**Erie County Community Climate Action Plan
2023**

COUNTY OF ERIE

MARK C. POLONCARZ
COUNTY EXECUTIVE

November 28th, 2023

Dear Fellow Residents,

Last year's catastrophic winter storms, summer wildfire smoke, and countless climate disasters across the planet have raised awareness about the significant impacts of climate change. Climate change is real, impacting all regions of the world, including our own, and we must work together to protect our community and reduce climate pollution.

The evidence-backed, forward-thinking, and ambitious initiatives outlined in this Erie County Community Climate Action Plan build on earlier initiatives and present a clear roadmap for our County to address climate change impacts and to secure resources for our community from unprecedented upcoming state and federal funding streams. Our plan encapsulates a vision for a thriving county that is equitable, ecologically sustainable, and economically prosperous. Climate action is not synonymous with sacrifice; it's about creating great places to live, work and play that preserve and protect our environment. By implementing this plan, we are investing in a healthier, happier Erie County—a place where our children and future generations can thrive.

I extend my heartfelt gratitude to the Community Climate Change Task Force and its ten volunteer working groups, as well as the County staff, stakeholders and members of the public who contributed their expertise and passion. Your input has been invaluable in crafting a strategy that aligns with our unique community's needs and aspirations.

We are living in a climate emergency. Implementing this plan will assure we remain a great community for future generations. The time to act is now.

Sincerely yours,

Mark C. Poloncarz, Esq.
Erie County Executive

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List of Acronyms

TERM	DEFINITION
AAA	American Automobile Association
ADA	Americans with Disabilities Act
AFPB	Agriculture and Farmland Protection Board
AGM	Agriculture and Markets
AIA	American Institute of Architects
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
BIPOC	Black, Indigenous, and People of Color
BNP	Buffalo Niagara Partnership
BOCES	Boards of Cooperative Educational Services
BOMA	Building Owners and Managers Association
BRRA	Black Rock Riverside Alliance
BRT	Bus Rapid Transit
BSA	Buffalo Sewer Authority
CASP	Climate Action & Sustainability Plan
CCA	Community Choice Aggregation
CCAP or "the Plan"	Community Climate Action Plan
CCE	Cornell Cooperative Extension
CDBG	Community Development Block Grant
CJWG	Climate Justice Working Group
CLCPA	Climate Leadership and Community Protection Act
CVA	Climate Vulnerability Assessment
DAC	Disadvantaged Communities
DMV	Department of Motor Vehicles
DPW	Department of Public Works
DSM	Division of Sewerage Management
DSS	Department of Social Services
EC	Erie County

TERM	DEFINITION
ECC	Erie Community College
ECDOH	Erie County Department of Health
ECEMC	Erie County Environmental Management Council
ECIDA	Erie County Industrial Development Agency
ECLIPSE	Erie County Low Income Program for Sustainable Energy
EIC NY	Energy Improvement Corporation of New York
EPR	Extended Producer Responsibility
EV	Electric Vehicle
FPC	Food Policy Council
FSIS	Food Safety and Inspection Service
GBNRTC	Greater Buffalo-Niagara Regional Transportation Council
GBUG	Greater Buffalo Urban Growers
GHG	Greenhouse Gas
GIS	Geographic Information System
HDPE	High-density polyethylene
HEAP	Home Energy Assistance Program
HHW	Household Hazardous Waste
HOCN	Heart of the City Neighborhoods
HOME	HOME Investment Partnerships Program
HUD	(United States) Department of Housing and Urban Development
IDA	Industrial Development Agency
IPCC	Intergovernmental Panel on Climate Change
IRA	Inflation Reduction Act
LDC	Local Development Corporation
LEWPA	Lake Erie Watershed Protection Alliance
LMI	Low- to Moderate-Income
MAP	Massachusetts Avenue Project

List of Acronyms

TERM	DEFINITION
MW	Megawatt
MWh	Megawatt Hour
NASA	National Aeronautics and Space Administration
NFTA	Niagara Frontier Transportation Authority
NOFA	Northeast Organic Farming Association
NRCS	Natural Resource Conservation Service
NY	New York
NYCOM	New York Conference of Mayors
NYFB	New York Farm Bureau
NYPA	New York Power Authority
NYS	New York State
NYSAC	New York State Association of Counties
NYS CFA	New York State Consolidated Funding Application
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOS	New York State Department of State
NYSDOT	New York State Department of Transportation
NYSDTF	New York State Department of Taxation and Finance
NYSEG	New York State Electric and Gas
NYSERDA	New York State Energy Research and Development Authority
NYSHCR	New York State Homes and Community Renewal
NYSP2I	New York State Pollution Prevention Institute
NWF	National Wildlife Federation
PACE	Property Assessed Clean Energy
PET	Polyethylene terephthalate
PFC	Providence Farm Collective
PILOT	Payment in Lieu of Taxes

TERM	DEFINITION
PPG	Partnership for the Public Good
PRISM	Partnership for Regional Invasive Species Management
PSC	Public Service Commission
PUSH	People United for Sustainable Housing
REDC	Regional Economic Development Councils
Regional Framework	Erie-Niagara County Framework for Regional Growth
RPTS	Real Property Tax Services
SEQRA	State Environmental Quality Review Act
SOV	Single Occupancy Vehicles
STEAM	Science, Technology, Engineering, Art, and Mathematics
SWCD	Soil & Water Conservation District
Task Force	Erie County Community Climate Change Task Force
UB	University at Buffalo
UBRI	University at Buffalo Regional Institute
US	United States
USDA	United States Department of Agriculture
USDOE	United States Department of Energy
USEDA	United States Economic Development Administration
USEPA	United States Environmental Protection Agency
USGBC	United States Green Building Council
VBN	Visit Buffalo Niagara
VRF	Variable Refrigerant Flow
WAP	Weatherization Assistance Program
WNY	Western New York
WNY SBR	Western New York Sustainable Business Roundtable
WNYLC	Western New York Land Conservancy

Buffalo Heritage Carousel, Inc. purchased the DeAngelis Carousel in 2016 with the premise of bringing it back to Buffalo as a catalyst and model for STEM programming. When it was manufactured in North Tonawanda in 1924, it was in some ways the height of technology for amusement park rides. The DeAngelis Carousel still is today, as the roundhouse and surrounding boardwalk are completely powered by solar panels, producing more electricity than it uses.

"We're honoring the past while showing our future by tying this piece of history to solar energy," says Executive Director Carima El-Behairy. "Our goal was to have a hands-on learning environment. You don't know you're learning when you're in here, and that's the best way to teach."

Introduction

Why Erie County Needs to Take Climate Action

The consequences of climate change are all around us. Warmer lake temperatures are causing more intense storms while high wind speeds, Lake Erie seiche events, and extreme temperature events are becoming more common. In 2022, the United States experienced $165 billion in weather and climate disasters, the third highest amount ever.[1] Erie County, like the rest of the world, is faced with the threat of a climate emergency, which is compounding the long-standing challenges of economic inequality and racial injustice. The most recent Intergovernmental Panel on Climate Change (IPCC) report, an international scientific assessment of the threats presented by climate change, was released in 2022 and indicates that the window in which to act and reduce the intensity of climate change impacts is rapidly shrinking.[2]

Earth's average temperature is warming due to increases in greenhouse gas (GHG) emissions being released into the atmosphere from human activities, which will continue increasing the temperatures on our planet for thousands of years. This warming of the Earth's atmosphere is driving rapid changes in our climate. Although cycles of warming and cooling throughout Earth's history are natural, the National Aeronautics

and Space Administration (NASA) (Figure 1) and the U.S. Global Change Research Program (Figure 2) show a notable, recent increase in the amount of carbon dioxide and other GHGs being released into the atmosphere.

GHG emissions are predominantly associated with the burning of fossil fuels for generating electricity, fueling transportation, space heating, and industrial processes. The increased concentration of GHGs in our atmosphere indicates that humans are severely altering the Earth's climate system.

Human activities that produce GHG emissions are changing our climate in a way that dramatically alters trends in weather, which affects all aspects of our lives, such as how we build houses and how we grow food. Erie County has already seen the impacts of climate change as Lake Erie warms and more frequent and intense storms impact our local environment, health, safety, infrastructure, and economy. It is important to note that these changes also have devastating impacts on our natural environment, resulting in altered

Figure 1 Long-term Changes in CO_2 Concentration in the Atmosphere
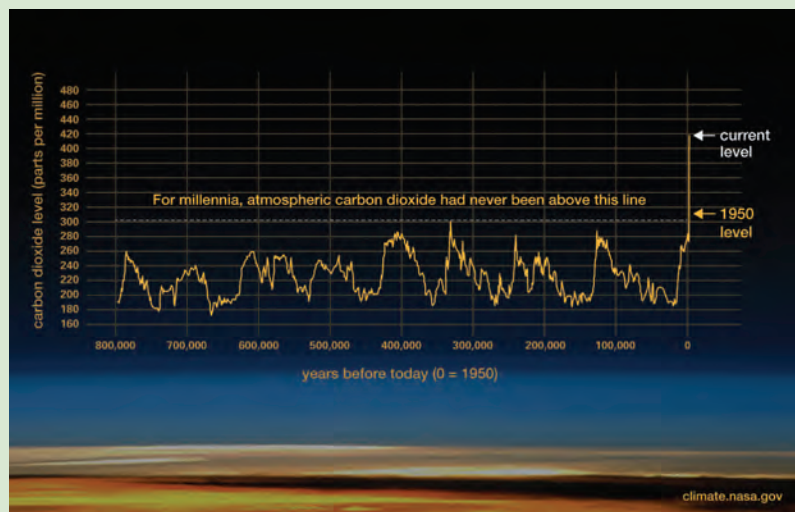
NASA, Carbon dioxide levels continue to rise, n.d., graph, NASA, https://climate.nasa.gov/climate_resources/24/graphic-the-relentless-rise-of-carbon-dioxide/

ecosystems, mass migrations, and mass extinctions of both plant and animal species. For every degree of average global temperature warming, the rate of species extinction increases further.

But there is hope and opportunity. Erie County alone cannot prevent the climate from changing, but action and support from the state, federal, and local governments, together with community residents and local businesses both here in Erie County and around the globe, can make a significant contribution towards limiting worldwide GHG emissions. Because the effects of climate change are already being experienced, we must also prepare ourselves to be more resilient to current and future impacts.

This Erie County Community Climate Action Plan (CCAP or "the Plan") is focused on creating opportunities to address climate change while also protecting our residents, creating jobs, protecting productive farmland, and addressing issues of inequity. The Plan outlines goals, strategies, and actions that the County can take, whether directly or indirectly, to address this important issue. Additionally, the Plan was developed with assistance from stakeholders with significant community input. In order to be inclusive of the Community's ideas of how to address climate change, the Plan is comprehensive and aspirational.

Background

Erie County has a long history of working to protect the environment, especially around issues of water quality protection. The County's work addressing climate change began in earnest in 2015 with the hiring of a Sustainability Coordinator and the creation of a Green Team, which includes representatives from all County departments, to reduce the climate impact of the County's internal operations.

In 2017, the County Executive issued an order directing all County departments to aggressively reduce GHG emissions. Erie County's Climate Action & Sustainability Plan (CASP), adopted in

Damage from seiche event at Times Beach
Photo credit: Jay Burney
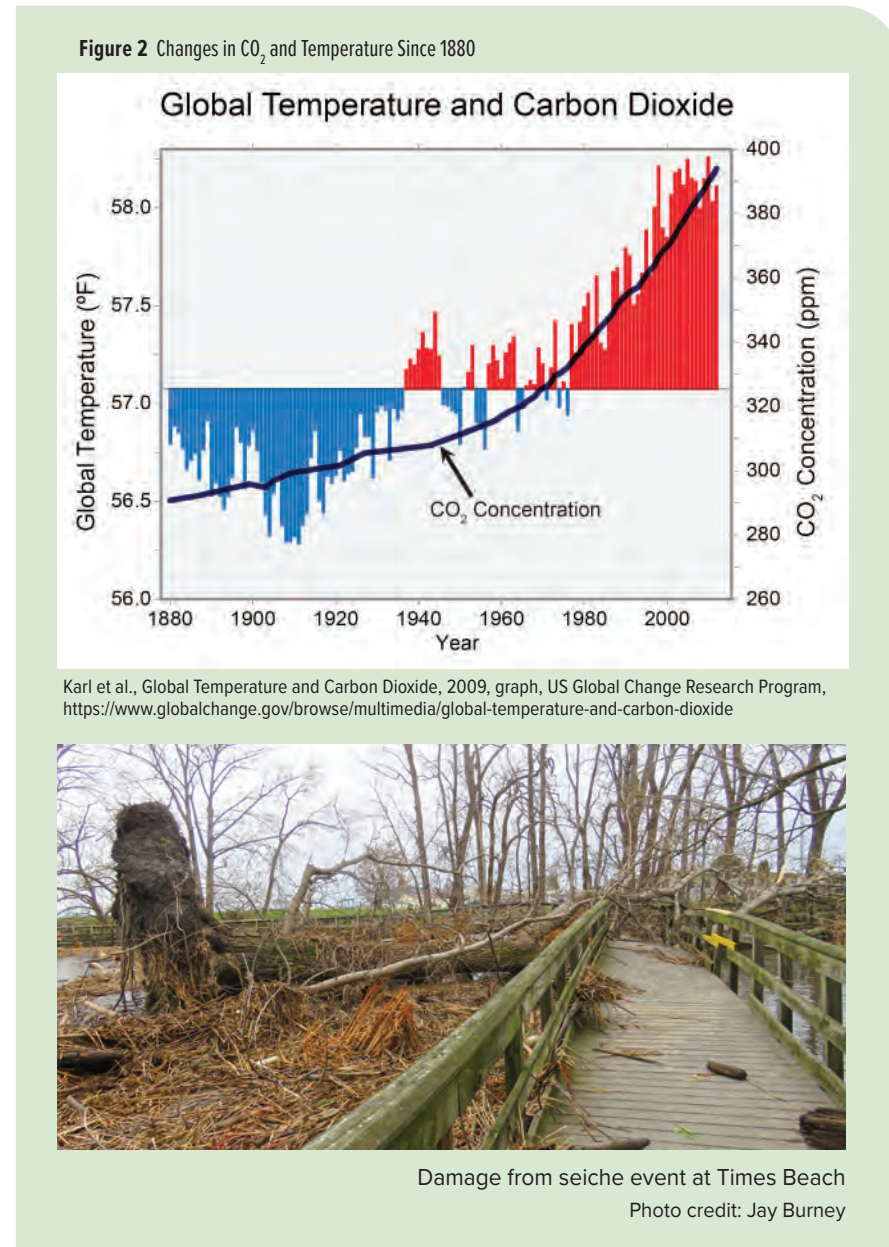
January 2019, was written primarily to reduce the carbon footprint of the County's internal operations.[3] Erie County has since been implementing the CASP and was recognized both nationally and state-wide as a leader on climate action, receiving designation as a Certified Silver Climate Smart Community and a Clean Energy Community.[4]

To better address climate change and reduce GHG emissions in the community, Erie County formed the Community Climate Change Task Force ("Task Force") as the official advisory board on the issue and established Erie County Climate Action as the County's planning process to create this equity-focused CCAP. The Task Force is a committee of the Erie County Environmental Management Council (ECEMC), which advises the County on environmental issues, and includes representatives from community-based organizations, nonprofit organizations, youth groups, colleges, municipalities, business representatives, transportation organizations, a utility company, libraries, and museums.

Figure 3 Timeline of Erie County's Climate Action Initiatives

Erie County Climate Action Timeline

2015
Interdepartmental Green Team formed

2017 - 2018
Develop Climate Action and Sustainability Plan (CASP) for Internal Operations

2021
Climate Smart Communities Silver Certification

2020
Scope Community Climate Action Plan (CCAP)

2019
Climate Smart Communities Bronze Certification

2019
Community Climate Change Task Force Formed

2019
CASP Adopted by Legislature

2021 - 2022
Working Groups Develop Draft CCAP

2022
Climate Vulnerability Assessment

2022
NYSERDA Clean Energy Community Highest Tier Achievement Grant

2023
Finalize CCAP

Near Future
Adopt CCAP and Begin CCAP Implementation

The County developed a community GHG inventory, which helped identify key focus areas for this Plan (Figure 4). The inventory found that transportation, commercial energy consumption, and residential energy consumption are the top three GHG emission sources in Erie County. The County plans to update this inventory in the near future with forthcoming federal grant resources. See Addendum B.

The Task Force advised the County regarding the development of an outline for the CCAP, identified ten (10) topic areas, and formed Working Groups to develop plan chapters for these topics, which are discussed below. Between March 2021 and February 2023, Erie County coordinated the development of the CCAP with over 100 volunteers from the Task Force and the com-munity. The chapters were written to include goals, strategies, and tangible action items that Erie County can take to reduce GHG emissions. A robust website, www.erie.gov/climateaction, was created to house documents for public comment as well as communi-cate ways that community members could get involved in the development of the CCAP.

Regional and State Plans

The Plan rests on the foundations of earlier regional plans, such as the Western New York (WNY) Regional Sustainability Plan (2013) and One Region Forward.[5] This planning process considered those plans and built on their recommendations.

Not long after the Task Force started meeting in 2019, the New York Climate Leadership and Community Protection Act (CLCPA) was passed. "New York State's Climate Act requires that 70% of New York State's electricity to come from renewable energy sources by 2030, and to achieve 100% zero-emission electricity supply by 2040."[6] This state legislation and the resulting New York State (NYS) Climate Scoping Plan, which was released in December 2022, is one of the most aggressive state plans in the country. The Task Force

Figure 4 Erie County 2014 Community GHG Inventory
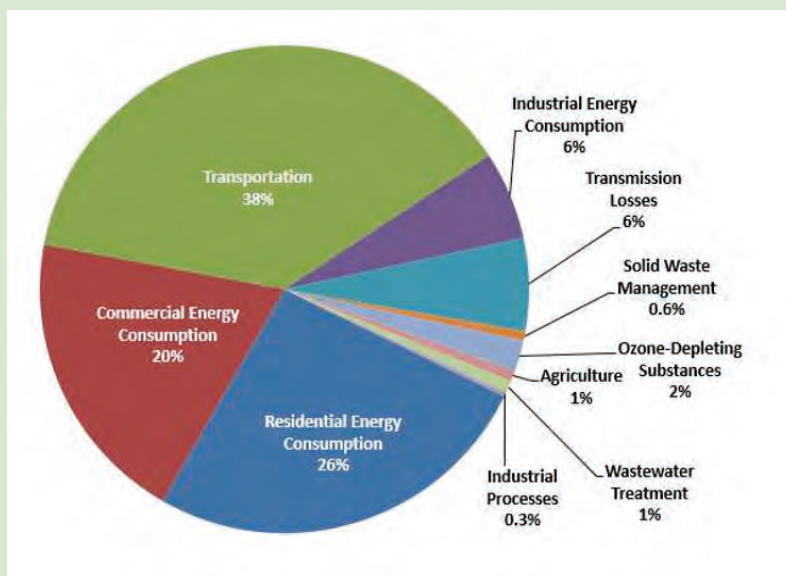
agreed that a community climate action plan for Erie County should strive toward the goals of the CLCPA, especially prioritizing investments in historically disadvantaged communities. While Erie County's plan is separate and distinct from the state plan, the state plan will likely result in funding opportunities, and thus it was considered while crafting this Community Climate Action Plan.

Commitment to Equity

The legacy of inequity that has been inherited from previous generations is still present today in Erie County, as well as the rest of the country. The compounding issues of past economic policies, such as racially influenced zoning regulations and lending policies, termed "redlining," have resulted in a segregated County that has areas with deep challenges, including lack of food access, lack of trees, old housing stock, and mobility issues. While many of these problems are most apparent in the urban areas of the County, rural communities also feel the impacts of inequity, poverty, and feeling forgotten.

Erie County has approached this Plan with a commitment to using an equity

lens while developing the Plan's strategies and action items. The Working Group members used the "Racial Equity Impact Analysis Tool," as described in Chapter 2, which is a series of questions to help ensure that a process does not forget to consider the impact of recommended strategies or actions on minority and disadvantaged communities. More information about this topic can be found in the Climate Justice chapter.

Erie County Government Levers

While Erie County has more residents than some countries and manages more roads than some states, Erie County's role is more limited than a federal or state government. Erie County's many responsibilities include administering social services and public health programs, as well as maintaining important infrastructure, such as County roads and wastewater treatment plants. It is important to note that because New York is a "home rule" state, Erie County does not have the lead role in many key aspects of reducing climate impacts, such as land use regulation and energy code enforcement, which

Why Electrify

Electrification holds great potential to reduce energy use because the efficiency of electric technologies is generally much higher than fossil fuel-based alternatives. For example, a heat pump is three times more efficient than a natural gas furnace or boiler.[1] The emission reduction benefits of electrification also go hand in hand with increases in renewable energy. Furthermore, because our region's electric grid is already low emission partially due to our large hydropower plant at Niagara Falls, electrification has a larger positive impact in WNY than most places.[2] As we electrify climate pollution sources (e.g., building and home heating, domestic water heating, light duty transportation, and some industrial heating) and develop more renewable energy sources, our community's climate pollution will drop dramatically.

The benefits of electrification go beyond reducing climate pollution.

• Electrification will create many jobs in WNY and build our local economy. Much of the money we spend on gasoline, diesel, and natural gas leaves our community, therefore, transitioning to electricity and local renewable energy keeps our energy dollars in WNY. Electrification of buildings and installation of solar alone can create 25 million jobs in the United States (US) in the near term, and an estimated 5 million jobs sustained over time, which is roughly double the number of jobs supported by today's energy industry.[3]

• As the cost of maintaining the aging US gas infrastructure increases, the cost of electric appliances, such as heat pumps, are projected to continue decreasing.

• Electrification dramatically improves air quality and improves our community's health. Children living in homes with gas appliances are 42% more likely to suffer asthma symptoms.[4]

• These benefits are especially helpful to disadvantaged communities because they often live close to and are disproportionately impacted by fossil fuel pollution.[5]

Sources:

1 IEA, "The Future of Heat Pumps - How a Heat Pump Works," IEA, 2022, https://www.iea.org/reports/the-future-of-heat-pumps/how-a-heat-pump-works; Sealed, "Heat Pump vs. Furnace — Which One Is Best for Home Heating?," Sealed, September 9, 2022, https://sealed.com/resources/heat-pump-vs-furnace.

2 USEPA, "Power Profiler," Data and Tools, United States Environmental Protection Agency, June 5, 2023, https://www.epa.gov/egrid/power-profiler.

3 Claire McKenna, Amar Shah, and Leah Louis-Prescott, "The New Economics of Electrifying Buildings," RMI, 2020, https://rmi.org/insight/the-new-economics-of-electrifying-buildings/.

4 McKenna, Shah, and Louis-Prescott.

5 USEPA, "Power Plants and Neighboring Communities," Data and Tools, United States Environmental Protection Agency, May 11, 2023, https://www.epa.gov/power-sector/power-plants-and-neighboring-communities.

Figure 5 New York State Has a Relatively Low Emission Electric Supply Compared to the Rest of the Country
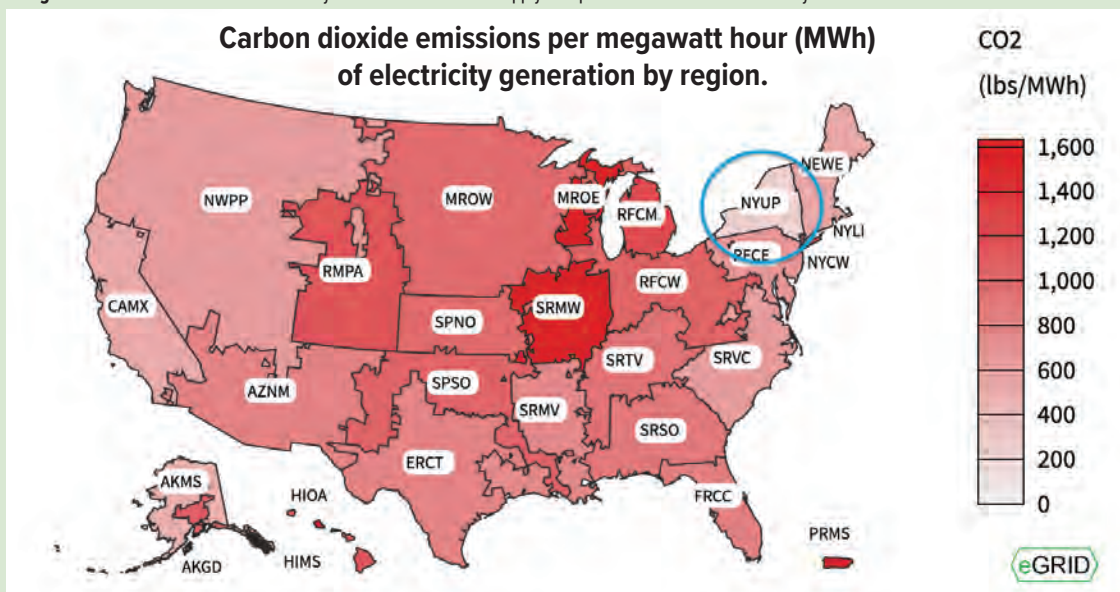
USEPA, eGRID subregion average emission rates, 2023, map, United States Environmental Protection Agency, https://www.epa.gov/egrid/power-profiler#/

are the responsibility of the cities, towns, and villages. In instances where the County has authority to take climate action through policy, laws could be passed. However, the focus of this Plan is incentivizing GHG reduction practices rather than mandating them.

Protecting the life and property of our community through services provided by the Departments of Health, Social Services, Environment & Planning, Senior Services, Veterans Services, and Emergency Services makes addressing impacts from climate change a natural role for the County. Erie County can also expand these programs to help support municipalities and households in their efforts to reduce GHG emissions and adapt to a changing climate.

In cases where Erie County does not have the jurisdiction to control or implement an action directly, it may have the ability to influence it. For example, the County is a board member of the Erie County Industrial Development Agency (ECIDA), and in that role, it can help prioritize climate action within economic development.

Benefits to Physical and Mental Health

Public health and climate change are deeply connected. Health issues resulting from poor air quality, poor water quality, and extreme weather events are putting pressure on those who already struggle with cardiovascular disease, respiratory issues, and other medical conditions. Ongoing health issues coupled with Erie County's older building stock and lack of air conditioning magnify the public health threat of extreme heat and cold (i.e., abnormally hot and cold temperatures), especially to our most vulnerable populations, children, and seniors, in communities that experience the most health disparities and inequities.

Addressing climate change can help improve the health of our community. For example, the transition to electric vehicles will reduce air pollution in neighborhoods. Erie County needs to anticipate and prepare for the issues that will arise from climate change to protect public health. The first step in this preparation was the creation of a Climate Vulnerability Assessment (CVA), which is discussed in more detail in the Climate Resiliency chapter. The Erie County Department of Health and Department of Environment & Planning now work together regularly to address this issue. The CVA identified extreme heat as a key vulnerability in our community, and this year the County started work on a Heat Emergency Plan.

It is also vital that we consider the impacts of a changing climate on our community's mental wellness. Anxiety and depression about climate change and the impacts of extreme weather events is adding to the existing mental health crisis. While this Plan is focused on taking positive action to address climate change, we also need to make connections to existing mental wellness and support programs that make space to discuss these concerns. The County should strive to encourage their partners in the service sector community to address this growing problem of climate change-related anxiety and depression.

Mental Health and Climate Change Connections

Climate change and disruptions to all aspects of the ecological systems that support life on our planet already have caused significant adversity for many humans facing threats to their accustomed ways of living. Delays in halting additional contributors to increased global temperatures (in the form of material and energy consumption and carbon emissions) have worsened pre-existing stresses and socioeconomic injustices suffered by large segments of the global human population. As new ecosystemic challenges emerge, complex dynamics will continue to drive human dislocation and migration, amplifying interpersonal friction, and mental strain and unwellness.

Yet even, and at times especially, under conditions of adversity, our ancestors developed previously unknown strengths and revealed remarkable capacities to thrive. In our destabilizing climate, to achieve the best outcomes for ourselves and our communities, it is essential for all of us everywhere to proactively assess both internal and community-based strengths and assets. We must strive to understand and seek out generative pathways and practices that lead to mental wellness and creative adaptations to new realities. In the midst of far-ranging ecological and social change, it serves us well collectively to remember that both protective and transformative potentials exist already in nature, in ourselves, and in our families, diverse cultures, and spiritual traditions. These require only our attention, nurturing and support to flourish.

Jennifer Fendya, PhD,
Psychologist & Forest Therapy Guide
Climate Psychology Alliance
Climate Reality Project, WNY Chapter Co-Chair

Implementation

Successful implementation of this Plan will require a multifaceted approach, including engaging with our community, securing state and federal funding sources, and leveraging partnerships. Implementation will begin after finalization of the CCAP. Annually, the County will issue a report regarding the implementation of the near-term action items outlined in this CCAP.

Creating programs that communicate the actions that we can take as a community to reduce the impacts of climate change, while at the same time preparing for the impacts of a changing climate, is vital to all the chapters within this Plan. The development of education and outreach materials should also ensure that we are trying to reach all residents by considering access, distribution, translation, accessibility, and more. It will be essential for the County to help our community become aware of opportunities to reduce GHG emissions and adapt to climate change to fulfill many of the goals, strategies, and actions outlined in this Plan.

Erie County will need to find ways to braid financial resources and leverage state and federal funding programs to address climate change. Recently passed state and federal legislation, like the New York Environmental Bond Act and federal Inflation Reduction Act (IRA), will be critical sources of funding. Also, this effort's careful consideration of NYS's climate action planning process has resulted in the inclusion of actions that are likely to align with future state funding opportunities. The timing of this CCAP will be beneficial as we compete with other communities to access these resources.

Just as this Plan involved the work of partners across the community, Erie County will not be able to achieve the objectives of this Plan alone. Erie County will need to work with municipalities, school districts, businesses, colleges and universities, nonprofit organizations, community groups, and residents to actualize its full potential.

Overarching/Cross-cutting Actions

In addition to the sector-based strategies and actions identified later in this Plan, the Erie County Community Climate Change Task Force has identified two overarching actions: (1) create a Chief Climate Officer role in the County Executive's Office to help lead the County's climate action program, and (2) create a Benefits of Climate Action Policy to guide decision makers as they make program and infrastructure decisions. Each of these positions are described below.

1.1.1: Chief Climate Officer

The climate crisis is one of Erie County's greatest challenges, and there is enormous opportunity in our response. It is essential that we coordinate our response across all County departments so that we can make the progress we so urgently need and drive our clean energy economy. Every department in the County has a role to play in mitigating GHG emissions and protecting our community from the impacts of climate change, which requires coordination across departments. Because so many County actions have some relationship to climate change, it is important that there is visibility and leadership at the highest level so that the County can implement a whole-government approach and prioritize the most impactful actions and the most coordinated response possible. To this end, the County will evaluate creating an executive-level role of Chief Climate Officer in the Office of the County Executive, charged with overseeing this response. The role could be assigned to an existing executive-level staff member or a new position could be created. The Chief Climate Officer would help lead and coordinate the County's climate efforts and would integrate a climate focus throughout all the County's lines of operation.

1.1.2: Benefits of Climate Action Policy

To be effective at addressing climate change, the County needs to carefully account for the climate impacts, both positive and negative, of its actions. As the County transitions to clean energy, many of these benefits are societal, benefiting our community's health and environment. As the County develops new programs, updates existing programs, and makes decisions about infrastructure investments, it is important that the societal value of GHG mitigation and climate resiliency be considered.

To create this policy, the County could reference New York State guidance titled "Establishing a Value of Carbon: Guidelines for State Agencies," which provides a relatively simple "damage-based approach" that is used by state agencies to account for GHG emissions and climate impacts

in their decision-making. This guidance provides a quantified dollar-per-ton societal cost for emissions of carbon dioxide, methane, and other GHGs.

The County will review the creation of a policy to incorporate an assessment of the benefits of climate action into its programmatic and infrastructure decision-making. This policy will not be binding on departments regarding final decision-making, but instead will create a framework so that decision-makers have transparency regarding the relative societal carbon costs and benefits of policy and infrastructure options. As the County develops this policy, it will consider thresholds and categories for applicability so that the policy can be applied in ways that are efficient, cost effective, and will have the greatest impact on addressing the County's climate goals.

Funding for Climate Action

Both the state and federal governments have approved historic funding initiatives to address climate change through both mitigation and adaptation. For years now, New York State has had opportunities for counties and other local governments to support climate action through both the NYS Department of Environmental Conservation's (NYSDEC) Climate Smart Communities program and New York State Energy Research and Development Authority's (NYSERDA) Clean Energy Communities program.[7] Erie County has received grants through both programs. More recently, New York State voters approved a $4.2 billion Environmental Bond Act. The Environmental Bond Act [8] will enable communities to imagine, redesign, and rebuild to strengthen their ability to withstand future high-water and storm events, extreme heat risks, and other long-term environmental changes. It will

also advance climate action priorities to reduce GHG emissions, includes significant labor provisions, and will promote job creation by establishing an estimated 84,000 green jobs.[9]

The federal government passed two significant pieces of legislation that are funding climate change mitigation and adaptation: the 2021 Infrastructure Bill and the 2022 Inflation Reduction Act (IRA).[10] The $1 trillion Infrastructure Bill includes $47 billion to fund infrastructure that will strengthen our nation's resilience to extreme weather and climate change while reducing GHG emissions, expanding access to clean drinking water, and building up a clean power grid. Even more dramatically, the IRA will invest $369 billion in climate solutions and environmental justice. Several IRA-funded federal grant opportunities have already been released and Erie County is pursuing them with community partners.

Purpose and Structure of the Plan

This document is intended to serve as a high-level roadmap to help guide and prioritize the County's climate actions. The CCAP will remain as a living document that will guide Erie County as we work to create a sustainable community.

This Plan consists of this introduction, three chapters that address overarching topics, and seven sector chapters (see Figure 6). The overarching chapters describe topics that cut across all of the sector technical areas, for example Climate Justice is interwoven throughout all of the chapters. The seven sector chapters address specific technical topic areas, such as transportation and agriculture, and each has one overall Goal with multiple Strategies and Action Items.

Figure 6 CCAP Chapter Working Groups

Community Climate Action Plan
CHAPTER WORKING GROUPS

Overarching Topics

Climate Justice
Reviewed all outputs with a justice lens to ensure that equity was the focus.

Climate Resiliency
Reviewed all outputs to assure a coordinated and comprehensive treatment of resilience topics within the Plan.

Communicating Progress
Prioritized community input and government transparency while developing the draft Plan.

Consumption and Waste Reduction
Goal: Responsible production and consumption of resources and sustainable management of waste.

Transportation
Goal: Create a safe, equitable, and affordable multi-modal transportation system that enhances mobility and access, phases out fossil fuel dependency, connects communities, supports a resilient supply chain, and decreases GHG emissions.

Housing and Neighborhood Resiliency
Goal: Foster zero-emission homes and neighborhoods that promote health and protect residents from extreme weather.

Economic and Workforce Development
Goal: Foster an equitable and robust green economy.

Commercial Energy Conservation and Renewable Energy
Goal: Move toward net zero carbon emission buildings and supporting the transition to a decarbonized electrical grid.

Nature-based Solutions
Goal: Protect intact landscapes, restore degraded ecosystems, and improve equitable access to green infrastructure, tree canopy, and open space.

Agriculture and Food Systems
Goal: Promote agriculture and food system solutions.

How to Read This Plan

The identified Goals, Strategies, and Action Items included in this Plan will significantly reduce or sequester GHG emissions in Erie County and make the community more resilient to severe weather and other threats from climate change. Each of the seven sector chapters has a single Goal, several Strategies, and for each Strategy the Working Groups identified key discrete Actions (Figure 7).

Each Action Item consists of:

Action Statement: Describes the policy, program, or tool that the County will deploy to support the goals and strategies.

Horizon: Identifies likely implementation timeframe. In some cases, implementation may span multiple time periods.
- **Short-term:** by or before year 2030;
- **Medium-term:** by 2040; and
- **Long-term:** by 2050.

Sphere of Influence: The two spheres are Direct and Indirect. Some actions may touch both spheres.
- **Direct:** The County can directly control the action; relating to County operations and infrastructure.
- **Indirect:** Regional agencies and municipalities have control, or the County can give support and influence to the action.

Lead County Entity: Departments or other County entities overseeing implementation of the action.

Partners: Implementation partner or partners who have an interest in the action.

STRATEGY 2: Diversion	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 5.2.5:	Reduce GHG emissions during the collection and processing of recycling and waste through electrification of fleets and use of efficient routing methods.			
	Short-Term	Indirect	DEP	Waste haulers, NYSERDA, local municipalities, NYSDEC
ACTION ITEM 5.2.6:	Educate and promote responsible waste management practices, such as the recovery and collection infrastructure, throughout all sectors of Erie County.			
	Ongoing	Direct	DEP	WNY SBR, local municipalities, NYSP2I, K-12 schools, Erie 1 Boards of Cooperative Educational Services (BOCES), grocery stores, religious and cultural institutions, DSS, waste

Figure 7 CCAP Goals, Strategies, and Actions

Community Climate Action Plan Organization

7 Goals — Broad, aspirational statements

30 Strategies — Approaches to achieving the Goal

168 Action Items — Tangible next steps for implementation, such as specific policies, programs, or tools to support a strategy

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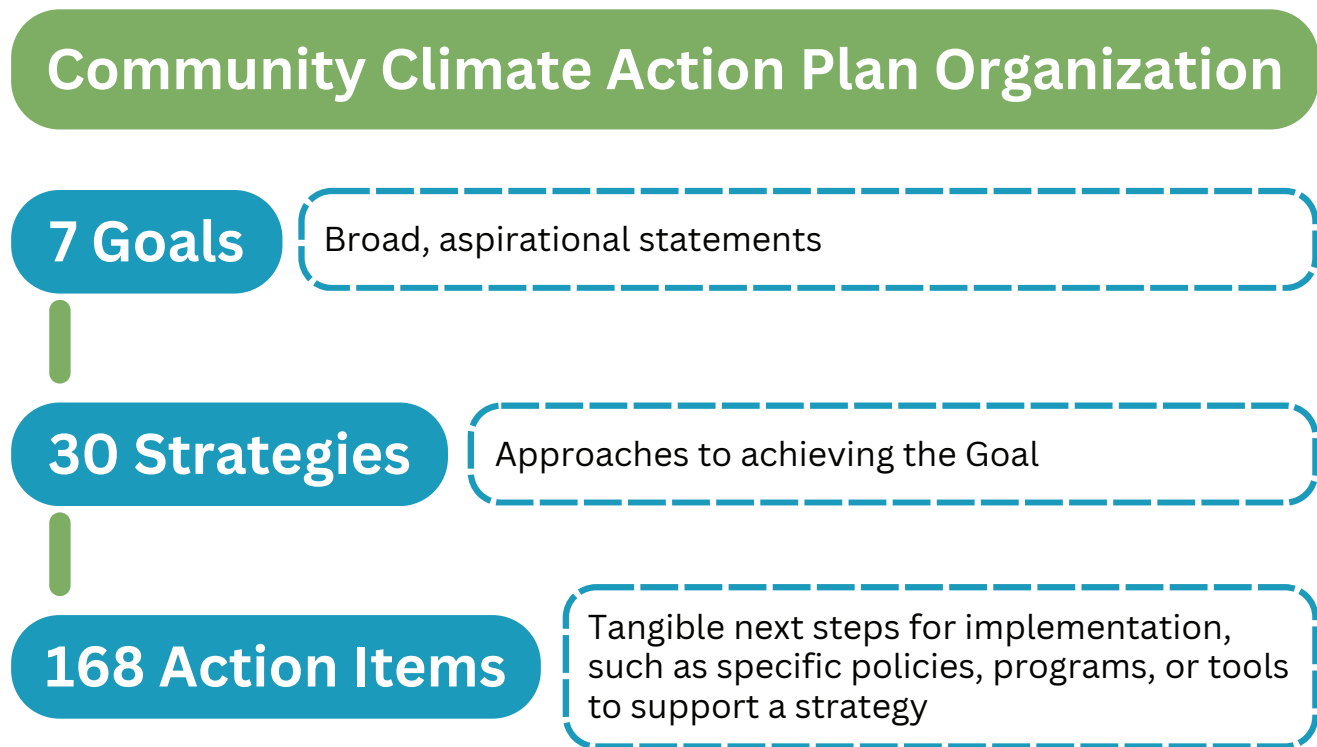
FOOTNOTES: Introduction

1   NOAA, "Billion-Dollar Weather and Climate Disasters" (NOAA National Centers for Environmental Information, 2023), https://doi.org/10.25921/STKW-7W73.

2   IPCC, "Climate Change 2022: Impacts, Adaptation and Vulnerability," IPCC, 2022, https://www.ipcc.ch/report/ar6/wg2/.

3   Erie County Climate Action and Sustainability Webpage: https://www3.erie.gov/environment/climate-action-and-sustainability and Erie County Climate Action and Sustainability Plan Document: https://www3.erie.gov/environment/sites/www3.erie.gov.environment/files/2022-05/final_casp_2019.pdf

4   NYS Climate Smart Communities, "Participating Communities," New York State, 2023, https://climatesmart.ny.gov/actions-certification/participating-communities/.

5   Regional Planning Consortium, "Western New York Regional Sustainability Plan," 2013, https://regional-institute.buffalo.edu/wp-content/uploads/sites/155/2020/10/Western-New-York-Regional-Sustainability-Plan.pdf; UBRI, "One Region Forward: A Way to Plan for Buffalo Niagara," February 2015, http://bap-home.net/solarize/wp-content/uploads/sites/28/2017/05/1RF_A-New-Way-To-Plan-For-Buffalo-Niagara_FinalPlan_reduced.pdf.

6   NYS Climate Action Council, "New York State Climate Action Scoping Plan," December 2022, https://climate.ny.gov/-/media/Project/Climate/Files/NYS-Climate-Action-Council-Final-Scoping-Plan-2022.pdf.

7   NYS Climate Smart Communities, "Climate Smart Communities," New York State, 2023, https://climatesmart.ny.gov/; NYSERDA, "Clean Energy Communities," NYSERDA, 2023, https://www.nyserda.ny.gov/All-Programs/Clean-Energy-Communities.

8   NYSDEC, "The Clean Water, Clean Air, and Green Jobs Environmental Bond Act," NYSDEC, 2022, https://www.dec.ny.gov/about/127431.html.

9   NYSDEC.

10 The White House, "Fact Sheet: The Bipartisan Infrastructure Deal," The White House, November 6, 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/11/06/fact-sheet-the-bipartisan-infrastructure-deal/; USDOE Loan Programs Office, "Inflation Reduction Act of 2022," Energy.gov, 2022, https://www.energy.gov/lpo/inflation-reduction-act-2022.

Sarah Dance, the chair of the Environmental and Climate Justice Committee for the local chapter of the NAACP, believes that communication is the key to helping everyone become better ambassadors to the planet. Through discussions with lawmakers and key decision makers, as well as partnering with local groups to hold informational community events, she is working to overcome access and education barriers so that the investments made to combat climate change are equitable.

"We don't want laws and changes and protections just for people who can afford it," Dance says. "It's important to have in place not only the funds, but an accessible and attainable process to do what's right. We don't need plans to be put in place without us knowing, so it's important for us to be heard and for everybody to be treated fairly at the same level."

