles, the IRA includes tax credits of up to $7,500 for new EVs and $4,000 for used EVs, helping to accelerate vehicle electrification and reduce transportation emissions. And while recent shifts in federal priorities have reduced or eliminated funding for climate action, future congressional support could reinstate these types of incentives to help support ongoing climate action and a more sustainable future.

The Northern Border Regional Commission's State Economic and Infrastructure Development Program also offers an opportunity for eligible communities to secure up

to $1 million in funding for clean energy and infrastructure projects that support economic development and climate resilience.

The Capital Region Transportation Council and the Capital District Regional Planning Commission (CDRPC) support a collaborative technical assistance program aimed at helping communities within Albany, Schenectady, Rensselaer and Saratoga Counties advance local projects that resonate with the regional transportation plan. Eligible project categories include, but are not limited to, Comprehensive/Neighborhood Planning, Community Design Assessment, General Community Planning, Land Use Planning and Implementation, Data Collection, Data Analysis and Mapping, Recreation Trail Planning, Transportation Safety and Operations Planning, and Zoning and Site Planning.

MONITORING AND TRACKING PROGRESS

The Capital Region Climate Action Portal provides an interactive graphic look at how communities across Albany, Columbia, Greene, Rensselaer, Saratoga, Schenectady, Warren, and Washington Counties are advancing climate action through local leadership and regional coordination.

Developed as a companion to the Capital Region Climate Action Plan, this resource documents the actions undertaken by the Capital Region Climate Action Collaborative. The Portal includes a Greenhouse Gas Inventory Dashboard with emissions data by sector across the eight counties, graphics, maps and visual illustrations of the region's movement toward shared emissions reduction goals such as solar development and EV adoption, and case studies real-world projects and local leadership in action. The Portal also shows municipal engagement in New York State programs and the grants obtained for clean energy implementation.

In addition to documentation of the region's progress in implementing the CCAP, the portal will also serve as a tool for ongoing tracking of the region's progress in implementing the GHG mitigation measures identified in this plan. The portal will be updated quarterly or as new projects and data become available. A yearly CCAP report card will be developed, posted on CDRPC's website, and shared regionally, to publicize the region's progress in implementing this plan.

To access the Capital Region Climate Action Portal, visit:
https://cdrpc.org/capitalregionclimateactionportal

APPENDIX

A. 2022 GHG Inventory Methods

Regional, county, and municipal Level GHG Inventories for all 167 counties, cities, towns, and villages in the Capital Region Regional Economic Development Council (REDC) region.

OVERVIEW

The Capital District Regional Planning Commission (CDRPC) previously published the 2010 Regional GHG Emissions Inventory for NYSDEC's 2015 Community and Regional GHG Inventory Guidance (2015 CRIG).[1] The current 2022 Regional GHG inventory is based on that methodology, allowing for assessment of changes over time. This report summarizes current methods used to obtain activity data, highlighting modifications and changes from the 2015 guidance that were introduced for 2022.

Global Warming Potentials – IPCC vs the NY Climate Act
The New York Climate Leadership and Community Protection Act (CLCPA) adopted changes to GHG emissions protocols from those used in 2010. The CLCPA:

- Adopts 20-year global warming potentials (GWPs) for GHGs, instead of the international standard 100-year GWPs adopted by the IPCC.
- Includes biogenic emissions in GHG emissions totals as Scope 1.
- Adds lifecycle emissions to fossil fuels to account for upstream extraction and transport emissions.

The 2022 GHG Inventory includes the Intergovernmental Panel on Climate Change (IPPC) framework. The IPPC framework permits an easier comparison with the 2010 baseline. A future update will include the CLCPA protocol as a toggle.

The most significant differences between the two protocols include an increase in the contribution of methane from agriculture, waste management, and natural gas usage in buildings. While other GHGs are less impacted, the 20-year GWP for methane is three times larger than the 100-year potential. It will increase the impact of closed landfills that were previously excluded from the inventory. The change will also increase emissions in rural communities that use wood-based biofuel burning for heat, as those emissions were excluded under IPCC rules.

Electricity Emissions Factors
The Inventory uses 2022 EPA Emissions and Generation Resources Integrated Database (EGRID) grid-average emission factor for the upstate New York region.[2]

METHODS REVIEW

GHG Emissions Accounting – GHG Scopes
A GHG emissions inventory is a collection of GHG emission sources from activities happening in the region or community. Each source is classified by scope:

- Scope 1: Emissions that physically occur inside the regional or community boundary.
- Scope 2: Emissions attributed to community electricity consumption from the mix of power plants that serve the upstate New York energy grid.
- Scope 3: Emissions happening elsewhere but attributed to activities happening

inside the region or community boundary.

APPENDIX

Scope 3 is used to ensure communities share responsibility for some GHG sources, and Scope 1 and 3 can describe the same source. For example, landfill emissions are recorded as Scope 1 in the communities that have them (e.g., Albany and Colonie). The inventory would also assign Scope 3 emissions to reflect their share based on how much waste they generate and send to landfills. Scope 3 can also be used to add lifecycle emissions. For example, the CLCPA adds a Scope 3 GHG footprint to fossil fuel combustion emissions (recorded as Scope 1) to account for emissions upstream from extraction, processing, and transport of the fuels.

GHG Emissions Accounting Framework

GHG Sector	
Built Environment	All Energy-related emissions in the residential, commercial, industrial, and power generation Sectors
Industrial Process and Product Use (IPPU)	Non-energy related GHG emissions from using GHGs as products (like refrigerants), or from industrial processes that create emissions as a non-combustion byproduct.
Waste Management	Both solid waste, and wastewater-related emissions.
Transportation	Emissions from transportation-related fuels in all on-road and off-road vehicles and equipment across all modes of travel (road, rail, marine, and air)
Agriculture, Forestry, and Land Use (AFOLU)	Agricultural emissions from livestock and soil practices, and emissions removals or emissions from land uses including forests and urban trees.

Built Environment

Residential / Commercial

Retail Electricity Sales and Natural Gas

Per the 2015 CRIG, the inventory takes consumption for each sector from the Utility Energy Registry (UER) [3] for cities, towns, and villages for 2022. This database covers major utilities. If communities are served by non-UER-publishing-entities (e.g., municipal utilities or cooperatives) then data is developed from annual reports to the public service commission.

Some data is missing or withheld in the UER for privacy concerns. The inventory completed data in the following order:

- If data is missing for the inventory year, but available for surrounding years, the missing year is an average of surrounding years; or,
- If data is missing for specific months, then the inventory is calculated using an average of surrounding months, or using the value of the same month in surrounding years; or,
- If the number of accounts is available but not consumption, then that number is multiplied by the average per-account consumption of that sector across communities of similar type (cities, towns, villages); or,
- If no methods above are possible, then consumption is estimated using the methods described for non-utilities fuels described below.

Fuel Oil (#1, #2, #4, #6), Propane/LPG, Coal, Wood, and Wood Residuals

The inventory estimates consumption using state consumption totals reported by the UER DOE State Energy Data System (SEDS)[4], which is then allocated into counties and communities using the census and employment data described below.

Residential Data

Per the 2015 CRIG, the inventory allocated SEDS NY residential consumption to communities based on the communities' statewide share of housing units that heat with the fuel from the American Community Survey (ACS).

Because "households" live in different structures that consume energy differently (e.g., houses vs apartments), community household counts are normalized to an equivalent number of single-family units (called "Effective" housing units or EHUs) based on average energy used. Single-family houses, for example, use twice the amount of energy than apartments in multifamily buildings. New to 2022, the inventory validated ACS household heating fuel counts against the number of utility residential electricity accounts reported to the UER.

Commercial Data

The inventory allocates NY SEDS commercial consumption to the county level based on NY Department of Labor (NYSDOL) 2022 employment statistics for non-industrial employment (by NAICS classification). Because jobs data is not available at the municipal level, county totals were allocated to municipalities by the ratio of community EHUs that heat with each fuel compared to the county EHU totals. EHU is a proxy for fuel choice in the commercial sector because businesses will choose the same type of fuel as residents where natural gas is not available.

Industrial Energy and Power Generation

Consistent with the 2015 CRIG, the inventory developed data per the steps below with some modifications and improvements.

Step 1. Place UER data.

Place utility electricity and natural gas industrial sector data into cities, towns, and villages for 2022. The UER was modified in 2018 to include much more data than previously available[5]. For missing electricity data, estimate it using the logic tree discussed for commercial data. For natural gas, however, do not attempt to estimate missing data marked as "withheld" and note that for use in later steps.

Step 2. Place Large Point Sources
Obtain all point sources reporting to EPA's mandatory GHG reporting rule (MMR), EPA's Title 5 air quality program, and EIA's 923 electric utility generation reporting program. Reconcile the list to remove overlaps since many entities report to one or all these programs. Identify them as industrial or power generation sources. Directly allocate fuel consumption and emissions to the communities identifying them as distinct industrial or power generation point sources.[6]

Step 3. Reconcile UER natural gas data and large point source data overlaps.
Natural gas is reported as point sources and by utilities in the UER. Where point source natural gas consumption corresponds with a large UER consumption value, assume there is overlap and remove the point source from UER data and assume any balance is valid non-reporting industrial natural gas. Where UER industrial natural gas data is marked as "withheld" and there is a point source for natural gas from step 2, mark the UER data fields as zero and use the point source data. If UER data is withheld and there is no point source, investigate the community to look for industry. If no significant industry is found, exclude the source.

Step 4. Place unaccounted-for-industry (2015 CRIG Pie Slice Method) consumption of oil, propane, and wood fuels.
Remove statewide industrial point sources emissions from step 2 from NY SEDS industrial sector consumption totals to estimate unaccounted-for small industries. Distribute this fuel to counties based on (1) manufacturing employment totals by county and (2) the ratio of households heating with natural gas versus total households, as a proxy for the location of the natural gas grid. Then, allocate from counties to municipalities following the methods used for the commercial sector.

Transmission and Distribution Losses
Following the 2015 CRIG, natural gas consumption was assigned a leakage rate of 2.5% of gross consumption to account for leaking from pipelines. This was based on utility-reported surveys that were still assumed to be valid for 2022.

Industrial Process and Product Use (IPPU)

Process Emissions
The inventory places industrial process emissions reported to EPA's MMR in the appropriate county and community inventory as a scope 1 point source. These are non-combustion-related emissions such as from cement manufacture.

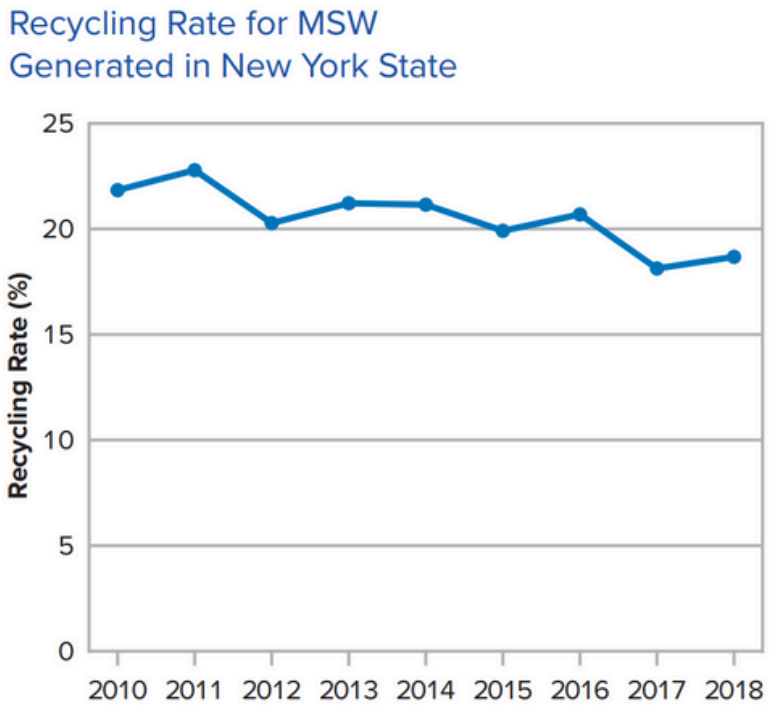
Product Use (ODS/Refrigerants)
These are emissions primarily from refrigerant usage in consumer products across all sectors for refrigeration, HVAC, mobile A/C, products in firefighting equipment, aerosol propellants, chemical foams, etc. The 2015 CGIG calculated a nationwide per-capita average from the EPA's 2010 US GHG Inventory and allocates emissions to communities based on population. As a change from the 2015 CRIG, the inventory now uses NY-specific per capita emissions derived from the 2022 NY State GHG Inventory report prepared by NYSDEC. While the NY value is also derived from federal data, this change will ensure consistency in data rollup between local and state inventories.

Waste Management
Solid Waste Management
Solid Waste (Open Landfills and Incinerators) – Scope 1
The 2022 inventory uses the preferred method from the 2015 guidance and places MMR-reported GHG emissions from the two regional landfills (Albany and Colonie) directly into the GHG inventory. For 2022, waste incinerators are reported under solid waste consistent with NYSDEC updates to its 2023 state inventory that found these facilities are now largely incinerating waste for tipping fees and not to generate power. In 2010, they were reported under power generation.

Closed Landfills (New to 2022 Update)
In recognition of the importance of closed landfills, especially considering the CLCPA protocol change adopting 20-year GWPs, the 2022 update includes locations of closed landfills as placeholders. Emissions will be added in a future update using the alternative modeling methods described in the 2015 guidance.

Solid Waste – Attribution to community waste generation - Scope 3
2022 inventory updates follow the recommended method and attributes emissions based on population, per-capita waste generation of municipal solid waste (MSW), and emissions factors to convert MSW into methane emissions using EPA's WARM model. The 2022 inventory uses updated per capita waste generation number from the updated 2023 New York State Solid Waste Management Plan – Building the Circular Economy through Sustainable Materials Management.

As shown in the figures below reproduced from the 2023 New York Solid Waste Management Plan, state average per-capita MSW generation (disposal rate) increased by 10% partially because recycling rates dropped by 15% during the period of 2010-2018. This period is used as a proxy for 2022 as it is the last and best data available.



Source: New York State Solid Waste Management Plan: Building the Circular Economy through Sustainable Materials Management, December 2023, New York State Department of Environmental Conservation, https://dec.ny.gov/sites/default/files/2024-05/finalsswmp20232.pdf .