Climate Justice

Climate Justice refers to acknowledging and addressing how climate change has disproportionate, adverse impacts on the social, economic, and public health of historically disadvantaged communities (DACs) such as Black, Indigenous, People of Color (BIPOC), and low-income communities.[11] Additionally, these frontline communities have historically been excluded from the environmental decision-making process and had limited opportunities for participation. Long-term mitigation and adaptation strategies can help address these impacts to achieve climate justice.

A Just Transition from fossil fuel-based energy sources to renewable, sustainable ones "is one that builds connections, creates opportunity, and ensures a good quality of life" for all.[12] A Just Transition process is another important concept that recognizes that if the shift of society away from fossil fuels is not implemented in an equitable manner, climate injustice will be exacerbated. For example, it is important to make sure that displaced workers from fossil fuel industries are retrained and able to obtain good jobs in clean energy industries.

This Plan has been developed with an equity focus. It is common to confuse the difference between equity and equality. The key difference between equity and equality is that with equality, everyone receives an equal amount of support, while equity involves helping those with the type and amount of support to meet an individual's needs (see Figure 8 and Figure 9). To ensure equity was consistently applied throughout the CCAP's de-

Figure 8 Inequality, Equality, Equity, and Justice

Tony Ruth, *Addressing Imbalance*, 2019, graphic, Design in Tech Report, https://achievebrowncounty.org/2021/05/defining-equity-equality-and-justice/

Figure 9 Equality vs. Equity
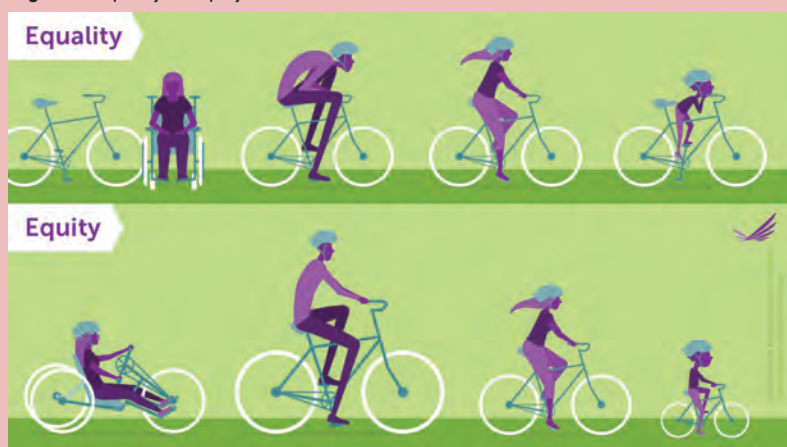
Joan Barlow, Equality vs. equity, 2022, graphic, Robert Wood Johnson Foundation, https://www.rwjf.org/en/insights/blog/2022/11/we-used-your-insights-to-update-our-graphic-on-equity.html?channelid=xli&cid=1003444

velopment, the Racial Equity Impact Analysis Tool was referenced by each Working Group, which provided questions to reflect on while they drafted the chapters (Figure 10).

Additionally, the Plan's Climate Justice Working Group reviewed all the outputs of every chapter with a justice lens and made suggestions where equity considerations were missing. The inclusion of this additional layer helped to ensure that the equity focus was not lost while putting together the Plan's Goals, Strategies, and Action Items. Mindful inclusion of equity and justice when developing climate change solutions is essential to achieving climate justice.

Figure 10 Racial Equity Impact Analysis
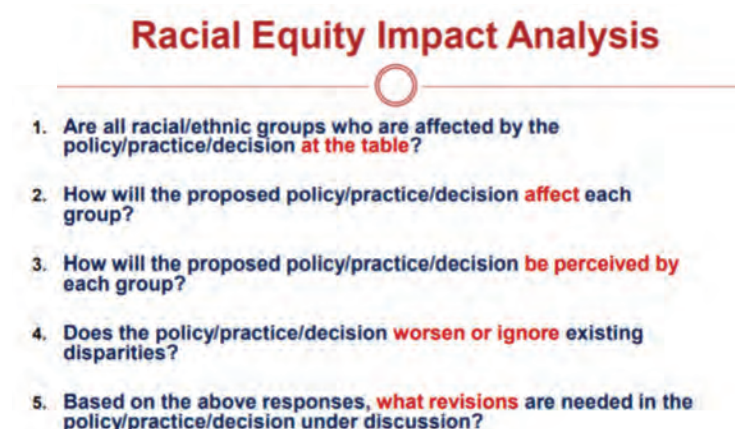
The Race Matters Institute of JustPartners, Inc., Racial Equity Impact Analysis, 2019, The Race Matters Institute of JustPartners, Inc., https://www.mchnavigator.org/documents/REIA.pdf

NYS Climate Leadership and Community Protection Act

Erie County modeled this Plan's climate-justice-focused review structure after the New York State Climate Action Council, which developed a Scoping Plan to reach the goals of the New York State Climate Leadership and Community Protection Act (CLCPA or "Climate Act"). The state is seeking to ensure that the "transition to a clean energy economy works to address the structural disadvantages that have caused historically marginalized communities (e.g., people of color, indigenous, low-income, and women) to bear a disproportionate burden of the impacts of climate change and pollution."[13]

Disadvantaged Communities Definition Development

To identify disadvantaged communities (DACs) in New York State, NYSERDA's Climate Justice Working Group (CJWG) "assessed data and information on environmental burdens, climate change risks, population characteristics, and health vulnerabilities at the community level and then developed a methodology for scoring communities based on these indicators."[1] The CJWG originally identified and considered 150 indicators as they developed the DACs criteria.[2] After evaluating the quality, level of detail, and correlation to other indicators for the available data, the CJWG decided on 45 indicators for the draft criteria to identify DACs.

Figure 11 NYSERDA Disadvantaged Communities Map
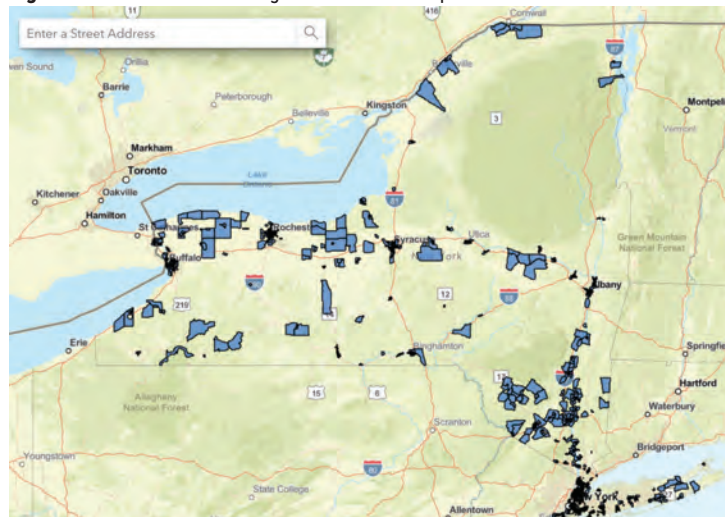
NYSERDA Climate Justice Working Group, Disadvantaged communities map, 2023, map, NYSERDA, https://www.nyserda.ny.gov/ny/Disadvantaged-Communities

It is important to note that while the mapping shows census tracts and municipalities that qualify as DACs, it does not illustrate the low-income households that also qualify for the 35-40% of direct clean energy and energy efficiency investments.

Sources and Notes:
1 NYSERDA Climate Justice Working Group, "Disadvantaged Communities Criteria Development Frequent Questions," New York State, 2023, https://climate.ny.gov/-/media/Project/Climate/Files/Disadvantaged-Communities-Frequently-Asked-Questions.pdf.

2 To learn more about NYSERDA's Disadvantaged Communities criteria, go to https://climate.ny.gov/resources/disadvantaged-communities-criteria/

The County shares New York State's goal to address the inequities in our communities and will use New York State's definition of "disadvantaged communities" to ensure that these communities are not left behind again. Through the Climate Act process, New York State has identified disadvantaged communities as "those that bear the burdens of negative public health effects, environmental pollution, impacts of climate change, and possess certain socioeconomic criteria, or comprise high-concentrations of low- and moderate- income households."[14]

Erie County recognizes that the term "disadvantaged communities" is a term that the communities themselves may not appreciate. However, to align with the Climate Act and reflect historic inequities, the term "disadvantaged communities" will be used.

Disadvantaged communities have not received equitable investment in infrastructure or amenities due to historic race and class-based land use and development policies, such as redlining, exclusionary zoning, and incentivizing sprawl.[15] Therefore, to achieve equity, it is

important that disadvantaged communities are prioritized to receive assistance. Through the Climate Act, disadvantaged communities will "receive no less than 35% of benefits [of clean energy and/ or energy efficiency investments], with a goal of 40% of benefits."[16] It is important to note that the map of disadvantaged communities from NYSERDA does not directly map individual low-income households. Even though those households are not shown on the map (Figure 11), they will be included as beneficiaries of the Plan.

Local & Regional Examples

Throughout this chapter are case studies highlighting many local and regional examples of projects and programs that are addressing inequity while also reducing GHGs and/or preparing for the impacts of climate change. These stories help us imagine solutions to our current crisis that also improve quality of life beyond thinking about climate change.

PUSH BUFFALO - School 77[17]

School 77 is an 80,000-square-foot former Buffalo Public School built in 1927, located on the West Side of Buffalo. School 77 was closed and abandoned for nearly six years. People United for Sustainable Housing (PUSH) Buffalo worked with the community to determine their needs and have now transformed it into solar-powered affordable senior apartments and a community center.

Photo credit: PUSH Buffalo

Photo credit: Rain Check Buffalo

Buffalo Sewer Authority Raincheck 2.0[18]

Green infrastructure, which manages stormwater through nature-based solutions, makes our community more resilient to climate change. It also offers a wide range of co-benefits, such as directing public investment into neighborhoods, enhancing community aesthetics, supporting public health and recreation, improving public safety, and creating green job opportunities. Buffalo Sewer Authority's Raincheck 2.0 is an extensive plan to implement green infrastructure across the City of Buffalo in a way that is equitable and leverages all of these co-benefits.

Providence Farm Collective[19]

Providence Farm Collective (PFC) is the only non-profit organization in Western New York that directly supports communities with access to rural farmland, farming and business education, technical assistance, markets, and the opportunity to farm for income. PFC has a mission to cultivate farmer-led and community-rooted agriculture and food systems to actualize the rights of under-resourced people.

Photo credit: Providence Farm Collective

Photo credit: Massachusetts Avenue Project

Massachusetts Avenue Project[20]

Massachusetts Avenue Project (MAP) has a mission to nurture the growth of a diverse, accessible, and equitable local food system; promote economic opportunities; and empower youth through social change education. MAP imagines a community in which all youth and families have access to fresh, healthy, and culturally appropriate food; people of all incomes have economic opportunities; vacant lots are transformed into productive green spaces; and youth and their families are engaged in their communities. MAP values inclusivity, diversity, equity, nourishment, and land stewardship.

The Foundry[21]

The Foundry uses an inclusive approach to advancing individuals through hands-on learning, entrepreneurship, and exposure to possibilities. They facilitate youth opportunities through Science, Technology, Engineering, Art, and Mathematics (STEAM) sessions in their shops and labs, training partnerships, part-time employment at the Foundry, job shadowing with Foundry entrepreneurs, and youth entrepreneurship programs.

The Foundry believes that creating opportunities and conditions necessary for self-sufficiency and economic stability promotes a healthier community. They primarily focus on working with low-income, minority, women-owned, and neighborhood-based businesses by providing affordable rental space, connections to mentoring, business classes and workshops, and connections to local support services.

Photo credit: The Foundry

Parks Adventure Bus[22]

In response to rider requests for improved public transit access to area parks and beaches, in the summer of 2022, the Niagara Frontier Transit Authority (NFTA) started the Parks Adventure Bus service, which provided free rides on Saturdays to County and State parks in Western New York. The first year of the NFTA Parks Adventure Bus was so successful that they expanded the program in 2023.

Photo credit: NFTA

Photo credit: Grassroots Gardens WNY

Grassroots Gardens WNY[23]

Grassroots Gardens of Western New York is a dedicated group of community gardeners and activists. Their mission is to share knowledge, power, and resources to grow healthy food, heal systemic harm, and strengthen neighborhood connections through community gardens. The Grassroots Gardens WNY vision is a lasting network of land and people growing healthy communities. Grassroots Gardens WNY values equity & justice, community leadership, fostering connections, stewardship, and restorative practices.

FOOTNOTES: Climate Justice

11 Daisy Simmons, "What Is 'Climate Justice'?, July 29, 2020, http://yaleclimateconnections.org/2020/07/what-is-climate-justice/.

12 NYS Climate Action Council, "New York State Climate Action Scoping Plan."

13 NYS Climate Action Council.

14 NYSERDA, "Definitions," NYSERDA, accessed August 2, 2023, https://www.nyserda.ny.gov/All-Programs/Clean-Energy-Workforce-Development-and-Training/Resources/Definitions.

15 To learn more about transportation accessibility, check out the Transportation chapter.

16 NYSERDA, "New York State Releases Draft Disadvantaged Communities Criteria to Advance Climate Justice," NYSERDA, March 9, 2022, https://www.nyserda.ny.gov/About/Newsroom/2022-Announcements/2022-03-09-New-York-State-Releases-Draft-Disadvantaged-Communities-Criteria.

17 To learn more about School 77 and PUSH Buffalo, go to https://www.pushbuffalo.org/school-77/

18 To learn more about Rain Check Buffalo, go to https://raincheckbuffalo.org/benefits-of-green-infrastructure/

19 To learn more about the Providence Farm Collective, go to https://providencefarmcollective.org/our-impact/

20 To learn more about the Massachusetts Avenue Project, go to https://www.mass-ave.org/who-we-are

21 To learn more about The Foundry, go to https://www.thefoundrybuffalo.org/

22 To learn more about Parks Adventure Bus, go to Erie County's website at https://www3.erie.gov/socialservices/press/parks-adventure-bus-service-nfta-offers-free-rides-wny-parks-summer

23 To learn more about Grassroots Gardens WNY, go to https://www.grassrootsgardens.org/

Schiller Park Community Services on Genesee Street in Buffalo has served as a safe place for seniors to socialize since the 1980s. Whether it's ice cream or a cold drink during the warmer months, or a soup with coffee or hot tea during the winter, the center is a refuge from extreme weather conditions that offers nutritious meals, daily programming, and case management services.

"When seniors come in here on a regular basis, especially when it's too hot outside, it gives them the relief from being in an uncomfortable home that may be without AC," says Director of Senior Services Cheryl Buttino. "Most of the seniors that come here live on their own, so we purposefully give them something to do to keep their bodies moving."
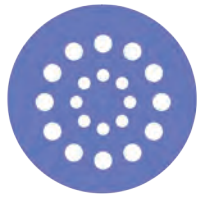
Climate Resiliency

The Western New York region is already experiencing changing climate conditions. Some of the most noticeable changes are increasing temperatures, more severe storms, and changing precipitation patterns.[24] Climate projections suggest that these trends will continue, especially under the most severe GHG emission scenarios.[25] These changing conditions present significant risks to Erie County and its residents. Particularly concerning are the disproportionate impacts that climate change has on vulnerable populations (e.g., elderly, youth, and disadvantaged communities).[26] Some of the major climate change impacts that are expected in the Western New York region include, but are not limited to:

- Increased temperatures and more frequent and intense heat wave events.

- Increased intensity of both floods and drought.

- More intense wind and precipitation events, magnified by warmer lake temperatures.

- Longer growing seasons, and changes in what type of crops can be effectively grown.

- More variability in lake levels and increased shoreline erosion on Lake Erie.

- Warmer Lake Erie temperatures that exacerbate algal blooms, leading to polluted water.

- Amplified threats to public health (e.g., reduced air quality, risk of disease-carrying insects, and extreme temperatures).

Understanding and addressing the threat posed by climate change is essential for Erie County to prosper economically, socially, and environmentally. It is also critical for enabling the County to remain a safe, livable, and vibrant place to live, work, and visit. Erie County has a leading role in supporting vulnerable people in our community through emergency services, public health, and social services. Therefore, it is especially important that the County is ready to protect our community from the impacts of climate change.

While Erie County is vulnerable to climate change impacts, it is located far away from the ocean, has an existing temperate climate with fertile soils, and its proximity to significant freshwater resources buffers it in comparison with areas that are or will be adversely affected by the same factors. Erie County has less vulnerability and more nature-based resiliency than many places, therefore, the County needs to prepare for climate-related migrants as drought, sea level rise, and other threats dislocate populations within the United States and around the world. A large future influx of people relocating to a more favorable climate has the potential to create complex problems that could be strategically alleviated with more intentional plans and programs now. For example, a population increase typically results in increased housing costs, increased development pressures, and the displacement of existing low- and moderate-income residents.

The County will need to work with local governments and community partners to assure that we are prepared for and welcoming to people and companies in search of a more moderate climate while also strengthening community resilience and sustainability.

At the outset of this planning process, the Task Force assembled a Climate Resiliency Working Group to guide the efforts on this topic. The Working Group determined that because climate resilience touches most aspects of climate action, from transportation to agriculture, this Plan must include climate resilience strategies and actions in each of the sector chapters. A process was implemented where each strategy in each chapter was reviewed by the Working Group as they were developed, which assured a coordinated and comprehensive treatment of resilience topics within the Plan.

The remainder of this chapter is written in two parts. The first part is a summary of the County's recently completed Climate Vulnerability Assessment (CVA), which serves as a guidepost to actions the County needs to take to protect the community. The second part of this chapter is a discussion of several overarching climate actions that are important to consider for the subsequent chapters.

Climate Vulnerability Assessment

To understand the implications of future climate impacts to our community, the County partnered with a research group at the University at Buffalo (UB) led by Dr. Susan Clark to conduct a CVA.[27] The CVA identified some of the County's key climate threats and hazards, assessed how sensitive the County is to these threats, and examined the current capacity to handle these hazards at the County level. The results of the CVA informed this Plan regarding actions needed to reduce the impact of future events resulting from climate change.

Based on a literature review and stakeholder input, four hazard categories were selected to investigate: 1) temperature focused on extreme heat; 2) precipitation focused on local and downstream flooding; 3) wind focused on shifting wind patterns and thunderstorm winds; and 4) biological threats focused on invasive species and vector-borne disease. These were selected from a longer list of climate threats based on their frequency and duration in Western New York, County jurisdiction, and impacts posed by the threats. The CVA also included a mobility analysis of Erie County residents during an emergency.

Sensitivity to Extreme Heat

Sensitivity to extreme heat is a major concern for Erie County, as it is predicted that the region will experience more frequent and more intense heat waves in the future. Where the County has more experience addressing extreme cold and lake effect snowfall events, vulnerability to heat waves and elevated temperatures is particularly problematic for its residents and infrastructure, which are unaccustomed to high temperatures. This is a particular concern for the County's many residents who have health issues that make them vulnerable to heat, and who may live in poorly insulated housing without air conditioning.

To assess sensitivity to extreme heat for the CVA, the County considered landscape factors including tree canopy, proximity to water sources, the prevalence of paved surfaces, and industrial parcels. We also considered socio-demographic factors related to economic, social, physiological, and mobility factors of County residents. When both landscape and socioeconomic factors are considered, the overall results (Figure 12) indicate that urban areas of the County, which are predominantly located in and around the City of Buffalo, are the most highly sensitive to extreme heat, while much lower extreme heat sensitivities are found in rural areas. The most sensitive locations are, in general, characterized by a high percentage of low-income and mobility-limited populations with a relatively low percentage of tree cover, more paved surfaces, and a high number of surrounding industrial parcels and/or truck terminals, which have a warming effect on surrounding areas.

Figure 12 Erie County Overall Sensitivity to Extreme Heat
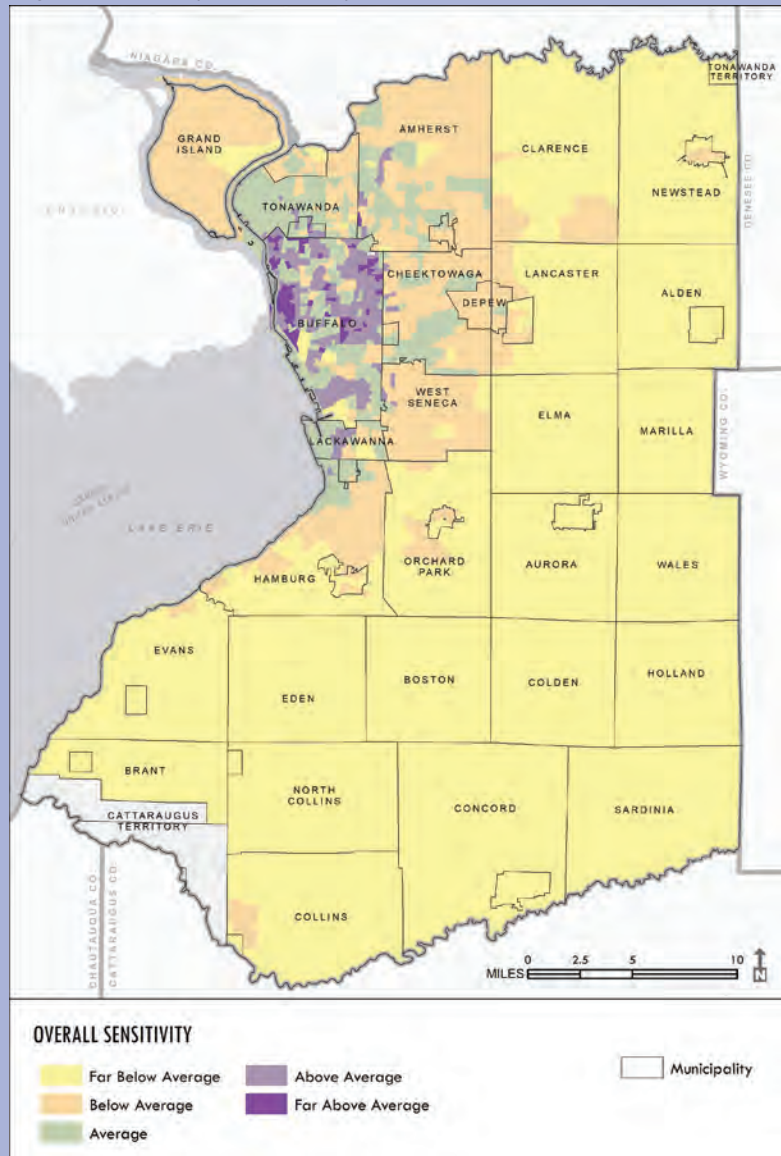
UB, Overall sensitivity to extreme heat in Erie County, map, at https://www.erie.gov/cva
Data source: University at Buffalo

Sensitivity to Flooding

Patterns in precipitation are changing because of the impacts of climate change, and this has resulted in greater frequencies of extreme rainfall and snow events. These events exacerbate flooding and runoff issues,[28] which can impact Erie County's residents and property, especially environmental justice communities because they are more likely to be located near contaminated sites.[29]

To create the CVA, sensitivity to flooding was looked at regarding local flooding, on-site flooding, and downstream flooding. The local flooding assessment shows large regions of Erie County's urban areas in and around the City of Buffalo, as well as areas along the northern border of the County, with the highest sensitivities. There are above-average sensitivities located throughout the central and southern areas of the County as well. The downstream flooding assessment suggests that while most of Erie County is characterized by far-below-average sensitivities, there are areas, located mostly in the northern part of the County and along waterways that are highly sensitive to downstream flooding. It is important to note that stormwater infrastructure is not factored into either of these analyses and tends to mitigate risks in the more urban areas.

Sensitivity to Wind

Through a literature review and interviews with climate experts, the sensitivity to wind assessment focused on changes in wind speed, wind direction, and seasonality of wind events observed and projected for Western New York.[30] This was seen recently with the Blizzard of 2022, where extreme prolonged winds combined with heavy snow caused power outages and severely impacted the community, resulting in the deaths of more than 40 individuals. The assessment found that wind speeds are projected to increase in the winter and summer months as the climate warms, which may continue the

locally observed trend toward more frequent and intense thunderstorm winds. Wind direction is also changing, and while Erie County currently experiences prevailing winds from the southwest, we could experience more northeasterly winds as the climate changes. This shift in direction, along with increased wind speeds, may increase the likelihood of wind damage to infrastructure, houses, trees, and other important components of the Erie County community.

In terms of seasonality, the Western New York region may experience a slight increase in the number of winter storms (due to an expected northerly shift of the jet stream) and associated high wind events. More off-season storms are also expected, which can be detrimental to trees and infrastructure. Snowstorms occurring in late Spring or early Fall, for example, can be particularly damaging. Regarding trees, once leaves on trees are budding in

Figure 13 Erie County Local Flooding Sensitivity

LOCAL FLOODING (IMPROVED CONDITIONS)

- Far Below Average
- Below Average
- Average
- Above Average
- Far Above Average
- Municipality
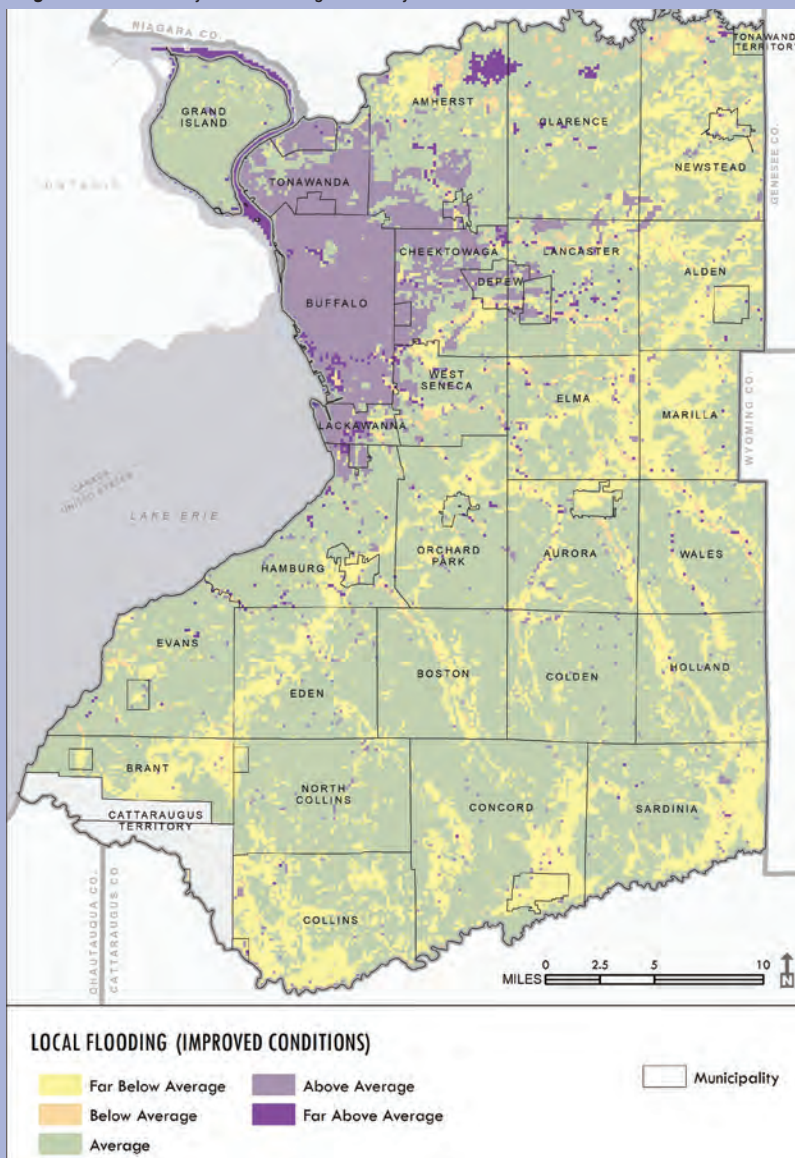
UB, Local flooding sensitivity in Erie County, map, at https://www.erie.gov/cva
Data source: University at Buffalo

the spring or remaining on trees in the fall, the weight of the snow will make their branches or the entire tree more susceptible to being knocked down by the wind, ice, and/or snow, increasing the likelihood of power outages. We also expect to see a summertime increase in the strength of the lake breeze coming from Lake Erie due to enhanced temperature differences between the lake and land, which could be beneficial for helping cool the region during the summer months.

Sensitivity to Biological Threats

As the climate changes, so do the ecosystems and habitats in our region. These changes in habitat suitability can lead to changes in the geographic range of many species. Vector-borne diseases, invasive species, and other biological threats are becoming more prevalent and are having a greater impact as the region's climate becomes more suitable for them.[31] For example, diseases spread by mosquitoes, ticks, and invasive species are becoming more prevalent where they already occur and are spreading to new areas.

The CVA mapped habitat suitability for thirteen vector-borne diseases and found that the issues that Erie County may face in terms of these species and their diseases will likely be dynamic and change over time as climate conditions change. For example, by mid-century, Erie County's habitat will be less suitable to the Deer Tick, which carries Lyme disease. Meanwhile, Erie County's habitat will become highly suitable for the Asian longhorned tick, a vector for cattle diseases that is not currently found in Erie County.[32]

Sensitivity with Respect to Mobility and Accessibility

Levels of mobility are how far a person can travel in a given amount of time, while levels of accessibility are the number of transportation services a person can reach in that given amount of time. Both indicators vary across space and socioeconomic demographics.[33] A key

concern for the County is the potential lack of access to care during emergency situations, especially for less mobile or disadvantaged populations that are more vulnerable to climate hazards.

In this analysis, mobility and accessibility were estimated for twenty-four hospital emergency departments and thirty-seven library cooling shelters across the County. Accessibility in terms of minimum driving times to area hospital emergency departments was found

to be relatively low for rural communities, whereas access to County cooling shelters is more uniform.

Adaptive Capacity

The final phase of the CVA assessed the adaptive capacity of Erie County in light of its sensitivity to climate threats. Adaptive capacity refers to the ability of the County to adapt or adjust to climate hazards and risks. Representatives from relevant Erie County departments were interviewed and asked to respond to

Figure 14 Erie County Hydrologic Soil Group

HYDROLOGIC SOIL GROUP (IMPROVED CONDITIONS)

Far Below Average
Below Average
Average
Above Average
Far Above Average
Municipality
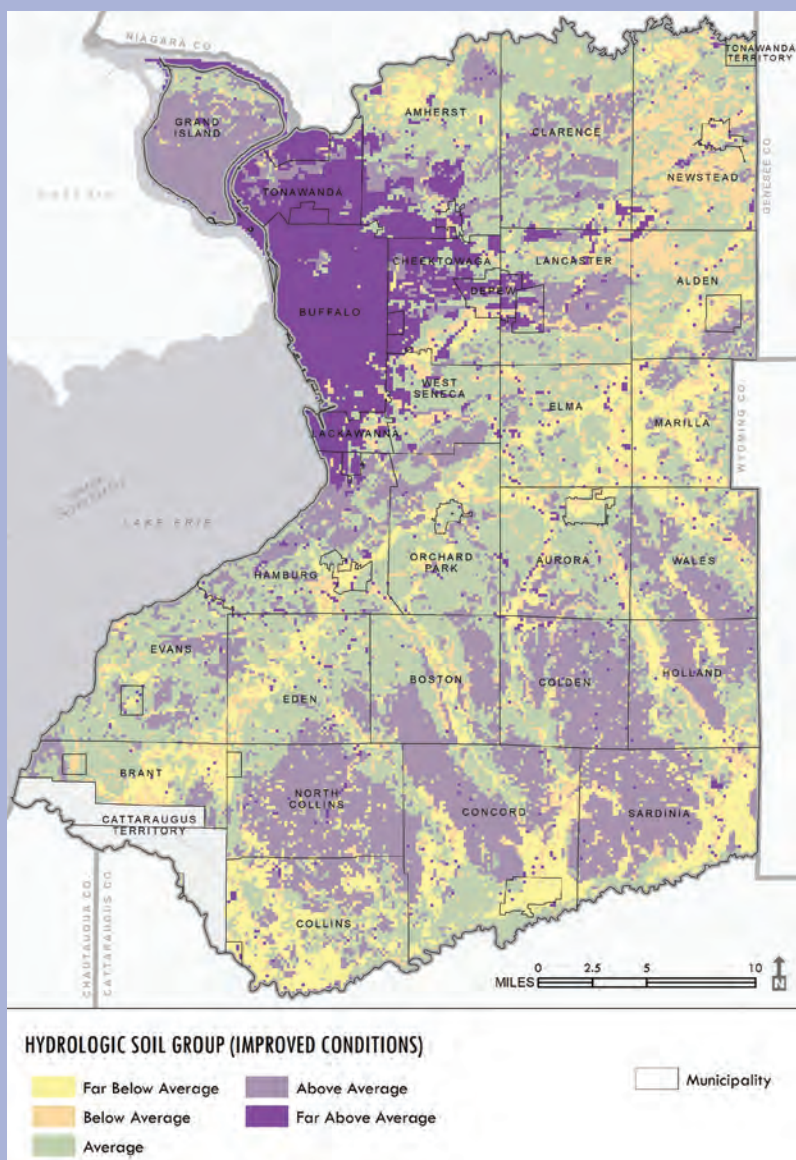
UB, Hydrologic soil group in Erie County, map, https://www.erie.gov/cva

Data source: University at Buffalo
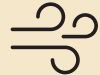
questions about current practices and planning related to the identified climate sensitivities. This phase found that the County has significant capacity to address climate impacts, but there are also key gaps. For example, although the County's public libraries have been identified as cooling center locations, in the event of a blackout, cooling centers do not have backup power for cooling systems. For a full description of adaptive capacity and capacity gaps, please refer to the CVA report.

Overall Vulnerability

In general, Erie County is expected to experience increases in the frequency and severity of heat waves, flooding, and storms with damaging winds. Changes in wind direction and seasonality of storms are also potential threats. Projected climate change in the region is also likely to reduce habitat suitability for a variety of native species while improving conditions for existing and new invasive species. Exposure to vector-borne diseases from both native and invasive species will therefore continue to change over time as habitat suitability shifts for these species over time. Finally, accessibility to area hospital emergency departments is relatively low for rural communities, whereas access to County cooling shelters at public libraries is more uniform. Table 1 summarizes Erie County's areas of vulnerability to climate change impacts that the CVA has identified, along with potential opportunities to mitigate this vulnerability now and into the future.

Table 1 Summary of Major Vulnerabilities and Potential Opportunities According to Threat Type

Threat	Vulnerabilities	Opportunities
Increase in the frequency and intensity of heat waves	• Stress on the power grid due to higher cooling demand • Increased health impacts, especially for vulnerable populations (e.g., the elderly, youth, and pregnant women) • Old, under-insulated housing stock and lack of access or affordability to air conditioning for the most vulnerable	• Increase communication and coordination with electric utility companies • Enhance outreach and awareness about heat vulnerability and ways to avoid impacts • Develop a heat emergency plan for Erie County • Create a system to check on and aid the most vulnerable County residents during a heat wave
Increase in frequency and severity of flooding	• More frequent local flooding, including County land, homes, and roadways • Increased debris in sewer systems • Reduced drinking water quality during flooding events	• Conserve existing trees and vegetation as well as invest in the development and maintenance of green infrastructure projects to improve water infiltration capacity, retention, and stormwater management • Map location of past and current flooding hotspots • Take steps to avoid or reduce development in high-flood-risk areas
Increase in wind damage	• More power outages • Reduced tree health and more tree damage • Financial burden and increased safety risk for workers	• Increase power backup system capacity (mobile generators, micro-grids, etc.) • Plant wind-resistant trees in tree-planting initiatives • Provide financial support for proactive tree removal
Changing habitat suitability for species/diseases	• Increased exposure and health impacts of County employees and residents to vector-borne disease	• Increase monitoring of changing species and health risks • Prepare and train County employees on precautions and safety regarding biological hazards, including vector-borne disease • Provide information and outreach to increase awareness and reduce the impacts of disease-carrying species
Accessibility and mobility challenges for vulnerable populations	• Access to critical lifeline services during and after extreme events and emergencies, especially for the most vulnerable residents	• Identify local community shelters in the most vulnerable communities • Increase access to public transportation services, especially in rural communities

Extensive flooding of the neighborhood around the Boston Valley Pump Station consistently caused damage to the site, which prompted Erie County to rebuild it in 2018 to make the infrastructure more resilient to extreme weather. The new station was designed with a single wet well, with pumps underground that are designed to operate underwater instead of the original pumps that needed to stay dry. Part of the site was also elevated to keep the electrical building and standby generator out of harm's way during future floods.

"Other stations have a dry pit and a wet pit," says Garry Pecak, standing left, the Assistant Deputy Commissioner for the Erie County Division of Sewer Management. "In this case, it's just a wet well. The pumps sit inside the water so that flooding's not a concern."

Overarching Climate Resilience Actions

The Climate Resiliency Working Group decided that rather than having a single chapter describing all the climate resilience strategies and actions, it would be better to have these developed by the sector-specific Working Groups and included in the sector-specific chapters. For example, transportation resilience strategies and actions are described in the Transportation chapter of this Plan. There are some actions that the Working Group identified as being overarching and relevant to multiple or all sectors. These overarching actions are described below.

3.1.1: Heat Emergency Plan

The CVA identified Erie County as being vulnerable to extreme heat, especially in urban areas where there is a lack of green space, older housing stock without air conditioning, and where residents tend to be older and suffer from health issues like asthma. The County has some rudimentary procedures for dealing with extreme heat, but the CVA identified developing a Heat Emergency Plan as an important next step. This project will build upon the extreme heat analysis in the CVA to develop a locally-informed plan for mitigating the effects of, and responding to, heat wave conditions. This project will also build upon current programs to check on and provide aid to the most vulnerable County residents during a heat wave.

3.1.2: Electric Grid Resilience

As we saw recently with the Blizzard of 2022, our community is vulnerable to severe winter storms that can cause power outages during extremely cold temperatures, which magnifies the impact on residents and the economy from these storms. Electrification is an important strategy to mitigate climate change, but it is especially important that as we increase reliance on electric power and invest in increasing the capacity of our electric system, we also consider strategies to increase resilience during power outages, such as installing back-up power systems for critical facilities. To this end, the County should strongly advocate to the electric utility companies and the Public Service Commission for the creation of an electric system that is resilient and can withstand severe storms year-round.

3.1.3: Coastal Resiliency

As the climate warms, it is expected that there will be greater impacts from lake seiche events, which are a tempo-rary disturbance or oscillation in the water level of a lake or partially enclosed body of water, especially one caused by changes in atmospheric pressure. Lake Erie will also have less ice coverage, which will increase shoreline erosion in the winter months. These changes will make homes, businesses, and infrastructure on Lake Erie and nearby waterways more vulnerable. The County will work with local, state, and federal government partners to identify opportunities to develop coordinated approaches to make our coastal areas more resilient.

3.1.4: Reducing Social Vulnerability

Social vulnerability refers to a community's capacity to prepare for and respond to the stress of hazard-ous events, including natural disasters and human-caused events, as well as disease outbreaks.[34] Social vulnerability assessments of the County suggest rela-tively high vulnerability near and around downtown Buffalo, plus vulnerable pop-ulations in the southwest and rural areas of the County.[35] Strategies to reduce the overall social vulnerability of Erie County residents will help improve the overall livelihoods of residents throughout the County and help reduce the impacts of extreme events.

3.1.5: Ongoing Improvement to Resilience Planning

While much about climate change has become clearer in recent years and we now know and experience our local weather dramatically warming and changing, many aspects of how our local climate will change and what impacts County residents will experience in the future are unknown. The trajectory of our understanding of Erie County's climate vulnerability will become clearer as climate modeling improves and as we continue to experience climate change impacts. To best protect life and prop-erty in our community, the County will regularly update and improve its climate resilience planning and resulting actions as new information becomes available.

FOOTNOTES: Climate Resiliency

24 Great Lakes Regional Integrated Sciences and Assessments Center, "2021 Annual Report," 2021, https://glisa.umich.edu/wp-content/uploads/2021/10/GLISA_2021_Annual_Report.pdf.

25 Radley M. Horton et al., "Climate Change in New York State: Updating the 2011 ClimAID Climate Risk Information" (NYSERDA, 2014), https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/Research/Environmental/EMEP/climaid/ClimAID-synthesis-report.pdf.

26 NYSDEC and NYSERDA, "New York State's Draft Disadvantaged Communities Criteria," NYS, May 2022, https://climate.ny.gov/-/media/project/climate/files/LMI-dac-criteria-fact-sheet.pdf.

27 To access the CVA, go to Erie County's Climate Action website at https://www.erie.gov/cva

28 To learn more about work the NYSDEC has done to handle the issue of flooding along contaminated sites, go to the NYSDEC's webpage on the Community Risk and Resiliency Act at https://www.dec.ny.gov/energy/102559.html

29 USEPA, "Climate Change and Human Health," Overviews and Factsheets, February 27, 2023, https://www.epa.gov/climateimpacts/climate-change-and-human-health.

30 Stephen Vermette, "Weathering Change in WNY: Climatic Trend Analysis (1965-2016)" (SUNY Buffalo State University Department of Geography & Planning, December 2017), https://weather.buffalostate.edu/sites/weather.buffalostate.edu/files/uploads/photos/PDF/Trend%20Analysis_December_2017.pdf; Susan Clark et al., "Climate Vulnerability Assessment," Erie County Climate Action, 2020, https://www.erie.gov/cva.

31 USEPA, "Climate Change Indicators: Lyme Disease," Reports and Assessments, United States Environmental Protection Agency, July 21, 2023, https://www.epa.gov/climate-indicators/climate-change-indicators-lyme-disease.

32 Clark et al., "Climate Vulnerability Assessment."

33 Jinhyung Lee and Harvey J. Miller, "Measuring the Impacts of New Public Transit Services on Space-Time Accessibility: An Analysis of Transit System Redesign and New Bus Rapid Transit in Columbus, Ohio, USA," Applied Geography 93 (April 2018): 47–63, https://doi.org/10.1016/j.apgeog.2018.02.012.

34 CDC/ATSDR, "At A Glance: CDC/ATSDR Social Vulnerability Index," CDC/ATSDR, October 26, 2022, https://www.atsdr.cdc.gov/placeandhealth/svi/at-a-glance_svi.html.

35 CDC/ATSDR, "CDC/ATSDR Social Vulnerability Index (SVI)," CDC/ATSDR, July 12, 2023, https://www.atsdr.cdc.gov/placeandhealth/svi/index.html.

Springville Middle School social studies teacher Drew Beiter and science teacher Kristin Hughey are part of a growing national movement among educators to teach students about climate change across multiple subject matters. Beiter – cofounder and executive director of the Academy for Human Rights and an inductee into the National Teachers Hall of Fame – says that education is a crucial component of the transition toward green energy.

"The younger the better," Beiter says. "It's an all-hands-on-deck movement. Ultimately, classrooms, businesses, and governments have to show future generations that we can do this. We've done great things in the history of this country before – like going from horses to Model Ts – so there's always room for hope that we can do it again here."

Communicating Progress

Erie County CLIMATE ACTION

This Plan prioritizes community input and government transparency and was developed with guidance from the Communicating Progress Working Group. Public input has made the Plan robust while encouraging buy-in from residents that will be impacted by the strategies and actions recommended by the Plan. The priorities of community input and government transparency will continue to be critical as the Plan is implemented. Below is a description of how the County sought input from community residents and organizations throughout the creation of the Plan, made the process transparent, and will continue these efforts during Plan implementation.

Outreach and Transparency While Developing the Draft Plan

To ensure that this Plan addressed the needs of community residents, the County and its partners sought community input in a variety of ways before the draft Plan was released. These included:

- **Press releases and events.** A press event was held to kick off the planning process.[36] County press releases included information about public meetings and updated reports.[37]

- **Climate action website.**[38] The County's Sustainability Team frequently updated its website outlining the planning process and ways for community residents and organizations to get involved, which included signing up for email updates, taking a survey, requesting a meeting, and becoming a climate ambassador.