Year	Disposal Rate (lbs/person/day)
2008	4.10
2009	3.75
2010	3.71
2011	3.77
2012	3.70
2013	3.86
2014	3.87
2015	3.88
2016	3.91
2017	4.11
2018	4.09

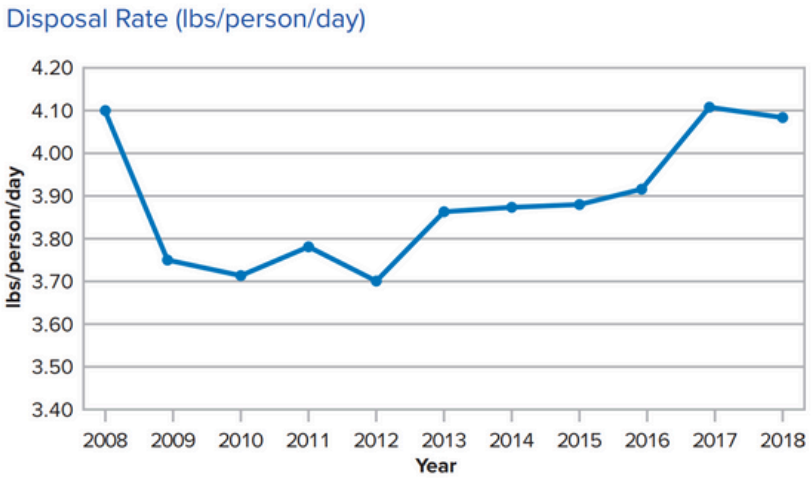


Figure 3.6. MSW disposal rate per person per day in New York State 2008–2018

Source: New York State Solid Waste Management Plan: Building the Circular Economy through Sustainable Materials Management, December 2023, New York State Department of Environmental Conservation, https://dec.ny.gov/sites/default/files/2024-05/finalsswmp20232.pdf .

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Sewage Treatment
Sewage Waste – Community-Attributed – Scope 3
The 2022 inventory uses the Local Government Operations Protocol (LGOP) to estimate total WWTP emissions based on a representative population served by WWTPs, and a representative population served by septic systems. The inventory combines total regional emission and distributes it by population to each community.

Sewage Waste – Wastewater Treatment Plants (WWTP) – Scope 1
New to the 2022 update, the GHG inventory contains a placeholder for all individual WWTPs located in each community. Emissions will be added in a future update. Scope 3 emissions are the preferred scope for community GHG inventories; therefore scope 1 emissions will be informational items.

Transportation

On-Road - Scope 1 (gasoline and diesel)

The 2022 regional GHG inventory follows the alternate method in the 2015 CRIG with some modifications and updates as described in the steps below. Specifically, the 2022 inventory:

- Constrains regional vehicle miles traveled (VMT) based on NYSDOT traffic data at a county level to ensure regional totals are self-consistent with other regions. The Capital Region Transportation Council also uses these totals as a constraint for local transportation demand modeling.
- Uses local transportation modeling to allocate emissions to municipalities based on actual locations of roads, and dynamics of traffic flow through municipalities. For the 2022 update, the inventory maintains the municipal geospatial breakdown based on modeling done with the Transportation Council for the 2010 product, with weighting adjustments made for local population changes.
- Converts VMT to GHG emissions using a fleet profile and fuel economy table based on the Federal Highway Administration's updated Highway Statistics Series reports of on-road fleet average fuel economy.

In counties outside of the Transportation Council's territory, the 2015 CRIG allocated VMT to communities by that community's share of county road length by function class (local, collectors, and principal arterials). Review of this method against new data suggests this over allocates county VMT to rural towns with low population and long local road lengths. Consequently, the method was updated to add population weighting to distribute VMT to local roads and collectors, while road length was maintained as sole weighting for principal arterials. Principal arterials convey pass-through traffic in rural communities, whereas local roads and collectors typically originate traffic from local populations.

Non-Road, Rail, Marine – Scope 1

County level emissions as based on the US EPA's 2020 National Emissions Inventory (NEI), based on work done by NYSDEC's Air Resource division in support of the NEI. DEC uses EPA's Motor Vehicle Emissions Simulator (MOVES) to estimate air pollution emissions from non-road mobile sources within New York State for all non-road mobile sources, except aircraft and rail. When CO2 emissions are not reported in the NEI, CO2 is estimated to use the CO/CO2 conversion ratios provided in the 2015 CRIG, based on carbon monoxide (CO) data.

Air - Scope 3

Scope 3 emissions attribute a GHG footprint to a community's use of airline travel. The method counts total emissions of trips by jets leaving regional airports and allocates emissions to a community by its share of population. The 2022 update followed a simplified method by scaling 2010 regional emissions by the national FAA flight miles trend (2010-2022) and allocating that to local community population.

Agriculture (AFOLU)

The inventory is based on the EPA's State Inventory Tool (SIT)'s methodologies, customized and applied at a county level based on the National Agricultural Statistic Survey (NASS) livestock and crop acreages reported in the 2022 Agricultural Census. Emissions are primarily from livestock operations- manure management and enteric fermentation, and from use of synthetic or manure fertilizers. The inventory excludes SIT emission categories for crop residue burning, liming, and urea fertilization because the categories were too small to be considered relevant. The inventory then allocates emissions to towns based on non-forested land area.

Future Updates

On-Road - Scope 3 (gasoline, diesel, and electric)

New to 2022, the inventory contains a placeholder for scope 3 GHG emissions accounting for on-road vehicles. This approach assigns VMT to communities, as a share of trips start and stop in the community, considering the full length of the trip from its origin or destination. This will require modeling work with location-services companies to track origin-destination patterns, and to statistically scale VMT to match regional constraint totals, while discounting regional pass-through traffic such as downstate to and from Canada or western NY. Emissions will be associated with commuter communities, work, and commerce centers, and less to communities with pass through traffic.

In addition, the regional fleet profile tables used for scope 1 will be modified to become local tables (unique for each community) and will include electric vehicle populations based on NYSDMV EV registration statistics. GHG footprints in communities adopting EVs faster show a more significant emissions decline in scope 3.

Commercial and Industrial Non-Utility Energy

Improve allocation from counties to municipalities by weighing commercial energy use by parcel class information instead of by population and residential fuel preference. Allocate unaccounted-for industrial fuel use weighting using parcel class information.

Agricultural Methodologies

Develop a more granular accounting of municipal level agricultural emissions using sources such as the Consolidated Animal Feeding Operations (CAFO) data and parcel data, to better associate county livestock emissions with specific farms in communities.

Carbon Sequestration - Removals

The inventory will include a separate accounting of carbon sequestration at the county-level, following IPCC methodologies for uptake by forests and other landforms. It will also be updated to include carbon stock of total carbon stored in land uses as a distinct product, presented side-by-side with GHG emissions. This will support expanded climate action planning to focus on growing carbon sequestration as a distinct addition to GHG mitigation actions.

Footnotes | **2022 GHG Inventory Methods**

[1] New York Community and Regional GHG Inventory Guidance Methods and Data Sources for Community-Wide (Geospatial) GHG Emissions Inventories September 2015, Version 1.0. https://climatesmart.ny.gov/fileadmin/csc/documents/GHG_Inventories/ghgguide.pdf

[2] US EPA, OAR. "Historical EGRID Data." Www.epa.gov, 16 Jan. 2023, www.epa.gov/egrid/historical-egrid-data.

[3] "Utility Energy Registry." Utilityregistry.org, 2025, publish.utilityregistry.org/. Accessed 24 July 2025.

[4] "U.S. Energy Information Administration - EIA - Independent Statistics and Analysis." Www.eia.gov, www.eia.gov/state/seds/.

[5] Power generation was also included in the UER industrial sector.

[6] Power Generation is not included in a community roll-up emissions inventory.

B. Benefits Estimates Methods

Greenhouse Gas Benefits Methods

This plan used a structured approach to estimate reductions potential of each measure.

- Identify the specific subset of emissions and related activities from the GHG baseline impacted.
- Develop scenarios for 2035 and 2050 to shift the underlying activity.
- Calculate GHG savings as the differential.

For example, to calculate the benefits of municipal heat pump adoption, we took all gas and fuel oil in the commercial sector, assumed 2% of that is for municipal operations based on CDRPC's experience with GHG inventories, further assumed a portion of that is for heating and cooling, and then adopted scenarios based on engagement with municipal leaders to shift an amount of oil and gas to heat pumps. We calculated GHG savings based on typical performance for cold climate heat pumps, assuming the grid still has some fossil fuels left.