- **A brochure**[39] **describing climate change impacts and opportunities in Erie County.** This brochure continues to be posted on the Climate Action website and has been distributed to all libraries throughout the County, as

well as at events and presentations. The brochure was translated into Spanish,[40] Swahili,[41] Burmese,[42] and Arabic[43] to reach a larger group of community residents beyond native English speakers.

- **Email updates.** More than 1,400 people signed up to receive regular updates on the Plan, which included information on the overall Plan, invitations to presentations, the opportunity to invite the County to present to local organizations, and notifications of when draft goals and strategies were available for public comment. The email recipients covered nearly every corner of the County. Updates were also sent through a more general Erie County Environmental Updates newsletter with a subscription list of 8,500 addresses.

- **Public presentations.** The County held public presentations that were open to the public at the Central Library in downtown Buffalo, both in-person and online.

- **Private presentations.** More than 75 presentations were given to community groups, municipal officials, not-for-profits, universities, senior centers, and businesses. The County continues to welcome invitations to present on the Plan.

- **Outreach at public events.** The County Department of Environment and Planning (DEP) tabled at more than 100 events throughout the County. Through these events, the DEP intentionally sought to reach a variety of age groups from small children to senior members as well as diversity in race and ethnicity to ensure there were ample opportunities for engagement. These events included the County Parks Department's Fall Fest and Winter Fest, the Erie County Fair, Kuleta Pamoja at the Johnnie B. Wiley Amateur Athletic Sports Pavilion, the Elmwood Festival of the Arts, Borderlands Music + Arts Festival, and the Lunar New Year Festival.

- **Social media.** The CCAP planning process was promoted on Facebook,[44] Instagram,[45] and Twitter.[46] Every time part of the Plan was ready for review, a notification was sent out via social media. Posts also included informational videos, brochures, and invitations to events.

- **Climate Ambassador Program.**[47] The ambassador program serves as a connection between the community and Erie County. It gives community members a chance to learn about our programs and educate groups on the impacts of climate change to gather feedback on what is needed in their communities.

As the Plan was developed, draft chapter outputs were available for public feedback for 30 days on the Climate Action website.[48] Outputs that were available for public feedback were announced via email and through social media posts. All feedback received was presented back to the Working Groups and incorporated where appropriate.

Students at the Omega Mentoring Program Learning About Climate Action

Solar smoothies

Repair cafe

Composting

Recognition of completion of the Climate Connections Project

Figure 15 Stakeholder and Public Involvement in Creating the Draft Plan

Stakeholder and Public Involvement in Creating the Draft Plan

More than
100 Volunteers
from **70 organizations**
Developed the Draft Community Climate Action Plan

More than
75 presentations
and over **100 events**
At Public Events and with Partner Organizations

250
Participants at Climate Action Showcase to unveil the Draft Plan

Over
300 Public Comments
Were received via email, at events, and on the telephone during the drafting of the Plan

Over
10,000 people receiving email updates
8,500 people received monthly newsletters and over 1,600 people received an update every time an output was released

Finalizing the Plan

The Draft CCAP was released at a public event on March 18, 2023 at D'Youville University in conjunction with a WNY Sustainable Business Roundtable (WNY SBR) educational event. There were approximately 250 participants at the event, which featured a youth art showcase, children's activities, refreshments, presentations, and tabling on each of the chapter Working Groups. Volunteers from the University at Buffalo scribed public comments at each Working Groups' table.

The Draft Plan was open for public comment for 90 days and made available on the County's Climate Action website. During the comment period, the County hosted public meetings, continued to conduct outreach at local events, and presented to community groups. Various showcase events were hosted by Erie County, which included in-person and virtual events across the County. Outreach about the finalization of the Plan and the opportunity to comment on the Draft Plan included:

- **Public presentations –** Three public presentations of the Draft Plan were held: the event at D'Youville University mentioned above and two virtual presentations.

- **Presentations to community groups –** More than 20 presentations were made to groups after the Draft Plan was released. These groups included the NAACP, the Buffalo Jewish Federation, the West Seneca Town Board, the Association of Supervisors, the League of Women Voters, Frontier Middle School, and Westminster Presbyterian Church of Buffalo.

- **Tabling at community events –** The County presented the Draft Plan at more than 15 community events including the Tifft Nature Preserve Egg-stravaganza, Reinstein Woods Nature Preserve Earth Day celebration, Say Yes to Education Buffalo Saturday Academies, and the Juneteenth

City of Buffalo leaders such as Cedric Holloway, executive director of the Omega Mentoring Program, believe that the shift toward cleaner and greener technologies needs to be equitable for historically disadvantaged communities. That starts with informing residents about the resources available and about how they can help.

"Most folks may be interested, but they don't know that they can make a difference," Holloway says, "so I think what we need to focus on is communicating this is what we're doing, this is how we can do it, and this is how it saves us, our community, and our climate."

Festival of Buffalo.

- **Email and social media updates –** The County continued promoting the public comment period on social media and through the email newsletter updates mentioned above.

- **Paid and earned media –** Sponsorships were purchased on the radio station WBFO, as well as a paid advertisement in The Challenger News. The County's efforts were also featured in a front-page article in The Buffalo News, on Channel 2 WGRZ, and on the NAACP's radio program on WUFO.

- **Climate Connections Project –** Erie County received a grant from the Urban Sustainability Directors Network to help build a relationship with the Omega Mentoring Program, which operates out of the Johnnie B. Wiley Amateur Athletic Sports Pavilion on Jefferson Avenue in Buffalo. The

County worked with the mentoring program to connect the youth with climate action in the community. This included interactive sessions on green infrastructure, nature climate solutions, and building trades.

When the public comment period closed, the County worked with the Task Force to address more than 100 comments that had been received since the Draft Plan was released. It is important to note that these were in addition to the comments that were received earlier in the process and had already been incorporated into the Draft Plan. The document was then formatted so that it was easy to read and included photos and graphics. The final draft of the CCAP will be shared widely with the public, including hard copies sent to all mayors, supervisors, and libraries in Erie County.

Transparency Regarding Plan Implementation

   As Erie County has done with its Climate Action and Sustainability Plan for internal operations, the County will issue an annual report regarding the implementation of the near-term action items outlined in this Plan. This will include feedback on the status of each action by its respective lead department. This update will be posted on the County's Climate Action website, as well as sent to the County Executive. The County will use the various outreach methods listed above to let the public know of the report.
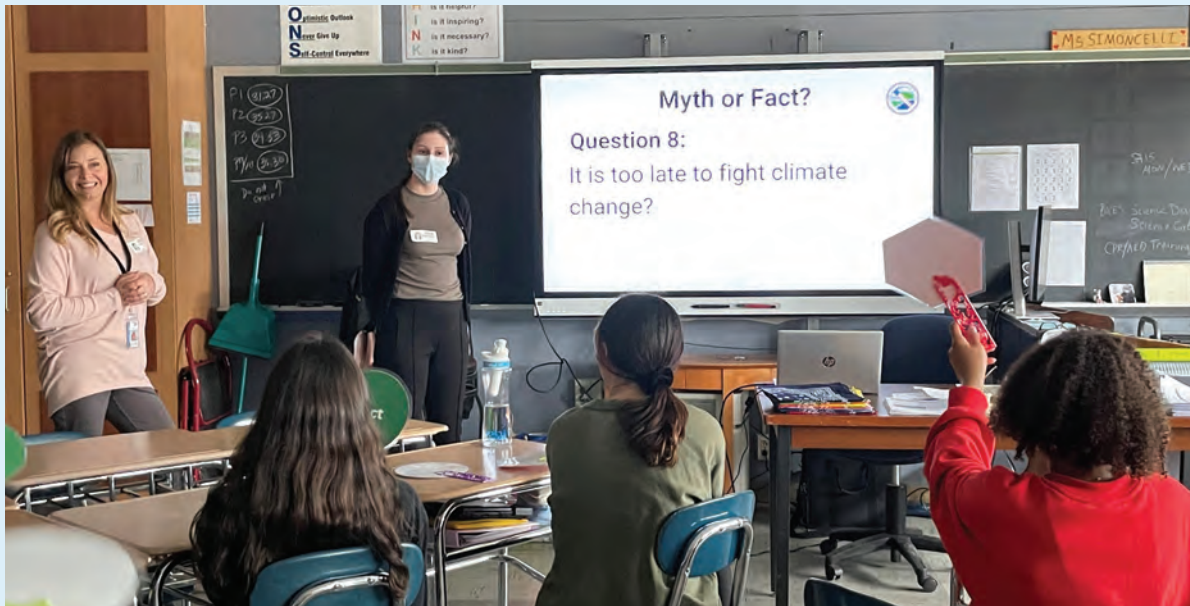
Marie Simoncelli's sixth grade class at Frontier Middle School

Photo credit: Marie Simoncelli

Erie County Sustainability Coordinator, Tracy Skalski, presenting at the March 18th Climate Action Showcase at D'Youville University

Kenmore West High School's Earth Week event

Photo credit: Denise Amato
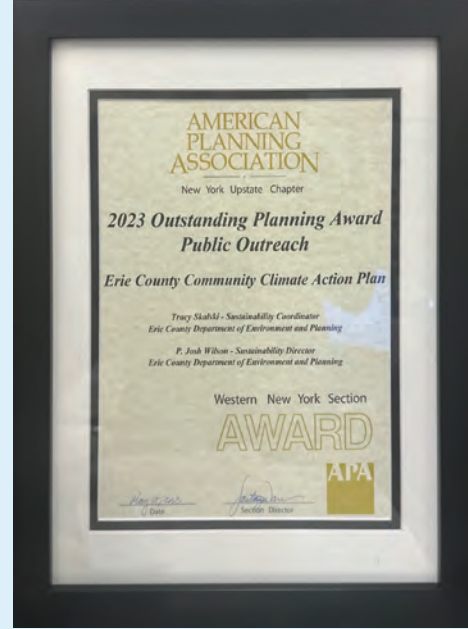
In May 2023, the American Planning Association New York Upstate Chapter selected The Erie County Community Climate Action Plan to receive an "Outstanding Planning Award" in the category of Public Outreach.

FOOTNOTES: Communicating Progress

36 To read about a public information session that was held at the Buffalo & Erie County Public Library in October 2022, go to Erie County's website at https://www2.erie.gov/exec/index.php?q=press/public-information-session-about-erie-county%E2%80%99s-community-climate-action-plan-take-place-buffal

37 To read about the start of public participation for the CCAP, go to Erie County's website at https://www2.erie.gov/exec/index.php?q=press/erie-county-details-community-climate-action-planning-process-requests-public-participation

38 Erie County's climate action website: https://www3.erie.gov/climateaction/

39 To access the English version of our climate change in Erie County brochure, go to https://www3.erie.gov/climateaction/sites/www3.erie.gov.climateaction/files/2021-03/Erie%20County%20climate%20change%20infographic%20Rev.%203.6.pdf

40 To access the Spanish version of our climate change in Erie County brochure, go to https://www3.erie.gov/climateaction/sites/www3.erie.gov.climateaction/files/2022-06/climate_11x17_3.22_for_translation_spanish_us_final.pdf

41 To access the Swahili version of our climate change in Erie County brochure, go to https://www3.erie.gov/climateaction/sites/www3.erie.gov.climateaction/files/2022-06/climate_11x17_3.22_for_translation_swahili_final.pdf

42 To access the Burmese version of our climate change in Erie County brochure, go to https://www3.erie.gov/climateaction/sites/www3.erie.gov.climateaction/files/2022-06/climate_11x17_3.22_for_translation_1_burmese_final.pdf

43 To access the Arabic version of our climate change in Erie County brochure, go to https://www3.erie.gov/climateaction/sites/www3.erie.gov.climateaction/files/2022-06/climate_11x17_3.22_for_translation_arabic_final.pdf

44 Erie County DEP Facebook: http://www.facebook.com/ErieCountyDEP

45 Erie County Climate Action Instagram: https://instagram.com/eriecounty_climateaction?igshid=NzAzN2Q1NTE=

46 Erie County DEP Twitter: https://twitter.com/eriecodep?s=21&t=0HBk5sPOxGVUXM-CnKlUjg

47 To learn more about Erie County's Climate Ambassador Program, go to Erie County's website at https://www3.erie.gov/climateaction/get-involved#Ambassador

48 Erie County's climate action website: https://www3.erie.gov/climateaction/

The Erie County Correctional Facility in Alden is repurposing 8-10 yards of food waste per month — about the equivalent of a large dumpster — with its composting program. Food waste from the facility and holding center is mixed with chicken litter from Kreher Family Farms in Clarence, seaweed from Black Rock Canal Park and wood chips that local municipalities are looking to dispose of to create nutrient-rich compost. It is then used on the grounds in vegetable and flower beds, as well as other areas that may need help nutritionally or with moisture retention. The program not only reduces GHG emissions, it also provides financial savings.

"The most immediate benefit is a decrease in the amount of garbage and the dumping fees associated with that," says Matt Dills, a forestry officer with the Erie County Sheriff's Office who leads the inmate program. "To me, it's basically free material that we're keeping from going to a landfill, and we're putting it immediately back into use around the jail."

Consumption and Waste

GOAL: Responsible production and consumption of resources and sustainable management of waste.

Managing waste through responsible consumption, production, and disposal of resources means minimizing the use of natural resources, toxic materials, and the emissions of waste and pollutants over the life cycle of a service or product so as to not jeopardize the needs of future generations.

Consumption and waste both contribute to far-reaching environmental impacts that are felt by our community and beyond. In particular, disadvantaged communities disproportionately experience the detrimental effects of rampant consumption and waste. For example, the siting of waste facilities has historically been in low-income communities.[49]

The County does not own or operate any active landfills and most of the waste generated in the County is transported to areas outside the County. However, waste management facilities, such as transfer stations, exist within the County's borders. Additionally, many of the products and resources that Erie County residents consume come from national and even global sources, further adding to our "hidden" GHG impacts surrounding waste and consumption. While the majority of GHG emissions that result from consumption and waste within Erie County are not accounted for, this does not alleviate the County's responsibilities as policymakers or consumers to reduce waste. Erie County's current efforts to reduce the production of waste include outreach and education with municipalities and commercial entities, but significantly more work is needed to reach greater reduction and diversion goals.

With this Plan, Erie County has a tremendous opportunity to reduce its waste, consumption of resources, and GHG emissions by means of responsible production and consumption of resources. With an equity-driven, inclusive approach, and through our overriding strategies of Reduction, Diversion, and Reuse, this Plan will positively impact the environment of individuals, neighborhoods, businesses, our great County, and our global community.

DEFINITIONS
FOR ACTIONS SPECIFICATIONS

Short-term:
By or before 2030

Medium-term:
By 2040

Long-term:
By 2050

Direct:
County government can directly control the action - relating to County government operations and infrastructure

Indirect:
Regional agencies and municipalities have control and/or County government can support/influence

STRATEGY 1: Reduction

Waste reduction means reducing waste at the source. As a consumer, this can be achieved through avoiding disposable products, buying in bulk, and developing mindful consumption habits. As a business, this can be accomplished through improved purchasing and packaging, eliminating the toxicity of products, improving the efficiency of operations and facilities, and by refurbishing, selling, or donating used equipment and tools. The simple act of not creating waste is often overlooked as we strive to help our communities properly divert as much material as possible. Waste reduction decreases GHG emissions that contribute to climate change while conserving natural resources and energy and reducing the toxicity of our waste.

Figure 16 Erase Waste

Mindful consumption = Think before you buy and replace

Can I borrow or rent it? Do I really need it now?

How can I make sure it is recycled properly?

Recycle

Repurpose

Retain

Repair

Can it be fixed instead of replaced?

Can I put this item to new use?

Do I really need to replace it now?
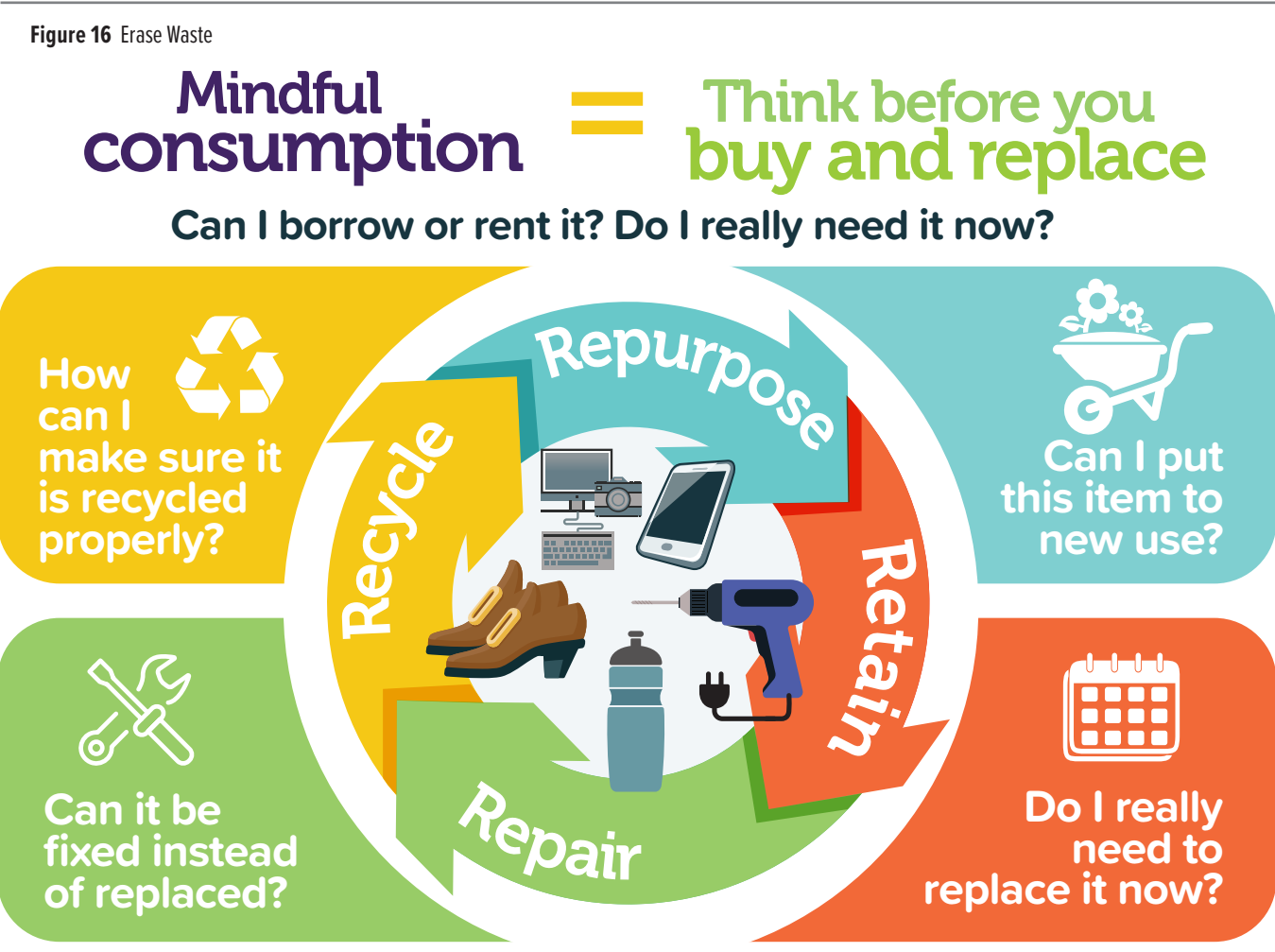
Mindful Consumption

Mindful consumption is the commitment to making purchasing decisions that have positive social, economic, and environmental impact. For example, only buying what is needed, buying second hand, and opting for reusable products over single-use products.

It is understood that there currently are limited opportunities to practice mindful consumption. The practice of mindful consumption requires holding self-accountability while shopping, such as considering if a product is necessary to buy, purchasing second-hand, or has a reusable alternative. The practice of putting extra thought into purchases is the first step to mindful consumption.

A step that you can take to be a mindful consumer is extending the life of the products you buy. For example, your clothing life can be extended by following the care label and using the proper amount of laundry detergent.

As consumers continue to put extra thought into what they are buying and how the product will be used, it will become progressively easier to practice mindful consumption.

Erase Waste

The processes of creating, selling, buying, and disposing of products causes a cascade of impacts on the environment that is often overlooked. The social pressure of frequently buying a new product, such as a cellphone, leads to products bought more often than necessary.

The Solid Waste Management Act of 1988[50] established New York State's Solid Waste Management Policy. The top solid waste management priority in this policy is to reduce the amount of solid waste generated. Similarly, the United States Environmental Protection Agency (USEPA) lists waste prevention as the most preferred waste management strategy.[51] The County aims to align its actions with these policies, making waste reduction the number one priority under the Consumption and Waste goal.

Additionally, Erie County supports the Northeast Southtowns and Northwest Local Solid Waste Management Plans in addition to collaborating on the City of Buffalo's local Comprehensive Recycling Analysis.[52] These plans include waste reduction as the number one priority in waste management strategies. Improvements in waste reduction at the source can be achieved through education, collaboration, support, and encouragement within all sectors of the community including individuals, businesses, not-for-profit organizations, and local municipalities.

Figure 17 USEPA Waste Management Hierarchy

The USEPA Waste Management Hierarchy ranks waste management strategies from most to least preferred, recognizing that different types of waste materials require certain management strategies.[1] This hierarchy is currently under review by the USEPA.[2]

USEPA, Waste Management Hierarchy, 2023, graphic, United States Environmental Protection Agency, https://www.epa.gov/smm/sustainable-materials-management-non-hazardous-materials-and-waste-management-hierarchy

Waste Management Hierarchy

Most Preferred
- Source Reduction & Reuse
- Recycling / Composting
- Energy Recovery
- Treatment & Disposal
Least Preferred

Sources and Notes:

1 USEPA, "Sustainable Materials Management: Non-Hazardous Materials and Waste Management Hierarchy," Collections and Lists, June 19, 2023, https://www.epa.gov/smm/sustainable-materials-management-non-hazardous-materials-and-waste-management-hierarchy.

2 To see if there is an update on the USEPA's Waste Management Hierarchy, go to the USEPA's website at https://www.epa.gov/smm/sustainable-materials-management-non-hazardous-materials-and-waste-management-hierarchy
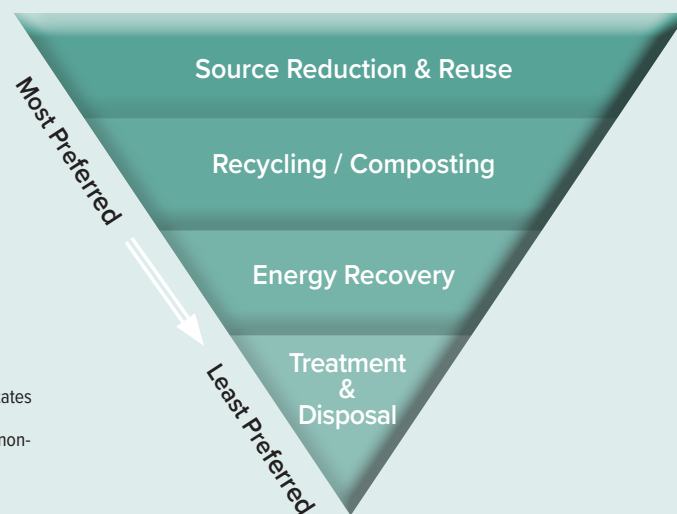
What's Going on with Recycling

Single-use plastic has become a product of convenience in our lives, but the environmental impacts that result from single-use plastic are extremely harmful. Single-use plastic is meant to be thrown away after one use, such as plastic cutlery, water bottles, food packaging, and produce bags. Even if a single-use plastic item is labeled as recyclable, the product is not guaranteed to be recycled. Plastic may not be recycled because the market to buy plastic is weak and the buyer may not be local, making shipping expensive.

The recycling industry needs to be bolstered to ensure plastic is successfully recycled. To do this, there should be restrictions on the type of plastic that can be made. Polyethylene terephthalate (PET), the number "1" recycling symbol, is the most widely recycled plastic. PET can be made into PET items again or other items, such as clothing, backpacks, and carpets.[1] High-density polyethylene (HDPE), the number "2" recycling symbol, is accepted at most recycling centers and is one of the easiest to recycle. HDPE can be recycled into different items, such as pens, ropes, toys, recycling bins, and trash cans.[2] By limiting the type of plastic that can be made for single-use to the best recycled plastic, the chance of plastic being recycled can be increased and kept out of landfills. Single-use plastic and plastic used for packaging should be made out of materials that are best to recycle. Creating single-use plastic that has a low chance of being recycled is wasteful and perpetuates the issue of plastic lingering in our world.

Sources:

1 Plastics For Change, "Which Plastic Can Be Recycled?,"
Plastics For Change, May 20, 2021,
https://www.plasticsforchange.org/blog/which-plastic-can-be-recycled.

2 Matthew McWilliams, "What Can High Density Polyethylene Be Recycled Into?,"
Accel Polymers (blog), December 31, 2020,
https://accelpolymers.com/what-can-high-density-polyethylene-be-recycled-into/.

Extended Producer Responsibility (EPR)

"Extended Producer Responsibility" (EPR) is a policy approach that gives producers significant responsibility – financial and/or physical – for the treatment or disposal of post-consumer products. This policy could provide incentives to prevent wastes at the source, promote product design that is more sustainable, and support successful public recycling and materials management goals.[1]

Source:

1 OECD, "Extended Producer Responsibility," Organisation for Economic Co-operation and Development, accessed July 17, 2023, https://www.oecd.org/environment/extended-producer-responsibility.htm.

CONSUMPTION AND WASTE GOAL: Responsible production and consumption of resources and sustainable management of waste.

STRATEGY 1: Reduction	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 5.1.1:	Work to reduce single use plastics and other single use products in government contracts and provide commercial entities with single use product reduction methodologies.			
	Short-Term	Direct	Purchasing	New York State Pollution Prevention Institute (NYSP2I), WNY SBR, New York State Association for Reduction, Reuse, and Recycling (NYSAR[3]), NYSDEC, Solid Waste Management Boards
ACTION ITEM 5.1.2:	Educate community members on the prevalence of food waste and solutions to food waste while promoting programs, such as the United States Environmental Protection Agency's (USEPA's) Food: Too Good to Waste Program[53] and United States Department of Agriculture's (USDA) Let's Glean Program.[54]			
	Ongoing	Direct	DEP	Local restaurant associations, local grocery stores, USEPA, USDA, local municipalities, ECEMC, schools
ACTION ITEM 5.1.3:	Promote and educate the community and businesses on mindful consumption through campaigns such as "Buy in Bulk" and "Bring Your Own," which aim to decrease food packaging waste.			
	Ongoing	Direct	DEP	USEPA, WNY SBR, NYSP2I , NYSAR[3]
ACTION ITEM 5.1.4:	Encourage municipalities to adopt programs that foster community member waste disposal reduction habits, including potential incentives, such as pay-as-you-throw pricing for municipal garbage.			
	Long-Term/ Ongoing	Direct	DEP	Local municipalities
	Pay-As-You-Throw Garbage Pay-as-you-throw: A usage-pricing model for disposing of municipal solid waste. Users are charged a rate based on how much waste they present for collection to the municipality or local authority.			
ACTION ITEM 5.1.5:	Work with external organizations to educate and encourage businesses and municipalities on the benefits of reducing energy usage, toxicity of products, improved packaging, and waste in supply chains.			
	Ongoing	Direct	DEP, Purchasing	WNY SBR, NYSP2I, local municipalities
ACTION ITEM 5.1.6:	Endorse Extended Producer Responsibility state legislation such as "Bottle Bill" legislation (Senate Bill S1185C,[55] Assembly Bill A10185,[56] Assembly Bill A8668A[57]).			
	Ongoing	Direct	DEP, County Executive	Statewide organizations, State and County legislatures
ACTION ITEM 5.1.7:	Encourage commercial entities to track waste, energy, and water data using USEPA tools, such as its ENERGY STAR Portfolio Manager.			
	Ongoing	Direct	DEP	USEPA, WNY SBR
ACTION ITEM 5.1.8:	Support community groups whose goals align with creating effective changes in waste reduction practices.			
	Ongoing	Indirect	DEP	Local and State community action groups

Extend the Bottle Bill

The New York State Returnable Container Act, also known as the "Bottle Bill," is an effective way to incentivize recycling and reduce littering. The current Bottle Bill requires a 5-cent deposit on certain beverage containers which is returned when the container is returned to a store or redemption center. Currently, "the law requires at least a 5-cent deposit on all individual, separate, and sealed glass, metal, aluminum, steel, or plastic bottles, cans, or jars containing less than one gallon of a beverage for consumption at the time of sale."[1]

The following beverages are currently covered by the Bottle Bill:
- Carbonated soft drinks
- Sparkling water
- Carbonated energy drinks
- Carbonated juice (anything less than 100% juice, containing added sugar or water)
- Carbonated tea
- Soda water
- Beer and other malt beverages
- Mineral water (both carbonated and non-carbonated)
- Wine products (including wine coolers)
- Water that does not contain sugar, including flavored or nutritionally enhanced water

The following beverages are NOT covered:
- Milk products
- Wine and liquors
- Hard ciders
- Non-carbonated tea
- Non-carbonated sports drinks
- Non-carbonated juice
- Non-carbonated energy drinks
- Drink boxes or pouches
- Waters containing sugar

Currently, New York Senate Bill S9164 is proposed to extend the Bottle Bill to wine, liquor, distilled spirit coolers, cider, and wine products. Bill S9164 also proposes to raise the deposit refund value from 5 cents to 10 cents and increase the handling fee from 3.5 cents to 6 cents.[2] Such an expansion of the Bottle Bill will increase the types of containers being recycled and will result in a decrease in litter. Also, raising the deposit to 10 cents will incentivize the public even further to return their recyclable containers. Erie County is in support of extending the Bottle Bill to create better opportunities for recycling. Overall, extending the Bottle Bill should keep more glass and plastic out of landfills, reduce litter, and ease the burden at municipal recycling facilities.[3]

Sources:

1 NYSAC, "The History and Future of the NYS Bottle Bill," May 2019, https://www.nysac.org/media/24qda3hl/bottle-bill-white-paper-5_14_19.pdf

2 Samantha Christmann, "New 'Bottle Bill' Proposes Doubling Deposit Fee, Expanding List of Beverages," The Buffalo News, February 13, 2023, https://buffalonews.com/news/local/new-bottle-bill-proposes-doubling-deposit-fee-expanding-list-of-beverages/article_516e4cee-ab01-11ed-b350-2bd6f73405fa.html; The New York State Senate, "Senate Bill S9164," The New York State Senate, 2022, https://www.nysenate.gov/legislation/bills/2021/S9164.

3 Christmann, "New 'Bottle Bill' Proposes Doubling Deposit Fee, Expanding List of Beverages"; The New York State Senate, "Senate Bill S9164."

STRATEGY 2: Diversion

"Diversion," as defined in this Plan, sets actions that target the removal of materials that are currently destined for landfills or incinerators so they can be recycled and remade into useful products. Expanding recycling and composting is one of the fastest, least expensive, and most effective strategies to reduce GHG emissions.[58] Although some citizens are motivated to manage their waste responsibly, the average municipal recycling and organic diversion rate in Erie County is 29%, indicating much room for improvement.[59] However, the solutions are not simple. In order to achieve significant reductions in GHG emissions, Erie County needs to expand waste diversion infrastructure; educate local leaders, citizens, businesses, and commercial entities on how to separate organic waste and "Recycle Right;"[60] and to support existing and proposed waste diversion programs. Furthermore, the County will pursue a community waste flow study to characterize the types, quantities, and current solutions to waste management available to determine how to most effectively support and improve waste diversion in Erie County.

Composting in the Backyard vs. Driving to a Collection Site

"Composting is a resourceful way to recycle the food scraps and yard trim you generate at home all year and manage your waste more sustainably."[1] According to the USEPA, for backyard composting, "Your compost pile should have an equal amount of browns to greens. You should also alternate layers of organic materials of different-sized particles. The brown materials provide carbon for your compost, the green materials provide nitrogen, and the water provides moisture to help break down the organic matter."[2]

In New York State, yard clippings can be picked up from the curb, but not food scraps. Instead, residents have to drive to a collection site to drop off food waste as well as compostable items, such as eating utensils and bags. Collection sites found in New York State can be found at New York State Association for Reduction, Reuse, and Recycling's website.[3]

Table 2 What You Can Compost in Your Backyard

What You Can Compost in Your Backyard	What to Avoid Composting in Your Backyard
Food and vegetable scraps	Meat, fish, and bones
Coffee grounds and paper filters	Cheese and dairy products
Paper tea bags (no staples)	Pet waste and cat litter
Eggshells (crushed)	Produce stickers
Most grass clippings and yard trimmings	Fats, oils, and greases
Dry leaves	Glossy paper
Plant stalks and twigs	Treated or painted wood
Shredded paper (non-glossy, not colored)	Aggressive weeds/weeds with seeds
Shredded brown bags	Diseased and pest-infested plants
Shredded cardboard (no wax coating, tape, or glue)	Compostable food service ware and compostable bags
Untreated wood chips	Cooked food (small amounts are fine)
	Herbicide treated plants
	Dryer lint

USEPA, "Composting At Home," June 14, 2023, https://www.epa.gov/recycle/composting-home#whatcancom

Sources and Notes:

1 USEPA, "Composting At Home," United States Environmental Protection Agency, June 14, 2023, https://www.epa.gov/recycle/composting-home.

2 USEPA.

3 To find food scrap collection sites at New York State Association for Reduction, Reuse, and Recycling's website, go to https://www.nysar3.org/page/nys-food-scraps-drop-off--collection-programs-178.html

Materials that can be diverted include recyclables, food waste, and other compostable materials, textiles, mattresses, carpets, construction and demolition debris, and disaster debris. Another key component of waste diversion is proper management of hazardous and other materials that are difficult to dispose of, which should reduce instances of illegal dumping. Materials such as pesticides, chemicals, and automotive fluids cannot be disposed of through weekly trash collection, and instead need to be disposed of through the County's Household Hazardous Waste (HHW) Program. The County also offers the Conditionally Exempt Small Quantity Generator Hazardous Waste Program to provide a convenient, cost effective, and environmentally acceptable method of disposal for Western New York businesses, municipalities, schools, or other agencies that meet the requirements for the program. In addition, there is a need for better regulation across municipalities for recycling across the board. The County will address barriers associated with HHW, such as deciphering new rules for collecting e-waste and serving community members that do not have vehicles, by partnering with local community centers and organizations who can help educate and provide support with more accessible collection events and opportunities for drop-offs.

Additionally, the County will encourage private-public partnerships to improve the waste recovery and collection infrastructure that is currently in place to better maximize the effectiveness of our diversion rates and mitigate the damaging effects that improper waste disposal has on our communities. Finally, we understand the need to actively pursue, promote, and encourage our citizens and commercial entities on why quality participation in this strategy is essential for successful climate impact mitigation in our region.

Figure 18 Recovery & Collection Infrastructure

Recovery & Collection Infrastructure

Recovery and collection infrastructure refers to the recovery (repurposing, donating, borrowing, and reusing) and collection (disposing of waste and recycling) of materials. Recycling and disposing materials correctly is key to a sound recovery and collection infrastructure.

Recycling Fluorescent Light Bulbs or Potentially Hazardous Materials

Fluorescent light bulbs often break when they are thrown away in the trash, which releases mercury into the environment. When fluorescent light bulbs are recycled, glass, metals, and other materials that make up the light bulb can be reused. In New York, improper disposal of mercury lamps is against the law.

Hazardous materials are substances that easily ignite, react, or explode when mixed with other substances, or that are corrosive or toxic. Check for labels that have "poison," "toxic," "warning," "danger," "combustible," "flammable," "corrosive," or "caution."
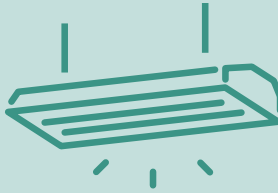
Visit Erie County's Materials/Recycling sites website[1] for all hazardous materials, including fluorescent light bulbs, and collection sites in Erie County.

Note:

1 Erie County's Material/Recycling website: https://www3.erie.gov/recycling/materials-recycling-sites

STRATEGY 2: Diversion	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 5.2.1:	**Encourage compliance with NY Department of Environmental Conservation (NYSDEC) Food Waste Law and Good Samaritan Law[61] for business enterprises through outreach and education.**			
	Ongoing	Direct	DEP	NYSDEC, WNY SBR, Sheriff's Department, Department of Public Works (DPW), local service providers, Erie County Department of Health (ECDOH)
	NYSDEC Food Waste Law The NYSDEC Food Waste Law currently requires businesses and institutions that generate an annual average of two tons of food per week or more must donate excess edible food and recycle all remaining food scraps if they are within 25 miles of an organics recycler (composting facility, anaerobic digester, etc.). It important to note that lowering the two ton threshold is being reviewed. This law does not include hospitals, nursing homes, adult care facilities, K-12 schools, and farms.[1] Source: 1 NYSDEC, "Food Donation and Food Scraps Recycling Law," New York State Department of Environmental Conservation, 2023, https://www.dec.ny.gov/chemical/114499.html.			
ACTION ITEM 5.2.2:	**Develop and expand food and yard waste recycling programs at municipal buildings and operations. Train and promote residential and commercial collection programs, including backyard composting.**			
	Short-Term	Direct	DEP	Local municipalities, ECEMC, DPW, Department of Social Services (DSS), local service providers
ACTION ITEM 5.2.3:	**Develop and enhance local recycling solutions for construction and demolition debris, refrigerant containing appliances, mattresses, textiles, and carpets.**			
	Medium-Term	Indirect	DEP	Waste haulers & recycling companies, local trade organizations
ACTION ITEM 5.2.4:	**Support recycling options for multi-family residential buildings, public housing, and commercial entities.**			
	Ongoing	Indirect	DEP	Building Owners and Managers Association (BOMA), WNY SBR, local municipalities, waste haulers & recycling companies, ECEMC

STRATEGY 2: Diversion	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 5.2.5:	**Reduce GHG emissions during the collection and processing of recycling and waste through electrification of fleets and use of efficient routing methods.**			
	Short-Term	Indirect	DEP	Waste haulers, NYSERDA, local municipalities, NYSDEC
ACTION ITEM 5.2.6:	**Educate and promote responsible waste management practices, such as the recovery and collection infrastructure, throughout all sectors of Erie County.**			
	Ongoing	Direct	DEP	WNY SBR, local municipalities, NYSP2I, K-12 schools, Erie 1 Boards of Cooperative Educational Services (BOCES), grocery stores, religious and cultural institutions, DSS, waste management companies, NYSDEC
ACTION ITEM 5.2.7:	**Develop local solutions for managing disaster debris.**			
	Medium-Term/ Ongoing	Direct/ Indirect	DEP	Emergency Services, local municipalities, ECEMC, NYSAR[3], NYSP2I
ACTION ITEM 5.2.8:	**Conduct a waste flow study to understand how waste moves throughout the County, local capacities for management, and baselines.**			
	Short-Term	Direct	DEP	Academic institutions, local municipalities, NYSDEC, NYSAR[3], NYSP2I, waste haulers & recycling companies, UB
ACTION ITEM 5.2.9:	**Promote and expand participation in the HHW collection program and address barriers to participation in existing and emerging programs.**			
	Ongoing	Direct	DEP	Local service providers, ECEMC, local municipalities
ACTION ITEM 5.2.10:	**Identify changes or opportunities to expand and increase recycling of electronics and other difficult to dispose of products (e.g., fluorescent tubes and refrigerants) in Erie County.**			
	Short-Term	Direct/ Indirect	DEP	NYSDEC, solid waste boards, UB

STRATEGY 3: Reuse

According to the USEPA, each person in America produces 4.9 pounds of waste every day.[62] This translates to 1,789 pounds per year per person, or 1.65 billion pounds of waste per year in Erie County alone! Additionally, the USEPA estimates that 28.1% of our municipal solid waste is made up of packaging.[63]

As expressed in STRATEGY 1: "Reduction," the most effective way to reduce waste is to not create it in the first place. Consider all the things we buy for use at home and work. GHG emissions from the creation of all these products and their packaging are emitted throughout the entire product life cycle, which begins during the extraction of raw materials from the earth and includes the manufacturing process, energy, waste, and transportation throughout the various stages.

As a result, reuse and repair can be extremely effective ways to reduce natural resource consumption, protect the environment, and save money. Waste reduction through reuse and repair can be achieved in many ways and has many benefits. When feasible, buying only what you need; buying items that can be used more than once; reusing and repurposing items; buying used, repaired, or remanufactured items; taking good care of your things through maintenance and repair; and borrowing, renting, and sharing items can all reduce the amount of waste generated in addition to saving consumers money.

The reuse and repair methodology is intended to extend the life of a product in order to protect our resources and reduce the amount of waste we produce by encouraging a shift in mindset away from both impulse buying and a "throw-away, convenience" culture. In order to increase reuse and repair in Erie County, the County will disseminate information about current reuse and repair practices, and focus on educating consumers, removing barriers, and supporting and enhancing reuse-repair activities. The County will make it easier for citizens to reduce the amount of waste they generate by informing the community on the positive impact of reuse, connecting people with reuse options, and promoting reuse through campaigns such as "Bring Your Own." Furthermore, the County will expand the reuse and repair movement through legislative support of bills that promote product stewardship by extending the life of products to reduce their impact, including the NYS Digital Fair Repair Act.

Figure 19 Consumer Habits

Erie County CLIMATE ACTION

OVERCONSUMPTION & OVERPRODUCTION OF GOODS

Break the Habit of Overconsumption

From 2000 to 2017, global material consumption rose 70%, faster than both population and economic output.

In the U.S., the number of households with two or more cars has increased substantially, from 22% in 1960 to 59% in 2020.

Between 30 to 40% of food is wasted. Food waste is the most common landfilled and incinerated material in the U.S.

In the world, 15% of fabric used in production is wasted. 57% of all discarded clothes end up in landfills.

Sources:
Mawgoud, Nadeem Abel. "Fast Fashion Statistics and Trends in 2023." Blog. Gitnux (blog), March 20, 2023. https://blog.gitnux.com/fast-fashion-statistics/.
Rodrigue, Jean-Paul. "Percentage of Households by Number of Vehicles, 1960-2020." The Geography of Transport Systems, 2020. https://transportgeography.org/contents/chapter8/urban-transport-challenges/household-vehicles-united-states/.
United Nations. "Ensure Sustainable Consumption and Production Patterns." Sustainable Development Goal Indicators. Accessed May 12, 2023. https://unstats.un.org/sdgs/report/2019/goal-12/.
US EPA. "United States 2030 Food Loss and Waste Reduction Goal." Overviews and Factsheets. United States Environmental Protection Agency, April 4, 2023. https://www.epa.gov/sustainable-management-food/united-states-2030-food-loss-and-waste-reduction-goal.