There is an inherent overlap between measures. For example, a measure to weatherize municipal buildings would start with the same energy baseline and calculate emission savings as a percent reducing oil and gas usage based on uptake projection. To avoid double-counting the heat pump measure, the amount of baseline energy available to shift to heat pumps should first be reduced by the weatherization measure. Where it could be identified, the overlap was reconciled. However, in sectors with measures with broadly overlapping policy components and outcomes, which is common, the analysis reviewed total benefits by sector for reasonableness, and where necessary, adjusted individual measures to reduce double-counting.

Air Quality Co-Benefits Methods

CAP (Criteria Air Pollutant) emissions refer to the release of six pollutants with National Ambient Air Quality Standards (NAAQS), including particulate matter (PM), ozone (O_3), carbon monoxide (CO), sulfur oxides (SOx), nitrogen oxides (NOx), and lead. HAP (Hazardous Air Pollutant) emissions involve the release of toxic substances, known as air toxics, that can cause serious health effects like cancer and neurological disorders, with specific examples like benzene and manganese also being Volatile Organic Compounds (VOCs) and precursors to ozone and particulate matter.
HAP, or hazardous air pollutant, is an air pollutant known or suspected to cause serious health effects like cancer, reproductive issues, or birth defects, and/or adverse environmental effects. HAPs are regulated under the Clean Air Act and are distinct from ambient air pollutants for which there are National Ambient Air Quality Standards. Examples include asbestos, mercury, benzene, and dioxin. There are 188 federally regulated Hazardous Air Pollutants (HAPs), also known as air toxics. These are pollutants identified by the U.S. Environmental Protection Agency (EPA) that are known or suspected to cause cancer or other serious health effects, such as reproductive harm or birth defects. The list of HAPs has been modified since its original creation under the Clean Air Act, but currently stands at 188.

The CCAP developed custom CAP and HAP emission factors to convert GHG savings in Metric Tons CO2e (MTCDE) from measures into CAP and HAP savings. These were created by taking CAP and HAP emissions from EPA's national emissions inventory (NEI) for the eight-county region from fossil fuel transportation and stationary sources and dividing them by corresponding GHG emissions from the same source and sector combinations from the 2022 regional GHG inventory. Total CAPs were further allocated to individual CAPs based on that gases' contribution to CAP totals as reported in the NEI for the region.

APPENDIX

CAP and HAP Emission Factors - Gross- Mobile					
Vehicle Type	Diesel/ Gas	CAP tons/gallon	HAP lbs/gallon	CAP tons/MTC02e	HAP lbs/MTCO2e
Light Duty Vehicles Short WB	GASOLINE	0.0000317498	0.001204447	0.003604403	0.136734931
Light Duty Vehicles Short WB	DIESEL	0.0000611576	0.00099246	0.005971929	0.096911938
Light Duty Vehicles Long WB	GASOLINE	0.000141167	0.004286631	0.016025998	0.486640199
Light Duty Vehicles Long WB	DIESEL	0.0000521972	0.001318111	0.005096962	0.128711168
Single-Unit Trucks	GASOLINE	0.0000697253	0.001824255	0.007915573	0.207098704
Single-Unit Trucks	DIESEL	0.0000561385	0.001274829	0.00548182	0.124484789
Buses	GASOLINE	0.0000759431	0.001021084	0.00862145	0.115918658
Buses	DIESEL	0.0000246762	0.000340361	0.002409587	0.033235678
Combination Trucks	GASOLINE	0.00452446	0.121586108	0.513639756	13.80307455
Combination Trucks	DIESEL	0.000119029	0.001108627	0.011622969	0.108255413
Motorcycles	GASOLINE	0.000740924	0.062030852	0.084113476	7.042058463
Average		0.000536106	0.017907979	0.006890965	0.166217008

CAP and HAP Emission Factors - Gross- Stationary		
	CAP/GHG (tons/MTCO2e)	HAP/GHG (lbs/MTCO2e)
Residential	0.002018	0.001956
Residential	0.000636	0.001933
Residential (ave)	0.001327	0.001944
Commercial	0.001161	0.000994
Commercial	0.001882	0.008634
Commercial (ave)	0.001521	0.004814
Average	0.001424	0.003379

APPENDIX

CAP Emissions Allocations, % by Gas, By Source Type (Capital Region)					
nonpoint	CAP	PM10 Primary (Filt + Cond)	PM10	283,162	20%
nonpoint	CAP	PM2.5 Primary (Filt + Cond)	PM2.5	92,622	6%
nonpoint	CAP	Carbon Monoxide	CO	353,777	25%
nonpoint	CAP	Volatile Organic Compounds	VOC	565,655	39%
nonpoint	CAP	Ammonia	AM	51,825	4%
nonpoint	CAP	Nitrogen Oxides	NOx	82,089	6%
nonpoint	CAP	Sulfur Dioxide	SOx	3,761	0%
nonroad	CAP	PM10 Primary (Filt + Cond)	PM10	3,260	0%
nonroad	CAP	PM2.5 Primary (Filt + Cond)	PM2.5	3,073	0%
nonroad	CAP	Carbon Monoxide	CO	577,888	87%
nonroad	CAP	Volatile Organic Compounds	VOC	45,891	7%
nonroad	CAP	Ammonia	AM	83	0%
nonroad	CAP	Nitrogen Oxides	NOx	32,156	5%
nonroad	CAP	Sulfur Dioxide	SOx	42	0%
onroad	CAP	PM10 Primary (Filt + Cond)	PM10	7,237	2%
onroad	CAP	PM2.5 Primary (Filt + Cond)	PM2.5	2,376	1%
onroad	CAP	Carbon Monoxide	CO	342,121	78%
onroad	CAP	Volatile Organic Compounds	VOC	27,688	6%
onroad	CAP	Ammonia	AM	2,891	1%
onroad	CAP	Nitrogen Oxides	NOx	56,401	13%
onroad	CAP	Sulfur Dioxide	SOx	338	0%

C. Clean Energy Public Input Survey

A public survey was taken to gauge receptivity to clean energy actions that might be taken by individuals. 53 citizens responded. The summary responses are shown below:

Q1. Where do you live?		
Answer Choices	Responses	
Albany County	18.87%	10
Schenectady County	28.30%	15
Saratoga County	33.96%	18
Rensselaer County	3.77%	2
Columbia County	7.55%	4
Warren County	3.77%	2
Washington County	0.00%	0
Greene County	1.89%	1
Other (please specify location)	1.89%	1
	Answered	**53**
	Skipped	**0**

Q2. Do you have interest in or want to purchase an electric vehicle (EV)?		
Answer Choices	Responses	
Yes, I have an EV	28.30%	15
I don't have an EV but am interested in purchasing one	49.06%	26
I am not interested in purchasing an EV	22.64%	12
Please provide details on your choice above - such as why you are or are not interested in an EV.		41
	Answered	**53**
	Skipped	**0**

APPENDIX

Q3. How do you regularly travel for work and errands?		
Answer Choices	Responses	
Personal/Private vehicle	90.57%	48
Public Transit	3.77%	2
Taxi/Private car service	0.00%	0
Walking/Biking/Scooter - non-motorized transit	1.89%	1
Other (Please explain below)	3.77%	2
Other (please specify):		11
	Answered	**53**
	Skipped	**0**

Q4. Do you recycle as a regular part of your household waste/garbage routine?		
Answer Choices	Responses	
Yes, I recycle regularly	98.04%	50
No, I don't recycle	1.96%	1
If you don't recycle, can you please explain why?		2
	Answered	**51**
	Skipped	**2**