STRATEGY 3: Reuse	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 5.3.1:	Identify and disseminate current reuse, repair, resell, and sharing practices and programs in Erie County to determine how they can be supported and enhanced.			
	Short-Term	Direct	DEP	Buy nothing-type groups, academic institutions, local donation centers, WNY SBR, local tool libraries, local repair cafes, local municipalities, library system
ACTION ITEM 5.3.2:	Promote and encourage repair per the NYS Digital Fair Repair Act.[64]			
	Ongoing	Direct	DEP	Chambers of commerce, local repair cafes
ACTION ITEM 5.3.3:	Promote and educate consumers on the benefits of reusable products like refillable containers, product repair, maker spaces, and buying used goods.			
	Ongoing	Direct	DEP, ECDOH	Local municipalities, WNY SBR, state agencies, The Foundry, library system
	Maker Spaces Places that have the tools, equipment, and permitting to make items and sell to others.			
ACTION ITEM 5.3.4:	Encourage businesses to develop reuse and material exchange programs in commercial spaces.			
	Ongoing	Direct	DEP	WNY SBR, NYSDEC

Further Reading

Reduction Strategy

Food: Too Good to Waste Program (USEPA) – The Food: Too Good to Waste Implementation Guide and Toolkit is designed for community organizations, local governments, households, and others interested in reducing wasteful household food management practices.

https://www.epa.gov/sites/default/files/2016-02/documents/implementation_guide_and_toolkit_ftgtw_2_1_2016_pubnumberadded508_alldocuments.pdf

Reduction Strategy

Too Good to Go – Downloadable app that can be used to explore stores and restaurants in your local area and save Surprise Bags of surplus food from going to waste at a great price.

https://www.toogoodtogo.com/en-us/

Diversion Strategy

Household Hazardous Waste (HHW) Program – Safe handling instructions and how to reduce HHW in your home.

https://www.epa.gov/hw/household-hazardous-waste-hhw
https://www.epa.gov/saferchoice

With help from its compost, a variety of peppers, tomatoes, and flowers are produced in the greenhouses and garden beds at the Erie County Correctional Facility. The goal is to add more vegetables in the future, such as squash and zucchini, and to donate the produce to a community-based organization.

FOOTNOTES: Consumption and Waste

49 Tishman Environment and Design Center, "U.S. Municipal Solid Waste Incinerators: An Industry in Decline" (The New School, May 2019), https://static1.squarespace.com/static/5d14dab43967cc000179f3d2/t/5d5c4bea0d59ad00012d220e/1566329840732/CR_GaiaReportFinal_05.21.pdf.

50 To learn about the Solid Waste Management Act of 1988, go to the NYSDEC's website at https://www.dec.ny.gov/chemical/294.html

51 USEPA, "Sustainable Materials Management: Non-Hazardous Materials and Waste Management Hierarchy," Collections and Lists, June 19, 2023, https://www.epa.gov/smm/sustainable-materials-management-non-hazardous-materials-and-waste-management-hierarchy.

52 NYSDEC, "Status of Local Solid Waste Management Plans (LSWMP)," New York State Department of Environmental Conservation, 2023, https://www.dec.ny.gov/chemical/65541.html; City of Buffalo, "Comprehensive Recycling Analysis Final Report," July 2020, https://buffalorecycles.org/wp-content/uploads/2021/06/Full-Final-Revised-Report-Buffalo-CRA-7-9-20.pdf.

53 To learn about the EPA's Food: Too Good to Waste Program, go to the EPA's website at https://www.epa.gov/sustainable-management-food/food-too-good-waste-implementation-guide-and-toolkit

54 To learn about the USDA's Let's Glean Program, go to the USDA's Let's Glean toolkit at https://www.usda.gov/sites/default/files/documents/usda_gleaning_toolkit.pdf

55 To learn about Senate Bill S1185C, go to the New York State Senate's website at https://www.nysenate.gov/legislation/bills/2021/S1185

56 To learn about Assembly Bill A10185, go to the New York State Senate's website at https://www.nysenate.gov/legislation/bills/2021/A10185

57 To learn about Assembly Bill A8668A, go to the New York State Senate's website at https://www.nysenate.gov/legislation/bills/2021/A8668

58 Eureka Recycling, "Environmental Benefits of Recycling and Composting," 2008, https://eurekarecycling.org/wp-content/uploads/2019/08/composting_factsheet_0.pdf; Eco-Cycle, "Zero Waste Is a Climate Change Solution," Eco-Cycle, accessed July 28, 2023, https://ecocycle.org/learn-about-zero-waste/zw-is-a-climate-change-solution/.

59 Erie County DEP, "Local Solid Waste Management Plan," 2020, https://www.dec.ny.gov/docs/materials_minerals_pdf/nestfinallswmp.pdf.

60 Recycle Right NY is an education and outreach effort with help from over 100 recycling professionals across New York State. They provide information and resources to help people understand easier how to recycle. Wish-Cycling is the act of recycling an item hoping will be recycled without knowing for sure if it is locally accepted for recycling. Adding items to recycling that are not recyclable can damage equipment, injure workers, slow the process down, increase the cost of sorting, and decrease the value of recyclables. To learn more, go to Recycle Right NY's website at https://recyclerightny.org/

61 The Good Samaritan Law provides limited liability protection for people who make good faith donations of food and grocery products to nonprofits that feed the hungry. The act also provides limited liability protection, both civil and criminal, for those who distribute food and groceries, such as food banks. This law does not cover direct donations to needy individuals or families.

62 USEPA, "National Overview: Facts and Figures on Materials, Wastes and Recycling," Overviews and Factsheets, December 3, 2022, https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials.

63 USEPA, "Containers and Packaging: Product-Specific Data," Data and Tools, United States Environmental Protection Agency, December 3, 2022, https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/containers-and-packaging-product-specific.

64 To learn more about the NYS Digital Fair Repair Act, go to New York State's website at https://www.governor.ny.gov/news/governor-hochul-signs-digital-fair-repair-act-law

A transformational streetscape project has restored the Village of Lancaster's historic central business district after the area was devastated by a fire more than 60 years ago. An extension of West Main Street, a pair of roundabouts, an EV charging station, and Cayuga Creek Park were among the additions made to better serve the community.

"I think the village and village board really committed to looking at the whole scope of climate smart initiatives," says Lancaster Mayor Lynne Ruda. "We're trying to get people out walking, create fewer emissions, and provide safe spaces for pedestrians and bicyclists. Embracing that has had a great impact on downtown and has allowed businesses to develop and grow."
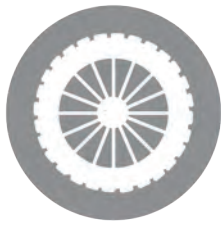
Transportation

GOAL: A safe, equitable, and affordable multi-modal transportation system that enhances mobility and access, phases out fossil fuel dependency, connects communities, supports a resilient supply chain, and decreases GHG emissions.

For thousands of years before European settlers arrived, the Haudenosaunee and other Indigenous people of North America understood the importance of Western New York's geography to the movement of people and trade throughout the region. The location and geography of what is now called Erie County remains important to the efficient transportation of people, goods, and services locally, regionally, and throughout North America.

Unfortunately, the rise of the automobile and reliance on fossil fuels have resulted in a wide range of adverse environmental, social, and economic impacts. Decades of "sprawl without growth" have created land use patterns that are increasingly difficult to provide convenient, reliable, and energy effi-cient transportation options, leaving our urban, suburban, and rural communities disconnected from one another. Sprawl and the expansion of auto-oriented highways and road infrastructure have also resulted in dramatic social, health, housing, and mobility inequities that primarily impact low-income and minority neighborhoods.

As the impacts of climate change become increasingly evident in our region, the resiliency of Erie County will be determined by how we choose to transport goods and services, connect people and communities, promote energy effi-cient modes of transportation, and reduce vehicle miles traveled.

New technologies and emerging trends offer unprecedented opportunities to build a transportation system that works better for our en-

DEFINITIONS
FOR ACTIONS SPECIFICATIONS

Short-term:
By or before 2030

Medium-term:
By 2040

Long-term:
By 2050

Direct:
County government can directly control the action - relating to County government operations and infrastructure

Indirect:
Regional agencies and municipalities have control and/or County government can support/influence

vironment and our health. Expanded and improved public transportation, electric vehicles (EVs), and ride-sharing services, as well as improved cycling and pedestrian infrastructure, offer ways to reduce GHG emissions, make land use more efficient, and connect people to employment opportunities.

One of the lessons that the COVID-19 pandemic has made clear is the need for more resilient supply chain networks. The supply chain is a critical element of our transportation network and it has a direct impact on our quality of life. Developing a more resilient supply chain requires that we rethink how we integrate our economic and industrial development, workforce development, energy management, agriculture and food systems delivery, and EV infrastruc- ture into land use decisions.

Transportation is what connects our economy, communities, and environment. How we develop and use our region's transportation system is a key to reducing GHG emissions and making the most of the many opportunities to increase resilience as we face an uncertain future.

STRATEGY 1: Active Transport

According to a 2017 National Household Transportation Survey, 45.6% of vehicle trips within Erie County are three miles or less.[65] These shorter trips provide a significant opportunity to utilize various types of transportation that reduce GHG emissions, improve public health, and promote economic vitality, including active transportation, such as walking and micromobility vehicles (e.g., electric scooters). Furthermore, expanding options for active transportation and micromobility vehicles will improve safety and quality of life for all residents, including those who do not have access to personal vehicles.

Active transportation is any form of human-powered, non-motorized transportation, such as cycling and walking. Substituting a motorized vehicle with zero-emission, active transportation choices can reduce an individual's total personal carbon footprint by more than 25%, in addition to improving one's health and quality of life. Additionally, there are emerging micromobility vehicle options which can further decrease one's carbon footprint by reducing the number of vehicle trips and providing convenient and cost-effective methods of transportation for shorter trips.

Enabling active transportation and micromobility options in Erie County means improving infrastructure, such as trails, sidewalks, streets, and intersections to provide safe and accessible routes to key destinations, services, and educational and employment opportunities. Educating residents about the benefits of active transportation in daily life, creating safe and seamless linkages to transit infrastructure, and expanding connectivity to existing cycling facilities and bicycle parking will promote lower-emission transportation in a way that centers equity, sustainability, and public health.

TRANSPORTATION GOAL: A safe, equitable, and affordable multi-modal transportation system that enhances mobility and access, phases out fossil fuel dependency, connects communities, supports a resilient supply chain, and decreases GHG emissions.

STRATEGY 1: Active Transport	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 6.1.1:	Work with partners to develop procedures and access resources to better implement the County's Complete Streets policy, and promote efforts to improve vehicular and pedestrian safety and mobility.			
	Short-Term/ Ongoing	Direct/ Indirect	DPW, DEP	Greater Buffalo-Niagara Regional Transportation Council (GBNRTC), local municipalities, Live Well Erie
ACTION ITEM 6.1.2:	Expand the County's active transportation network, including connecting on-road, park, and trail gaps.			
	Ongoing	Direct/ Indirect	DPW, DEP; Planning	GBNRTC, local municipalities
ACTION ITEM 6.1.3:	Work with local governments to implement the Regional Bicycle Master Plan, including the Shoreline Trail.[67]			
	Medium-Term	Direct	DEP	DPW, GBNRTC, local municipalities
ACTION ITEM 6.1.4(A):	Educate County residents about the health and economic benefits of choosing active transport options.			
	Ongoing	Direct	DEP	Live Well Erie, GObike Buffalo, GO Buffalo Niagara
ACTION ITEM 6.1.4(B):	Educate all road users, including pedestrians, cyclists, and drivers, on the rules of the road and how to safely interact with each other.			
	Ongoing	Direct	DEP	Central Police Services, Sheriff's Dept., GObike Buffalo, County Clerk, Department of Motor Vehicles (DMV)
ACTION ITEM 6.1.5:	Provide recommendations on projects referred to the County through the 239-M[68] process to improve walkability and bikeability.			
	Ongoing	Indirect	DEP	Local municipalities
ACTION ITEM 6.1.6:	Address barriers to active transportation through maintenance of sidewalks, paths, and trails; increase access to repair tools and bike racks; and install Americans with Disabilities Act (ADA) compliant pedestrian devices.			
	Short-Term/ Ongoing	Direct/ Indirect	Parks, DEP	Local municipalities, GBNRTC, local bike and trail organizations, local school districts, parent-teacher associations, students
ACTION ITEM 6.1.7:	Support community campaigns to encourage kids and adults to use active transportation methods to nearby destinations.			
	Short-Term/ Ongoing	Indirect	DEP	Live Well Erie, GObike Buffalo, GO Buffalo Niagara, bike clubs

Figure 20 Complete Streets

COMPLETE STREETS

1. Lighting
2. Transit stops
3. Pedestrian signals or crossings
4. Curb ramps
5. Landscaping
6. Sidewalks
7. Bicycle lanes

Complete Streets

"Complete Streets is an approach to planning, designing, and building streets that enables safe access for all users, including pedestrians, bicyclists, motorists, and transit riders of all ages and abilities."[1] Complete Streets make it easier to cross the street, walk to destinations, bicycle to work, and move actively with assistive devices. Complete Streets improve safety, allow buses to run on time, increase economic development, and enhance quality of life.[2]

The design of Complete Streets varies depending on the community's needs, but can include any of the following.

- **Lighting**
- **Covered transit stops**
- **Sidewalks**
- **Bicycle lanes**
- **Frequent and safe crosswalks with pedestrian signals**

- **Curb ramps**
- **Landscaping**
- **Median islands**
- **Special bus lanes**
- **Traffic calming tools like traffic circles**

Sources:

1 Smart Growth America, "Complete Streets," Smart Growth America, accessed July 17, 2023, https://smartgrowthamerica.org/what-are-complete-streets/.

2 Smart Growth America.

STRATEGY 2: Transit

Creating a safer, more efficient, and more affordable public transportation system will promote increased use by County residents, reduce the use of highly polluting, car-focused modes of transportation, and reduce climate pollution. The transportation sector generates the largest share of GHG emissions in the United States. One of the greatest overall contributors to transportation GHG emissions is single occupancy vehicle use.[70] According to the 2017 National Household Travel Survey, 44% of trips in the Buffalo-Niagara region are made in single occupancy vehicles, with 87% of

trips made in private vehicles (single or multiple occupants).[71] Reliance on private passenger vehicles negatively affects air quality, takes up significant space that could be used for more beneficial purposes, and results in more than 30% of our overall carbon footprint. Lack of investment in public transportation means that our low- and moderate-income residents and disabled residents often lack mobility or are burdened by the high transportation costs.

Erie County will continue to support the development of safe, efficient, and affordable transportation systems

through representation on boards such as NFTA and the Greater Buffalo-Niagara Regional Transportation Council (GBNRTC). Additionally, the County will

To learn about land use, check out the Smart Growth Strategy in the Housing and Neighborhood Resliency chapter.

work with municipalities to update their comprehensive plans, provide technical assistance, and obtain funding. In order to promote climate resilience, the County will coordinate with its transportation system providers to improve connectivity to vulnerable neighborhoods during extreme weather events.

Figure 21 Buffalo-Niagara Region Trips
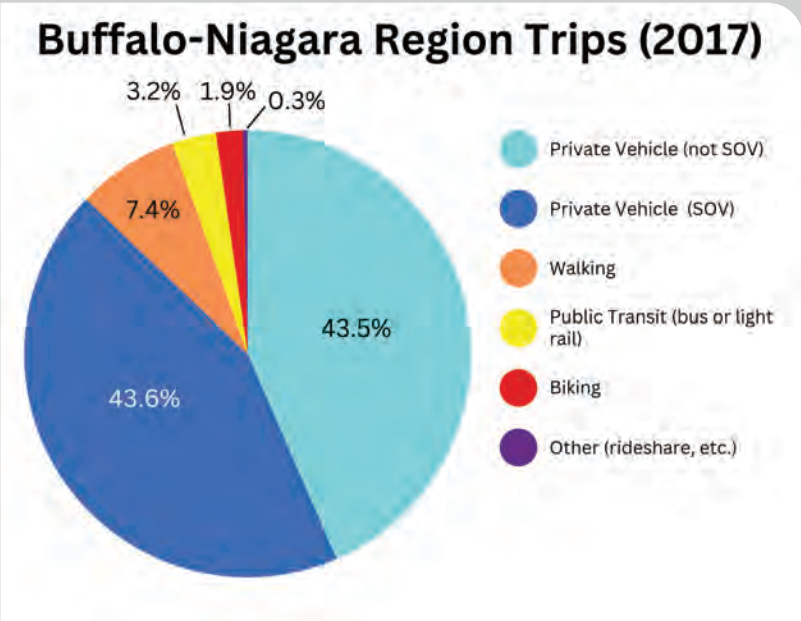
Data source: Federal Highway Administration National Household Travel Survey, http://nhts.ornl.gov

Modes of Transport

In the Erie and Niagara County region, 87% of trips used a private vehicle and almost half of those were in single occupancy vehicles (SOV). A significant number of households in the County do not own a vehicle, so the accessibility of public transportation, walkability, and bikeability is essential to reduce the reliance on private vehicles, which also reduces GHG emissions.

STRATEGY 2: Transit	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 6.2.1:	Support expansion of the County's current light rail system, including connection to East Buffalo and the airport.			
	Ongoing	Indirect	DEP	NFTA, GBNRTC, ECEMC, City of Buffalo, local municipalities
ACTION ITEM 6.2.2:	Support development of bus rapid transit service throughout the County.			
	Ongoing	Indirect	DEP	NFTA, GBNRTC, ECEMC, City of Buffalo, local municipalities
ACTION ITEM 6.2.3:	Support expansion of the County's regional "hub and corridor" transit system, including increased transit frequency and the span of service day.			
	Ongoing	Indirect	DEP	NFTA, GBNRTC, ECEMC, City of Buffalo, local municipalities
ACTION ITEM 6.2.4:	Develop alternative transportation programs, including microtransit options, that address transportation gaps.			
	Short-Term/ Ongoing	Direct/ Indirect	DEP	NFTA, GBNRTC, private sector operators
ACTION ITEM 6.2.5:	Expand transit options for rural residents, including the County's Rural Transit Services program.			
	Short-Term	Direct	DEP	NFTA, local municipalities, private sector operators, GBNRTC
ACTION ITEM 6.2.6:	Educate the community on the benefits of alternative commuting options such as work from home, alternatives to single occupancy vehicles, and public transportation incentives.			
	Ongoing	Direct	DEP	GO Buffalo Niagara, local municipalities
ACTION ITEM 6.2.7:	Advocate for the implementation of the NFTA Equitable Transit Oriented Development Plan[72] for Metro Rail in alignment with state and federal initiatives.			
	Medium-Term	Direct	DEP	NFTA, GBNRTC, local municipalities
ACTION ITEM 6.2.8:	Identify opportunities to expand programs that make transit more affordable to low- and moderate-income residents.			
	Ongoing	Indirect	DEP	NFTA, Senior Services, Workforce Investment Board
ACTION ITEM 6.2.9:	Develop programs which ensure transportation for disadvantaged communities during extreme weather events.			
	Short-Term	Direct	DEP	ECDOH, Senior Services, UB, NFTA, DSS

Bus Rapid Transit on Bailey Ave

Bus Rapid Transit (BRT) is a high-quality bus-based transit system that delivers fast and efficient service at capacities similar to light rail that may include dedicated lanes, busways, traffic signal priority, off-board fare collection, elevated platforms, and enhanced stations. BRT also presents the opportunity to include multi-modal transportation enhancements, such as improved pedestrian and bicycle infrastructure and connections to other regional transportation corridors by creating mobility hubs.

NFTA Route 19, also known as Bailey Avenue, is one of the busiest transit corridors in the Buffalo-Niagara region, carrying about 4,300 passengers on a typical weekday (before the COVID-19 pandemic). This route connects to the Metro Rail and 13 other bus routes. The NFTA-Metro in partnership with the GBNRTC and the City of Buffalo are working on a BRT project on Bailey Avenue. BRT enhancements are intended to make travel on Bailey Avenue safer and more efficient.

NFTA Metro Bus

GBNRTC, NFTA Metro bus with bicycle, 2017, photograph, Buffalo, NY, https://tinyurl.com/2bmjfp4v

Microtransit

At times of the day when public transportation is not running, and in less densely populated areas that have a weaker public transportation system, microtransit is a useful shared transit method that reduces GHG emissions and traffic. Microtransit is a method of shared transit that uses small-scale vehicles, such as shuttles, minibuses, or regular cars, to provide transportation to the public. Microtransit can provide services when public transit is not running.[1] Furthermore, microtransit is often described as a "first mile last mile" solution, where it bridges the gap from departure and mass transit points to the final destination where public transportation is inaccessible.[2]

Sources:

1 GBNRTC, "Moving Forward 2050: A Regional Transportation Plan for Buffalo Niagara," May 2018, https://drive.google.com/file/d/1w5rEUkp9MXkE5NeA8HCJc5U5jWgQjydn/view?usp=sharing.

2 Kristoffer Vik Hansen, "What Is Microtransit? Bringing Greater Equity to Public Transit," Spare Labs, February 4, 2021, https://sparelabs.com/en/blog/what-is-microtransit.

Rural Transit Service

Rural Transit Service[1] is a non-profit organization run by volunteers in Erie County that provides safe, affordable, and reliable transportation to seniors, low-income, and disabled clients. Eligible residents are transported to places such as medical offices, pharmacies, colleges, workplaces, adult day care facilities, grocery stores, banks, and salons/barbers.

Rural Transit Service is a great way for those that need transportation assistance to better handle climate change-related events. For example, they can go to the grocery store to stock up on food and medicine before a forecasted disaster. After the disaster has happened, if someone has been injured, Rural Transit Service can take them to a medical office to receive medical treatment. Without Rural Transit Service, essential methods to protect someone's health and safety may not be possible for those without reliable transportation. Clients are not required to pay for their services, but donations are welcome.

Rural Transit Service Van

Rural Transit Service, Rural Transit Service van, n.d., photograph, https://www.ruraltransitservice.org/Photo-Gallery

Note:

1 To learn more about the Rural Transit Service, go to https://www.ruraltransitservice.org/Ridership/-Eligiblilty

STRATEGY 3: Electric Vehicles

Light duty vehicles like cars and small trucks account for about 28% of Erie County's carbon footprint and reducing these emissions is key to achieving our GHG reduction goals. A recent development is the availability of practical, longer-range EVs that promise to quickly transform the County's light duty vehicle fleet to one powered by our relatively low-carbon electric grid, while also improving air quality in our neighborhoods and lowering costs for vehicle owners. This transition is happening regardless of our actions and is mostly funded by consumer and business purchasing. The County's challenge is to make sure it supports a quick and smooth transition to EVs that is equitable and addresses key challenges so that low- and moderate-income residents are not left behind. Zero-emission heavy duty vehicles are also on the horizon, although this transition will be slower and more challenging.

While technological breakthroughs will continue to improve EVs and make them more affordable, there are practical, local issues with EV adoption that require leadership from the Erie County government. For most vehicle owners, the lowest cost way to charge EVs is at home and at night, when time-of-use metering make charging less expensive. Unfortunately, many residents, especially lower-income residents, are not able to easily install EV chargers for a variety of reasons. These issues disproportionately affect low- and moderate-income urban and rural residents, so to equitably transition to EVs, the County will need to exert leadership and help municipalities implement creative solutions to meet a variety of EV

charging needs.

Business adoption of EVs will also be important to Erie County's clean energy transition. Commercial vehicle use is increasing with the rise of online shopping and delivery services. Where the County is involved in business development, it needs to inform businesses of the benefits of EVs and available incentives for EVs and EV infrastructure. Erie County also needs to promote businesses providing EV charging stations to their workers, which may become a solution for increasing EV charger access to low- and moderate-income workers.

Although the transition to EVs provides important benefits, many impacts will remain, including the County's current transportation system centered around cars and trucks, which has contributed to sprawl and the need for County residents to own a single-occupancy vehicle. These vehicles often use prime public space for parking and they can create safety issues for bicyclists and pedestrians. Even as prices for EVs decrease, they will not be affordable or accessible for everyone. As the County supports an equitable transition to EVs, it should support initiatives that move away from our reliance on cars and small trucks, and towards a more multi-modal public transportation system that reduces urban sprawl and encourages dense, mixed-use development.

Installing EV Chargers

Most EV owners charge at home, occasionally using fast-charging locations on longer trips. As EVs become more common, the County expects many more home chargers to be installed.

Figure 22 Installing EV Chargers

Transitioning to Electric Vehicles

EVs improve air quality. An American Lung Association report found that a shift to 100% sales of zero-emission passenger vehicles by 2035 and medium- and heavy-duty trucks by 2040, coupled with renewable electricity generation, would generate over $1.2 trillion in public health benefits nationwide between 2020 and 2050. These benefits avoid up to 110,000 premature deaths, nearly 3 million asthma attacks, and over 13 million workdays lost due to cleaner air.[1]

Source:

1 The American Lung Association, "Zeroing in on Healthy Air" (The American Lung Association, March 2022), https://www.lung.org/getmedia/13248145-06f0-4e35-b79b-6dfacfd29a71/zeroing-in-on-healthy-air-report-2022.

Myths about Electric Vehicles

Western New York has one of the cleanest electricity grids in the nation.[1] Therefore, EVs are a powerful tool to reduce our community's carbon and air pollution. However, there are many myths about EVs that have created confusion, which can be found on the USEPA's "Electric Vehicle Myths" page online.[2]

Sources and Notes:

1 USEPA, "Power Profiler," Data and Tools, United States Environmental Protection Agency, June 5, 2023, https://www.epa.gov/egrid/power-profiler.

2 Check out the USEPA's "Electric Vehicle Myths" page to learn about common EV myths here, https://www.epa.gov/greenvehicles/electric-vehicle-myths

STRATEGY 3: Electric Vehicles	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 6.3.1:	Foster the development of EV ridesharing and car sharing programs to provide more clean energy options, particularly in disadvantaged communities.			
	Short-Term/ Ongoing	Direct/ Indirect	DEP	NYSERDA, GO Buffalo Niagara, ridesharing and taxi companies
ACTION ITEM 6.3.2:	Install public-facing EV charging stations at County facilities.			
	Short-Term/ Ongoing	Direct	DPW	New York State Electric and Gas (NYSEG), National Grid, NYSERDA, GBNRTC
ACTION ITEM 6.3.3:	Advocate for EV charging infrastructure on real estate development projects, especially for projects with direct County involvement.			
	Short-Term/ Ongoing	Indirect	DEP	NYSEG, National Grid, New York Power Authority (NYPA), ECIDA, NYSERDA
ACTION ITEM 6.3.4:	Participate in the regional planning of EV charging infrastructure and advocate for an equitable EV charging station network.			
	Short-Term/ Ongoing	Indirect	DEP	GBNRTC, NYSEG, National Grid, Clean Communities of WNY, New York State Department of Transportation (NYSDOT)
ACTION ITEM 6.3.5:	Expand publicly accessible EV charging stations for all by promoting their siting and installation through private and public programs throughout Erie County.			
	Short-Term/ Ongoing	Indirect	DEP	Local municipalities, NYSERDA, NYSDOT, National Grid, Clean Communities of WNY, NYSEG, NYPA, NYSDEC, NYS Parks, American Automobile Association (AAA)
ACTION ITEM 6.3.6:	Promote purchasing, replacing, and converting gas and diesel-powered vehicles and fleets, construction equipment, and generators with electric- powered alternatives through federal, state, and utility incentive programs.			
	Short-Term/ Ongoing	Indirect	DEP	National Grid, NYSERDA, NYSEG, NYSDEC, NYSDOT, Clean Communities of WNY, NYPA, AAA, WNY SBR
ACTION ITEM 6.3.7:	Work with partners to promote and educate about the use of EVs, installation of home chargers, tax incentives, rebates, and trade-in programs to foster the equitable and affordable adoption of EVs.			
	Short-Term/ Ongoing	Direct/ Indirect	DEP	NYSEG, National Grid, NYSERDA, New York State Department of Taxation and Finance (NYSDTF), GBNRTC, Niagara Frontier Auto Dealers Association, ECEMC
ACTION ITEM 6.3.8:	Continue to promote low and zero-emission fleet vehicles and the use of alternate fuels by municipalities and businesses throughout Erie County.			
	Short-Term/ Ongoing	Indirect	DEP	Local municipalities, universities, school districts, ECEMC, Association of Governments, WNY SBR
ACTION ITEM 6.3.9:	Consider the inclusion of conduit and other features that allow for the eventual inclusion of EV charging stations in the design criteria for publicly accessible parking lots, construction projects, Community Development Block Grant-funded projects, 239-M review projects, and other County projects.			
	Ongoing	Indirect	DPW	Division of Sewerage Management (DSM), local municipalities, highway departments

STRATEGY 4: Transportation Resilience

Erie County owns and operates more than one thousand miles of roadways and is responsible for ensuring that those roads are safe during weather events.[73] As the climate changes, the County is adapting to new threats and how it works with community partners to design, operate, and maintain its transportation system to be resilient in its response to and recovery from extreme weather events. Extreme rain, snow, wind, and heat events all present different types of challenges and solutions. During extreme heat events, the County needs to work with partners to make sure that residents have safe ways to get to cooling centers or green spaces to cool off, including the promotion of tree-lined streets and bus shelters that provide shade. Likewise, for extreme snow events, ensuring a safe and reliable way to get to warming

> *To learn more about green infrastructure, a solution to extreme rain events, go to the Nature-Based Solutions chapter.*

centers is essential. Finally, the County will support the transition to EVs that are fully integrated into the utility grid, which will make homes and businesses more resilient during power outages.

Another aspect of transportation resilience is ensuring that the County's logistics and distribution systems are adapted to withstand supply chain disruptions as we have seen during recent extreme weather events, such as the recent late-fall snowstorms. The County government must work with partner organizations to achieve a diverse freight network and avoid interruptions that impact both businesses and residents. The County should also ensure that its transportation system supports local businesses including agriculture, which will make us less dependent on long-distance transportation to meet community needs.

Traffic signals were replaced with two landscaped roundabouts in the Village of Lancaster as part of its West Main Street Extension Project. The slower but safer and more efficient flow of traffic has led to a reduction in emissions and intersection delays.

STRATEGY 4: Transportation Resilience	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 6.4.1:	**Incorporate changes in seasonal and extreme events into how the County designs and builds transportation infrastructure.**			
	Short-Term/Long-Term	Direct	DPW	Local municipalities, NYSDOT, NFTA
ACTION ITEM 6.4.2:	**Work with partners to make sure that streets, sidewalks, bike lanes, and transit stops are accessible during weather events, including snow and rain.**			
	Short-Term/Long-Term	Direct/Indirect	DPW	Local municipalities, NYSDOT, NFTA, National Guard, GObike Buffalo, Partnership for the Public Good (PPG)
ACTION ITEM 6.4.3:	**Implement high-priority transportation freight infrastructure projects that serve to increase the efficiency and diversity of our freight network.**			
	Short-Term/Long-Term	Indirect	DEP	GBNRTC, International Trade Gateway Organization
ACTION ITEM 6.4.4:	**Work with food and goods distributors and freight operators to assure that the community has access to food and supplies during disruptive storms.**			
	Long-Term	Indirect	DEP	NYSDOT, local municipalities

Further Reading

Transit Strategy
Federal Justice40 Initiative –
Confronts and addresses decades of underinvestment in disadvantaged communities by bringing resources to communities most impacted by climate change, pollution, and environmental hazards.

https://www.transportation.gov/equity-Justice40

Electric Vehicles Strategy
Electrify School Buses by 2035 –
Learn more about New York State's commitment for all new school buses purchased to be zero emission by 2027 and all school buses in operation to be electric by 2035.

https://www.nyserda.ny.gov/All-Programs/Electric-School-Buses

Active Transportation Strategy
Regional Bicycle Master Plan –
Bike Buffalo Niagara, the Regional Bicycle Master Plan for Erie and Niagara Counties will serve as a guide to provide a transportation system that safely integrates bicyclists in a coordinated and holistic manner.

https://www.gbnrtc.org/regional-bike-buffalo-niagara-master-plan

Snowstorms and other extreme weather conditions present various transportation challenges and solutions due to the impacts of climate change. Kevin Heffernan (shown above) helped clear an NFTA bus stop during a snowstorm in January 2022.

Photo credit: Simon Husted

FOOTNOTES: Transportation

65 Federal Highway Administration, "National Household Travel Survey," US Department of Transportation Federal Highway Administration, 2017, https://nhts.ornl.gov/.

66 CoolClimate Network, "CoolClimate Calculator," CoolClimate Network, accessed July 14, 2023, https://coolclimate.berkeley.edu/calculator.

67 To access the Regional Bicycle Master Plan from the GBNRTC, go to https://static1.squarespace.com/static/56ccbbfd3c44d8670dbd1d84/t/60f710fe80c4d02ab34347c0/1626804481563/Bike_Buffalo_Niagara_Cover_and_Table_of_Contents.pdf

68 To learn more about the 239-M process, check out the Further Reading section of the Housing and Neighborhood Resiliency chapter or go to Erie County's website at https://www3.erie.gov/environment/municipal-referrals

69 USEPA, "Sources of Greenhouse Gas Emissions," Overviews and Factsheets, United States Environmental Protection Agency, April 28, 2023, https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions.

70 Alexandra S. Kang et al., "Tackling Single-Occupancy Vehicles to Reduce Carbon Emissions: Actionable Model of Drivers' Implementation Intention to Try Public Buses," Journal of Cleaner Production 260 (July 2020): 1–13, https://doi.org/10.1016/j.jclepro.2020.121111.

71 Federal Highway Administration, "National Household Travel Survey."

72 To access the NFTA Equitable Transit Oriented Development Plan, go to https://www.nfta.com/media/j1eeljng/tdp-2023-final-reduc.pdf

73 Maintenance districts in Erie County can be accessed at https://www3.erie.gov/dpw/sites/www3.erie.gov.dpw/files/2022-09/erie_county_maintenance_districts.pdf. The Erie County Snow Plow Road List can be accessed at http://www2.erie.gov/dpw/sites/www2.erie.gov.dpw/files/uploads/Snow%20Plow%20Routes.pdf

Jose and Linda Corchado are new homeowners who purchased a postwar house in Tonawanda, but it was not until their first winter that they discovered a variety of insulation issues. With the help of Home Head-Quarters – a non-profit organization that partners with the City of Buffalo, Erie County, and New York State to offer a variety of programs – the Corchados applied for low-interest loans and grants to help fund an insulation project to increase the sustainability, resiliency, and comfort of their home.

"Due to the lack of investment tools available to these homeowners, many homes are particularly susceptible to the effects of climate change because of the age and design of the major components of their home," says Home HeadQuarters Deputy Executive Director Anna Falicov. "Homeowners should know that there are many affordable ways to make the necessary repairs that will allow them to stay safe or reduce damage during extreme weather events such as blizzards, stormwater flooding, and sewer overflows."

Housing and Neighborhood Resiliency

GOAL: Zero-emission homes and neighborhoods that promote health and protect residents from extreme weather.

Housing comprises 25% of Erie County's GHG emissions, primarily from natural gas use for space heating, gas appliances, and electricity use. Therefore, reducing GHG emissions from homes is key to meeting the community's climate goals. Housing also overlaps with other critical issues and County program areas, including those focused on health and poverty. Efforts to electrify homes with electricity produced from renewable energy and reduced fossil fuel use can also help the County government achieve related goals, especially by improving indoor air quality. However, the County's electrification efforts need to ensure that residents are safe during power outages,[74] including that residents have access to emergency heating. During this electrification transition, it is important for our electrical grid to be upgraded and made more resilient.[75]

The County will support efforts to protect vulnerable residents from changes in our climate through resiliency and efficiency efforts. Resiliency and efficiency can be achieved through home weatherization strategies and encouraging heat pump adoption, which can provide heating and cooling, protecting residents from both extreme heat and extreme cold. The installation of more green spaces and trees, along with the development of a robust utility grid that is less subject to blackouts, will also be important.

The County will support development and conservation strategies that curb sprawl and aim to make neighborhoods healthier and more livable, which is a family of strategies sometimes called Smart Growth. These strategies promote dense, mixed-income, walkable neighborhoods developed in coordination with public transit and greatly reduce the County's carbon footprint while making our community healthier and more equitable.

DEFINITIONS
FOR ACTIONS SPECIFICATIONS

Short-term:
By or before 2030

Medium-term:
By 2040

Long-term:
By 2050

Direct:
County government can directly control the action - relating to County government operations and infrastructure

Indirect:
Regional agencies and municipalities have control and/or County government can support/influence

Finally, there are many opportunities to transition our homes to clean energy, but it is a priority for the County to make sure that these initiatives are affordable, especially for low- and moderate-income residents. Current programs in Erie County, such as Home Energy Assistance Program (HEAP) and Community Development Block Grant (CDBG) are methods to help vulnerable residents withstand the effects of climate change, address energy poverty, and decarbonize housing. The Erie County Low-Income Program for Sustainable Energy (ECLIPSE) is a grant-funded program currently in development at Erie County that is working in partnership with HEAP[76] and CDBG[77] to reduce energy costs and access to renewable energy for low-income residents, including community solar projects. Erie County is also a partner of the WNY Clean Energy Hub, which provides local staff to connect residents of all income levels to residential clean energy incentives and technical assistance programs.[78]

Resilient Energy System for Erie County

Erie County has always experienced severe storms, but extreme weather events are becoming more common with climate change. Therefore, making sure that homes and businesses have reliable energy sources is a critical consideration as we transition to technologies that avoid climate pollution. Our existing infrastructure already makes us vulnerable. For example, most homes rely on electricity to run heating systems, and as we saw with the Blizzard of 2022 when four substations in Buffalo went offline from snow and wind, many aspects of our aging electric infrastructure are not designed to handle severe storms. As Erie County experiences more frequent storms and as heat waves become more common, it is especially important that we improve the reliability of our power grid.

While we expand our electric infrastructure to accommodate uses like electrified space heating and transportation, it is also an important opportunity to modernize and decentralize the system with technologies, such as rooftop solar, battery storage, vehicle-to-grid, demand management, and microgrids — all of which are discussed later in this Plan. A smart, decentralized energy system is much less vulnerable to disruption than our current centralized "hub and spoke" distribution system and the result is a grid that is much more resilient to extreme weather.

Finally, while we work towards modern electric distribution and storage systems, equipment that protects our community, such as fossil fuel-powered backup generators and emergency space heaters, will continue to be important in Erie County. Fortunately, using fossil fuels as back-up power is not a large source of climate pollution.

Figure 23 How Does Community Solar Work?

HOW DOES COMMUNITY SOLAR WORK?

Community solar is a program that allows everyone to benefit from clean energy, whether they rent or own their home.

Step 1
A developer constructs a solar project. Often these projects are built on fallow land, brownfields, or roofs.

Step 2
Clean energy is fed into the local power grid.

Step 3
Individuals, businesses, and nonprofits subscribe to receive bill credits from a shared system of solar panels.

Step 4
Subscribers will see savings on their electricity bill.

ECLIPSE and Community Solar

The Erie County Low-Income Program for Sustainable Energy (ECLIPSE) is currently developing an energy program that prioritizes clean energy benefits for low- to moderate-income (LMI) residents. ECLIPSE has the following goals:

- Reduce energy burden for LMI residents
- Increase access to clean, renewable energy
- Promote energy efficiency and weatherization

One of the key program types being investigated by ECLIPSE is an Erie County community solar program focused on LMI residents. **Community solar** is a purchasing program where users, such as individuals, businesses, and nonprofits, subscribe to a shared system of solar panels and receive the benefits of solar power.[1]

LMI and minority residents disproportionately face energy burdens. **Energy burden** is the percentage of household income that goes toward energy costs (electricity and home heating), which causes extra financial stress on households.[2] Residents must make difficult decisions to pay for energy bills or other necessities, such as food and medical care. To lower energy bill costs, residents may reduce energy use, such as not heating their home and use inadequate lighting, which causes unhealthy and unsafe living conditions.

As we continue to electrify, those that struggle with energy burden will need more relief from assistance programs, such as the Erie County Home Energy Assistance Program (HEAP). Currently, about 85,000 homes are authorized to receive HEAP benefits in Erie County.[3] One method to provide extra assistance to HEAP residents is to implement a community solar program. Some benefits for community solar include:

- Both homeowners and renters can participate
- Bill savings are guaranteed
- No upfront costs
- If you move within your utility area, you can transfer your account
- Opportunity for workforce development
- Environmental and health benefits from burning less fossil fuels
- Opportunity for asset ownership and wealth building for low-income communities

Erie County is in the process of working with community-based organizations and solar developers in the region to build out community solar to encourage enrollment from our HEAP recipients. This will lead to lower energy bills, economic development, and better health for individuals and the environment.

Sources:

1 USDOE, "Breaking Barriers to Community Solar Development with the Community Power Accelerator TM Learning Lab," Energy.gov, February 16, 2023, https://www.energy.gov/communitysolar/articles/breaking-barriers-community-solar-development-community-power-accelerator; USDOE Solar Energy Technologies Office, "Community Solar Basics," Energy.gov, accessed July 12, 2023, https://www.energy.gov/eere/solar/community-solar-basics.

2 American Council for an Energy-Efficient Economy, "Low-Income, Black, Hispanic, and Native American Households Face High Energy Burdens," ACEEE, accessed July 12, 2023, https://www.aceee.org/energy-burden.

3 Erie County, "2023 Budget: Book A Operating Funds," December 1, 2022, https://www3.erie.gov/budget/sites/www3.erie.gov.budget/files/2023-01/adopted_2023_a_book-searchable.pdf.

STRATEGY 1: Efficiency & Conservation

Promote the transition to energy efficient and weatherized buildings to reduce GHG emissions, minimize energy costs, and improve health.

The buildings sector is the largest source of GHG emissions in New York State. Overall, the combustion of fossil fuels in residential buildings was responsible for 11% of statewide GHG emissions in 2019.[79] Energy conservation and weatherization reduce fossil fuel use, make buildings healthier, and greatly reduce the amount of new clean energy that needs to be generated, keeping energy costs in check. Reductions in energy consumption can be achieved through actions including energy tracking, weatherization, and upgrades to energy efficient technology. An initial step to reducing energy consumption in existing buildings is to begin tracking energy use to better understand consumption patterns while identifying opportunities for energy retrofits such as weatherization and energy-efficiency upgrades. Weatherization includes insulating walls and roofs, improving doors and windows, and using air sealing. Energy efficiency upgrades include energy-certified appliances, high-efficiency light bulbs, and heat pump technologies, which are further detailed in the Electrification & Renewable Energy Strategy.

Local governments have tremendous influence on what Erie County's future building stock will look like. Prioritizing energy efficiency and proper weatherization will reduce GHG emissions and energy bills, while improving occupant health and well-being by increasing resilience to extreme temperatures and decreasing exposure to combustion-related indoor air contaminants that can cause respiratory distress. Furthermore, energy-efficient homes reduce the energy burden on disadvantaged communities by reducing electric and heating bills.

While new construction offers opportunities to utilize modern technologies and design approaches, the majority of the existing buildings in the Western New York region are aging and will need to be retrofitted to achieve full energy efficiency potential. The Erie County Low-income Program for Sustainable Energy (ECLIPSE) is currently investigating how it can administer clean energy in the region and use the funds brought in from the program to invest in energy efficiency upgrades in disadvantaged communities. Additionally, the newly-formed WNY Clean Energy Hub[80] provides local staff to connect residents of all income levels with incentive programs during this transition.