Q5. Do you compost?		
Answer Choices	Responses	
Yes, I compost on my property	39.22%	20
Yes, I am part of a local/community/private composting program	5.88%	3
No, I don't compost	54.90%	28
If you don't compost, can you please explain why?		21
	Answered	**51**
	Skipped	**2**

Q6. Would you support your municipality creating a composting program?		
Answer Choices	Responses	
Yes	88.00%	44
No	2.00%	1
Not Sure	10.00%	5
	Answered	**50**
	Skipped	**3**

Q7. Do you have, or are you interested in, installing geothermal or air-source heat pump heating and cooling equipment in your home?		
Answer Choices	Responses	
I already have one of these systems in my home	14.00%	7
Yes, I am interested in installing geothermal	14.00%	7
Yes, I am interested in installing a heat pump	30.00%	15
No, I am not interested	14.00%	7
No, I do not have the ability to install a system (live in a rented home, multi-family home/building, live in an apartment/condo, etc.)	28.00%	14
	Answered	**50**
	Skipped	**3**

Q8. Do you have, or are you interested in improving the insulation in your home to reduce the amount of energy used to heat and cool the structure?		
Answer Choices	Responses	
I already have improved the insulation in my home/it is well insulated	30.00%	15
Yes, I am interested in improving the insulation of my home	36.00%	18
No, I am not interested in improving the insulation of my home	6.00%	3
No, I do not have the ability to improve the insulation (live in a rented home, multi-family home/building, live in an apartment/condo, etc.)	28.00%	14
	Answered	**50**
	Skipped	**3**

Q9. Do you have, or are you interested in, solar energy to power your home?		
Answer Choices	Responses	
I already have solar energy powering my home (solar array on property or through community solar)	26.00%	13
Yes, I am interested in installing solar	32.00%	16
No, I am not interested in installing solar	14.00%	7
I do not have the ability to install solar but am interested in participating in community solar	28.00%	14
	Answered	**50**
	Skipped	**3**

APPENDIX

D. Workforce Analysis

The following analysis is partially excerpted, edited and expanded from a workforce report developed by the Capital Region Clean Energy Hub.

The clean energy workforce landscape in the Capital Region shows strong potential but also faces some challenges. As with any economic sector, the clean energy contractor network is affected by general labor market trends with a very competitive landscape, including competition for skilled workers. According to the Capital Region Workforce Strategy Report (2022) from the Regional Economic Development Council, the region has significant employment in clean and renewable energy. With a total of 23,522 jobs across 882 businesses, the sector makes up 4% of our region's total workforce.

The main challenges identified by CREDC's report include:

- Low or nonexistent pipeline of workers
- Difficulty offering remote opportunities
- Competition for higher wages and benefits
- Bureaucracy and slow pace of state workforce training programs
- Lack of experienced workers, requiring in-house training programs
- Not enough journeymen to support apprentices filling trades pipelines (due to regulated ratios on job sites, especially electrical)

Three main themes emerge when studying these challenges and opportunities:

- Electricians are in extremely high demand, with the largest skill gap in clean energy.
- Engineers are needed to meet demand (industrial, electrical, civil, and mechanical).
- An entrepreneurial mindset is desired within existing companies and to maintain the pace of new venture creation for NY to lead on clean energy.

There are various pathways into the clean energy industry, facilitated by the Regional Workforce Development Boards and numerous partner organizations. Altogether, the Capital Region boasts more than twenty higher education institutions alongside numerous trade schools, workforce education programs, and apprenticeship options. While this abundance provides many opportunities, it can also lead to decision paralysis for job seekers unfamiliar with the sector. Capital Region Clean Energy Hub workforce staff provide support for career centers and job seekers to gain knowledge of the clean energy industry while making decisions on which career pathway to pursue.

According to NYSERDA's 2023 New York Clean Energy Industry Report, 74% of all clean energy jobs and 88% of clean energy businesses focus on building decarbonization and energy efficiency. Since this building industry subsector comprises most clean energy jobs, there is a direct correlation between the current construction skills gap, caused by baby boomers retiring at alarming rates, that underscores the urgent need to recruit and train the next generation of building trades professionals.

Statewide, installation businesses account for almost half (47%) of all clean energy establishments, followed by professional services (8%), sales and distribution (6%), public or private utility (2%), and manufacturing (2%). As the clean energy economy grows statewide, and to meet federal "American-made" requirements tied to subsidies, the manufacturing sector is slated to increase market share to satisfy demand. For example, parts for offshore wind turbines must be domestically produced, benefitting local hubs such as the Port of Albany and Port of Coeymans. These future jobs present opportunities for residents near port facilities, especially to support upward mobility for low-income

individuals from the disadvantaged community bordering the Port of Albany in the South End neighborhood. To fulfill statewide clean energy targets and ensure equity, funding for manufacturing facilities and workforce development in these communities is essential.

To prepare the workforce for these opportunities, the Capital Region Clean Energy Hubs have been collaborating with Capital Region BOCES and United Way of the Greater Capital Region on their Offshore Wind Career Pathway training program. The training begins with a general construction safety class before participants choose one of three tracks, general laborer, electrical, or welding. It is designed to be accessible to individuals without a high school diploma and those re-entering the workforce post-incarceration. The Hubs staff have done outreach at career fairs and other events, using printed materials to increase awareness of the program.

Data from NYSERDA's Clean Energy Industry Report in the chart below, demonstrates promising trends that can be leveraged to increase widespread job market uptake of clean energy technology training. While the largest numbers of clean energy jobs are based in Albany and Saratoga Counties, many of these workers tend to reside outside of those two counties. This commuter pattern suggests that some may eventually establish businesses closer to home, helping to expand local capacity as the clean energy market transformation takes hold. This aligns with the Capital Region Economic Development Council's recommendation to develop the entrepreneurial mindset, making a strong case to provide incentives to new businesses who plan to operate within their county of residence and beyond.

County	# Jobs by Employer Location	# Jobs by Worker Residence
Albany	4,215	2,529
Columbia	379	483
Greene	187	402
Rensselaer	1,283	1,979
Saratoga	2,415	454
Schenectady	1,760	2,581
Warren	1,099	1,495
Washington	194	359

APPENDIX

The South End Community Collaborative is a network of community-based organizations, social welfare advocates, training providers, and others working toward equity in Albany's South End and throughout the city. Their meetings represent a think tank for how to provide a continuum of care to support residents in need. The group tracks the status of NYSERDA funding for the Port of Albany as well as community development in and around the region.

The NYS Department of Labor Office of Just Energy Transition and all three career centers in the core counties (Albany, Rensselaer, Schenectady) have plans to coordinate regional training programs. As part of OJET's recent RFP Growing the Clean Energy Workforce (GCEW), two leading workforce organizations were selected to expand their clean energy offerings: Albany-Schoharie-Schenectady-Saratoga BOCES and Social Enterprise and Training (SEAT) Center.

Many small contractors and all union building trades prefer to train new workers themselves from the ground up, expressing concerns about retraining habits learned in prior non-union programs. This knowledge must be shared with all training partners to reinforce the credibility of the existing training infrastructure. Ideally, workforce training programs would have a shared training methodology, such as the Multi-Craft Core Curriculum (MC3), grounded in core construction skills, that can accommodate modules related to energy efficiency, electrification, and clean energy. Recent MC3 train-the-trainer workshops run by Trades Futures, a program of the North American Building Trade Unions (NABTU), and sponsored by the New York State Building & Construction Trades Council, have commenced in Albany. These trainings were hosted by the Center for Employment Opportunities (CEO), training their staff in addition to City of Albany Department of Youth and Workforce Services and Clean Energy Hub workforce leaders.

The Capital Region Clean Energy Hub, funded by NYSERDA, is a coalition of regional organizations that help and provide information to individuals, small businesses, and affordable housing owners about the benefits of the clean energy economy, ways to reduce energy use and costs, and how to make more informed energy decisions. The main goal of the Hub's workforce development effort is to increase participation in NYSERDA's Clean Energy Internships, Climate Justice Fellowships, and On-the-Job Trainings through NYSERDA approved contractors. The Hub's experience conducting contractor interviews and engaging in critical dialogue with partners has revealed barriers to participation, mainly that these programs are opaque and unviable for busy contractors without administrative staff. This feedback points to the need for programmatic consistency and frictionless transition between each of these three programs. Integrating all NYSERDA workforce programs into one seamless initiative would allow contractors and their training partners to more easily collaborate and transfer trainees into the workforce.

The Hub has partnered with the Capital Area Urban League, City of Albany Department of Youth and Workforce Services, and E&J Construction Training to connect community members with union training opportunities. Their first collaboration with the Urban League helped recruit eight trainees from Albany's South End for LiUNA Laborers Local 190's solar installation technician training facility in Glenmont. This inspired a broader partnership with that union and others. The main challenge with this program was finding money to transport participants to the union training facility, which is not on the Capital District Transportation Authority (CDTA) bus line. This highlights the urgent need for wider public transit options that will enable clean energy workforce training and wraparound service providers to meet the transportation needs of community members without their own vehicles.

Other workforce training challenges include gaps in training capacity and wraparound service accessibility that must be fixed to scale the clean energy industry. Overcoming these challenges will require strong partnerships with municipalities, technical schools, trade unions, and other regional community- based organizations.

Clean Energy Sector Growth Potential

The Office of Strategic Workforce Development (OSWD) prioritizes training programs that are developed with employers, lead to good jobs within high-growth target industry sectors, address the needs of historically marginalized New Yorkers, and measure impact in line with other New York State programs. Their mission is to align New York State's workforce development efforts with the needs and priorities of current and future employers and workers by investing in innovative programs working to diversify representation in these high-opportunity industries.

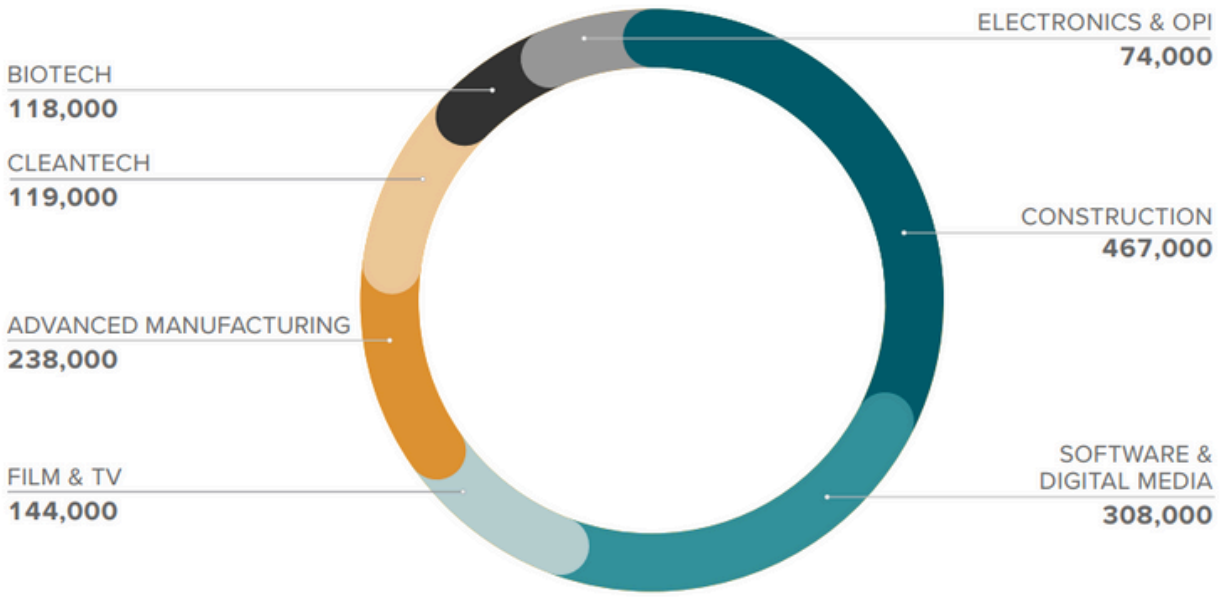
According to OSWD, these seven key industries employ 1.2 million New Yorkers– roughly 1 in every 8 workers in the State – and represent nearly a third of new jobs created across the State over the last decade. They also make up a significant share of quality, accessible jobs, or jobs that pay above a living wage and do not typically require a four-year degree. Advanced Manufacturing, Construction, and Clean Technology/ Renewable Energy fields are described as follows:

Advanced Manufacturing: R&D-driven manufacturing such as the production of electronics and machinery, as well as processing of glass, metals, chemicals, and minerals. The advanced manufacturing and materials industry grew by more than 5% from 2021 to 2022, adding more than 6,800 jobs. Growth over the next decade is projected to surpass job losses from the mid-20th and early 21st centuries. This industry is critical to providing accessible, well-paid jobs throughout the State, as 71% of these jobs typically do not require a four-year degree.

Construction: Industries related to the construction of buildings and infrastructure, including specialty trades. New York State is poised to invest billions of dollars in infrastructure funding stemming from federal and statewide stimulus programs and has embarked on the most ambitious effort in recent history to create housing to address meaningful shortages. This includes a wide range of projects funded with State and federal dollars – such as $6.76 billion for New York's ambitious transportation agenda, more than $1 billion in public and private investment to support broadband infrastructure expansion.

The investments will require a significant expansion of the construction workforce, which has a track record of providing well-paying, accessible (often union) jobs to workers without advanced degrees. The construction industry provided a total of 467,000 jobs, the largest number among the target industries, and is continuing to rebound from the COVID-19 pandemic and associated economic downturn. While the industry has grown more racially diverse in recent years, women remain underrepresented, comprising of just15% of the industry.

TOTAL JOBS BY INDUSTRY (2022)[4]