To ensure success, Erie County will educate homeowners and multi-family building owners on the value of efficiency improvements and look for ways to incentivize energy benchmarking to better understand consumption patterns and accurately identify opportunities for improvements. The County will look for opportunities to work with landlords to support increasing the efficiency of residences throughout the County while assuring that protections are in place for renters to keep rent affordable after upgrades. Financing weatherization work on homes in disadvantaged communities will be prioritized as well as developing new, affordable, energy efficient apartment buildings. The County will develop and strengthen its programs to assure that building owners are connected to the resources necessary to make energy-saving and cost-saving retrofits.
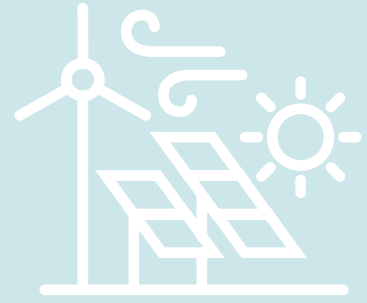
Clean Energy and Health

Many aspects of public health research highlight how burning fossil fuels negatively affects the health of individuals and communities globally and locally. The transition to clean energy has positive health outcomes. Using cleaner energy in households and communities has been seen as a sustainable way of reducing childhood and adolescent asthma prevalence and preventing certain health conditions (e.g., stroke, heart disease, chronic obstructive pulmonary disease, adult asthma, and lung cancer).[1] A recent study found that 12.7% of current childhood asthma in the United States (18.8% in New York State) is attributed to gas stove use.[2] Not only will the transition to clean energy benefit the environment, but also society as a whole.

Sources:

1 American Lung Association Editorial Staff, "The Importance of Transitioning to Clean Energy," American Lung Association, August 3, 2020, https://www.lung.org/blog/transitioning-clean-energy.

2 Talor Gruenwald et al., "Population Attributable Fraction of Gas Stoves and Childhood Asthma in the United States," International Journal of Environmental Research and Public Health 20, no. 1 (December 21, 2022): 75–79, https://doi.org/10.3390/ijerph20010075.

HOUSING AND NEIGHBORHOOD RESILIENCY GOAL: Zero-emission homes and neighborhoods that promote health and protect residents from extreme weather.

STRATEGY 1: Efficiency & Conservation	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 7.1.1:		**Engage and alert the public about access to free or low-cost energy assessments offered by New York State.**		
	Ongoing	Direct	DEP	PUSH Buffalo, WNY Clean Energy Hub, Heart of the City Neighborhoods (HOCN)
ACTION ITEM 7.1.2:	**Leverage CDBG and other resources available to the County and residents to increase support for energy efficiency and weatherization improvements.**			
	Ongoing	Direct	DEP	NYSERDA, Weatherization Assistance Program (WAP)
ACTION ITEM 7.1.3:	**Educate homeowners on energy and cost savings from weatherization and upgrades to energy efficient technologies, including heat pumps.**			
	Short-Term	Direct	DEP	PUSH Buffalo, WAP, WNY Clean Energy Hub, HOCN, ECEMC
ACTION ITEM 7.1.4:	**Work with programs including WAP, HEAP, and Empower to improve resilience and energy efficiency outcomes, including creating incentives for homeowners and renters for energy conservation.**			
	Medium-Term	Direct	DEP	DSS, NYSERDA, WAP
ACTION ITEM 7.1.5:	**Investigate opportunities to develop a weatherization program through the Erie County ECLIPSE program.**			
	Medium-Term	Direct	DEP	DSS, WAP, PUSH Buffalo, HOCN
ACTION ITEM 7.1.6:	**Support rules for retailers requiring minimum efficiency standards for appliances and equipment that can be sold in the County.**			
	Ongoing	Indirect	DEP	State initiatives, environmental advocacy groups
ACTION ITEM 7.1.7:	**Support local benchmarking and disclosure programs that help renters and home buyers identify energy-efficient properties.**			
	Medium-Term	Direct	DEP	City of Buffalo Rental Registry Program, Office of Geographic Information Systems (GIS), local municipalities

STRATEGY 2: Electrification & Renewable Energy

Transition buildings to affordable zero-emission energy sources by promoting renewable energy and electrification.

A key strategy to achieve zero-emission buildings is electrification paired with renewable energy sources. WNY is already starting strong on this mission since we have the lowest GHG emission rate of any region in the country.[81] Similar to energy transitions in the past, such as the transition from natural gas lighting to electric lighting, as well as the transition from coal to natural gas for building heating, this transition will take decades and must be conducted carefully. Furthermore, like those earlier transitions, this change is supported by a tremendous wave of innovation by engineers and businesses, which is resulting in opportunities to make our homes healthier and more resilient while creating local clean energy jobs. The transition will also require full consideration of costs so that we remain economically competitive as a region while disadvantaged communities are not negatively impacted. In addition, it is important to carefully consider resiliency strategies so that homes and residents are safe during extreme weather events.

In order to encourage a transition to zero-emission buildings, the County will work to increase access to clean, renewable energy sources County-wide by encouraging the development of neighborhood solar installations, wind, geothermal, and energy storage that prioritizes community ownership and investments at the neighborhood level. Community Choice Aggregation (CCA) is also being investigated by the County, which would allow local governments to provide energy supply services for residents and small businesses. CCA can be an important tool to increase renewable energy uptake while reducing electric costs.

Heating and cooling make up the largest use of energy by homes, and most of the housing units in Erie County are heated with natural gas. High-efficiency heat pump technologies are

> *To learn more about the different heat pump options to install in your home, please see the Building Performance & Efficiency Education Strategy in the Commercial Energy Conservation and Renewable Energy chapter.*

now available that work well in cold weather climates and provide affordable electric heating and cooling. The transition to heat pumps will be challenging and take time, but changing to heat pumps is the most effective way to reduce fossil fuel use in our homes. As the County works to advance this transition, it will need to make sure that heat pump programs are implemented so that household costs do not increase, especially for low- and moderate-income residents. Erie County has partnered with the WNY Clean Energy Hub[82] to help guide residents as they transition to heat pumps and other clean energy upgrades.

By advocating for additional funding at the state-level, the County will work to improve the access and utilization of clean energy technologies, such as renewable energy, demand management, and heat pumps, while addressing the upfront cost of this transition. Erie County is located in a storm-prone area, so the County will advocate that the transition to electrification is done in a way that ensures residents are protected during power outages. It is important to have a back-up plan to make sure residents have heat and power during outages, and for the foreseeable future, backup power may need to be fossil-fuel-based. Also, it is important that electric utilities increase the storm-readiness of the electric distribution system, including by looking for opportunities to move more of the electric distribution system underground.

Finally, the switch to electrification and clean, renewable energy will improve health, reduce environmental degradation, and create jobs. Continued investment into fossil fuel energy will lock us into infrastructure that is not emission-free. Newer technology has made electrification more practical, reliable, and cost-effective, and future technological advancement will make electrification even more affordable and effective. This transition will bring job creation, but requires workforce and local supply chain investments to take advantage of this opportunity, which is further discussed in the Economic and Workforce Development chapter.

Figure 24 Clean Energy Options

Clean energy options for your home

Trees and Landscaping
Shade cooling in summer, warming in winter

Solar Panels
Utilize clean energy for your energy needs

Efficient Lighting
Switch to LEDs for low energy high quality lighting

Sealing and Insulation
Reduces heating and cooling demand

High Performance Windows and Doors
Reduces heat loss, increases daylighting and allows for passive solar heating

Low-Flow Water Fixtures
Saves water and reduces energy use to heat hot water

Energy Management
Optimizes energy use throughout the home

Energy Star® Electric Appliances
Efficient models for all major appliances, including induction stoves

Electric Vehicle Charger
Some EV vehicles can power house in an outage

Heat Pump Space Heating
Efficient electric heating and cooling

Heat Pump Water Heater
Efficient electric heating of water

Battery Storage
Store electricity locally, for later consumption

● Weatherization
● Electrification

STRATEGY 2: Electrification & Renewable Energy	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 7.2.1:	**Create a County-wide community energy program that utilizes 100% clean energy that prioritizes disadvantaged community residents as first adopters.**			
	Short-Term	Direct	DEP	NYSERDA
ACTION ITEM 7.2.2:	**Encourage responsible community solar project development on agricultural land to make clean, renewable energy more accessible to rural communities without losing our most productive farmland.[83]**			
	Short-Term	Direct	DEP	NYSERDA, solar developers, community-based organizations
ACTION ITEM 7.2.3:	**Advocate for expanded state utility (NYSERDA, National Grid, NYSEG) programs to help homeowners and residents electrify new and existing buildings (including appliances) and to install residential renewable energy systems.**			
	Short-Term	Direct	DEP	NYSERDA, utilities
ACTION ITEM 7.2.4:	**Look for opportunities for ECLIPSE to subsidize electric heating and cooling technologies and home weatherization, especially for disadvantaged communities.**			
	Short-Term	Direct	DEP	NYSERDA, utilities
ACTION ITEM 7.2.5:	**Provide homeowners and landlords access to affordable capital, such as low-interest loans, to make the switch to fully electric residential solar systems with energy storage.**			
	Medium-Term	Indirect	DEP	Private banks and State Green Bank
ACTION ITEM 7.2.6:	**Work to assure that energy and housing costs are affordable for the County's low- and moderate-income residents.**			
	Short-Term	Direct	DEP	NYSERDA, WAP, DSS
ACTION ITEM 7.2.7:	**Support the wide-spread implementation of heat pumps in homes throughout Erie County.**			
	Short-Term	Direct/ Indirect	DEP	Local municipalities, WNY Clean Energy Hub
ACTION ITEM 7.2.8:	**As part of ECLIPSE, investigate creating a land trust to develop neighborhood solar installations and energy storage in vacant lots in urban and suburban neighborhoods.**			
	Medium-Term	Direct	DEP	NY Green Bank, Private banks

PUSH Buffalo West Side Homes Project

PUSH Buffalo West Side Homes is a project that proposes to develop 49 units of affordable rental housing.[1] The project plans to have two rehabilitated and 14 newly-constructed buildings. These units are designed to fit in with the neighborhood's style to retain with the character of the neighborhood. Residents will primarily be from the West Side, but all people are welcome to apply. In addition, the Buffalo Neighborhood Stabilization Company has partnered with Best Self Behavioral Health to designate 30% of the apartments for homeless individuals and families that include an individual with a substance use disorder or serious mental illness.

Construction of West Side Homes began Spring 2022. The apartments will be all electric (no natural gas will be incorporated), have rooftop solar, and energy efficiency beyond code. One location will be net-zero and another will meet passive house standards. To learn more about passive design, check out the Commercial Energy Conservation and Renewable Energy Goal.

Source:

1 PUSH Buffalo, "West Side Homes," PUSH Buffalo, accessed July 19, 2023, https://www.pushbuffalo.org/developments/west-side-homes/.

STRATEGY 3: Resilience

Minimize exposure and build capacity to address climate driven hazards, such as extreme heat, flooding, and wind.

Erie County faces increasing weather impacts from climate change, and the County government's highest priority is to make sure we protect our residents and their homes from harm. To better assess these threats, the County's DEP conducted the Climate Vulnerability Assessment (CVA), which is described in Chapter 3. The CVA found that extreme heat and storms causing extreme precipitation and wind are key threats related to housing in Erie County. Low- and moderate-income residents, who may live in uninsulated housing without air conditioning or backup power in neighborhoods with less green space and trees, are more at risk from these climate threats. Erie County residents are less accustomed to extreme heat, and as a result, our community is more vulnerable. The CVA also found that the County has gaps in our capacity to respond to these threats, such as an inadequate number of properly equipped cooling centers.

The County will consider climate adaptation and resilience in future planning and development decisions, informed by the CVA and Erie County Hazard Mitigation Plan.[84] By resilience, we refer to our region's capacity to prepare for, respond to, and recover from significant climate-related threats, such as extreme heat. Minimizing exposure includes enacting initiatives that protect residents and County assets from climate impact risks, such as increasing tree canopy and green space along commuting routes, walkways, and bike paths on County roadways. In addition, the County can prioritize green infrastructure that helps improve stormwater management and can help reduce local summer-time temperatures on County-owned lands.[85] Green infrastructure includes natural and manufactured green space to collect stormwater runoff, improve habitat, and provide shade. The County will need to build capacity by enhancing programs, training staff, and building infrastructure to address inequities and improve public health.

A key strategy for minimizing exposure from the impacts of climate change and building capacity is through the development of resilient housing. This involves designing housing and promoting policy and regulatory standards that incentivize construction of new housing and retrofitting existing housing. These designs will include energy efficiency and conservation methods, renewable energy production, and energy storage.

At the neighborhood level, strategies include implementing more green space, building capacity for renewable energy, and investing in battery back-up systems to ensure critical community services are maintained during disaster events with power outages. Fully integrating EVs into the utility grid will eventually allow the vehicle's battery to provide energy to homes and businesses during power outages while helping make communities more resilient.

Every action the County government, businesses, organizations, and residents take now to protect homes and infrastructure should better prepare us all for the future and protect us against climate impacts and their disproportionate burden on disadvantaged communities. The County's work also requires actively promoting and facilitating community engagement to ensure everyone has a voice in the decision-making process. The County must encourage collaboration and coordination of climate resiliency planning with action implementation among all Erie County municipalities in order to streamline costs, integrate systems, and maximize impact.

STRATEGY 3: Resilience	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 7.3.1:				Support the development of climate-resilient housing (both new housing and retrofitted existing housing) while preventing the displacement of current residents.
	Medium-Term	Indirect	DEP	Housing organizations, private philanthropy, local municipalities, developers, NYS Homes and Community Renewal (NYSHCR), PPG
ACTION ITEM 7.3.2:				ECLIPSE will investigate creating neighborhood microgrids to increase resilience to disasters while prioritizing the needs of disadvantaged communities throughout the County.
	Medium-Term	Direct	DEP	UB, utilities, local municipalities, developers, neighborhood organizations
ACTION ITEM 7.3.3:				Developing or securing opportunities to support re-treeing, creating green spaces in neighborhoods (including the use of existing vacant lots when possible), and allowing community members to have a say in how green space is used.
	Short-Term	Direct/ Indirect	DEP	Buffalo Sewer Authority (BSA), neighborhood organizations, local municipalities, PPG
ACTION ITEM 7.3.4:				Work with local governments to ensure that new housing (including public housing) protects residents from climate change threats, such as flooding and extreme heat.
	Medium-Term	Indirect	DEP	Local municipalities, NYSHCR, developers
ACTION ITEM 7.3.5:				Expand the Erie County Healthy Neighborhoods Program[86] to include climate resilience aspects.
	Short-Term	Direct	DEP	ECDOH, local municipalities, private philanthropy, housing organizations, NYSHCR
ACTION ITEM 7.3.6:				Create an education program for residents on extreme weather event preparedness.
	Short-Term	Direct	DEP	Erie County Department of Homeland Security & Emergency Services, Erie County Sheriff's Office, ECDOH, local municipalities

STRATEGY 4: Smart Growth

To effectively steer development and growth in a planned and coordinated manner using Smart Growth principles to curb urban sprawl, such that all communities become more economically stable and prosperous, socially equitable, and environmentally sustainable.

How and where development occurs within Erie County directly affects many facets of our everyday lives from peoples' homes, schools, taxes, place of employment, commute, health, surrounding natural environment, and economic status now and into the future. All of these facets of life are influenced by how well a community plans and invests in its future. The Erie-Niagara Framework for Regional Growth ("Regional Framework") has sought to guide such development in an orderly and coherent manner over the past few decades.[87] While much progress has been made in mitigating extensive sprawl throughout Western New York, work is still needed on other housing issues, such as affordability and adaptability (e.g., turning whole homes into multi-unit homes so elderly residents can age in place). The affordability crisis, where American resi-

dents are paying more than 30% of their gross income for rent or mortgage and utilities, continues to hinder residents locally and nationally.[88] Affordability gaps exacerbate climate mitigation efforts by constraining the ability of disadvantaged communities to make needed improvements that adapt to climate change and increase resiliency in the face of climate change impacts.

In seeking to address issues such as housing affordability, the County plays a unique role in that it has an overarching influence 44 municipalities located within its boundaries. While the County does not control most development, it can guide and shape the direction of how the Western New York region grows through investments in infrastructure and housing, the General Municipal Law §239-M/Integrated Review Process, training opportunities, and support of

municipal planning.

Erie County will continue to focus on creating more compact, walkable, and vibrant neighborhoods in the region's urban and developing areas. The County will encourage new housing development in areas that have existing infrastructure, transit systems, employment, and amenities, while taking into consideration both affordable and market-rate housing options. Existing programs within the County that provide housing rehabilitation assistance will continue to be prioritized, while also seeking out additional funds for climate resilience and mitigation measures, such as weatherization and electrification. Also, most importantly, the County will continue to take the lead in addressing climate change for our region via the action items contained within this section and the broader Plan.

The Village of Lancaster saw its first new development in 60 years due to the West Main Street Extension Project. "Not only retail, but people want to live here now, too," says Mayor Lynne Ruda. "The infrastructure completely transformed the downtown core."

Housing Affordability

Housing affordability is when housing costs (including energy costs) do not exceed 30% of a household's gross income. A household is considered "cost-burdened" if they are paying more than 30% of their gross income toward housing, and "severely cost-burdened" if they are paying more than 50% of their gross income toward housing. Nearly one in every four renter households in Buffalo pay at least half of their household income toward housing costs, with households of color disproportionately impacted. Severely cost-burdened households face incredible strain with meeting other daily necessities, such as purchasing food and medicine. They are also the most vulnerable and unstable, facing ever-present threats of eviction and homelessness. Oftentimes, these households are forced to resort to substandard, unsafe, and inadequate housing because of lack of affordable alternatives. Renewable energy can create cost savings, which is important to achieve housing affordability.[1]

Source:

1 Sarah Wooton, "Rental Housing Costs in Buffalo" (Partnership for the Public Good, September 2018), https://ppgbuffalo.org/files/documents/housing_neighborhoods/general/rentalhousingcostsinbuffalo.pdf.

Figure 25 Percent of Households in Buffalo, NY with Severe Housing Burden

**Percent Households in Buffalo NY with Severe Housing Burden
(spending more than 50% of income on housing costs) by Race and Ethnicity**

Race and Ethnicity	Percent
Black, Non-Hispanic	26.82%
Hispanic	29.86%
White, Non-Hispanic	14.49%
Native American, Non-Hispanic	40.70%
Asian or Pacific Islander, Non-Hispanic	25.02%
Other, Non-Hispanic	32.51%
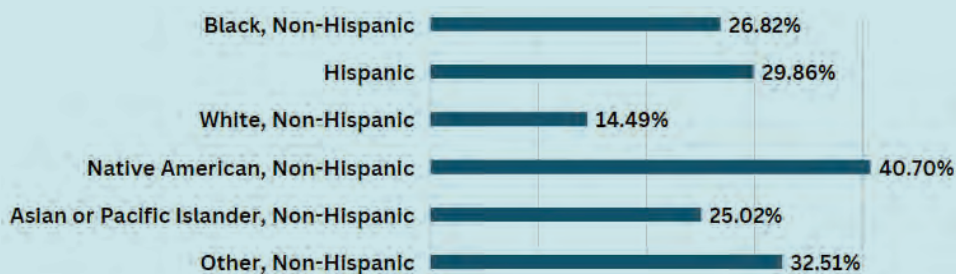
Note: "Race and ethnicity" is determined by the Head of Household's race and ethnicity.

Sarah Wooton, Percent Household in Buffalo NY with Severe Housing Burden, 2023, graph. *Revised by Sandra Notaro*.

Data source: US Housing and Urban Development Department, Affirmatively Furthering Fair Housing Map Tool, https://egis.hud.gov/affht/#

Urban Sprawl

The dependence on the automobile has led to a cycle of relying on independent modes of transportation. The automobile was once a status symbol and now has become a necessity for most people. As a result, communities throughout Erie County are characterized by low density housing, shops, and offices surrounded by massive parking lots, roads, and highways that are unsafe for pedestrians, and discontinuous streets (e.g., cul-de-sacs). Consequently, walking and bicycling are less safe and more difficult means of transportation.

Sprawl has some of the following negative effects on society:

- **Increases reliance on single-occupancy vehicles:** Greenhouse gas reduction becomes more difficult as we drive more and commute longer.

- **Contributes to health issues:** Due to the lack of active transportation options, health issues, such as obesity, arise.

- **Leads to inefficient use of our land:** Growing less food locally from loss of productive farmland due to development and loss of greenery.

- **Disadvantages everyone:** It is harder to access shops and vital services without a private vehicle, especially for the poor, senior citizens, and people with disabilities.[1]

In addition, having sprawl without growth has left many houses vacant, abandoned, and demolished as suburban development creeps into rural areas, causing farms to go out of business. As a result, older housing that is closer to cities is losing housing value.[2]

Sources:

1 UBRI, "One Region Forward: A Way to Plan for Buffalo Niagara," February 2015, http://bap-home.net/solarize/wp-content/uploads/sites/28/2017/05/1RF_A-New-Way-To-Plan-For-Buffalo-Niagara_FinalPlan_reduced.pdf

2 UBRI.

STRATEGY 4: Smart Growth

	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 7.4.1:	Direct investment and new housing development to areas served by existing utility infrastructure and near public transportation, employment, and community services. Discourage sewer and water extensions in rural and/or developing areas, as per the Regional Framework.			
	Ongoing	Direct/ Indirect	DEP; DSM	NFTA, GBNRTC, NYSHCR, local municipalities, (United States) Department of Housing and Urban Development (HUD) grant programs
ACTION ITEM 7.4.2:	Expand support for municipal comprehensive plan updates. Encourage increased densities and compact design, "live where you work" concepts, affordable housing, mixed-use development, multi-family housing, and migrant farmworker housing.			
	Short-Term/ Medium-Term	Direct/ Indirect	DEP	Local municipalities, New York State Consolidated Funding Application (NYS CFA); HUD CDBG grant, New York State Department of State (NYSDOS)
ACTION ITEM 7.4.3:	Work with local governments on obtaining and implementing smart growth planning and climate-mitigating grants, especially the County's small municipalities with limited capacities.			
	Short-Term/ Medium-Term/ Long-Term	Direct	DEP	NYSDOS DRI grants, UBRI, NYSERDA, HUD CDBG grant
ACTION ITEM 7.4.4:	Fund additional Erie County CDBG Smart Growth Projects.			
	Short-Term	Direct	DEP	NYS CFA, HUD CDBG grant
ACTION ITEM 7.4.5:	Consider expanding the CDBG County Housing Rehab Program to include climate resiliency improvements.			
	Short-Term/ Medium-Term	Direct	DEP	HUD CDBG & HOME grants, NYSERDA
ACTION ITEM 7.4.6:	Explore the recreation of a Regional Planning Board, which would help coordinate smart growth initiatives throughout the County.			
	Medium-Term	Direct	DEP	Niagara County, local municipalities, University at Buffalo Regional Institute (UBRI)
ACTION ITEM 7.4.7:	Update the Erie-Niagara Framework for Regional Growth.			
	Short-Term	Direct	DEP	Niagara County, UBRI, GBNRTC

County Housing Rehab Program

"The Erie County Housing Rehabilitation Loan Program[1] assists owner-occupied one- to two-family households with essential repairs. Funded through CDBG and HOME Investment Partnership Program monies, the program aims to eliminate substandard living conditions and prolong the useful life of the housing stock occupied by low- and moderate-income households. Assistance is provided in the form of repayable loans of up to $15,000 that are issued at a 0% fixed interest rate."[2]

Repairs typically include roofing, energy conservation, siding repair and/or replacement, and upgrading mechanical systems, such as plumbing, heating, and electrical systems.[3]

Sources and Notes:

1 To see if your household qualifies for the Erie County Rehabilitation Loan Program, go to Erie County's website at https://www2.erie.gov/exec/index.php?q=press/erie-county-housing-rehabilitation-loan-program-helps-homeowners-spruce-countywide

To access the Housing Rehabilitation Loan Program flyer, go to https://www3.erie.gov/environment/sites/www3.erie.gov.environment/files/2022-07/housing_rehabilitation_loan_program_6-15-2022.pdf

2 Erie County DEP, "Housing Programs," Erie County, April 28, 2023, https://www3.erie.gov/environment/housing-programs.

3 Erie County, "Erie County Housing Rehabilitation Loan Program Helps Homeowners Spruce Up Countywide," Erie County, December 9, 2022, https://www2.erie.gov/exec/index.php?q=press/erie-county-housing-rehabilitation-loan-program-helps-homeowners-spruce-countywide

Further Reading

Smart Growth Strategy

10 Principles of Smart Growth – Learn more on how smart growth is helping every town and city become a more economically prosperous, socially equitable, and environmentally sustainable place to live, helping everyone flourish.

https://smartgrowthamerica.org/what-is-smart-growth/

General Municipal Law §239-M/Integrated Review Process –
NYS General Municipal Law, Sections 239-l, m and n, provide for the referral and coordination of certain Town, City, and/or Village proposed land use actions that may have more of a regional or inter-community impact. This law requires local municipalities to refer actions that meet a certain threshold to the County Planning Department for review and comment.

https://www3.erie.gov/environment/municipal-referrals

Resilience Strategy

Electrified Homes in Emergencies – Learn more about resilience to disasters as homes are transitioning to electric power.

https://climate.mit.edu/ask-mit/will-upgrading-our-homes-run-entirely-electricity-make-us-more-vulnerable-blackouts

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FOOTNOTES: Housing and Neighborhood Resiliency

74 To learn how to save money during this electrification transition, go to Rewiring America's savings calculator at https://www.rewiringamerica.org/app/ira-calculator

75 To learn how heat pumps can be effective in cold climates, check out the Heat Pumps call-out for the Building Performance & Efficiency Education Strategy in the Commercial Energy chapter

76 To learn more about HEAP, go to Erie County's website at https://www3.erie.gov/heap/

77 To learn more about CDBG, go to Erie County's website at https://www3.erie.gov/economicdevelopment/community-development-block-grant-programs

78 To learn more about Regional Clean Energy Hubs in New York State, go to NYSERDA's website at https://www.nyserda.ny.gov/All-Programs/Regional-Clean-Energy-Hubs/Find-Your-Clean-Energy-Hub-Today

79 NYSDEC, "2022 Statewide GHG Emissions Report," 2022, https://www.dec.ny.gov/docs/administration_pdf/ghgsumrpt22.pdf.

80 To learn more about Regional Clean Energy Hubs in New York State, go to NYSERDA's website at https://www.nyserda.ny.gov/All-Programs/Regional-Clean-Energy-Hubs/Find-Your-Clean-Energy-Hub-Today

81 USEPA, "Power Profiler," Data and Tools, United States Environmental Protection Agency, June 5, 2023, https://www.epa.gov/egrid/power-profiler.

82 To learn more about Regional Clean Energy Hubs in New York State, go to NYSERDA's website at https://www.nyserda.ny.gov/All-Programs/Regional-Clean-Energy-Hubs/Find-Your-Clean-Energy-Hub-Today

83 See the Balancing Agriculture and Development call-out in the Promote & Protect Agriculture Strategy in the Agriculture and Food Systems chapter.

84 To access the CVA, go to Erie County's Climate Action website at https://www3.erie.gov/climateaction/climate-vulnerability-assessment

To access the Erie County Hazard Mitigation Plan, go to https://www3.erie.gov/dhses/sites/www3.erie.gov.dhses/files/2022-04/hazmit_2022_vol1.pdf

85 To learn more about green infrastructure, see the What are Nature-based Solutions call-out in the Goal for the Nature-based Solutions chapter.

86 To learn more about the Healthy Neighborhoods Program, go to Erie County's website at https://www3.erie.gov/envhealth/healthy-neighborhoods-program-hnp

87 To access the Erie-Niagara Framework for Regional Growth, go to Erie County's website at https://www4.erie.gov/regionalframework/framework-regional-growth-final-plan

88 Molly Cromwell, "Renters More Likely Than Homeowners to Spend More Than 30% of Income on Housing in Almost All Counties," US Census Bureau, December 8, 2022, https://www.census.gov/library/stories/2022/12/housing-costs-burden.html.

The International Brotherhood of Electrical Workers Local 41 consistently updates its curriculum to keep its workforce prepared for the region's growing investment in sustainable energy technologies.

"We know that wind, solar, and electric cars are a part of the future," IBEW Local 41 Training Director Matt Hilmy says, "so it's important for us to learn how to properly teach our new electricians and keep them up to date."

Economic and Workforce Development

Erie County
CLIMATE ACTION

GOAL: Foster an equitable and robust green economy

At present, our economic systems and workforce development pipelines are not fit to overcome the challenges from climate change or deliver a healthy balance between social and environmental goals. Instead, our current system promotes overconsumption, degrades natural systems, and breaks down communal bonds. A new vision for economic and workforce development is required to solve these problems in an equitable manner. In fact, there are economic opportunities as the County works to reduce the impact of and bolster its resilience in the face of climate change.

According to the United Nations, a green economy is an economy that "results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. It is low carbon, resource efficient, and socially inclusive."[89] A green economy protects, restores, and invests in its natural systems while supporting responsible production and consumption of resources.

In order to foster a just transition from our current economic system to a regenerative green economy, Erie County government, businesses, organizations, and residents must strive to move all sectors away from carbon-intensive practices and steer the region toward a low-carbon future. This economic transition can serve as an opportunity to implement more inclusive economic development practices that will reduce inequality and support all residents. To do this, Erie County will focus on developing the County's workforce, promoting a regenerative green economy through policies and infrastructure, and working with businesses County-wide so that they can realize the benefits of sustainable operations.

STRATEGY 1: Outreach

The idea that addressing climate change as an investment in our economic future is not new. In fact, more than 70 businesses in Erie County have already joined together as part of the WNY Sustainable Business Roundtable that recognize the value of addressing climate change.[90] However, more outreach is needed for all the County's local businesses to see the opportunity to innovate, conserve energy, improve quality of life, and attract employees. The County government should work with the WNY SBR and other economic development and workforce organizations to educate, motivate, and reward businesses that take such actions.

Before developing any outreach materials or holding meetings, it is important to understand the baseline knowledge, concerns, and needs surrounding the intersection of climate change and business in Erie County. A survey tool should be developed and distributed with partners, including the County's Community Climate Ambassadors, and be used to inform outreach materials and economic development summits. The knowledge garnered from surveys and meetings should be used to inform programs and foster actions that support this equity-focused Plan.

ECONOMIC AND WORKFORCE DEVELOPMENT GOAL: Foster an equitable and robust green economy.

STRATEGY 1: Outreach	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 8.1.1:	Determine the needs of community members, businesses, and municipalities through annual surveys.			
	Short-Term/ Ongoing	Direct/ Indirect	DEP	Climate Ambassadors, all local IDAs, Buffalo Niagara Partnership (BNP), Invest Buffalo Niagara, WNY SBR, NYSERDA, WNY Regional Economic Development Council (REDC), Erie County Association of Governments Climate Smart Committee, Task Force, Visit Buffalo Niagara (VBN), ECEMC
ACTION ITEM 8.1.2:	Develop and regularly update a Climate Action Toolkit to provide a roadmap to success for both large and small business.			
	Short-Term/ Ongoing	Direct/ Indirect	DEP	Climate Ambassadors, local IDAs, BNP, Invest Buffalo Niagara, WNY SBR, NYSERDA, WNY REDC, Erie County Association of Governments Climate Smart Committee, Task Force, VBN
ACTION ITEM 8.1.3:	Hold an annual inclusive economic development summit focused on identifying needs and highlighting available programs that support businesses to address climate change.			
	Short-Term/ Ongoing	Direct/ Indirect	DEP	WNY SBR, local IDAs, Chambers of Commerce, Invest Buffalo Niagara
ACTION ITEM 8.1.4:	Work with government agencies to create new and leverage existing programs that are responsive to the needs identified through the summits to educate, motivate, attract, and reward businesses to invest in climate action.			
	Medium-Term/ Ongoing	Direct/ Indirect	DEP	NYSERDA, NYSDEC, USEPA, United States Department of Energy (USDOE), REDC, United States Economic Development Administration (USEDA), Invest Buffalo Niagara, local IDAs, WNY SBR
ACTION ITEM 8.1.5:	Engage in direct community outreach to assess needs and provide resource assistance.			
	Short-Term/ Ongoing	Direct	DEP	Climate Ambassadors, local municipalities, community groups, UBRI, WNY SBR

STRATEGY 2: Policies & Infrastructure

It is vital that both economic development policies and infrastructure investments are aligned with the goals of this equity-focused Plan. To ensure widespread implementation and

success, policies should be in the form of incentives. For example, financial incentives to attract new businesses or support existing enterprises should include sustainability criteria, such as climate change impacts, climate resilience, and climate justice. Similarly, investments in infrastructure such as roads, sewer lines, broadband, and brownfield restoration should support smart growth principles.[91] It has been well documented in local planning documents, such as One Region Forward,[92] Framework for Regional Growth,[93] and the Regional Niagara River/Lake Erie Watershed Management Plan,[94] that continual sprawl has negative impacts on the environment and our region's economic stability. For example, sprawl results in more infrastructure for municipalities to maintain, which requires increased funding through taxes plus additional GHG emissions from increased vehicle miles traveled. Through "ErieNet," the County is currently working to ensure that all areas of the County can access the internet, which has become a required utility for doing business and can assist in reducing GHG emissions in a variety of ways, such as decreasing the need to travel through virtual meetings and incorporating "smart" technology[95] to conserve energy.

STRATEGY 2: Policies & Infrastructure	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 8.2.1:	Review current local economic development policies for environmental, social, and equity concerns and benchmark against other communities.			
	Short-Term	Direct	DEP	ECIDA, Invest Buffalo Niagara, WNY SBR, Chambers of Commerce
ACTION ITEM 8.2.2:	Work with stakeholders to develop policies that encourage business efforts to reduce GHG emissions and become more resilient to a changing climate, including equitable transportation-oriented development, energy conservation, renewable energy, and job creation.			
	Short-Term	Indirect	DEP	ECIDA, Other IDAs, Invest Buffalo Niagara, WNY SBR, Chambers of Commerce, Equal Employment Office, GBNRTC, NFTA, EC Association of Governments
ACTION ITEM 8.2.3:	Focus on redeveloping brownfields while aligning with Smart Growth and equity objectives.			
	Short-Term	Direct	DEP	NYSDEC, USEPA, ECIDA, Invest Buffalo Niagara
ACTION ITEM 8.2.4:	Identify preferred economic sites within the County that lack renewable electric infrastructure, renewable electric capacity, or both.			
	Medium-Term	Direct	DEP	ECIDA, local municipalities, NYSERDA, local utilities, Association of Governments, Invest Buffalo Niagara, local developers
ACTION ITEM 8.2.5:	Expand broadband internet throughout Erie County.			
	Short-Term/Ongoing	Direct	DEP	ErieNet Local Development Corporation (LDC), PPG
ACTION ITEM 8.2.6:	Advocate for sustainable supply chain products and services.			
	Short-Term/Ongoing	Direct	DEP, Purchasing	WNY SBR, private entities
ACTION ITEM 8.2.7:	Continue to support the WNY SBR.			
	Short-Term/Ongoing	Direct	DEP	WNY SBR
ACTION ITEM 8.2.8:	Assist and guide municipalities in planning and implementing zoning regulations that support green businesses.			
	Ongoing	Direct	DEP	Local municipalities, Association of Governments

Training director Matt Hilmy sends the IBEW Local 41 union's instructors to the National Training Institute each year to learn how to properly teach incoming apprentices.

"We've been working on training our electricians on solar and wind for years, Hilmy says, "and now we've added things like electric vehicle charging and battery storage to our curriculum."

STRATEGY 3: Workforce Development

Addressing climate change impacts while building community resilience to those impacts will result in changes to the region's workforce. As we plan for a just transition to jobs that address climate change impacts and build resilience, it is important to consider both the existing jobs that are affected and how to create opportunities for workers who live in disadvantaged communities.

To learn more about nature-based jobs, check out the Skilled Labor Jobs Strategy in the Nature-based Solutions chapter.

Many of the solutions to climate change require labor related to renewable energy, energy conservation, tree planting, green infrastructure, building new homes while renovating existing ones, and upgrades to utilities. These are all "green" jobs. The Invest Buffalo Niagara Labor Market Assessment, which specifically looks at "green" jobs and identifies needs, was released in late 2022.[96] It is important to align the outcomes of this needs assessment with existing entities and partners to create interest, training opportunities, and placement in green jobs, such as Tonawanda Tomorrow.[97]

STRATEGY 3: Workforce Development	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 8.3.1:				**Advocate for solutions to remove barriers to employment, including access and affordability to transportation[98] and childcare.**
	Ongoing	Indirect	DEP, DSS	Workforce Investment Board, Childcare Coalition, Live Well Erie
ACTION ITEM 8.3.2:				**Identify and promote WNY educational institutions that have training programs to attract labor force and industries that are pivoting to green technologies.**
	Short-Term/ Ongoing	Direct	DEP	Workforce Investment Board, local educational institutes, Northland Training Center, NYS Labor Board, NYSERDA, Buffalo Niagara Builders Association, BOCES, Erie Community College (ECC)
ACTION ITEM 8.3.3:				**Use local market data to convene a summit with workforce development organizations to identify needs and ways to leverage and fund programs.**
	Short-Term	Direct	DEP	Invest Buffalo Niagara, community colleges, universities, local municipalities, labor unions, BOCES, Northland Training Center, NYS Labor Board, Workforce Investment Board, NYSERDA, USEPA

Figure 26 Green Jobs

Green job growth in a changing climate

Significant increase

in cleantech jobs over the next 5 years

according to recent Invest Buffalo Niagara Labor Market Assessment

Residential construction · Electrical equipment manufacturing · Waste collection · Utility system construction · Architectural · Engineering · Technical services

Further Reading

Outreach Strategy
Climate Action Toolkit for Businesses – This Toolkit provides practical and cost-effective actions that every business can take to reduce GHG emissions and build resilience.

https://businessclimateactiontoolkit.ca/

Policies & Infrastructure Strategy
ErieNet – Creating a foundation to address the broadband needs of unserved areas, improve services in underserved areas of the community, and enable world-class broadband investment and deployment countywide.

www.erienet.com

Workforce Development Strategy
Invest Buffalo Niagara Labor Market Assessment – An overview of Buffalo-Niagara's economy, labor force, and target industries.

https://regional-institute.buffalo.edu/wp-content/uploads/sites/155/2020/11/LOWSingles_LMA17_WhosOurEconomy.pdf

FOOTNOTES: Economic and Workforce Development

89 United Nations, "Green Economy," United Nations Sustainable Development Goals, accessed July 18, 2023, https://sustainabledevelopment.un.org/index.php?menu=1446.

90 To see the list of WNY SBR Members, go to the WNY SBR's website at https://www.wnysustainablebusiness.org/our-members

91 See the Smart Growth Strategy in the Housing and Neighborhood Resiliency chapter.

92 To access the One Region Forward by UBRI document, go to
http://bap-home.net/solarize/wp-content/uploads/sites/28/2017/05/1RF_A-New-Way-To-Plan-For-Buffalo-Niagara_FinalPlan_reduced.pdf

93 To access the Erie-Niagara Framework for Regional Growth, go to Erie County's website at https://www4.erie.gov/regionalframework/framework-regional-growth-final-plan

94 To access Erie County's Regional Niagara River/Lake Erie Watershed Management Plan, go to Erie County's website at
https://www3.erie.gov/environment/watershed-management-plan

95 To learn more about smart technology, go to the Williams College website at https://oit.williams.edu/itech-posts/what-is-smart-technology/

96 The Invest Buffalo Niagara's Labor Market Assessment can be found on Invest Buffalo Niagara's website at https://info.buffaloniagara.org/2022lma

97 To learn more about Tonawanda Tomorrow, go to UBRI's website at http://regional-institute.buffalo.edu/work/tonawanda-tomorrow/

98 Check out the Transportation chapter to learn about the connection between transportation infrastructure and equitable workforce development.

The Erie County Board of Elections had been relying on a large boiler system to heat the entirety of the 120,000-square-foot building on West Eagle Street in Buffalo. In March 2023, the County began retrofitting the 90-year-old structure with an electrical heat pump system, which is a cleaner and healthier alternative to traditional heating and cooling systems. New condensers located throughout the building will allow room temperatures to be controlled individually.

"We're doing what we can to shift away from fossil fuels," says Erie County Director of Energy Development and Management Reed Braman. "This is a demonstration of the technology that exists today and how multi-story buildings can be brought up to modern standards."

Commercial Energy Conservation and Renewable Energy

Erie County CLIMATE ACTION

GOAL: Move toward net-zero-carbon-emissions commercial buildings and support the transition to a decarbonized electrical grid.

Commercial buildings provide the setting for much of the social, cultural, and economic activity in Erie County, but almost all of them were constructed at a time before the burning of fossil fuels for energy was a concern. During Erie County's cold winters, buildings require significant amounts of energy for heating, while the changing climate is resulting in increased energy loads to cool buildings during hot summer months. Furthermore, many of the buildings in Erie County were constructed before proper insulation, high-performing windows, energy-smart, or fossil-free technologies became available. Consequently, commercial buildings contribute significantly to our carbon footprint, with office buildings alone accounting for 22% of statewide GHG emissions, mostly from natural gas use.[99]

Decarbonizing commercial energy in Erie County requires a deep understanding of the value of carbon reduction and energy efficiency within the commercial building sector while partnering with key stakeholder utilities and energy consumers. From there, Erie County can work toward improvements in three ways:

1) From the demand side by supporting improved energy code implementation in buildings and building electrification;

2) From the supply side by supporting ramped-up renewable electricity production; and

3) From the interface between both sides by encouraging the incorporation of energy storage and flexible, smart management of electrical demand on the grid. Because the electrical grid serving Erie County already has the lowest GHG emissions rate of any region in the country, with a GHG emission rate less than one third the national average, Erie County is already well on its way toward a decarbonized electric energy supply.[100]

In the future, new commercial buildings that are compliant with more efficient energy codes and deploy high performance technologies will interface with a decarbonized grid built from distributed renewables and storage. A smarter grid will manage its loads such that electricity will be sent from wherever it is produced to wherever it is needed and buildings will scale back electricity usage in times of high demand. However, Erie County's transition to a decarbonized grid is not only a technological challenge, but will also require clear and reliable information for planning energy projects and consistent advocacy for the County government's goal of net-zero-carbon-emission buildings and a decarbonized electrical grid.

DEFINITIONS
FOR ACTIONS SPECIFICATIONS

Short-term:
By or before 2030

Medium-term:
By 2040

Long-term:
By 2050

Direct:
County government can directly control the action - relating to County government operations and infrastructure

Indirect:
Regional agencies and municipalities have control and/or County government can support/influence

Green Energy Futures, Passive solar energy is key to building a net-zero home, 2012, photograph, https://www.flickr.com/photos/greenenergyfutures/14520819865/in/photostream/

Passive Design Techniques for Buildings

Passive design works with the local climate to maintain a comfortable temperature in a building without an external heat source like a boiler or heat pump. The following are examples of passive design strategies:

- Keep spaces open to allow wind to passively ventilate the building.
- Provide shade with large overhangs and trellises.
- Efficient insulation.
- Use high-performance windows and doors.
- Create an airtight building.
- Build high-performing walls.
- For new builds, strategically place the building to maximize solar exposure, provide protection from prevailing winds, and take advantage of the site's natural features.[1]

Source:

1 Laura Rote, "9 Passive Design Strategies to Inspire Your Next Project," gb&d, July 12, 2021, https://gbdmagazine.com/passive-design-strategies/.

Electrification: An Opportunity for WNY

Electrification and transitioning to clean energy offers a host of opportunities to reduce air pollution, invest our energy dollars in local jobs, and move our community into the future while protecting the planet from climate pollution. Technology improvements are driving down renewable energy costs, resulting in exponential growth around the world (see Figure 27). We are well on our way to a truly clean electric grid since WNY has the greenest, least carbon intensive electricity of any region in the country.[1] Our large hydropower plant at Niagara Falls can supplement when solar and wind power outputs are low. Therefore, our community is especially well suited for building wind and solar power projects.