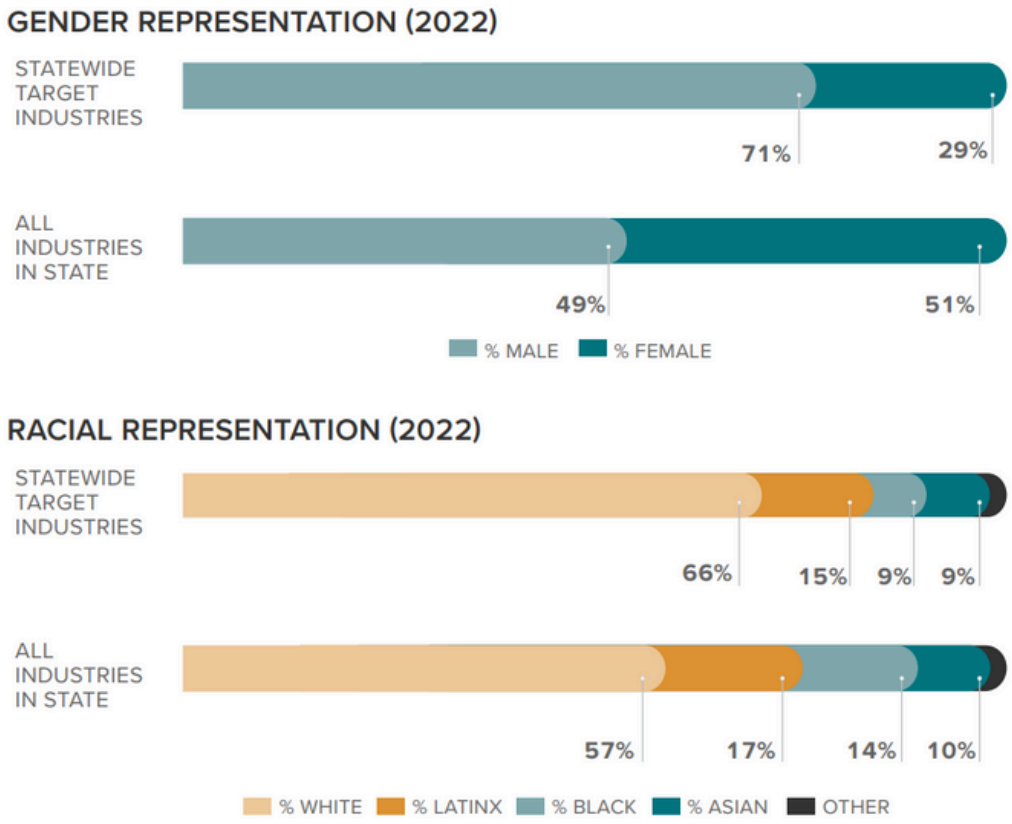


TARGET INDUSTRIES: 2021 - 2022

	2022 Jobs	2021-2022 Job Growth (#)	2021-2022 Job Growth (%)	Average Annual Job Growth Rate (2011-2022) (%)
Advanced Manufacturing	238,000	6,900	3.0%	-0.7%
Biotech	118,000	5,800	5.2%	1.6%
Cleantech	119,000	1,500	1.3%	0.3%
Construction	467,000	10,500	2.3%	1.5%
Electronics & OPI	74,000	2,000	2.8%	-1.5%
Film & TV	144,000	4,000	3.1%	2.0%
Software & Digital Media	308,000	24,900	8.8%	3.9%
All Target Industries	1,230,000	51,100	4.3%	1.4%
All Industries in State	10,247,000	454,000	4.6%	0.7%

4 Total jobs by industry do not sum to total jobs as some occupations span multiple industries.

Source: Office of Strategic Workforce Development: Annual Report Office of Strategic Workforce Development, 2. 2024. https://esd.ny.gov/sites/default/files/media/document/OSWD-Annual-Report-20240201.pdf



Source: Office of Strategic Workforce Development: Annual Report Office of Strategic Workforce Development, 2. 2024. https://esd.ny.gov/sites/default/files/media/document/OSWD-Annual-Report-20240201.pdf

Clean Technology and Renewable Energy: This sector includes industries that generate, transmit, and store clean energy; manufacture components for clean energy generation; and retrofit buildings and infrastructure to incorporate modern technology. New York's strengths in technology, advanced manufacturing, and construction-related industries, coupled with its natural resources, have positioned the State as a leader in cleantech innovation. Cleantech encompasses a wide range of emerging industries and is supported by a growing network of research at universities, established firms, new startups, and recent State investments in this innovative industry.

New York's unprecedented clean energy investments, through the work of NYSERDA, include more than $55 billion to 145 largescale renewable and transmission projects across the State. New Energy New York (NENY), a multisector partnership catalyzed by a $63 million Build Back Better Regional Challenge award and $50 million in matching New York State investment.

Cleantech is one of the most accessible industries for workers without a four-year degree, thanks to its high share of manufacturing jobs. More than 80% of jobs in the industry do not typically require a degree, and those jobs have a median annual wage of $65,000, above the statewide median. (Source: Office of Strategic Workforce Development Annual Report, 2024)

In March of 2023, Clarkson University received a $729K grant through New York State's Department of Strategic Workforce Development (OSWD) to launch the AIM Project, addressing critical challenges for workforce development in these main categories: Advanced Manufacturing, Construction and Clean Energy Tech. Clarkson held a three-day Workforce Leaders Workshop series in Schenectady, NY to discuss barriers, successes, and of the role of micro-credentials.

APPENDIX

The data below identified the most in-demand skills in these fields. (Source: Clarkson University AIM Findings via email Allie Tessier, AIM Project Manager)

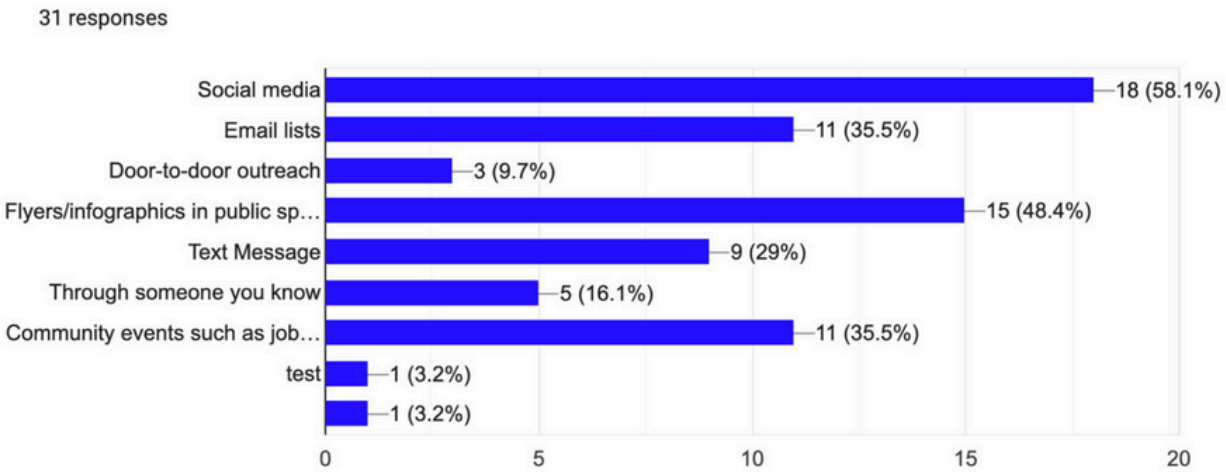
In-Demand Skills

Category	Advanced Manufacturing	Construction
Technical Skills	• Math • Mechanical Schematics & Aptitude • Operate Machinery & Controls • Blueprint/Print Reading • Organization & Material Management • Safety Requirements	• Math • Mechanical Schematics & Aptitude • Operate Machinery & Controls • Blueprint/Print Reading • Organization & Material Management • Safety Requirements
Soft Skills	• Communication • Teamwork • Time Management • Emotional Intelligence	• Communication • Teamwork • Time Management • Emotional Intelligence
Technical/Soft Skills	• Problem-Solving / Troubleshooting (Job-Dependent)	• Problem-Solving / Troubleshooting (Job-Dependent)
Job Types Analyzed	• Field Engineer Technician (A/A1) • Production Operator • Electrical Controls Engineer	• Mason • Carpenter • Steel Erector • AMI/CMS • Operating Engineer

Clean Energy Survey

To better understand workforce challenges, a Clean Energy Job Survey was developed by the Clean Energy Hub. The survey received a total of 31 responses, with 56.7% of participants under the age of 18, and 20% between the ages of 18-25. Older age groups were underrepresented, comprising 6.7% or less of our survey responses. Of the survey respondents, 48.4% were currently employed, 38.7% were not employed, and 12.9% were currently in school. The top three barriers from the survey were: Transportation (41.9%), Work Hours (29%), Mental Health (19.4%) and Family Support (19.4%). Transportation is a leading barrier for young adults and job seekers, due to the Capital Regions vehicle-dependent infrastructure. Many of the prerequisites/requirements in trade work require access to reliable transportation.