Many of the clean energy technologies also make our electric system more resilient to the intense storms that we are more frequently experiencing because of climate change. Strategies like rooftop solar, vehicle-to-grid and battery storage systems, smart load shifting technologies, load shedding technologies, and microgrids make the electric system less centralized and less vulnerable to disruption. As utilities upgrade the electric distribution system to increase its capacity, there is an important opportunity to make the system more resilient to storms to avoid power outages. For example, during the Buffalo 2022 blizzard, substations were not designed for heavy wind and snow and were shut down for days. A more resilient electrical grid will be less vulnerable to disruption.

Economic and health benefits offer additional benefits and opportunities. By investing in clean energy technology, such as local wind and solar farms, EVs, and efficient buildings, we create local investment, local jobs, and keep our energy dollars in our community. Furthermore, transitioning to clean energy greatly improves air quality, keeps workers on the job, and lifts up communities that have suffered the most from fossil fuel pollution.

Figure 27 Solar and Wind Generation
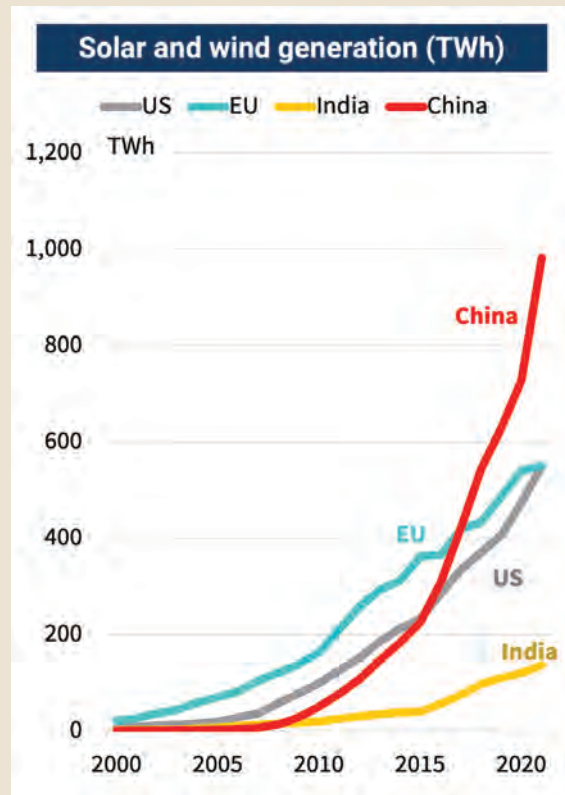
Rocky Mountain Institute, Solar and wind generation, 2023, graph, https://rmi.org/the-energy-transition-in-five-charts-and-not-too-many-numbers/

Source:
1 USEPA, "Power Profiler," Data and Tools, United States Environmental Protection Agency, June 5, 2023, https://www.epa.gov/egrid/power-profiler.

STRATEGY 1: Building Performance & Efficiency Education

The commercial buildings in Erie County are major energy users, and until such time as the grid is carbon-free and buildings are electrified, they will remain significant contributors to GHG emissions. This is to be expected, given the advanced age of much of the commercial building stock. As the climate shifts toward hotter summers in Erie County with more frequent extreme heat events, the energy demand for cooling technologies will rise, placing even more demand on the electrical grid. While the County sets its long-term sights on system-wide changes, it must not lose perspective on the need to improve commercial building performance throughout Erie County to reduce the electricity loads put on the grid, which reduces the overall need for new renewable energy sources over time.

Figure 28 Ground Source Heat Pumps

Ground source heat pumps

provide a connection between the ground and the air in a building so that heat can flow between them.

Since the ground is usually warmer than the air in the winter, but cooler in the summer, it can be more effcient to use ground source heat pumps to heat and cool your building.

1. **Water is circulated**
2. **Winter:** heat is absorbed **Summer:** heat is discharged
3. **Heated/cooled air is distributed**

GROUND SOURCE:
Underground, the Earth is a fairly consistent temperature year round. For heating mode, ground source heat pumps use the warm underground temperature to distribute the heat around the building through a process that works like an air conditioner in reverse. In addition, the system offers high-efficiency cooling. Ground source heat pumps can be more expensive than air source, but achieve somewhat higher efficiencies.

A significant additional step toward reducing the GHG emissions associated with current commercial buildings is to develop a clear understanding about the drivers of energy use in commercial buildings and transparent communication to all stakeholders about building energy performance. The gaps in information include:

- Sound business cases for high-performance strategies in old buildings in cold climates exist, but may not be readily known to building owners and managers.

- The energy performance of a building relative to its comparable peers is often unclear to both the current owners hoping to improve efficiency and to prospective buyers or renters looking to mitigate future energy cost risk.

- Information about funding and financing for efficiency improvements may be hard to find or understand.

Erie County can play a significant role in closing the information gaps among commercial building stakeholders with clear market signals demanding high performance, energy efficiency, and the reduction of GHG emissions from its commercial building inventory.

COMMERCIAL ENERGY CONSERVATION AND RENEWABLE ENERGY GOAL: Move toward net-zero-carbon-emissions commercial buildings and support the transition to a decarbonized electrical grid.

STRATEGY 1: Building Performance & Efficiency Education	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 9.1.1:	**Create and maintain a website to connect the community to key local and industry resources (including case studies) related to building energy performance.**			
	Short-Term	Direct	DEP, DPW	American Institute of Architects (AIA), United States Green Building Council (USGBC), WNY SBR, NYSERDA, Buffalo & Erie County Library
ACTION ITEM 9.1.2:	**Advocate for utility companies to include energy performance ratings on energy bills.**			
	Medium-Term/ Long-Term	Indirect	DEP, DPW	Utilities, New York State Association of Counties (NYSAC), Public Service Commission (PSC)
ACTION ITEM 9.1.3:	**Advocate for building performance information requirements and resources to address building efficiency be provided to homebuyers and renters at time of closing or leasing.**			
	Medium-Term/ Long-Term	Indirect	DEP, DPW	Energy Performance Contractors, Utilities, NYSERDA, Association of Realtors, County Clerk's Office
ACTION ITEM 9.1.4:	**Advocate for public benchmarking and disclosure of commercial building energy consumption for larger buildings.**			
	Long-Term	Indirect	DEP	NYS, local municipalities, NYSERDA, WNY SBR
ACTION ITEM 9.1.5:	**Educate developers on funding and financing opportunities, including Property Assessed Clean Energy (PACE) financing.[101]**			
	Short-Term/ Medium-Term	Direct	DEP, DPW	Local financial institutions, Energy Improvement Corporation of New York (EIC NY)
ACTION ITEM 9.1.6:	**Use high performing County-owned buildings and facilities to educate the community on building efficiency opportunities.**			
	Short-Term/ Medium-Term	Direct	DEP, DPW	NYSERDA, Arc, USGBC
ACTION ITEM 9.1.7:	**Work with Industrial Development Agencies (IDAs) to incentivize high-performing buildings.**			
	Short-Term/ Medium-Term	Indirect	DEP; Office of Economic Development	ECIDA, regional IDAs, Chambers of Commerce

Heat Pumps

Cold-climate heat pumps are a clean, comfortable, and efficient way to heat and cool homes and buildings — achieving two to four times the efficiency of electric resistance heating while emitting no climate pollution when paired with renewable energy.[1] In heating mode, they work like an air conditioner in reverse — moving energy from outside air, ground, or water to the interior of the building. Below are common types of heat pumps:

- **Air Source:** In heating mode, air from the outside acts as an energy source (cold air still has heat in it), with common models operating at full capacity below -15 °F. Air source heat pumps are often less expensive than ground source heat pumps. There are different types of air source heat pumps:

  - **Ducted Air Source Heat Pump -** Some versions replace a conventional furnace, using the building's existing ductwork.
  - **Ductless Air Source Heat Pump -** Sometimes called a "mini-split" or "multi-split," these systems often have wall-mounted interior units and do not use ductwork.
  - **Variable Refrigerant Flow (VRF) Systems -** Large scale systems that use sophisticated control systems to heat and cool commercial buildings.

- **Ground Source:** Underground, the Earth is a fairly consistent temperature year-round. For heating mode, ground source heat pumps use the warm underground temperature to distribute the heat around the building through a process that works like an air conditioner in reverse. In addition, the system offers high-efficiency cooling. Another variation uses a pond or other body of water as the energy source and sink for heating and cooling, respectively. Ground source heat pumps can be more expensive than air source, but achieve somewhat higher efficiencies.

- **Heat Pump Domestic Hot Water Heater:** Heat pump water heaters can be used in homes and larger buildings to heat hot water for sinks, showers, and other uses. Energy from the surrounding air is transferred to water in an enclosed tank.

VRF at the Erie County Board of Elections building.

Commercial air source mini-split heat pumps at the Police Apartments in Buffalo, NY.

Ductless air source heat pump indoor unit.

National Renewable Energy Laboratory, Ductless air source heat pump indoor unit, 2017, photograph, 61st and Pena Station, Denver, https://www.flickr.com/photos/nrel/37751098576

Source:

1 Lacey Tan and Jack Teener, "Now Is the Time to Go All In on Heat Pumps," RMI, July 6, 2023, https://rmi.org/now-is-the-time-to-go-all-in-on-heat-pumps/.

STRATEGY 2: Decarbonized Power Sector

The largest reductions in Erie County's carbon footprint will be seen by the electrification of buildings and transportation using renewable energy. To maximize the benefits of electrification, New York State has set a goal of 100% zero-emission electricity by 2040.[103] Fortunately, New York State already has one of the lowest carbon-based electric supplies in the United States, with about 74% of generation within upstate NY from zero-emissions sources, including solar, wind, nuclear, and hydropower.[104] Reaching this goal will require a much broader deployment of renewable energy sources. To be successful in our community, the County must continue leading this transition, while working to protect important resources including agricultural and Native lands, as well as ecologically sensitive areas.

The Erie County government currently supports utility-scale renewable energy development in key ways. For most utility-scale projects, the County's DEP reviews site plans and advises local governments on approval determinations. Typically, developers negotiate Payment in Lieu of Taxes (PILOT) agreements with towns, school districts, and the County, which reduces real estate taxes for developers. This system reflects that solar and wind projects create community benefits, do not create increased demands on municipal services, and gives the County some leverage on whether and how the projects move forward. In addition, the County hosts trainings for local government leaders and staff regarding renewable energy planning and permitting. Furthermore, the County provides planning grants through its Office of Agriculture to support updates to municipal comprehensive plans, zoning regulations, and ordinances.

Despite these positive actions, Erie County must do more to decarbonize the power sector. There is increasing confusion in the community regarding the benefits and impacts of renewable energy, and the County needs to proactively provide scientific information in plain, accessible language while advocating for appropriate clean energy projects. The County government must also support the development of a workforce with the skills to implement clean energy projects, including training workers from disadvantaged communities, which is discussed in the Economic and Workforce Development chapter. Finally, the County will lead our community with innovative solutions that support an affordable and equitable transition to clean energy, which is being planned through its ECLIPSE program.

STRATEGY 2: Decarbonized Power Sector	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 9.2.1:	**Work with renewable energy developers, land owners, local governments, residents, and other stakeholders to foster the broad deployment of renewable energy, including wind power, solar energy, and hydropower.**			
	Short-Term/Long-Term	Indirect	DEP	Local municipalities, developers, NYSERDA, WNY SBR
ACTION ITEM 9.2.2:	**Educate and train municipal leaders on how to plan and permit renewable energy development.**			
	Short-Term/Long-Term	Direct	DEP	UBRI, NYSERDA, NYSDOS, local municipalities
ACTION ITEM 9.2.3:	**Emphasize projects that conserve energy in the County's CDBG program.**			
	Short-Term/Long-Term	Indirect	DEP	HUD, local municipalities, WNY SBR
ACTION ITEM 9.2.4:	**Promote finance programs, such as PILOT and PACE for renewable energy projects.**			
	Short-Term/Long-Term	Indirect	DEP	County IDAs, businesses, WNY SBR, developers, NYSERDA
ACTION ITEM 9.2.5:	**Support the alignment of economic development policy and incentives for renewable energy with climate goals.**			
	Short-Term/Long-Term	Indirect	DEP; Office of Economic Development	County IDAs, local municipalities, developers, WNY SBR, NYSERDA
ACTION ITEM 9.2.6:	**Coordinate with the NYSDEC to raise awareness about the New York Works Well Plugging Initiative[102] as well as the importance of identifying and plugging wells.**			
	Short-Term/Long-Term	Indirect	DEP	NYSDEC, Erie County Soil & Water Conservation District (SWCD), WNY Land Conservancy (WNYLC)

Figure 29 Orphaned Wells in Erie County
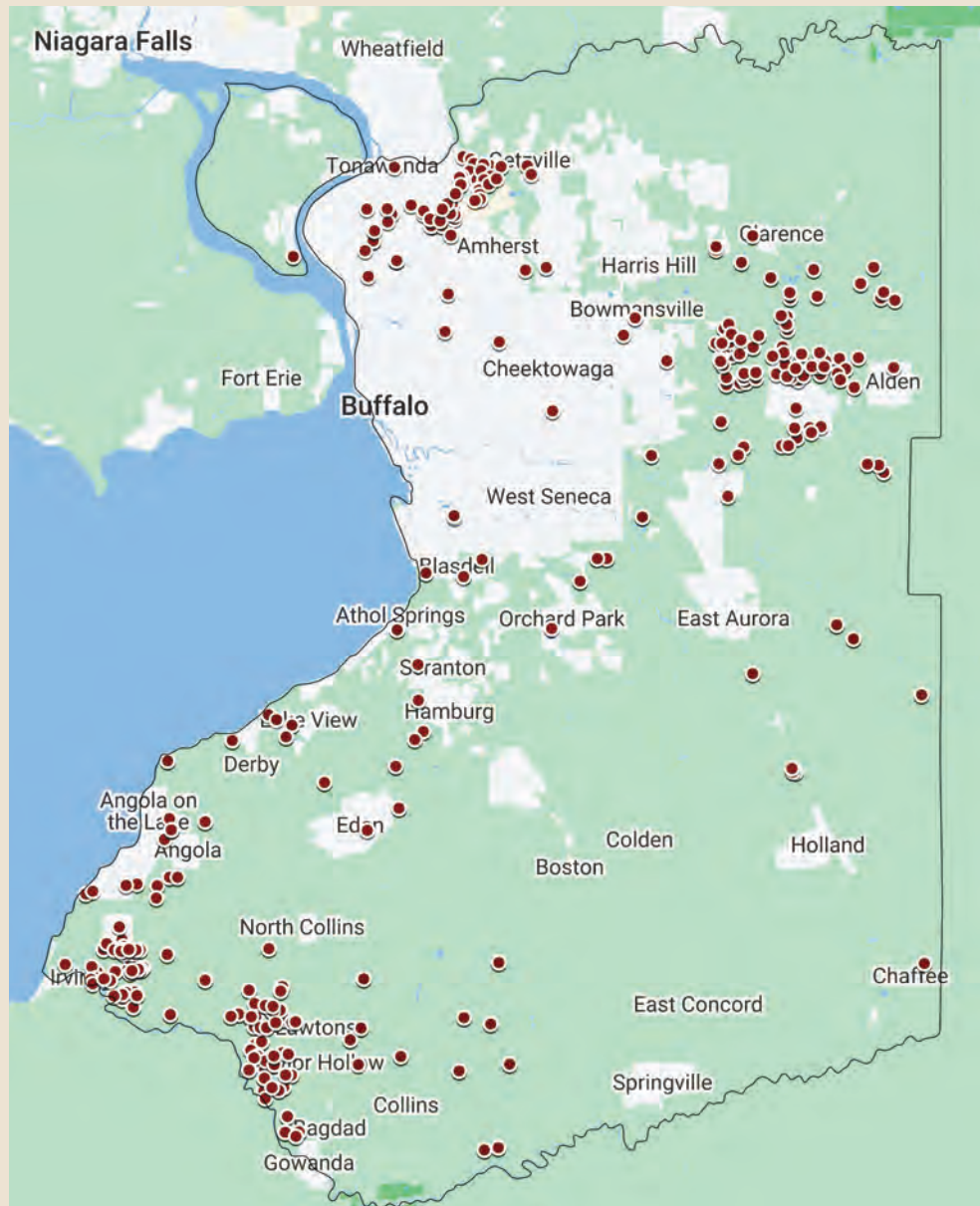
Abandoned Oil and Gas Wells

Abandoned, uncapped oil and gas wells often leak methane, a potent climate pollutant, and they also often contribute to groundwater contamination. NYSDEC has identified 334 potential abandoned wells in Erie County, almost all of which are natural gas wells, which are especially challenging to cap. Capping the wells is a challenging and expensive technical process that involves the placement of cement at specific depth intervals in a wellbore to seal hydrocarbon-bearing zones, therefore, preventing pollution. Fortunately, NYSDEC has a voluntary program to identify wells and cap them at no expense to landowners. If you are aware of a well that might be uncapped, or if you are a landowner and would like to learn more about this program, please contact NYSDEC.[1]

Note:

1 To learn more about orphaned and abandoned well plugging, go to the NYSDEC's website at https://www.dec.ny.gov/energy/111211.html

STRATEGY 3: Energy Code

Constructing new commercial buildings efficiently and incorporating energy efficiency into rehabilitation projects is much more cost effective than later retrofitting existing buildings. Additionally, energy efficiency is linked with reduced energy burden and health benefits. New York State has issued an Energy Code for buildings that is enforced by local governments and is frequently updated to incorporate improved practices.[105] In addition to the required Energy Code, NYSERDA released the 2020 NYStretch Energy Code to support higher efficiency standards and serves as an option for municipalities to adopt as an alternative to the existing Energy Code.[106] Local governments are not always able to fully enforce the Energy Code, and there is an opportunity for the County to support its municipalities so they can better implement the Energy Code while supporting implementation of the NYStretch Energy Code. Enforcement of the Energy Code for commercial buildings is especially important regarding multifamily residential buildings where LMI residents live because this will reduce their energy burden while improving health for a population that is often negatively impacted by substandard housing.

As we look for opportunities to revitalize our communities and update an aging building stock, the County will continue to advance energy efficiency measures by educating code officials on new smart technologies and their integration into building systems. By partnering with the NYDOS, NYSERDA, and other experts, Erie County will continue to provide training sessions on Energy Code and other specialized energy topics for municipalities and commercial building owners. Topics may include long-duration battery storage, solar power generation, wind power generation, and potentially geothermal heating and cooling systems. These trainings can target not just municipalities, but also renters, landlords, homeowners, businesses, and building professionals, especially those from disadvantaged communities. Additionally, the County will develop educational materials, such as business case studies that will be shared with elected officials and planning board members to highlight clean energy advantages and encourage the adoption of the NYStretch Energy Code. Finally, Erie County will identify opportunities to directly support improvements in County-wide code compliance by providing technical support to local governments for Energy Code compliance implementation.

STRATEGY 3: Energy Code	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 9.3.1:	**Educate local governments on energy and building codes, including NYStretch Code and American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).**			
	Short-Term/ Ongoing	Direct	DEP	NYDOS, NYSERDA, utilities, UBRI, BOMA, Association of Local Governments
ACTION ITEM 9.3.2:	**Provide direct technical support to local governments for Energy Code compliance and implementation.**			
	Short-Term/ Ongoing	Direct	DEP	Association of Local Governments, IDAs, Construction Exchange, AIA, New York Conference of Mayors (NYCOM), NYSAC

NYStretch Code

Every local government is required to regulate new building construction according to minimum energy conservation requirements described in the Energy Conservation Construction Code for New York State. NYStretch Energy Code 2020 (NYStretch) was developed by NYSERDA as a voluntary option for local governments that saves 10-12% more energy than the NYS's base energy code.[1] NYStretch can protect the environment while creating healthier, more comfortable buildings with lower operating costs.[2] Erie County can provide training and support to implement NYStretch.

The NYStretch Code benefits:
- Significant energy and utility cost savings for homeowners, tenants, renters, and building owners.
- Reduced building operational costs.
- Reduced climate and environmental impacts.
- Increased occupant comfort and health.
- Increased real estate value and community attractiveness.
- Research and development stimulation and commercialization of products that improve energy efficiency performance.
- Green job creation.[3]

Sources:

1 NYSERDA, "NYStretch Energy Code: 2020 Outreach, Training and Resources," NYSERDA, July 17, 2023, https://www.nyserda.ny.gov/All-Programs/Clean-Resilient-Building-Codes/NYStretch-Energy-Code-2020.

2 NYSERDA.

3 NYSERDA, "NYStretch Energy Code — 2020: Frequently Asked Questions," July 2019, https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Programs/Energy-Code-Training/codes-faqs.pdf.

STRATEGY 4: Energy Storage & Demand Management

Western New York's electrical grid adjusts to large fluctuations in electric demand mostly by ramping up and down the electricity generated at natural gas and hydropower plants. However, the grid will become increasingly powered by renewable energy sources in the coming years, as new wind and solar projects are built. The productivity of renewable energy sources is driven by the availability of wind and sunlight, which does not always closely line up with the times of peak electricity demand on the grid. Furthermore, some additional capacity for the grid to respond to shifting demand will be needed to maintain a resilient supply of electricity to consumers throughout Erie County. In anticipation of increased quantities of renewable energy production sources, the grid should incorporate more energy storage capacity while enabling demand management strategies. Storage and demand management will allow a zero-GHG-emissions grid to deliver electricity even in high-demand situations, such as during extreme heat events with high air-conditioning use. Overall, a grid with storage capacity is more resilient to climate change impacts. In addition, a grid with significant energy storage and managed demands requires the utility to invest less in new power plants to meet times of high demand. This averted cost may translate into lower costs for ratepayers as well.

Energy storage today includes both utility-scale battery and non-battery facilities. Battery systems are installed within commercial and residential buildings. The world is experiencing a revolution in battery technology, with new, high-performance options becoming increasingly affordable.[107] Soon, advanced EVs will allow vehicle owners to make their car battery available for grid energy storage. This gives the owner the option to use the power for their home or provide power to the grid when electricity is in high demand and charge up their vehicle when there is less demand. While energy storage systems are considered safe,[108] battery systems will need to be carefully deployed and disposed. In the case of utility-scale systems, energy storage systems will require careful siting and sensitivity to climate justice, agricultural, and ecological concerns.

Demand management strategies are the mechanisms that allow the grid to take full advantage of energy storage and allow consumers to make energy-use choices, which can reduce the peak electricity demand on the grid. These strategies require a flow of information to consumers, indicating a need for a shift in how information is provided and received based on the forecasted demand. Today, alerts warning consumers of an upcoming high demand day may be sent to consumers via email or text. As newer "smart" meters are deployed through-out the County, grid demand information can be sent in real time directly to consumers' equipment and appliances, allowing for an automated response in accordance with the owner's predetermined choices. For example, a building owner might set an air conditioning system to raise the building thermostat a few degrees when the utility signals electricity is in high demand. Often, smart metering is accompanied by demand pricing, which incentivizes the decision to shift loads by making electricity more expensive in times of peak usage. Thus, behaviors which make the grid resilient can also translate into lower costs for consumers.

Erie County has already begun promoting the use of battery storage technology by hosting training sessions to educate municipal staff on how to include battery storage in comprehensive plans and to inform local government code enforcement officers on how to permit battery storage projects. To help support New York State's goals of 1,500 megawatts (MW) of energy storage by 2025 and 3,000 MW by 2030, the County will promote battery storage and load shifting technologies, provide building owners with educational resources, work with municipalities to formulate ordinances and codes for when battery storage is employed, and ensure equitable distribution of the benefits of these technologies.

Figure 30 Peak vs. Average Load in New York State
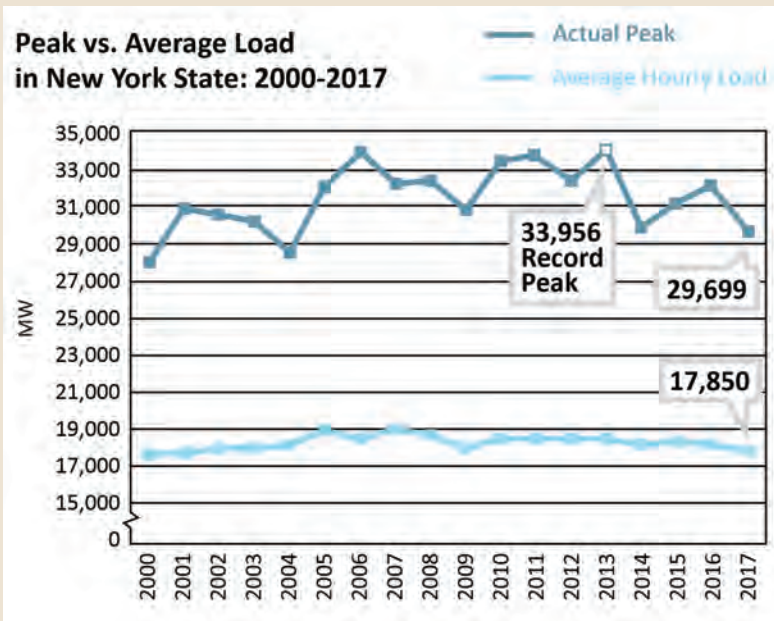
New York Independent System Operator, Peak vs. Average Load in New York State: 2000 — 2017, 2018, graph, https://www.nyiso.com/-/understanding-summer-energy-demand

Revised by Shania Julia Anunciacion

Load Shifting, Interconnectivity, Demand Response, and Load Leveling

Our entire electric system, including generating facilities, substations, transmission lines, and distribution lines, is designed to have the capacity to deliver electricity at times of peak electric use. These peak loads may only occur for brief times and are typically more than twice the average loads (see Figure 30 above). In our region, peak electric use normally happens during hot days in the summer, when air conditioning use is high. As we transition to clean energy, if we use electricity more flexibly to reduce peak loads and make electric demand more balanced (sometimes called **load leveling**), our community can greatly reduce the cost of investments in the electric system.

There are a wide variety of approaches to reduce peak loads that fall under the umbrella terms **demand management** and **demand response**. Many activities that require electricity can be coordinated so that they use the electricity when there isn't as much demand on the grid. Examples can include Time of Use meters that allow utilities to charge less for electricity when demand is low. For example, National Grid residential customers

can request a Time of Use meter that allows them to charge their EV at night, when there is excess electric capacity and rates are inexpensive.

More sophisticated approaches can involve smart meters and connected devices where, for example, an individual or business can sign up to allow the utility to make changes to a thermostat or delay the use of an appliance to reduce peak loads. This is often called **load shifting**. Some of these strategies are already in use with large commercial buildings and industrial energy consumers, but it is anticipated that new technologies will allow for much more equipment and appliances to be automatically controlled which will have a larger effect.

Energy storage systems like building batteries or "vehicle-to-grid" systems using electric vehicle batteries, sometimes called **distributed storage systems**, are also likely to be important tools for leveling electric loads, as individuals and businesses can save electric costs by charging batteries when electric rates are inexpensive, and selling or using the stored energy when rates are high.

STRATEGY 4: Energy Storage & Demand Management	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 9.4.1:	Educate commercial, industrial, residential, and school building owners about battery storage and load shifting options.			
	Short-Term/ Medium-Term	Direct	DEP, DPW	BOMA, WNY SBR, NYSERDA, NYPA, NY State Assembly & Senate, NYSAC
ACTION ITEM 9.4.2:	Educate municipal officials about battery storage for formulation of ordinances and codes protecting life and property, while valuing climate justice.			
	Short-Term/ Medium-Term	Direct	DEP	NYDOS, NYSERDA, ECEMC
ACTION ITEM 9.4.3:	Incorporate battery storage and load shifting into the County's heat emergency plan and other resilience plans.			
	Medium-Term	Direct	DEP, Emergency Services, ECDOH	Libraries

Further Reading

Building Performance & Efficiency Education Strategy

Air Source Heat Pumps –
Visual of how air source heat pumps work.

https://goclean.masscec.com/article/how-air-source-heat-pumps-work/#tab-id-1

Ducted and Ductless Air Source Heat Pumps –
Visual of how ducted and ductless air source heat pumps work.

https://goclean.masscec.com/clean-energy-solutions/air-source-heat-pumps/#tab-id-1

Decarbonized Power Sector Strategy

Top 5 Large-Scale Solar Myths – Initial reactions to the prospect of large-scale photovoltaic facilities or solar farms tend to include a myriad of misperceptions.

https://www.nrel.gov/state-local-tribal/blog/posts/top-five-large-scale-solar-myths.html

Wind and Solar on the Power Grid:
Myths and Misperceptions – Common myths and misperceptions on wind and solar regarding their contribution to a low-cost and reliable power grid.

https://www.nrel.gov/docs/fy15osti/63045.pdf

Wind Energy Myths – 10 common myths and misconceptions with explanations on how energy efficiency and clean, renewable energy will mean a stronger economy, a cleaner environment, and greater energy independence for America.

https://www.nrel.gov/docs/fy05osti/37657.pdf

Energy Code Strategy

Microgrid and Smart Grid Technologies – Learn more about the difference is between a smart grid and a microgrid.

https://epeconsulting.com/microgrid-vs-smart-grid/

Western New York's electrical grid will become increasingly powered by renewable energy sources in the coming years as more clean energy technology projects, such as solar farms, are built.

FOOTNOTES: Commercial Energy Conservation and Renewable Energy

99   NYSDEC, "2022 Statewide GHG Emissions Report."

100 USEPA, "Power Profiler."

101 NYSERDA, "Commercial Property Assessed Clean Energy (PACE) Financing Resources," NYSERDA, accessed July 12, 2023, https://www.nyserda.ny.gov/All-Programs/Commercial-Property-Assessed-Clean-Energy-PACE-Financing-Resources.

102 New York Works Well Plugging Initiative plugs oil and gas wells on private property at no cost to land owners, and reduces an important source of methane emissions

103 NYS Climate Action Council, "New York State Climate Action Scoping Plan."

104 USEPA, "Power Profiler."

105 International Code Council, "Effective Use of the Energy Conservation Construction Code of New York State," ICC, November 2019, https://codes.iccsafe.org/content/NYSECC2020P1/effective-use-of-the-energy-conservation-construction-code-of-new-york-state.

106 NYSERDA, "NYStretch Energy Code — 2020," July 2019, https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Programs/Energy-Code-Training/NYStretch-Energy-Code-2020.pdf.

107 To learn more about battery technology improving, go this report completed by the Rocky Mountain Institute, https://rmi.org/wp-content/uploads/2019/10/rmi_breakthrough_batteries.pdf

108 The federal and NYS government have worked to make sure that energy storage systems are safe in residential and commercial settings. To learn more, go to this frequently asked questions document from the National Renewable Energy Laboratory, https://www.nrel.gov/docs/fy21osti/79393.pdf

Since 2020, Erie County and the City of Buffalo have both received Community Wildlife Habitat certifications from the National Wildlife Federation, creating a wildlife corridor of parks, community gardens, private residences, schools, and businesses for easier passage for animals of all species. Black Rock Riverside Alliance Executive Director Anne McCooey, second from the left, has spearheaded The Habitat Project, which has had a significant positive impact on ecosystem health, community action and education, as well as wildlife welfare.

"It's simple, easy things like planting native plants in your garden or a native tree in front of your yard," says McCooey, standing in the recently certified Market Square Park in Black Rock. "We need to make sure as animals are moving through our communities, they find things to eat, places to drink, and places to have babies and raise their young safely."

Nature-based Solutions

Erie County CLIMATE ACTION

GOAL: Promote equitable nature-based solutions to protect intact landscapes, restore degraded ecosystems, and improve equitable access to green infrastructure, tree canopy, and open space for all residents.

Nature-based solutions to climate change are often cost effective, provide opportunities for communities and landowners to benefit from climate investments, and provide co-benefits for communities and ecosystems. Erie County is a region with diverse ecosystems and habitats that have been degraded due to loss of land from overdevelopment and sprawl, climate change, and extreme weather events. Degradation of ecosystems is disproportionately endured by low-income communities and communities of color. Loss of biodiversity impacts our health, food, air quality, water quality, soil, and culture. To overcome these impacts, Erie County must prioritize protecting habitats, upgrading infrastructure, and creating green space. This includes preserving tree canopies, protecting water quality, and combating invasive species.

There is tremendous opportunity within Erie County to use nature-based solutions to improve the County's natural environment. The Great Lakes provide over 20% of the world's available fresh water. Erie County lies on the shores of the Great Lake of Lake Erie, providing drinking water for 12 million people. The Niagara River, which forms part of Erie County's western border, was officially designated as a Wetland of International Importance in 2019 under the Ramsar

DEFINITIONS
FOR ACTIONS SPECIFICATIONS

Short-term:
By or before 2030

Medium-term:
By 2040

Long-term:
By 2050

Direct:
County government can directly control the action - relating to County government operations and infrastructure

Indirect:
Regional agencies and municipalities have control and/or County government can support/influence

Convention, an international treaty that promotes the sustainable use of the world's wetlands.[109] The Niagara River corridor has also been named a "globally significant" Important Bird Area.

The Erie County government manages nearly 10,000 acres of traditional parks, natural habitat parks, and forestry lots. In addition, the County is responsible for over 1,000 miles of roadway and the adjacent rights-of-way.

In addition to providing habitats for flora and fauna, the diverse landscapes throughout Erie County offer residents and communities green spaces to be active and enjoy nature, which greatly improves health and emotional well-being. However, as a result of environmental racism, discriminatory land use practices, and unequal public investment, low-income communities and communities of color commonly reside in areas of Erie County that have fewer trees, as well as less access to parks and recreation.[110] Erie County will work to ensure all residents have equitable access to green spaces and that new projects consider and seek to remedy historic injustices.

Figure 31 What are Nature-based Solutions?
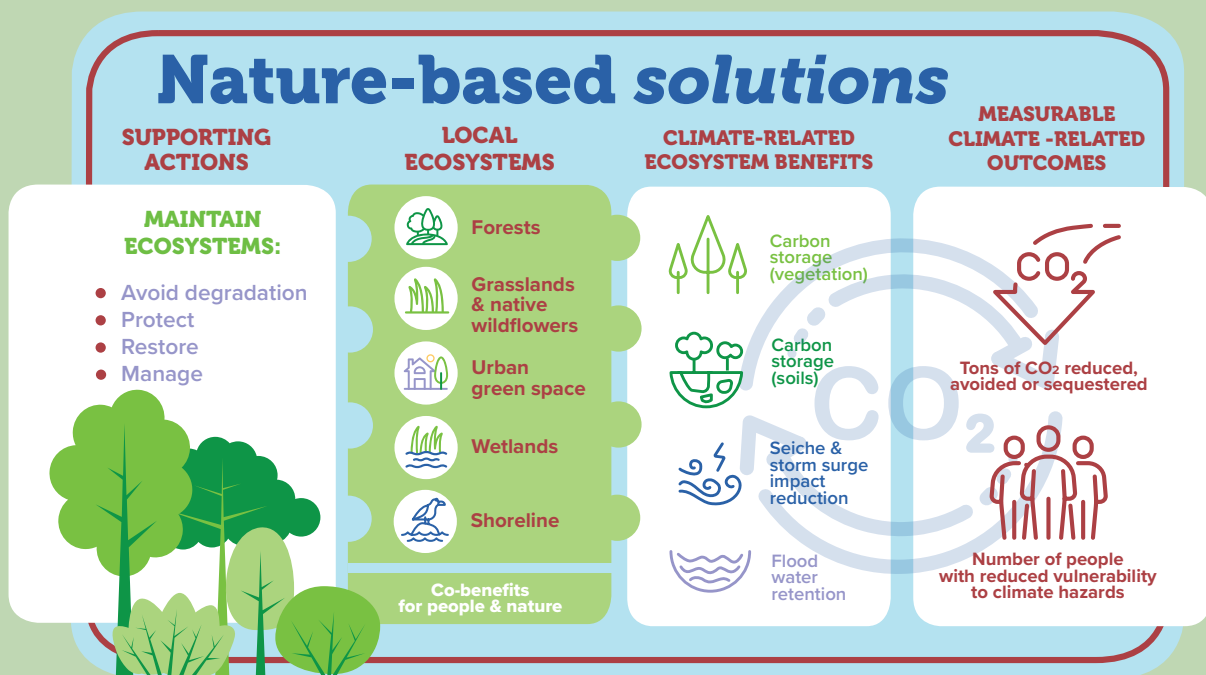
What are Nature-based Solutions?

Nature-based solutions are inspired and supported by nature, cost-effective, and simultaneously provide environmental, social, and economic benefits. These solutions also help build resilience.

Protection of forests are one of the best examples of nature-based solutions. Home to 80% of the world's terrestrial biodiversity, forests provide clean air and water, protect against erosion and landslides, and help to regulate the climate by removing carbon from the atmosphere.[1]

Examples of nature-based solutions:

Carbon sequestration: The process of capturing and storing atmospheric carbon dioxide. For example, trees remove carbon from the atmosphere.

Green infrastructure: An approach to water management that filters and absorbs stormwater where it falls and reduces flow to sewer systems or to surface waters.

Permeable pavement: Permeable surfaces allows rain to soak into the ground, which helps reduce the risk of flooding, reduces runoff, and replenishes the groundwater table.

Source:
1 United Nations, "UN Forum on Forests: 5 Things You Need to Know," UN News, May 8, 2023, https://news.un.org/en/story/2023/05/1136442.

STRATEGY 1: Skilled Labor Jobs

As extreme weather events occur more often throughout the County due to the changing climate, a mix of labor-based approaches to adaptation will be necessary. Developing dedicated positions that focus on fortifying our landscape and restoring it from the effects of extreme weather events, as well as incorporating mitigation techniques and practices within the existing workforce, is and will continue to be pivotal in Erie County. As described in the Erie County CVA (found in Chapter 3 Climate Resiliency), Erie County's landscape, infrastructure, and communities, especially disadvantaged communities, are impacted by increased heat, wind storms, ice storms, rain, snowfall, flooding, and seiche events.[111]

Professionals require specialized training to accomplish most nature-based solutions. Some training includes landscaping and groundskeeping, forestry, construction, equipment operation, soil and plant science, green infrastructure installation and maintenance, ecological monitoring, field testing, tree removal, tree trimming, tree pruning, and invasive species management. New York State recognized the need for this workforce when in 2022, Governor Kathy Hochul signed a pledge to "add more women to the ranks of Environmental Conservation Police Officers, Forest Rangers, and Park Police Officers."[112]

Erie County will prioritize working with partners to provide interested residents access to the essential training and skills required to work on nature-based projects. The County will work to ensure that these jobs have family-sustaining wages and are available to all residents that are interested, especially individuals living in communities that are disproportionately affected by environmental degradation. It is a primary goal to create economic opportunities that benefit workers in Erie County and prioritize disadvantaged communities, which are those that are more vulnerable to the harmful impacts of climate change.

To achieve this workforce-focused goal, working with interested parties like New York State, Climate Corps, and AmeriCorps will be a high priority. To provide equitable opportunities for all, investing in education and exposure to nature-based, skilled labor jobs at the high school and college levels is of utmost importance. Erie County will work with training facilities to ensure adequate availability at affordable prices, which may include providing resources like grants and other funding opportunities to supplement training costs. Providing childcare, transportation, and a geographic spread of training sites in communities throughout Erie County will also help achieve this goal.

NATURE-BASED SOLUTIONS GOAL: Promote equitable nature-based solutions to protect intact landscapes, restore degraded ecosystems, and improve equitable access to green infrastructure, tree canopy, and open space for all residents.

STRATEGY 1: Skilled Labor Jobs	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 10.1.1:	Partner with interested parties to collaborate on training needs and opportunities.			
	Short-Term	Indirect	DEP	High schools and colleges, Corps Groups, state and federal agencies, non-profits, BOCES programs, Workforce Investment Board, job training facilities, local municipalities, businesses, unions, community-based organizations and block clubs, Live Well Erie
ACTION ITEM 10.1.2:	Provide skilled labor job training for nature-based projects.			
	Short-Term	Indirect	DEP	High schools and colleges, Corps Groups, state and federal agencies, non-profits, BOCES programs, Workforce Investment Board, job training facilities, local municipalities, businesses, unions, community-based organizations and block clubs, Live Well Erie
ACTION ITEM 10.1.3:	Hire workers from skilled labor job trainings.			
	Medium-Term	Direct	Parks, DPW, DSM	Local businesses, unions, non-profits
ACTION ITEM 10.1.4:	Pursue on-going preventive and maintenance efforts for nature-based projects.			
	Medium-Term	Direct	Parks, DPW	Community-based organizations

Figure 32 Land Protection & Land Use Planning

Land protection & planning

Human health

Clean water & healthy soils

Carbon sequestration

Capture & filtration of rainwater

Preservation of biodiversity & native species

Improved connectivity & creation of habitat corridors

Reduced flooding & erosion of stream banks

Increased resilience to intense & frequent storms

Protected forests, floodplains, & other natural habitats

Strategic planning and permanent protection of natural ecosystems are critical solutions for the impacts from climate change.

Impacts of poor land use:

- **Reduced biodiversity which impacts human health, food, air quality, water resources, & soil**
- **Increased runoff**
- **Flooding, degrading water quality, & increased burden on stormwater infrastructure**
- **Creation of fragmented landscapes, & prime conditions for invasive species**
- **Deforestation which releases carbon stored in trees**

STRATEGY 2:
Conserve Resilient Lands, Waterways, & Priority Habitats

Land conservation protects valuable ecosystem services and is one tool that ensures resilient lands remain intact. Protected lands provide improved water and air quality, habitat for native plants and wildlife, critical water storage and flood mitigations, and open space and recreational opportunities for the public. In 2022, Governor Kathy Hochul signed legislation "that sets the goal to support and contribute to national efforts to conserve at least 30 percent of U.S. land and water by 2030."[113]

Resilient lands are a critical focus for land conservation. The Nature Conservancy defines resilient land as "an area of land where high microclimatic diversity and low levels of human modification provide species with connected, diverse climatic conditions they will need to persist and adapt to changing regional climates."[114] Resilience is influenced by local connectedness, which is the ability for species to move across a landscape without barriers. Resilient lands promote biodiversity through connection and microclimatic diversity. By protecting resilient lands and areas of high biodiversity, and ensuring those lands are connected, species are better able to respond to changes in climatic conditions.

Land conservation provides valuable ecosystem services and avoided costs for Erie County. Ecosystem services are ways that people benefit from their surrounding environment. Common ecosystem services include benefits that support daily life, such as air filtration, carbon sequestration, water filtration, flood regulation, soil formation, and pollination. The most well-known example of avoided costs by investing in ecosystem services in the eastern United States is the protection of the Catskill and Delaware Watersheds instead of New York City spending $8 to $10 billion to build a water filtration plant plus an annual cost of $100 million to operate.[115] Avoided costs also include the potential future costs if intact natural systems are lost. A USEPA paper on protecting healthy watersheds shows a correlation between the percentage of forest cover and predicted water treatment costs.[116]

Land conservation also provides the opportunity for outdoor recreation resulting in overall public health benefits, a stronger relationship to nature, and better stewardship of natural spaces. Exposure to nature has many physiologic benefits, including lowering cortisol levels and blood pressure, thus lowering stress and anxiety.[117] Living near green space reduces mortality even when adjusted for additional socio-demographic factors.[118] People having access to local green space can also foster a sense of community, ownership, and thus stewardship, in addition to health benefits.

STRATEGY 2: Conserve Resilient Lands, Waterways, & Priority Habitats	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 10.2.1:	**Map the most climate resilient lands in Erie County and prioritize them for protection.[119]**			
	Short-Term	Direct	DEP	NYSDEC, WNYLC, Buffalo Niagara Waterkeeper, Lake Erie Watershed Protection Alliance (LEWPA)
ACTION ITEM 10.2.2:	**Create a Conservation Plan for Erie County that prioritizes areas for protection and ensures equitable access to open space, connectivity, and green infrastructure.**			
	Short-Term	Indirect	DEP	Local municipalities, NYSDEC, WNYLC, Buffalo Niagara Waterkeeper, LEWPA
ACTION ITEM 10.2.3:	**Work with partners and residents to protect priority lands through outreach and education.**			
	Medium-Term	Direct/ Indirect	DEP	Local municipalities, NYSDEC, WNYLC, Buffalo Niagara Waterkeeper, LEWPA

STRATEGY 3: Restoration Strategies

For portions of the County where lands have been degraded or contaminated, restoration techniques can re-establish ecosystem services associated with intact natural landscapes. Restoration techniques can improve carbon storage, increase biodiversity, add flood retention, and provide many other benefits that both mitigate and improve resilience to climate vulnerabilities identified within Erie County.

In addition to the ecosystem services described above, living shoreline restoration has proven to be successful in acting as the first line of defense in protecting communities from coastal erosion and extreme flooding. Living shorelines include native plant species that grow deep and complex root systems, which improve resilience to forces acting along shorelines and are increasingly important as the impacts of climate change intensify. Natural materials like logs and stone can also be incorporated to protect the shoreline while creating important habitats. Living shorelines also improve water quality by filtering out runoff and pollutants before they flow into local waterways, while overhanging cover cools water temperatures, improves water quality, and reduces the occurrence of harmful algal blooms. The dense native plant communities also prevent the occurrence of invasive species.

Beyond restoration of shoreline areas, restoring inland wetlands, natural corridors, open green spaces, urban forests, and grassland habitats are all nature-based solutions that contribute towards climate resilience. Additionally, focusing on transforming brownfields or contaminated properties into a natural habitat is another effective nature-based solution that addresses inequities in low-income communities and communities of color that have been historically dominated by industrial land with minimal green space.

An important component of all restoration efforts is the removal of invasive and non-native species while establishing beneficial native plants. This requires ongoing, long-term monitoring and adaptive management to ensure any recurrence of invasive species is controlled so that native species can thrive. Coordination with partners, such as the Partnership for Regional Invasive Species Management (PRISM) and others doing this work locally who can share best practices and knowledge will benefit these efforts in Erie County.

Ecosystem Services

An ecosystem service is any positive benefit, small or large, that wildlife or ecosystems provide to people.[1]

Ecosystem services result in:
- Carbon sequestration
- Filtration of pollutants and nutrients from runoff
- Increased biodiversity
- Flood water retention
- Reduced erosion
- Increased coastal and climate resiliency
- Soil formation and nutrient cycling
- Uptake of contaminants in soils
- Educational, cultural, and aesthetic values

Source:

1 NWF, "Ecosystem Services," National Wildlife Federation, accessed July 12, 2023, https://www.nwf.org/Home/Educational-Resources/Wildlife-Guide/Understanding-Conservation/Ecosystem-Services

Connecticut Agricultural Experiment Station Archive, Evidence of hemlock woolly adelgid on western hemlock, 2005, photograph, United States, https://en.wikipedia.org/wiki/Hemlock_woolly_adelgid#/media/File:Adelges_tsugae_3225077.jpg

Native Species

A species that originated and developed in its surrounding habitat and has adapted to living in that particular environment. For North America, is one that was found within (as a component of) the ecosystem under consideration pre-European settlement.
Western Hemlock

Invasive Species

A species that is non-native to an ecosystem under consideration and whose introduction causes, or is likely to cause, economic or environmental harm or harm to human health.
Hemlock Woolly Adelgid

Stream Bank Stabilization & Green Infrastructure

As the severity of storm events increases due to climate change, stream banks erode at a faster rate. Erosion of stream banks can increase nutrient load in the water (which can increase algal growth), causing potential property loss and posing a risk for existing ecosystems.

Implementing green infrastructure can sequester storm water before it reaches streams, which increases resilience to climate change. In addition, protecting stream banks and restoring eroded shorelines can reduce the impacts on aquatic ecosystems. Techniques to protect aquatic ecosystems, which are described below, include building living shorelines, utilizing in-water root wads, and establishing rock reefs and rock weirs.

In-Water Root Wads:

"A bank stabilization and aquatic habitat improvement strategy that involves burying a dead tree into the streambank with the root system still attached."[2]

Red Jacket Riverfront Natural Habitat Park

Rock Weirs:

A pile of stones that redirect stream flow to the center of the stream channel and slow down the flow of water.[4]

Red Jacket Riverfront Natural Habitat Park

Living shorelines:

"A living shoreline is a protected, stabilized coastal edge made of natural materials such as plants, sand, or rock."[1]

Pre-Restoration at Ellicott Creek Park
Photo credit: Buffalo Niagara Waterkeeper

Post-Restoration at Ellicott Creek Park
Photo credit: Buffalo Niagara Waterkeeper

Rock Reefs:

A method to "lessen wave energy impacting the shoreline, and the calm water area behind these structures [creates] more suitable conditions for wetland vegetation."[3]

Beaver Island State Park
Photo credit: Buffalo Niagara Waterkeeper

Sources:

1 NOAA Fisheries, "Understanding Living Shorelines," NOAA Fisheries, October 12, 2022, National, https://www.fisheries.noaa.gov/insight/understanding-living-shorelines.

2 Regional Stream Stewardship & Recovery Handbook, "Root Wads," Stream Handbook, 2017, https://streamhandbook.org/project/root-wads/.

3 Buffalo Niagara Waterkeeper, "Little Beaver Island," Buffalo Niagara Waterkeeper (blog), September 24, 2019, https://bnwaterkeeper.wpengine.com/beaver-island/.

4 Missouri Botanical Garden, "Rainscaping Guide: Rock Weirs and Filter Socks," Missouri Botanical Garden, accessed July 14, 2023, https://www.missouribotanicalgarden.org/sustainability/sustainability/sustainable-living/at-home/rainscaping-guide/rock-weirs-and-sock-dams; Janine Castro and Robert Sampson, "Design of Rock Weirs" (USDA, February 1, 2001), https://efotg.sc.egov.usda.gov/references/Delete/2010-1-23/eng_tn13.pdf.

STRATEGY 3: Restoration Strategies	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 10.3.1:	**Identify and prioritize degraded lands, including shorelines, for implementation projects.**			
	Short-Term	Direct	DEP	LEWPA, Erie County Soil & Water Conservation District (SWCD), NYSDEC, PRISM, WNYLC, Buffalo Niagara Waterkeeper, ECEMC, local municipalities, Erie County Parks
ACTION ITEM 10.3.2:	**Identify lead organizations for implementation projects and funding sources.**			
	Short-Term	Direct	DEP	LEWPA, Erie County SWCD, NYSDEC, PRISM, WNYLC, Buffalo Niagara Waterkeeper, ECEMC, local municipalities, Erie County Parks
ACTION ITEM 10.3.3:	**Complete habitat and living shoreline restoration, including signage, to educate the community. Focus on priority areas that address climate vulnerabilities identified for Erie County.**			
	Medium-Term	Direct	DEP	LEWPA, Erie County SWCD, NYSDEC, PRISM, WNYLC, Buffalo Niagara Waterkeeper, ECEMC, local municipalities, Erie County Parks
ACTION ITEM 10.3.4:	**Develop protocols and mechanisms for continued monitoring and adaptive management of work completed as part of this goal.**			
	Medium-Term	Indirect	DEP	LEWPA, Erie County SWCD, NYSDEC, PRISM, WNYLC, Buffalo Niagara Waterkeeper, ECEMC, local municipalities, Erie County Parks

STRATEGY 4: Improve Connectivity for Pollinators & Wildlife

Pollinators are integral to ensuring the health of the natural food web, without which all other species, including humans, would struggle to survive. Bees are most commonly thought of when pollinators are discussed, however, over 100,000 invertebrates (including bees, butterflies, beetles, moths, wasps, and flies) and more than a thousand mammals, birds, reptiles, and amphibians take on the job of pollinating plants as well.[120] Much of Erie County is located within the Eastern Wildway and the Western New York Wildway (see Figure 33), making it all the more valuable to protect the pollinators. Pollination is a mutualistic

relationship for the plant and animal, meaning both parties benefit. The pollinator consumes protein rich pollen and high energy nectar from the plant, while the plant's pollen is transported to other neighboring plants of the same species, allowing fertilization to occur. Pollinators are valuable in supplementing the fertilization of both wild plants and the agricultural crops we use for food.

Without pollinators, some plant species can resort to other modes of fertilization, such as pollen carried by the wind. Despite this, for some plants, wind pollination is inefficient and unsuccessful, making pollinators the ideal method of fertilization. One-third

of the food we eat is dependent on the successful fertilization that occurs through pollinators.[121] As a result, their importance to both a balanced ecosystem and human food production cannot be understated.

Unfortunately, pollinator numbers are on the decline as they face serious threats. Habitat loss due to changing weather patterns and temperatures coupled with industrial development practices are a huge threat to pollinators. Pesticide poisoning and foreign insect diseases are some of the other main causes of decline. The accumulation of all of these threats has resulted in reductions of insect populations

across the board and has endangered wild bee species and monarch butterflies populations, which have declined by 90% over the past 20 years.[122] Despite the trending decline, 2022 showed an increase in monarch butterfly populations over-wintering in Mexico, which may signify that conservation and protection actions (e.g., protecting grasslands, planting milkweed and wildflowers, and educating the public) are working.[123] In the midst of climate change, native perennial plants that provide shelter or food for wildlife are integral for promoting a healthy ecosystem and biodiversity.

Improving the connectivity for pollinators and wildlife can be done easily, inexpensively, and scaled from the park-sized level to the individual resident's backyard. In fact, Black Rock Riverside Alliance worked with residents to certify Erie County as a National Wildlife Federation (NWF) Wildlife Habitat Community.[124] This certification requires a certain amount of green spaces to be converted into pollinator-and wildlife-friendly habitats that encourage a symbiotic existence between humans and nature. It also requires education and outreach efforts that spread the understanding and knowledge of how to plant with nature in mind.

Erie County is the sixth largest NWF Community Wildlife Habitat in the country. This grassroots approach to creating wildlife-friendly habitats throughout the County continues in order to maintain certification status[125] and to expand the network of individual certified properties. Despite the great accomplishments that Erie County has achieved to receive the certification, there is still a lot of work to be done in the realm of improving habitat and connectivity.

STRATEGY 4: Improve Connectivity for Pollinators & Wildlife	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 10.4.1:	**Encourage and educate the public on creating pollinator-friendly habitat.**			
	Short-Term	Direct	DEP	ECEMC, Home for a Gnome, Citizen Coalition for Wildlife and Environment, Pollinator Conservation Association, Save the Bees WNY, Cornell Cooperative Extension (CCE) Master Gardeners, Buffalo Niagara Waterkeeper, NYSDEC, local municipalities
ACTION ITEM 10.4.2:	**Continue habitat certification efforts through outreach and education.**			
	Short-Term	Direct	DEP	Black Rock Riverside Alliance, The Nature Conservancy, National Wildlife Foundation
ACTION ITEM 10.4.3:	**Support the planting of pollinator gardens in both urban and rural environments.**			
	Short-Term	Indirect	DEP	Community gardens, CCE Master Gardeners, Grassroots Gardens WNY, nurseries, Pollinator Conservation Association
ACTION ITEM 10.4.4:	**Support the planting of native plants in both urban and rural environments.**			
	Short-Term	Indirect	DEP	Nurseries, garden stores, Grassroots Gardens WNY, MAP, other urban farms with Agriculture & Markets Greenhouse licenses, NYSDEC
ACTION ITEM 10.4.5:	**Combat invasive species to promote biodiversity.**			
	Short-Term	Indirect	DEP	PRISM, Erie County SWCD, LEWPA, WNYLC, Let's Goat Buffalo
ACTION ITEM 10.4.6:	**Educate the public about nature-based residential lawn care.**			
	Short-Term	Direct	DEP	CCE Master Gardeners, ECEMC, Home for a Gnome, Black Rock Riverside Alliance

Planting with Nature in Mind

Changing the way we plant our lawns and gardens is one key nature-based solution that individuals can implement. By using native and local trees, pollinator-friendly plants, and stopping the use of pesticides, we can encourage a more resilient and biodiverse local ecosystem. For more information about planting with nature in mind, visit the NWF webpage, which sponsors the certification of community wildlife habitats.[1] With the help of the Black Rock Riverside Alliance, Erie County has already been certified as a NWF Wildlife Habitat Community![2] Community members can certify their own garden to help build momentum to earn community-wide certification in their municipality, especially since about 93% of the land in Erie County is privately owned.

Sources and Notes:

1 To visit the NWF webpage, go to https://www.nwf.org/communitywildlifehabitat

2 BRRA, "National Wildlife Federation Community Wildlife Habitat Project," Black Rock Riverside Alliance, 2023, https://brralliance.org/index.php/projects/making-buffalo-a-national-wildlife-federation-habitat-city/

Figure 33 The Western New York Wildway
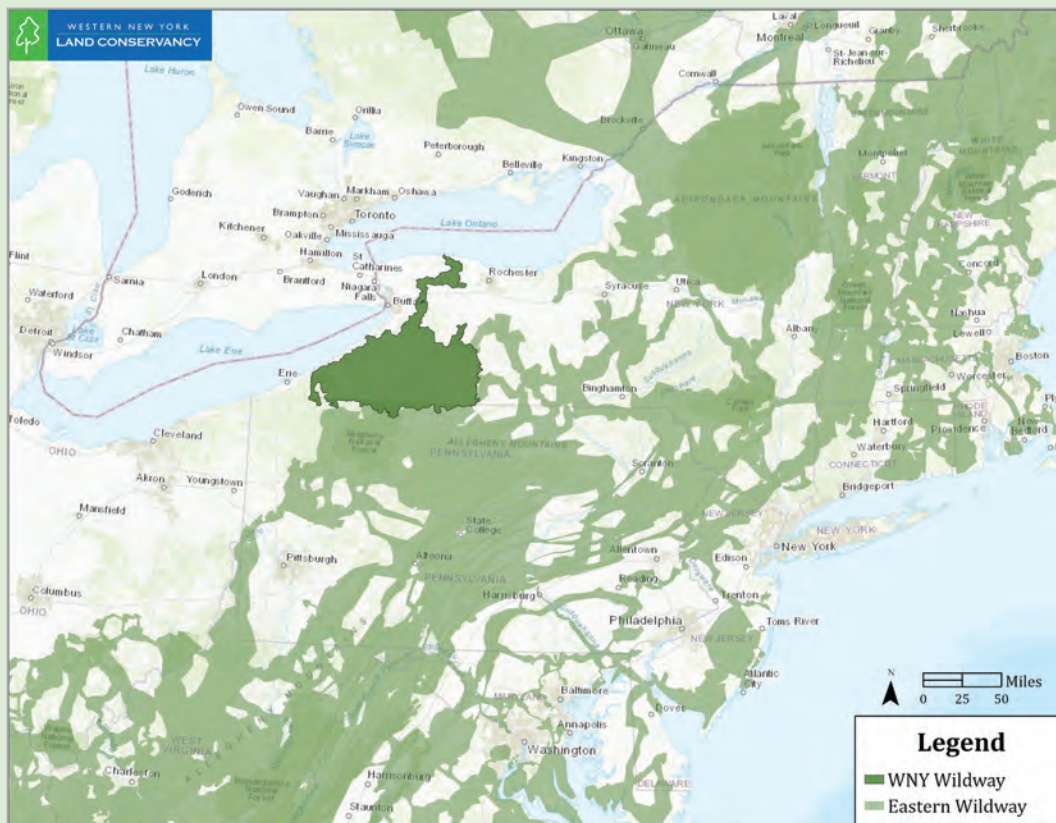
The Western New York Wildway

In 1991, the Wildlands Network was created to protect species from extinction by promoting habitat connectivity between existing protected areas.[1] The Western New York Land Conservancy is leading an effort to create the Western New York Wildway, which will be a part of the Eastern Wildway. The Eastern Wildway was formed in 2015 as part of the Wildlands Network to advance conservation efforts across eastern North America.[2] The Western New York Wildway will create a corridor for plants and animals to move with the changing climate and access new core habitats.[3]

To explore the Western New York Wildway through an interactive map, go the Western New York Land Conservancy's (WNYLC) online story map.[4]

Sources and Notes:

1 Wildlands Network, "Eastern Wildway Version 2.2," ArcGIS Online, October 2019, https://wn.maps.arcgis.com/apps/webappviewer/index.html?id=d247ee318cca498bb457d71eba9aac2a

2 Network for Landscape Conservation, "Eastern Wildway," Network for Landscape Conservation, accessed July 12, 2023, https://landscapeconservation.org/our-work/initiatives-list/eastern-wildway/.

3 WNYLC, "Western New York Wildway," Western New York Land Conservancy, July 12, 2023, https://www.wnylc.org/wnywildway.

4 To access WNYLC's online story map of the Western New York Wildway, go to https://storymaps.arcgis.com/stories/2205b3f623fc42a2b46779f05cacd5b6

STRATEGY 5: Increase and Preserve Tree Canopy

Strategic tree canopy preservation and expansion are vital approaches for mitigating the harms of human-induced climate change. Trees and forest ecosystems are carbon sinks that can remove emitted carbon from the atmosphere through natural photo-synthetic and respiration processes.[126] Tree canopies, therefore, provide a natural method for removing carbon from the atmosphere without relying on expensive and technologically com-plex solutions, such as carbon capture, carbon storage, and geoengineering.

The presence of tree canopy pro-vides weatherization benefits, such as cooling and stormwater management for nearby communities, thus reduc-ing the reliance on energy-intensive technologies (e.g. air conditioning and stormwater pumps). As crucial as it is to plant new trees, it is important to ac-knowledge that older trees have a larg-er canopy, thus providing more shade and a larger root system. Therefore, preservation of older trees should be a priority. Strategic tree planting could reduce building energy demand by up to 30%.[127] Trees can mitigate the effects of stormwater, flooding, and erosion from runoff by absorbing excess water and providing ground covering.[128] The polluting effects of high energy de-mand and extreme storms can also be reduced by the presence of strategical-ly situated tree canopies.

Increasing tree canopies provide co-benefits related to local social and economic infrastructure by expanding outdoor recreation and environmental workforce development opportunities. Tree canopies also provide a myriad of physical and mental health benefits, especially with the climate crisis being the gravest global health threat of this century. Importantly, tree canopy pres-ervation and expansion can be a highly cost effective climate strategy with agencies, such as NYSDEC and the USDA, investing in tree planting pro-grams because of their relatively low costs and high job creating potential.

STRATEGY 5: Increase and Preserve Tree Canopy	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 10.5.1:	**Establish and maintain a list of native and climate resilient tree and shrub species of all sizes that can thrive in current and future climate conditions projected for the region, paired with a list of complementary best practices for planting and maintenance.**			
	Short-Term	Indirect	DEP	CCE, Erie County SWCD, NYSDEC, local municipalities, USDA
ACTION ITEM 10.5.2:	**Map and assess the demographic and geographic disparities in tree canopy, including a timeline with 2030 and 2050 goals, thereby establishing priority communities for tree canopy preservation and expansion.**			
	Short-Term	Direct	DEP	CCE, Erie County SWCD, NYSDEC, local municipalities, colleges and universities, USDA
ACTION ITEM 10.5.3:	**Establish mechanisms for ongoing care and maintenance of canopy trees.**			
	Short-Term	Indirect	DEP	CCE, Erie County SWCD, NYSDEC, local municipalities, block clubs, USDA
ACTION ITEM 10.5.4:	**Encourage developers, builders, homeowners, and municipalities to plant and grow shade trees effectively.**			
	Short-Term	Indirect	DEP	CCE, Erie County SWCD, NYSDEC, local municipalities, block clubs, WNY SBR, USDA

Figure 34 Benefits of Planting Trees

TREE BENEFITS

PLANT A TREE | SAVE THE EARTH

IMPROVE MENTAL HEALTH

Studies show being near trees can reduce stress levels by decreasing your blood pressure and slowing your heart rate.

PROTECT WILDLIFE

Trees provide a home and protection to animals

HELP US BREATHE

Through photosynthesis, trees produce oxygen

COMBAT CLIMATE CHANGE

Trees absorb carbon-dioxide and convert it to oxygen

PROVIDE SHELTER

Trees provide shelter and shade from the heat and cold

PREVENT FLOODING

Trees along river banks help soak up excess water and keep soil in place

SOURCE OF FOOD

Many parts of a tree are a source of food for people and animals: roots, leaves, flowers, fruits, seeds, nuts, pollens and sap.

TREE CARE

"TREASURE OUR TREES"
YOUR STREET TREE IS STUPENDOUS!

WATER YOUR TREE

Each young tree needs about 15-20 gallons of water per week. Water slowly every few days so it doesn't run off the surface.

ADD MULCH

Mulch will help keep soil moist, but don't mound it around the trunk. Say No to Mulch Volcanoes!

KEEP SHARP OBJECTS AWAY

String trimmers & mower blades can damage the trunk or roots

NOTICE THE FEATURES OF YOUR TREE

Does it have a fairy or gnome, an interesting knot, or is it HUGE!

PRETTY BLOOMS OR LEAVES?

Keep track of when your tree is in bloom or has colorful leaves

NAME YOUR TREE

HELLO MY NAME IS

Each tree is unique. Give yours a unique name

REQUEST A STREET TREE THROUGH YOUR MUNICIPALITY

CLIMATE ACTION

Inquire availability with your municipality.

Further Reading

Restoration Strategies Strategy

Early Detection of Invasive Species — Explore WNY PRISM's Priority Species list, which includes all of the invasive species that are known to already be in, and those that are approaching the Western New York region. Learn about ways to play a part in the early detection/reporting of these species.

https://www.wnyprism.org/management/early-detection/

Let's Goat Buffalo sent a team of goats to Erie County's Red Jacket Riverfront Natural Habitat Park to eat an invasive species, Japanese Knotweed, on an otherwise hard to manage sloped terrain.

FOOTNOTES: Nature-based Solutions

109   WNYLC, "The Niagara River Corridor: A Ramsar Site," WNYLC, accessed August 4, 2023, https://www.wnylc.org/niagara-river-corridor.

110   Anna Blatto, "A City Divided: A Brief History of Segregation in Buffalo" (Partnership for the Public Good, April 2018), https://ppgbuffalo.org/files/documents/data-demographics-history/a_city_divided__a_brief_history_of_segregation_in_the_city_of_buffalo.pdf.

111   Clark et al., "Climate Vulnerability Assessment."

112   New York State, "Governor Hochul Announces DEC, State Parks Commitment to Add More Women to Ranks of Forest Rangers, Environmental Conservation Police Officers and Park Police Officers," New York State, May 6, 2022, https://www.governor.ny.gov/news/governor-hochul-announces-dec-state-parks-commitment-add-more-women-ranks-forest-rangers.

113   New York State, "Governor Hochul Signs Legislation to Conserve 30 Percent of Land and Water by 2030," New York State, December 23, 2022, https://www.governor.ny.gov/news/governor-hochul-signs-legislation-conserve-30-percent-land-and-water-2030.

114   The Nature Conservancy, "Terrestrial Resilience Core Concepts," The Nature Conservancy, accessed July 12, 2023, https://maps.tnc.org/resilientland/coreConcepts.html.

115   Frank Convery, "How and Why Farmers in the Catskills Protect New York City's Drinking Water," Environmental Defense Fund, November 7, 2017, https://blogs.edf.org/markets/2017/11/07/how-and-why-farmers-in-the-catskills-protect-new-york-citys-drinking-water/.

116   USEPA, "The Economic Benefits of Protecting Healthy Watersheds," April 2012, https://www.epa.gov/sites/default/files/2015-10/documents/economic_benefits_factsheet3.pdf.

117   Gregory N. Bratman et al., "Nature Experience Reduces Rumination and Subgenual Prefrontal Cortex Activation," Proceedings of the National Academy of Sciences 112, no. 28 (June 29, 2015): 8567–72, https://doi.org/10.1073/pnas.1510459112.

118   Danielle Vienneau et al., "More than Clean Air and Tranquillity: Residential Green Is Independently Associated with Decreasing Mortality," Environment International 108 (November 2017): 176–84, https://doi.org/10.1016/j.envint.2017.08.012.

119   To learn more about natural resources in Erie County, go to Erie County's National Resource Inventory here, https://erieny.maps.arcgis.com/apps/MapSeries/index.html?appid=bbee702e750942d5af21eb0790b8e42f

120   National Wildlife Federation, "Pollinators Are the Unsung Heroes of Our Gardens, Fields, and Farms," National Wildlife Federation, accessed August 4, 2023, https://www.nwf.org/Home/Educational-Resources/Wildlife-Guide/Pollinators.

121   USDA, "The Importance of Pollinators," US Department of Agriculture, accessed July 24, 2023, https://www.usda.gov/peoples-garden/pollinators.

122   National Wildlife Federation, "Pollinators Are the Unsung Heroes of Our Gardens, Fields, and Farms."

123   The Yucatan Times, "Data on Monarch Butterflies in 2022 Show a Sharp Increase in Their Numbers," The Yucatan Times, June 17, 2022, https://www.theyucatantimes.com/2022/06/data-on-monarch-butterflies-in-2022-show-a-sharp-increase-in-their-numbers/.

124   BRRA, "National Wildlife Federation Community Wildlife Habitat Project," Black Rock Riverside Alliance, 2023, https://brralliance.org/index.php/projects/making-buffalo-a-national-wildlife-federation-habitat-city/.

125   To learn more about the certification status for NWF Wildlife Habitat Community projects in WNY, go to the Black Rock Riverside Alliance's website at https://brralliance.org/index.php/projects/making-buffalo-a-national-wildlife-federation-habitat-city/

126   National Geographic Society, "Carbon Sources and Sinks," National Geographic, December 14, 2022, https://education.nationalgeographic.org/resource/carbon-sources-and-sinks.

127   TreesCharlotte, "Trees Save Energy," TreesCharlotte, April 8, 2015, https://treescharlotte.org/tree-education/trees-save-energy/.

128   USEPA, "Soak Up the Rain: Trees Help Reduce Runoff," Collections and Lists, United States Environmental Protection Agency, March 24, 2023, https://www.epa.gov/soakuptherain/soak-rain-trees-help-reduce-runoff.

When Stefan Hay Co. founder Michael Stefan was approached by a friend about building a windmill on his farm in North Collins, he considered it a no-brainer. Not only would it produce low-cost electricity for 10 electricity meters in the town, it took away very minimal space on his 3,200 acres of land. Years later, the energy savings allow Stefan to continue investing in a fifth-generation family business, which now includes his three sons.

"If the windmill even helps us become a little more profitable, that helps my children," Stefan says. "I'm a supporter of green energy, so it's been a win-win situation."

Agriculture and Food Systems

GOAL: Promote agriculture and food system solutions that advance farmland and environmental protection; strengthen ecosystem health; improve equitable access to healthy, local food; mitigate the impacts of climate change; and increase climate resiliency.

Agriculture is necessary for our civilization's survival and is an important contributor to Erie County's economy, contributing about 2.6% to our gross domestic product.[129] Of course, the history of agriculture in our County long predates these economic metrics, spanning thousands of years into the past to when the region's Indigenous peoples, the Haudenosaunee, first recognized the value and importance of Erie County's fertile soils and microclimate along the shores of Lake Erie.

Today, Erie County's agricultural resources are threatened by a variety of environmental and economic factors, and these threats are exacerbated by climate change.[130] Generations of unchecked development have resulted in a massive loss of farmland, which has contributed to the fragmentation of agricultural and natural lands, resulting in degraded habitat and land management challenges. Climate change is already impacting agriculture through increases in temperatures, changes in precipitation patterns, and more frequent and extreme weather events.

The future of Erie County's agricultural land is uncertain. Our region's farmers are aging and most of the farmland will transfer into new hands in the coming years.[131] As we look to the future, farming will need to be more inclusive to serve our whole community. Erie County will need to provide access and support to new and beginning farmers, especially farmers from Indigenous, immigrant, and refugee communities for their cultural farming practices.

Through the implementation of targeted actions, the County will be able to mitigate the impacts of climate change, strengthen our farms and food systems, increase climate resiliency, and improve access to locally grown, nutritious food for residents. As the impacts of climate change become more pronounced, the ways in which farmers farm and the County government supports the food system will be paramount in determining how resilient Erie County will be.

DEFINITIONS
FOR ACTIONS SPECIFICATIONS

Short-term:
By or before 2030

Medium-term:
By 2040

Long-term:
By 2050

Direct:
County government can directly control the action - relating to County government operations and infrastructure

Indirect:
Regional agencies and municipalities have control and/or County government can support/influence

Figure 35 Food System Climate Action Opportunities

Food System Climate Action
OPPORTUNITIES

1. **Production**
- **Expand agricultural practices that improve soil health**
- **On-farm renewable energy**
- **Cap manure lagoons and flair methane or use biodigesters for manure**
- **Electrify farm equipment when practical**

2. **Processing**
- **Electrify equipment and vehicles**
- **Compost food waste***
- **Consider vertical farming**
- **Renewable energy for process heating**
- **Heat pump space heating**
- **Minimize packaging materials**

3. **Distribution**

SUPERMARKET
- **Electrify equipment and vehicles**
- **Heat pump space heating**
- **Compost food waste***
- **Change to climate friendly refrigerants**
- **Encourage local production**

4. **Consumption**

COMPOST
- **Reduce food waste in businesses, institutions, and households**
- **Compost food waste***
- **Encourage buying local****

*Read more about food waste in the Consumption and Waste chapter
**Visit www.erie.gov/eriegrown for resources

Food systems are complex networks that include all the inputs and outputs associated with food production, processing, transport, and consumption. The inputs and outputs of the food system play a part in climate change, including equity and food security.

STRATEGY 1: Promote & Protect Agriculture

Our ability to slow climate change and withstand its predicted and potentially unanticipated effects is tied to the health of Erie County's ecosystem and our ability to produce the food we need within our region. Erie County needs actions and policies to keep people farming, advance urban and rural farmland protection, discourage sprawl, support the viability of the agricultural economy while promoting agricultural education, and encourage agricultural practices that protect the soil and ecosystem health, including providing opportunities for increasing carbon sequestration and GHG reduction.

Balancing Agriculture and Development

New York State has one of the highest levels of farmland conversion threat across the nation, with Erie County alone losing 79,134 acres of farmland since 1969.[1] Sprawling development patterns, a majority of which are residential, have resulted in a ring of agricultural land located on the fringes of Erie County.[2] As New York State works to achieve the Clean Energy Standard, competing interests for agricultural land must be balanced against farmland protection efforts and the climate and economic benefits of solar energy development. The County should encourage development of solar on marginal lands and rooftops, while protecting prime farmland, and encouraging the use of robust agrivoltaics where practicable.

Figure 36 Farmland Loss in New York State
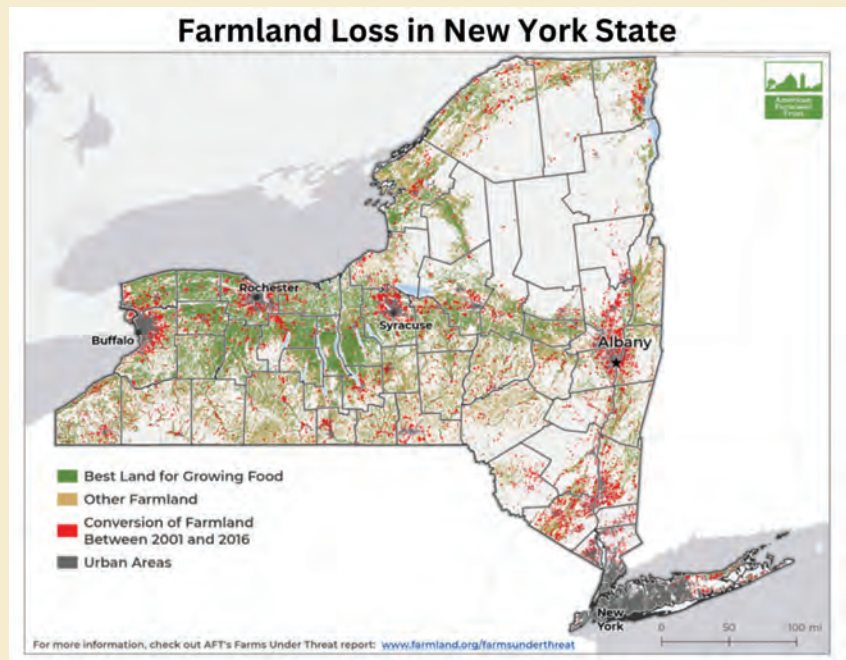
American Farmland Trust, Farmland Loss in New York State, 2022, map, https://farmlandinfo.org/wp-content/uploads/sites/2/2022/01/NY-Smart-Solar-Siting-on-Farmland_FINAL-REPORT_1.31.22.pdf

Sources and Notes:

1 USDA, "Farms, Land, Value," 1969, https://agcensus.library.cornell.edu/wp-content/uploads/1969-New_York-Chapter_2._County_Summary_Data_For_Selected_Items_1969-483-Table-01.pdf; USDA National Agricultural Statistics Service, "County Summary Highlights: 2017," 2017, https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_2_County_Level/New_York/st36_2_0001_0001.pdf.

2 To learn more about urban sprawl, go to the Urban Sprawl call-out in the Housing and Neighborhood Resiliency chapter.

AGRICULTURE AND FOOD SYSTEMS GOAL: Promote agriculture and food system solutions that advance farmland and environmental protection; strengthen ecosystem health; improve equitable access to healthy, local food; mitigate the impacts of climate change; and increase climate resiliency.

STRATEGY 1: Promote & Protect Agriculture	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 11.1.1:	Support the development of the Evans Agribusiness Park and encourage the use of locally farmed products in its operations.			
	Short-Term	Direct	DEP	ECIDA, Town of Evans, Food Policy Council (FPC), Invest Buffalo Niagara
ACTION ITEM 11.1.2:	Use the General Municipal Law Section 239-M process to encourage the appropriate siting of developments (e.g., solar, residential) so that agricultural land is not negatively impacted.			
	Ongoing	Direct	DEP	Local municipalities
ACTION ITEM 11.1.3:	Support municipalities' enforcement of New York State's Agriculture and Markets (AGM) construction and mitigation guidelines for solar on farmland.			
	Ongoing	Indirect	DEP	Municipal code enforcement officers, AGM, Agriculture and Farmland Protection Board (AFPB)
ACTION ITEM 11.1.4:	Advocate for expanded impact mitigation payments to farmers for smaller renewable energy projects on smaller acreages of farmland.			
	Short-Term	Direct	DEP	AGM, FPC
ACTION ITEM 11.1.5:	Conduct outreach and education to municipal officials for farmland protection.			
	Ongoing	Direct	DEP	Local municipalities, UBRI, Natural Resource Conservation Service (NRCS), Erie County SWCD, WNY Soil Health Alliance, CCE, EC Farm Bureau, LEWPA
ACTION ITEM 11.1.6:	Support the protection of productive farmland with conservation easements.			
	Ongoing	Indirect	DEP	WNYLC, AFPB
ACTION ITEM 11.1.7:	Promote the use of enforceable soil safety and integrity regulations and testing to protect consumers.			
	Short-Term	Indirect	ECDOH	Greater Buffalo Urban Growers (GBUG), FPC, CCE, Erie County Farm Bureau, NY Farm Bureau (NYFB), Northeast Organic Farming Association (NOFA)
ACTION ITEM 11.1.8:	Maintain the geography of the Planning Policy Areas as identified in the Erie-Niagara Framework for Regional Growth through zoning, comprehensive planning, and preservation of farmland in rural areas.			
	Ongoing	Direct	DEP	Local municipalities

Erie-Niagara Framework for Regional Growth Planning Policy Areas

Erie and Niagara Counties partnered with one another to develop the Framework for Regional Growth, which establishes basic policies and principles to guide the future growth and development of the region.[1] The Framework generally discourages the expansion of water, sewer, and transportation infrastructure in rural areas as a means to prevent urban sprawl and thus protect farmland.

Note:

1 To access the Erie-Niagara Framework for Regional Growth online, go to Erie County's website at https://www4.erie.gov/regionalframework/framework-regional-growth-final-plan

Figure 37 Erie County Planning Policy Areas
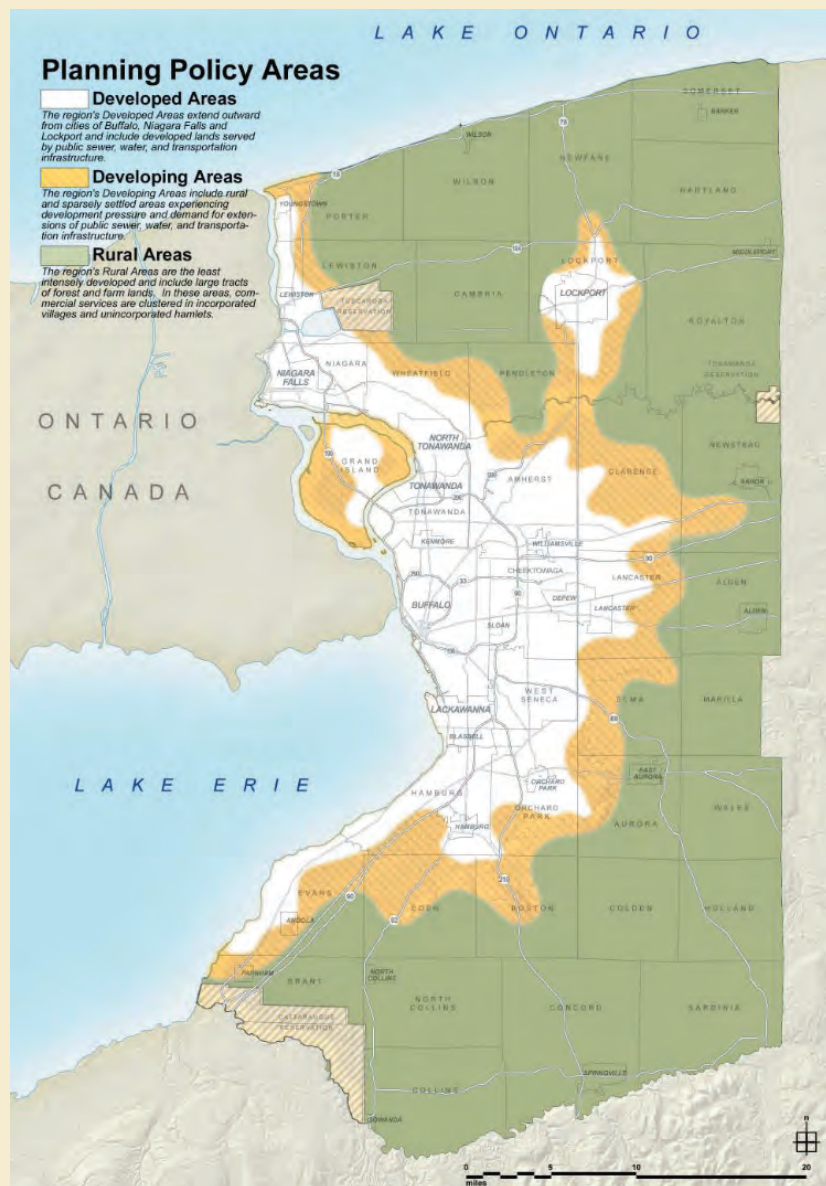
Erie County, Planning Policy Areas, map,
https://www4.erie.gov/regionalframework/sites/www4.erie.gov.regionalframework/files/2021-06/Framework_Chapter_3.pdf

STRATEGY 2: Protect & Restore Ecosystems

To restore ecosystems, the County must discourage urban sprawl, promote sustainable nutrient management and integrated pest management practices, and encourage agricultural and forestry practices that promote healthy ecology with clean water, clean air, and robust biodiversity. This Plan advocates for policies that promote carbon sequestration on farm and forest land, create training and capacity building opportunities for community members and stakeholders, minimize the consumption of fossil fuels, and promote the use of renewable energy captured locally.

To learn more about restoring ecosystems, check out the Nature-based Solutions chapter.

STRATEGY 2: Protect & Restore Ecosystems	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 11.2.1:	**Promote the reduced use of pesticides and synthetic fertilizer while advocating for alternatives that regenerate soil biology as a key to improving soil health.**			
	Ongoing	Direct	DEP	ECDOH, Erie County SWCD, NYSDEC
ACTION ITEM 11.2.2:	**Provide regular training to municipal officials and the community at large on the proper use of the State Environmental Quality Review Act (SEQRA) and project review tools, with consideration of a proposed project's ecological and climate impacts.**			
	Ongoing	Direct	DEP	NYSDEC, NYSDOS, local municipalities
ACTION ITEM 11.2.3:	**Provide stable and enhanced support for agencies and organizations with missions and functions that help reinforce agroecosystem restoration, protection, and enhancement.**			
	Ongoing	Indirect	DEP	CCE, FPC, Erie County SWCD
ACTION ITEM 11.2.4:	**Promote sustainable forest management to increase carbon sequestration and climate resiliency while protecting forest ecosystems.**			
	Ongoing	Direct	Parks	Erie County SWCD, NYSDEC, NRCS, CCE, private sector businesses

Figure 38 Agroecosystems

What is an
Agroecosystem?

Agroecosystems are the communities of plants and animals interacting with their physical and chemical environments that have been modified by people to produce food, fiber, fuel, and other products for human consumption and processing.

Managed woodlands

Homes + agricultural buildings

Cropland, hayland, pastureland

Unmanaged nature
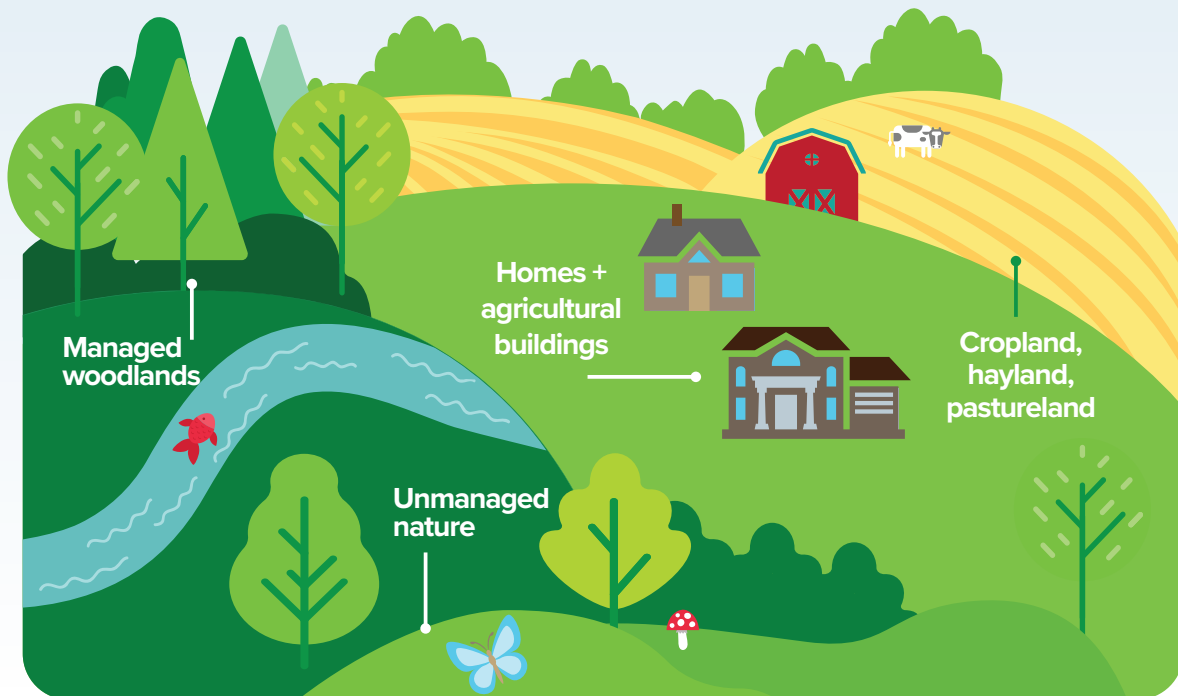
Rural agroecosystems
are typically large commercial farms

Urban/suburban agroecosystems
bring local economic & biodiversity benefits

Potential positive ecological impacts of Agroecosysems

Habitat & biodiversity

Air quality

Water quality

GHG reduction

STRATEGY 3: Access to Healthy Food

Food insecurity and food injustice are issues for many Erie County residents. The historical inequity of the food system fails to serve our most vulnerable populations and is particularly challenging for disadvantaged communities. This Plan supports the many ongoing initiatives focused on creating an equitable food system that benefits all by encouraging greater participation in the growing, processing, and distribution of food throughout all areas of Erie County. This Plan also supports the ethical treatment of frontline farm laborers.