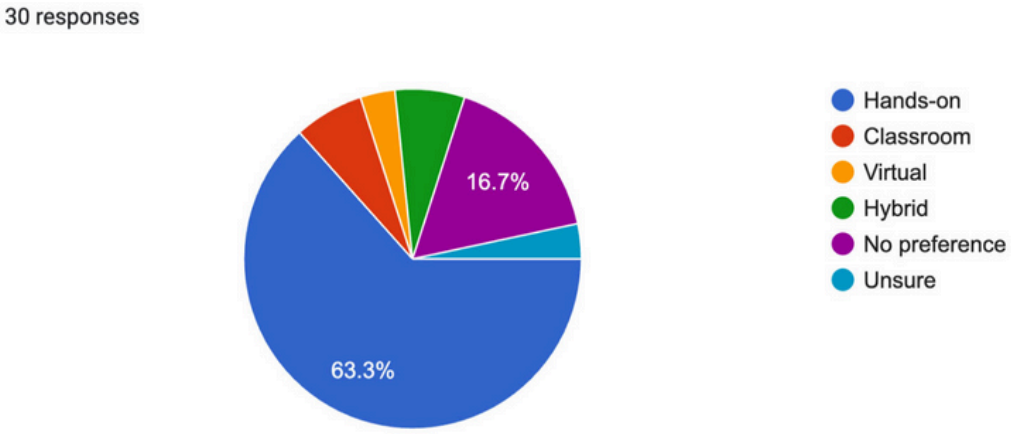
What would be the most effective method(s) of getting information regarding employment opportunities to you and your community?



Source: Capital District Clean Energy Hub. Regional Assessment and Barriers Analysis, May 2024.

When asked about effective outreach methods, (58.1%) identified that social media would be the most effective method to receive information, followed by flyers and infographics (48.4%), while email lists and community events were tied at 35.5%.

What method of job training do you prefer?



Source: Capital District Clean Energy Hub. Regional Assessment and Barriers Analysis, May 2024.

Survey participants were asked what their preferred method of job training to better understand perceptions of physical or manual labor — an essential component of many clean energy careers.. Most of the respondents (63.3%) indicated that hands-on training is their preferred method, while 16.7% of those had no preference.

Key Regional Workforce Training Opportunities

The Capital Region has numerous educational institutions, advocacy groups, non-for-profit organizations, state and municipal departments, career and training centers, small and large businesses, unions, and coalitions. These entities can connect residents and small businesses with workforce or business development opportunities, while fostering partnerships necessary to expand participation in the clean energy transition. Below are several examples of green jobs training programs available to Capital Region residents.

APPENDIX

NYSERDA provides funding and resources support a diverse range of workforce development programs and training activities to help businesses, organizations, and individuals build their clean energy future.

- On-the-job training for new clean energy staff
- Internships for students seeking hands-on experience at a clean energy company
- Curriculum development to meet the demands of clean energy employers
- Expand or create a sustainable talent pipeline to reduce the costs and risks of hiring new employees
- Clean energy training for pre-apprenticeships, apprenticeships, and journey workers.
- Training for building and operations staff to properly operate and maintain building systems

https://www.nyserda.ny.gov/All-Programs/Clean-Energy-Workforce-Development-and-Training/Leveraging-Multiple-Workforce-Programs

Hudson Valley Community College (HVCC) offers an AAS degree in Clean Energy Management. The degree program combines renewable energy and business courses to meet industry demands for employees with a blend of technical skills and business management abilities. The only associate degree program of its kind in the Capital Region, the Clean Energy Management degree is designed to lead to immediate employment. In addition to basic electrical theory and an exploration of photovoltaic, geothermal, wind and fuel cell energies, the program focuses on the essential principles of finance, marketing and business development, as well as technical training in PV installation, troubleshooting and maintenance.

https://www.hvcc.edu/programs/all/stem/clean-energy-management-aas.html

Capital Region Colleges and Universities – Most of the Capital Region's colleges and universities offer environmental science, environmental engineering and/or environmental studies degrees, including Union College, Siena College, Skidmore College, RPI and UAlbany.

The Center for Economic Growth promotes workforce training opportunities, including partnering with Tooling U-SME to promote their online Electrification Certification, Electric Vehicles Fundamentals, to increase talent in the EV industry. This credential is designed for entry-level positions in the areas of automotive assembly and production for electric vehicles. The EV Fundamentals will also provide the necessary skills for individuals with no background in vehicle production and assembly or for individuals who have experience in this area but need to tailor their knowledge to the EV market.

https://learn.toolingu.com/manufacturing-products-services/electrification-training/

The NY Capital Region chapter of the Association of Energy Engineers offers a variety of professional training and certification programs in energy management and sustainable development.

https://www.aeecenter.org/listing/new-york-capital-region-chapter/

The Capital Region BOCES and the **Capital Region Workforce Development Board** offer a variety of job opportunities and training programs, including those related to clean energy.

https://www.capitalregionboces.org/
https://capreg.org/

The Social Enterprise and Training (SEAT) Center, located in Schenectady, provides training for young people between the ages of 18-24, providing programs and services that aim to build workforce access and preparation pipelines. SEAT Centers revolutionary approach in their train-to-work pipeline differentiates from other surrounding training centers through their Youth Build Program, FUTURES Program, Mental Toughness Trainings.

https://www.seatcenter.org/

APPENDIX

E. List of Acronyms

Acronym	Full Name
AFOLU	Agriculture, Forestry, and Other Land Use
BAU	Business as Usual
CAP	Criteria Air Pollutants
CCAP	Comprehensive Climate Action Plan
CDRPC	Capital District Regional Planning Commission
CEC	NYSERDA Clean Energy Communities
CH4	Methane
CLCPA	NYS Climate Leadership and Community Protection Act
CO2	Carbon Dioxide
CPRG	EPA Climate Pollution Reduction Grant
CRIG	New York Community and Regional GHG Inventory Guidance
CSC	NYS Climate Smart Communities
DEC	Department of Environmental Conservation (NYS)
EGRID	Emissions and Generation Resource Integrated Database
EIA	Energy Information Administration
EPA	Environmental Protection Agency
ESG	Environmental and Social Governance
EV	Electric Vehicle
FAA	Federal Aviation Administration
GHG	Greenhouse Gas
GWP	Global Warming Potential
H2O	Water Vapor

APPENDIX

Acronym	Full Name
HAPs	Hazardous Air Pollutants
HFCs	Hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change
IPPU	Industrial Process and Product Use
IRA	Inflation Reduction Act
LGOP	Local Government Operations Protocol
MMBTU	Million British Thermal Units
MMR	Mandatory Monitoring Rule (EPA)
MSA	Metropolitan Statistical Area
MTCO2e	Metric Tons of Carbon Dioxide Equivalent
MOVES	Motor Vehicle Emissions Simulator
N2O	Nitrous Oxide
NASS	National Agricultural Statistics Service
NEI	National Emissions Inventory
NF3	Nitrogen Trifluoride
NYSERDA	New York State Energy Research and Development Authority
O3	Ozone
PACE	Property Assessed Clean Energy
PFCs	Perfluorocarbons
PM2.5	Particulate Matter 2.5 microns or less
PSC	Public Service Commission
REDC	Regional Economic Development Council

APPENDIX

Acronym	Full Name
SF6	Sulfur Hexafluoride
SIT	State Inventory Tool
TEN	Thermal Energy Network
UER	Utility Energy Registry
VMT	Vehicle Miles Traveled
WWTP	Wastewater Treatment Plant
ZEV	Zero Emission Vehicle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