Note that food injustice is addressed in several existing documents, including:

- The Buffalo and Erie County Local Food Action Plan[132]
- The UB Food Systems Planning and Healthy Communities Lab[133]
- One Region Forward - Growing Together Report[134]

Figure 39 USEPA Food Recovery Hierarchy

The Food Recovery Hierarchy prioritizes actions that one can do to prevent and divert food waste from most preferred to least preferred actions.[1] The most preferred methods reduce climate impacts and create the most benefits for the environment, society, and the economy.

Source:

1 USEPA, "Food Recovery Hierarchy," Overviews and Factsheets, United States Environmental Protection Agency, August 28, 2022, https://www.epa.gov/sustainable-management-food/food-recovery-hierarchy.

USEPA, Food Recovery Hierarchy, 2022, graphic, https://www.epa.gov/sustainable-management-food/food-recovery-hierarchy

STRATEGY 3: Access to Healthy Food	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 11.3.1:	Support the sale and consumption of locally produced foods by supporting relevant legislation and programming, such as value-based procurement and the Good Food Purchasing Program.			
	Ongoing	Indirect	DEP, ECDOH	FPC, AFPB, NYFB, GBUG, NYS Senate, Good Food Buffalo, Erie Grown, PPG
ACTION ITEM 11.3.2:	Promote the Healthy Community Store Initiative[135] to provide healthy options at corner stores, especially those in food insecure neighborhoods.			
	Ongoing	Indirect	ECDOH	CCE, FPC
ACTION ITEM 11.3.3:	Promote incentives for food retailers in food insecure, disadvantaged communities who provide fresh produce, locally sourced meats, and culturally appropriate food.			
	Ongoing	Indirect	ECDOH	NYSDOH, AGM, USDA, NRCS, Field & Fork, FPC, American Heart Association
ACTION ITEM 11.3.4:	Improve the existing food donation network and increase food security by incorporating surplus prepared foods.			
	Long-Term	Indirect	ECDOH	FeedMore WNY, AGM, FPC
ACTION ITEM 11.3.5:	Encourage regulatory authorities to prioritize helping small-scale food producers overcome food safety regulation hurdles.			
	Medium-Term	Indirect	ECDOH	FPC, UB Food Lab, USDA, Food Safety and Inspection Service (FSIS), CCE, AGM
ACTION ITEM 11.3.6:	Enhance educational campaigns to educate consumers on the impacts that their food choices have on nutrition and waste.			
	Short-Term	Direct	ECDOH	NRCS, Erie County SWCD, CCE, Urban Fruits and Veggies, West Side Promise Neighborhood, African Heritage Food Cooperative, MAP
ACTION ITEM 11.3.7:	Support expanded educational programming on at-home canning and other food preservation techniques, as well as eating seasonally to increase the shelf life of local foods and incentivize local purchasing.			
	Short-Term	Indirect	ECDOH	FPC, CCE
ACTION ITEM 11.3.8:	Explore participation in the Good Food Purchasing Program.[136]			
	Short-Term	Direct	Purchasing	Local municipalities, school districts
ACTION ITEM 11.3.9:	Build support for and recommend changes to policies and health codes that support and encourage food waste recovery infrastructure and diversion.			
	Short-Term	Indirect	ECDOH	FPC, NYSDEC, local municipalities

STRATEGY 4: Mitigate the Impacts of Climate Change

As explained throughout this Plan, the impacts of climate change are already being experienced by Erie County residents, which includes farmers and other workers that contribute to the food supply chain. As climate change impacts such as weather extremes increase, food systems must adapt if they are to remain productive. Climate-friendly farming practices,

> *Visit the Consumption and Waste Chapter to learn about how food systems and food waste go together.*

such as regenerative and sustainable agriculture, have the potential to alleviate continued trends toward climate change and can build up the resiliency of our local food system. This Plan advocates for the continued support of regionally-specific practices that align with climate-smart programs and initiatives at the local, state, national, and global levels.

STRATEGY 4: Mitigate the Impacts of Climate Change	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 11.4.1:	**Establish a renewable energy siting policy (e.g., PILOT or community benefit agreement) that protects farmland while supporting renewable energy development.**			
	Short-Term	Direct	DEP	Real Property Tax Services (RPTS), Law Department
ACTION ITEM 11.4.2:	**Conduct outreach and education to farmers about the importance of adapting to climate change.**			
	Ongoing	Direct	DEP	NRCS, Erie County SWCD, CCE
ACTION ITEM 11.4.3:	**Update the Erie County Agricultural and Farmland Protection Plan to include climate resiliency, mitigation, and adaptation initiatives.**			
	Short-Term	Direct	DEP	AFPB

Further Reading

Promote & Protect Agriculture Strategy
General Municipal Law §239-M/Integrated Review Process – NYS General Municipal Law, Sections 239-l, m and n, provide for the referral and coordination of certain Town, City, and/or Village proposed land use actions that may have more of a regional or inter-community impact. This law requires local municipalities to refer actions that meet a certain threshold to the County Planning Department for review and comment.

https://www3.erie.gov/environment/municipal-referrals

Access to Healthy Food Strategy
Healthy Community Service Initiative – A collaborative partnership and coalition to address increasing access to fresh, healthy foods in the City of Buffalo.

https://erie.cce.cornell.edu/healthy-community-store-initiative

STRATEGY 5: Coordination

Lack of collaboration between governance systems, including Erie County, is an issue across the United States that has resulted in fragmented policy responses to the ongoing climate crisis. Recognizing that we are all facing rapidly changing climate impacts together, we must learn to collaborate for the benefit of our communities, including those within the agricultural and food system sectors. Acknowledging that a history of past mistakes has resulted in government mistrust, this Plan encourages and promotes the coordination and collaboration among government agencies, Tribes and Nations, private entities, BIPOC individuals, and all Erie County residents to work towards taking regionally-coordinated climate action that supports the County's agriculture and food systems.

STRATEGY 5: Coordination	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS
ACTION ITEM 11.5.1:	**Work with existing food hubs to expand opportunities and connections between farmers, restaurants, and retailers.**			
	Ongoing	Indirect	DEP	Buffalo Go Green, African Heritage Food Cooperative, MAP, PFC, Feed Buffalo, Alliance Butchery, FPC, CCE
ACTION ITEM 11.5.2:	**Create an Erie County one-stop-shop of agriculture and food system programs and resources.**			
	Short-Term	Direct	DEP, ECDOH	Erie County SWCD, NRCS, FPC
ACTION ITEM 11.5.3:	**Promote and share examples of regenerative agriculture practices being conducted in our region.**			
	Ongoing	Direct	DEP	Erie County SWCD, CCE, MAP

FOOTNOTES: Agriculture and Food Systems

129 USDA, "2017 Census of Agriculture: County Profile," 2017, https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/New_York/cp36029.pdf

130 Clark et al., "Climate Vulnerability Assessment."

131 Samantha Levy, Mikaela Ruiz-Ramón, and Ethan Winter, "Smart Solar Siting on Farmland: Achieving Climate Goals While Strengthening the Future for Farming in New York" (American Farmland Trust, February 2022), https://farmlandinfo.org/wp-content/uploads/sites/2/2022/01/NY-Smart-Solar-Siting-on-Farmland_FINAL-REPORT_1.31.22.pdf

132 To read the Food Policy Council of Buffalo and Erie County's Local Food Action Plan 2020 – 2024, go to https://www3.erie.gov/fpc/sites/www3.erie.gov.fpc/files/2021-09/beclfap-9.14.21.pdf

133 To learn about UB Food Systems Planning and Healthy Communities Lab, go to UB's website at http://foodsystemsplanning.ap.buffalo.edu/

134 To read the One Region Forward Growing Together Report from UBRI, go to https://foodsystemsplanning.ap.buffalo.edu/wp-content/uploads/sites/68/2017/06/GrowingTogether_Final-2.pdf

135 To learn more about CCE's Healthy Community Store Initiative, go to CCE's website at https://erie.cce.cornell.edu/healthy-community-store-initiative

136 To learn more about the Good Food Purchasing Program, go to the Good Food Purchasing website at https://goodfoodpurchasing.org/

Conclusion

As Erie County continues to work on mitigating and preparing for the impacts of climate change, this equity-centered Community Climate Action Plan will serve as a high-level roadmap to help guide our actions. While addressing the effects of climate change is urgent, not all of the planned actions can be acted on immediately. However, because of the work that has been done on this plan, the County is prepared to pursue the significant federal and state funding that is being made available to address climate change. Addressing climate change impacts is a gradual process that will take well-thought-out steps to achieve success during this time of transition.

The content of this Plan was developed with minimal technical consultant support and relied on the efforts of volunteer stakeholders and County staff. The County wishes to acknowledge the Environmental Management Council (ECEMC) and its Community Climate Change Task Force (Task Force) for their assistance. The current Task Force Chair, Dr. Susan Clark, the current ECEMC Chair, Jason Kulaszewski, as well as the past Chair of both the ECEMC and the Task Force Anne Bergantz, our Working Group Leads, and our many stakeholder participants who volunteered their leadership and expertise were instrumental in bringing this project to fruition. Additionally, the County would like to thank the organizations that participated in this process (see the following Supporting Organizations list).

The following Erie County departments and offices also participated in the creation of this Plan: County Executive Office, Emergency Services, Environment & Planning, Equal Employment Opportunities, Health, Office of Health Equity, Office of People with Disabilities, Parks, Recreation & Forestry, Public Works, Division of Purchase, Senior Services, Social Services, Workforce Investment Board.

Thank you to our technical editor, Prospect Hill Consulting, LLC and our marketing and communications consultant, Amplified Buffalo.

Supporting Organizations

The County is grateful for the support of our many volunteers.
Below is a list of organizations whose staff supported development of the County's Plan.

Academy for Human Rights
Barton & Loguidice
Black Rock Riverside Alliance
Blue Green Alliance
Buffalo & Erie County Library
Buffalo Museum of Science
Buffalo Niagara Waterkeeper
Buffalo Seminary
Buffalo Sewer Authority
Buffalo State Small Business Development Center
Center for Biological Diversity
Central Terminal Restoration Corp
Citizens for Regional Transit
City of Buffalo
Community Action Organization of WNY
Community Foundation for Greater Buffalo
Cornell Cooperative Extension
Curbell Inc.
Daemen University
Designing to Live Sustainably
Empire State Development
Erie County Environmental Management Council
Erie County Industrial Development Agency
Erie County Soil & Water Conservation District
Farmer Pirates
FeedMore WNY
GObike Buffalo
GO Buffalo Niagara
Grassroots Gardens WNY
Greater Buffalo Niagara Regional Transportation Council
Greater Buffalo Urban Growers
Guidehouse
Home HeadQuarters
Kidney Foundation of WNY
Kreher Family Farms

Lake Erie Watershed Protection Alliance
LISC WNY
Massachusetts Avenue Project
Monarch of Infinite Possibilities
NAACP
National Grid
NeighborWorks Community Partners
NFTA - Metro
NOCO
Northland Workforce Training Center
Partnership for the Public Good
Phillips Lytle LLP
PUSH Buffalo
Rich Products
Rural Transit Service
Russo's Auto Service
Shared Mobility Inc.
Sierra Club
SUNY Erie
The Buffalo Bisons
Town of Evans
Town of Tonawanda
UB Regional Institute
University at Buffalo- Students and faculty
Villanova University
West Side Promise Neighborhood
WNY AFL-CIO
WNY Environmental Alliance
WNY Foundation
WNY Homeless Alliance
WNY Land Conservancy
WNY STEM HUB
WNY Sustainable Business Roundtable
Youth Climate Council

Action Item Summary

ACTION ITEM	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS	KEY WORDS
INTRODUCTION					
STRATEGY 1: Overarching					
1.1.1: Create an executive level Chief Climate Officer to coordinate the County's climate action efforts across all lines of operation.	Short-Term	Direct	County Executive	N/A	Engagement, Law & Policy
1.1.2: Implement a "Benefits of Climate Action" Policy that will incorporate an assessment of the costs of climate pollution into decision making for larger projects.	Short-Term	Direct	County Executive	N/A	Infrastructure, Law & Policy
CLIMATE RESILIENCY					
STRATEGY 1: Overarching Resilience					
3.1.1: Develop a Heat Emergency Plan to work with partners to create a County program to mitigate impacts to extreme heat conditions.	Short-Term	Direct	DEP, EC-DOH, Senior Services, Emergency Services	UB, NYSDEC	Public Health, Resilience
3.1.2: Advocate for a more resilient electric grid, and support grid resilience initiatives.	Short-Term	Direct	DEP	Utilities, community-based organizations	Energy, Equity, Infrastructure, Public Health, Resilience
3.1.3: Work with partners to develop coordinated approaches to make our coastal areas more resilient.	Short-Term	Direct	DEP	Buffalo Niagara Waterkeeper, NYSDEC, US Army Corps of Engineers, local municipalities	Equity, Landscapes & Ecosystems, Public Health, Resilience
3.1.4: Identify and implement strategies to reduce social vulnerability and isolation, to better support residents during extreme weather events.	Short-Term	Direct	DEP	Universities, local municipalities, community-based organizations	Equity, Public Health, Resilience
3.1.5: Regularly update and improve climate resilience planning and programs as understanding of climate change evolves.	Long-Term	Direct	DEP	Universities, local municipalities, community-based organizations	Equity, Public Health, Resilience
CONSUMPTION AND WASTE GOAL: Responsible production and consumption of resources and sustainable management of waste.					
STRATEGY 1: Reduction					
5.1.1: Work to reduce single use plastics and other single use products in government contracts and provide commercial entities with single use product reduction methodologies.	Short-Term	Direct	Purchasing	NYSP2I, WNY SBR, NYSAR[3], NYSDEC, Solid Waste Management Boards	Engagement, Waste & Resource Management
5.1.2: Educate community members on the prevalence of food waste and solutions to food waste while promoting programs, such as the United States Environmental Protection Agency's (USEPA's) Food: Too Good to Waste Program and United States Department of Agriculture's (USDA) Let's Glean Program.	Ongoing	Direct	DEP	Local restaurant associations, local grocery stores, USEPA, USDA, local municipalities, ECEMC, schools	Engagement, Food, Law & Policy, Waste & Resource Management
5.1.3: Promote and educate the community and businesses on mindful consumption through campaigns such as Buy in Bulk and Bring Your Own, which aim to decrease food packaging waste.	Ongoing	Direct	DEP	USEPA, WNY SBR, NYSP2I, NYSAR[3]	Economy & Workforce, Engagement, Food, Infrastructure, Waste & Resource Management
5.1.4: Encourage municipalities to adopt programs that foster community member waste disposal reduction habits, including potential incentives, such as pay-as-you-throw pricing for municipal garbage.	Long-Term/Ongoing	Direct	DEP	Local municipalities	Engagement, Law & Policy, Waste & Resource Management
5.1.5: Work with external organizations to educate and encourage businesses and municipalities on the benefits of reducing energy usage, toxicity of products, improved packaging, and waste in supply chains.	Ongoing	Direct	DEP, Purchasing	WNY SBR, NYSP2I, local municipalities	Economy & Workforce, Energy, Engagement, Waste & Resource Management
5.1.6: Endorse Extended Producer Responsibility state legislation such as Bottle Bill legislation (Senate Bill S1185C, Assembly Bill A10185, Assembly Bill A8668A).	Ongoing	Direct	DEP, County Executive	Statewide organizations, State and County legislatures	Law & Policy, Waste & Resource Management
5.1.7: Encourage commercial entities to track waste, energy, and water data using USEPA tools, such as its ENERGY STAR Portfolio Manager.	Ongoing	Direct	DEP	USEPA, WNY SBR	Energy, Engagement, Waste & Resource Management
5.1.8: Support community groups whose goals align with creating effective changes in waste reduction practices.	Ongoing	Indirect	DEP	Local and State community action groups	Engagement, Waste & Resource Management

ACTION ITEM	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS	KEY WORDS
STRATEGY 2: Diversion					
5.2.1: Encourage compliance with NY Department of Environmental Conservation (NYSDEC) Food Waste Law and Good Samaritan Law for business enterprises through outreach and education.	Ongoing	Direct	DEP	NYSDEC, WNY SBR, Sheriff's Department, DPW, local service providers, ECDOH	Economy & Workforce, Engagement, Food, Funding, Law & Policy, Waste & Resource Management
5.2.2: Develop and expand food and yard waste recycling programs at municipal buildings and operations. Train and promote residential and commercial collection programs, including backyard composting.	Short-Term	Direct	DEP	Local municipalities, ECEMC, DPW, DSS, local service providers	Engagement, Food, Waste & Resource Management
5.2.3: Develop and enhance local recycling solutions for construction and demolition debris, refrigerant containing appliances, mattresses, textiles, and carpets.	Medium-Term	Indirect	DEP	Waste haulers & recycling companies, local trade organizations	Waste & Resource Management
5.2.4: Support recycling options for multi-family residential buildings, public housing, and commercial entities.	Ongoing	Indirect	DEP	BOMA, WNY SBR, local municipalities, waste haulers & recycling companies, ECEMC	Equity, Waste & Resource Management
5.2.5: Reduce GHG emissions during the collection and processing of recycling and waste through electrification of fleets and use of efficient routing methods.	Short-Term	Indirect	DEP	Waste haulers, NYSERDA, local municipalities, NYSDEC	Energy, Equity, Waste & Resource Management
5.2.6: Educate and promote responsible waste management practices, such as the recovery and collection infrastructure, throughout all sectors of Erie County.	Ongoing	Direct	DEP	WNY SBR, local municipalities, NYSP2I, K-12 schools, BOCES, grocery stores, religious and cultural institutions, DSS, waste management companies, NYSDEC	Engagement, Infrastructure, Waste & Resource Management
5.2.7: Develop local solutions for managing disaster debris.	Medium-Term/Ongoing	Direct/Indirect	DEP	Emergency Services, local municipalities, ECEMC, NYSAR[3], NYSP2I	Equity, Public Health, Resilience, Waste & Resource Management
5.2.8: Conduct a waste flow study to understand how waste moves throughout the County, local capacities for management, and baselines.	Short-Term	Direct	DEP	Academic institutions, local municipalities, NYSDEC, NYSAR[3], NYSP2I, waste haulers & recycling companies, UB	Infrastructure, Waste & Resource Management
5.2.9: Promote and expand participation in the HHW collection program and address barriers to participation in existing and emerging programs.	Ongoing	Direct	DEP	Local service providers, ECEMC, local municipalities	Engagement, Equity, Public Health, Waste & Resource Management
5.2.10: Identify changes or opportunities to expand and increase recycling of electronics and other difficult to dispose of products (e.g., fluorescent tubes and refrigerants) in Erie County.	Short-Term	Direct/Indirect	DEP	NYSDEC, solid waste boards, UB	Funding, Infrastructure, Waste & Resource Management
STRATEGY 3: Reuse					
5.3.1: Identify and disseminate current reuse, repair, resell, and sharing practices and programs in Erie County to determine how they can be supported and enhanced.	Short-Term	Direct	DEP	Buy nothing-type groups, academic institutions, local donation centers, WNY SBR, local tool libraries, local repair cafes, local municipalities, library system	Economy & Workforce, Engagement, Funding, Waste & Resource Management
5.3.2: Promote and encourage repair per the NYS Digital Fair Repair Act.	Ongoing	Direct	DEP	Chambers of commerce, local repair cafes	Engagement, Law & Policy, Waste & Resource Management
5.3.3: Promote and educate consumers on the benefits of reusable products like refillable containers, product repair, maker spaces, and buying used goods.	Ongoing	Direct	DEP, ECDOH	Local municipalities, WNY SBR, state agencies, The Foundry, library system	Economy & Workforce, Engagement, Waste & Resource Management
5.3.4: Encourage businesses to develop reuse and material exchange programs in commercial spaces.	Ongoing	Direct	DEP	WNY SBR, NYSDEC	Economy & Workforce, Engagement, Waste & Resource Management
TRANSPORTATION GOAL: A safe, equitable, and affordable multi-modal transportation system that enhances mobility and access, phases out fossil fuel dependency, connects communities, supports a resilient supply chain, and decreases GHG emissions.					
STRATEGY 1: Active Transport					
6.1.1: Work with partners to develop procedures and access resources to better implement the County's Complete Streets policy, and promote efforts to improve vehicular and pedestrian safety and mobility.	Short-Term/Ongoing	Direct/Indirect	DPW, DEP	GBNRTC, local municipalities, Live Well Erie	Equity, Infrastructure, Law & Policy, Public Health, Transportation
6.1.2: Expand the County's active transportation network, including connecting on-road, park, and trail gaps.	Ongoing	Direct/Indirect	DPW, DEP; Planning	GBNRTC, local municipalities	Infrastructure, Public Health, Transportation
6.1.3: Work with local governments to implement the Regional Bicycle Master Plan, including the Shoreline Trail.	Medium-Term	Direct	DEP	DPW, GBNRTC, local municipalities	Engagement, Infrastructure, Public Health, Transportation

Action Item Summary

ACTION ITEM	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS	KEY WORDS
6.1.4(A): Educate County residents about the health and economic benefits of choosing active transport options.	Ongoing	Direct	DEP	Live Well Erie, GObike Buffalo, GO Buffalo Niagara	Economy & Workforce, Engagement, Public Health, Transportation
6.1.4(B): Educate all road users, including pedestrians, cyclists, and drivers, on the rules of the road and how to safely interact with each other.	Ongoing	Direct	DEP	Central Police Services, Sheriff's Dept, GObike Buffalo, County Clerk, DMV	Engagement, Public Health, Transportation
6.1.5: Provide recommendations on projects referred to the County through the 239-M process to improve walkability and bikeability.	Ongoing	Indirect	DEP	Local municipalities	Infrastructure, Law & Policy, Public Health, Transportation
6.1.6: Address barriers to active transportation through maintenance of sidewalks, paths, and trails; increase access to repair tools and bike racks; and install ADA compliant pedestrian devices.	Short-Term/ Ongoing	Direct/ Indirect	Parks, DEP	Local municipalities, GBNRTC, local bike and trail organizations, local school districts, parent-teacher associations, students	Equity, Infrastructure, Public Health, Transportation
6.1.7: Support community campaigns to encourage kids and adults to use active transportation methods to nearby destinations.	Short-Term/ Ongoing	Indirect	DEP	Live Well Erie, GObike Buffalo, GO Buffalo Niagara	Engagement , Infrastructure, Public Health, Transportation
STRATEGY 2: Transit					
6.2.1: Support expansion of the County's current light rail system, including connection to East Buffalo and airport.	Ongoing	Indirect	DEP	NFTA, GBNRTC, ECEMC, City of Buffalo, local municipalities	Equity, Funding, Infrastructure, Transportation
6.2.2: Support development of bus rapid transit service throughout the County.	Ongoing	Indirect	DEP	NFTA, GBNRTC, ECEMC, City of Buffalo, local municipalities	Equity, Infrastructure, Transportation
6.2.3: Support expansion of the County's regional hub and corridor transit system, including increased transit frequency and the span of service day.	Ongoing	Indirect	DEP	NFTA, GBNRTC, ECEMC, City of Buffalo, local municipalities	Equity, Infrastructure, Transportation
6.2.4: Develop alternative transportation programs, including microtransit options, that address transportation gaps.	Short-Term/ Ongoing	Direct/ Indirect	DEP	NFTA, GBNRTC, private sector operators	Equity, Infrastructure, Resilience, Transportation
6.2.5: Expand transit options for rural residents, including the County's Rural Transit Services program.	Short-Term	Direct	DEP	NFTA, local municipalities, private sector operators, GBNRTC	Equity, Infrastructure, Resilience, Transportation
6.2.6: Educate the community on the benefits of alternative commuting options such as work from home, alternatives to single occupancy vehicles, and public transportation incentives.	Ongoing	Direct	DEP	GO Buffalo Niagara, local municipalities	Engagement, Public Health, Transportation
6.2.7: Advocate for the implementation of the NFTA Equitable Transit Oriented Development Plan for Metro Rail in alignment with state and federal initiatives.	Medium-Term	Direct	DEP	NFTA, GBNRTC, local municipalities	Equity, Infrastructure, Transportation
6.2.8: Identify opportunities to expand programs that make transit more affordable to low- and moderate-income residents.	Ongoing	Indirect	DEP	NFTA, Senior Services, Workforce Investment Board	Equity, Funding, Infrastructure, Transportation
6.2.9: Develop programs which ensure transportation for disadvantaged communities during extreme weather events.	Short-Term	Direct	DEP	ECDOH, Senior Services, UB, NFTA, DSS	Equity, Infrastructure, Public Health, Resilience, Transportation
STRATEGY 3: Electric Vehicles					
6.3.1: Foster the development of EV ridesharing and car sharing programs to provide more clean energy options, particularly in disadvantaged communities.	Short-Term/ Ongoing	Direct/ Indirect	DEP	NYSERDA, GO Buffalo Niagara, ridesharing and taxi companies	Energy, Equity, Transportation
6.3.2 Install public-facing EV charging stations at County facilities.	Short-Term/ Ongoing	Direct	DPW	NYSEG, National Grid, NYSERDA, GBNRTC	Equity, Energy, Infrastructure, Transportation
6.3.3 Advocate for EV charging infrastructure on real estate development projects, especially for projects with direct County involvement.	Short-Term/ Ongoing	Indirect	DEP	NYSEG, National Grid, NYPA, ECIDA, NYSERDA	Energy, Equity, Infrastructure, Transportation
6.3.4 Participate in the regional planning of EV charging infrastructure and advocate for an equitable EV charging station network.	Short-Term/ Ongoing	Indirect	DEP	GBNRTC, NYSEG, National Grid, Clean Communities of WNY, NYSDOT	Energy, Equity, Infrastructure, Transportation
6.3.5: Expand publicly accessible EV charging stations for all by promoting their siting and installation through private and public programs throughout Erie County.	Short-Term/ Ongoing	Indirect	DEP	Local municipalities, NYSERDA, NYSDOT, National Grid, Clean Communities of WNY, NYSEG, NYPA, NYSDEC, NYS Parks, AAA	Economy & Workforce, Energy, Engagement, Equity, Infrastructure, Transportation
6.3.6: Promote purchasing, replacing, and converting gas and diesel-powered vehicles and fleets, construction equipment, and generators with electric- powered alternatives through federal, state, and utility incentive programs.	Short-Term/ Ongoing	Indirect	DEP	National Grid, NYSERDA, NYSEG, NYSDEC, NYSDOT, Clean Communities of WNY, NYPA, AAA, WNY SBR	Energy, Engagement, Funding, Transportation

ACTION ITEM	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS	KEY WORDS
6.3.7: Work with partners to promote and educate about the use of EVs, installation of home chargers, tax incentives, rebates, and trade-in programs to foster the equitable and affordable adoption of EVs.	Short-Term/ Ongoing	Direct/ Indirect	DEP	NYSEG, National Grid, NYSERDA, NYSDTF, GBNRTC, Niagara Frontier Auto Dealers Association, ECEMC	Energy, Engagement, Equity, Funding, Transportation
6.3.8: Continue to promote low and zero-emission fleet vehicles and the use of alternate fuels by municipalities and businesses throughout Erie County.	Short-Term/ Ongoing	Indirect	DEP	Local municipalities, universities, school districts, ECEMC, Association of Governments, WNY SBR	Economy & Workforce, Energy, Engagement, Transportation
6.3.9: Consider the inclusion of conduit and other features that allow for the eventual inclusion of EV charging stations in the design criteria for publicly accessible parking lots, construction projects, CDBG-funded projects, 239-M review projects, and other County projects.	Ongoing	Indirect	DPW	DSM, local municipalities, highway departments	Energy, Funding, Infrastructure, Law & Policy, Transportation
STRATEGY 4: Transportation Resilience					
6.4.1: Incorporate changes in seasonal and extreme events into how the County designs and builds transportation infrastructure.	Short-Term/Long-Term	Direct	DPW	Local municipalities, NYSDOT, NFTA	Infrastructure, Resilience, Transportation
6.4.2: Work with partners to make sure that streets, sidewalks, bike lanes, and transit stops are accessible during weather events, including snow and rain.	Short-Term/Long-Term	Direct/ Indirect	DPW	Local municipalities, NYSDOT, NFTA, National Guard, GObike Buffalo, PPG	Engagement, Equity, Resilience, Transportation
6.4.3: Implement high-priority transportation freight infrastructure projects that serve to increase the efficiency and diversity of our freight network.	Short-Term/Long-Term	Indirect	DEP	GBNRTC, International Trade Gateway Organization	Economy & Workforce, Infrastructure, Resilience, Transportation
6.4.4: Work with food and goods distributors and freight operators to assure that the community has access to food and supplies during disruptive storms.	Long-Term	Indirect	DEP	NYSDOT, local municipalities	Economy & Workforce, Engagement, Equity, Food, Infrastructure, Public Health, Resilience, Transportation
HOUSING AND NEIGHBORHOOD RESILIENCY GOAL: Zero-emission homes and neighborhoods that promote health and protect residents from extreme weather.					
STRATEGY 1: Efficiency & Conservation					
7.1.1: Engage and alert the public about access to free or low-cost energy assessments offered by New York State.	Ongoing	Direct	DEP	PUSH Buffalo, WNY Clean Energy Hub, HOCN	Energy, Engagement, Equity, Funding
7.1.2: Leverage CDBG and other resources available to the County and residents to increase support for energy efficiency and weatherization improvements.	Ongoing	Direct	DEP	NYSERDA, WAP	Energy, Equity, Funding, Resilience
7.1.3: Educate homeowners on energy and cost savings from weatherization and upgrades to energy efficient technologies, including heat pumps.	Short-Term	Direct	DEP	PUSH Buffalo, WAP, WNY Clean Energy Hub, HOCN, ECEMC	Energy, Engagement, Equity, Funding
7.1.4: Work with programs including WAP, HEAP, and Empower to improve resilience and energy efficiency outcomes, including creating incentives for homeowners and renters for energy conservation.	Medium-Term	Direct	DEP	DSS, NYSERDA, WAP	Energy, Engagement, Equity, Funding, Law & Policy, Resilience
7.1.5: Investigate opportunities to develop a weatherization program through the Erie County ECLIPSE program.	Medium-Term	Direct	DEP	DSS, WAP, PUSH Buffalo, HOCN	Energy, Equity, Law & Policy, Resilience
7.1.6: Support rules for retailers requiring minimum efficiency standards for appliances and equipment that can be sold in the County.	Ongoing	Indirect	DEP	State initiatives, environmental advocacy groups	Economy & Workforce, Energy, Law & Policy
7.1.7: Support local benchmarking and disclosure programs that help renters and home buyers identify energy-efficient properties.	Medium-Term	Direct	DEP	City of Buffalo Rental Registry Program, Office of GIS, local municipalities	Economy & Workforce, Energy, Equity
STRATEGY 2: Electrification & Renewable Energy					
7.2.1: Create a County-wide community energy program that utilizes 100% clean energy that prioritizes disadvantaged community residents as first adopters.	Short-Term	Direct	DEP	NYSERDA	Energy, Equity
7.2.2: Encourage responsible community solar project development on agricultural land to make clean, renewable energy more accessible to rural communities without losing our most productive farmland.	Short-Term	Direct	DEP	NYSERDA, solar developers, community-based organizations	Energy, Engagement, Equity, Landscapes & Ecosystems
7.2.3: Advocate for expanded state utility (NYSERDA, National Grid, NYSEG) programs to help homeowners and residents electrify new and existing buildings (including appliances) and to install residential renewable energy systems.	Short-Term	Direct	DEP	NYSERDA, utilities	Energy, Engagement, Equity, Law & Policy
7.2.4: Look for opportunities for ECLIPSE to subsidize electric heating and cooling technologies and home weatherization, especially for disadvantaged communities.	Short-Term	Direct	DEP	NYSERDA, utilities	Energy, Equity, Funding

Action Item Summary

ACTION ITEM	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS	KEY WORDS
7.2.5: Provide homeowners and landlords access to affordable capital, such as low-interest loans, to make the switch to fully electric residential solar systems with energy storage.	Medium-Term	Indirect	DEP	Private banks and State Green Bank	Energy, Engagement, Equity, Funding
7.2.6: Work to assure that energy and housing costs are affordable for the County's low- and moderate-income residents.	Short-Term	Direct	DEP	NYSERDA, WAP, DSS	Energy, Equity, Funding
7.2.7: Support the wide-spread implementation of heat pumps in homes throughout Erie County.	Short-Term	Direct/ Indirect	DEP	Local municipalities, WNY Clean Energy Hub	Energy, Engagement, Equity, Infrastructure
7.2.8: As part of ECLIPSE, investigate creating a land trust to develop neighborhood solar installations and energy storage in vacant lots in urban and suburban neighborhoods.	Medium-Term	Direct	DEP	NY Green Bank, Private banks	Energy, Equity, Funding, Infrastructure
STRATEGY 3: Resilience					
7.3.1: Support the development of climate-resilient housing (both new housing and retrofitted existing housing) while preventing the displacement of current residents.	Medium-Term	Indirect	DEP	Housing organizations, private philanthropy, local municipalities, developers, NYSHCR, PPG	Energy, Engagement, Equity, Infrastructure, Resilience
7.3.2: ECLIPSE will investigate creating neighborhood microgrids to increase resilience to disasters while prioritizing the needs of disadvantaged communities throughout the County.	Medium-Term	Direct	DEP	UB, utilities, local municipalities, developers, neighborhood organizations	Energy, Equity, Infra-structure, Public Health, Resilience
7.3.3: Develop or secure opportunities to support re-treeing, creating green spaces in neighborhoods (including the use of existing vacant lots when possible), and allowing community members to have a say in how green space is used.	Short-Term	Direct/ Indirect	DEP	BSA, neighborhood organizations, local municipalities, PPG	Engagement, Equity, Funding, Infrastructure, Landscapes & Ecosystems, Resilience
7.3.4: Work with local governments to ensure that new housing (including public housing) protects residents from climate change threats, such as flooding and extreme heat.	Medium-Term	Indirect	DEP	Local municipalities, NYSHCR, developers	Energy, Engagement, Equity, Infrastructure, Law & Policy, Public Health, Resilience
7.3.5: Expand the Erie County Healthy Neighborhoods Program to include climate resilience aspects.	Short-Term	Direct	DEP	ECDOH, local municipalities, private philanthropy, housing organizations, NYSHCR	Energy, Equity, Law & Policy, Resilience
7.3.6: Create an education program for residents on extreme weather event preparedness.	Short-Term	Direct	DEP	Erie County Department of Home-land Security & Emergency Services, Erie County Sheriff's Office, ECDOH, local municipalities	Engagement, Equity, Public Health, Resilience
STRATEGY 4: Smart Growth					
7.4.1: Direct investment and new housing development to areas served by existing utility infrastructure and near public transportation, employment, and community services. Discourage sewer and water extensions in rural and/or developing areas, as per the Regional Framework.	Ongoing	Direct/ Indirect	DEP; DSM	NFTA, GBNRTC, NYSHCR, local municipalities, (United States) De-partment of HUD grant programs	Economy & Workforce, Equity, Funding, Infrastruc-ture, Landscapes & Eco-systems, Transportation
7.4.2: Expand support for municipal comprehensive plan updates. Encourage increased densities and compact design, live where you work concepts, affordable housing, mixed-use development, multi-family housing, and migrant farmworker housing.	Short-Term/ Medium-Term	Direct/ Indirect	DEP	Local municipalities, NYS CFA; HUD CDBG grant, NYSDOS	Engagement, Equity, Infrastructure, Landscapes & Ecosystems
7.4.3: Work with local governments on obtaining and implementing smart growth planning and climate-mitigating grants, especially the County's small municipalities with limited capacities.	Short-Term/ Medium-Term/ Long-Term	Direct	DEP	NYSDOS DRI grants, UBRI, NYSERDA, HUD CDBG grant	Infrastructure, Landscapes & Ecosystems, Transpor-tation
7.4.4: Fund additional Erie County CDBG Smart Growth Projects.	Short-Term	Direct	DEP	NYS CFA, HUD CDBG grant	Equity, Funding, Infrastruc-ture, Landscapes & Eco-systems, Transportation
7.4.5: Consider expanding the CDBG County Housing Rehab Program to include climate resiliency improvements.	Short-Term/ Medium-Term	Direct	DEP	HUD CDBG & HOME grants, NYSERDA	Equity, Infrastructure, Law & Policy, Resilience
7.4.6: Explore the recreation of a Regional Planning Board, which would help coordinate smart growth initiatives throughout the County.	Medium-Term	Direct	DEP	Niagara County, local municipalities, UBRI	Infrastructure, Landscapes & Ecosystems, Law & Policy, Transportation
7.4.7: Update the Erie-Niagara Framework for Regional Growth.	Short-Term	Direct	DEP	Niagara County, UBRI, GBNRTC	Economy & Workforce, Infrastructure, Landscapes & Ecosystems, Law & Policy, Transportation

ACTION ITEM	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS	KEY WORDS
ECONOMIC AND WORKFORCE DEVELOPMENT GOAL: Foster an equitable and robust green economy.					
STRATEGY 1: Outreach					
8.1.1: Determine the needs of community members, businesses, and municipalities through annual surveys.	Short-Term/Ongoing	Direct/Indirect	DEP	Climate Ambassadors, all local IDAs, BNP, Invest Buffalo Niagara, WNY SBR, NYSERDA, WNY REDC, Erie County Association of Governments Climate Smart Committee, Task Force, VBN, ECEMC	Economy & Workforce, Engagement
8.1.2: Develop and regularly update a Climate Action Toolkit to provide a roadmap to success for both large and small business.	Short-Term/Ongoing	Direct/Indirect	DEP	Climate Ambassadors, local IDAs, BNP, Invest Buffalo Niagara, WNY SBR, NYSERDA, WNY REDC, Erie County Association of Governments Climate Smart Committee, Task Force, VBN	Economy & Workforce, Engagement
8.1.3: Hold an annual inclusive economic development summit focused on identifying needs and highlighting available programs that support businesses to address climate change.	Short-Term/Ongoing	Direct/Indirect	DEP	WNY SBR, local IDAs, Chambers of Commerce, Invest Buffalo Niagara	Economy & Workforce, Engagement, Equity, Funding
8.1.4: Work with government agencies to create new and leverage existing programs that are responsive to the needs identified through the summits to educate, motivate, attract, and reward businesses to invest in climate action.	Medium-Term/Ongoing	Direct/Indirect	DEP	NYSERDA, NYSDEC, USEPA, USDOE, REDC, USEDA, Invest Buffalo Niagara, local IDAs, WNY SBR	Economy & Workforce, Engagement, Funding, Law & Policy
8.1.5 Engage in direct community outreach to assess needs and provide resource assistance.	Short-Term/Ongoing	Direct	DEP	Climate Ambassadors, local municipalities, community groups, UBRI, WNY SBR	Economy & Workforce, Engagement
STRATEGY 2: Policies & Infrastructure					
8.2.1: Review current local economic development policies for environmental, social, and equity concerns and benchmark against other communities.	Short-Term	Direct	DEP	ECIDA, Invest Buffalo Niagara, WNY SBR, Chambers of Commerce	Economy & Workforce, Equity, Landscapes & Ecosystems, Law & Policy
8.2.2 Work with stakeholders to develop policies that encourage business efforts to reduce GHG emissions and become more resilient to a changing climate, including equitable transportation-oriented development, energy conservation, renewable energy, and job creation.	Short-Term	Indirect	DEP	ECIDA, Other IDAs, Invest Buffalo Niagara, WNY SBR, Chambers of Commerce, Equal Employment Office, GBNRTC, NFTA, EC Association of Governments	Economy & Workforce, Energy, Engagement, Equity, Law & Policy, Resilience, Transportation
8.2.3: Focus on redeveloping brownfields while aligning with Smart Growth and equity objectives.	Short-Term	Direct	DEP	NYSDEC, USEPA, ECIDA, Invest Buffalo Niagara	Economy & Workforce, Equity, Infrastructure, Landscapes & Ecosystems, Law & Policy, Public Health
8.2.4: Identify preferred economic sites within the County that lack renewable electric infrastructure, renewable electric capacity, or both.	Medium-Term	Direct	DEP	ECIDA, local municipalities, NYSERDA, local utilities, Association of Governments, Invest Buffalo Niagara, local developers	Economy & Workforce, Energy, Equity, Infrastructure, Landscapes & Ecosystems
8.2.5: Expand broadband internet throughout Erie County.	Short-Term/Ongoing	Direct	DEP	ErieNet LDC, PPG	Economy & Workforce, Equity, Infrastructure
8.2.6: Advocate for sustainable supply chain products and services.	Short-Term/Ongoing	Direct	DEP, Purchasing	WNY SBR, private entities	Economy & Workforce, Engagement, Energy, Waste & Resource Management
8.2.7: Continue to support the WNY SBR.	Short-Term/Ongoing	Direct	DEP	WNY SBR	Economy & Workforce, Engagement
8.2.8: Assist and guide municipalities in planning and implementing zoning regulations that support green businesses.	Ongoing	Direct	DEP	Local municipalities, Association of Governments	Economy & Workforce, Engagement, Infrastructure, Law & Policy
STRATEGY 3: Workforce Development					
8.3.1: Advocate for solutions to remove barriers to employment, including access and affordability to transportation and childcare.	Ongoing	Indirect	DEP, DSS	Workforce Investment Board, Childcare Coalition, Live Well Erie	Economy & Workforce, Engagement, Equity, Infrastructure, Transportation
8.3.2: Identify and promote WNY educational institutions that have training programs to attract labor force and industries that are pivoting to green technologies.	Short-Term/Ongoing	Direct	DEP	Workforce Investment Board, local educational institutes, Northland Training Center, NYS Labor Board, NYSERDA, Buffalo Niagara Builders Association, BOCES, ECC	Economy & Workforce, Engagement
8.3.3: Use local market data to convene a summit with workforce development organizations to identify needs and ways to leverage and fund programs.	Short-Term	Direct	DEP	Invest Buffalo Niagara, community colleges, universities, local municipalities, labor unions, BOCES, Northland Training Center, NYS Labor Board, Workforce Investment Board, NYSERDA, USEPA	Economy & Workforce, Engagement, Funding

Action Item Summary

ACTION ITEM	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS	KEY WORDS
COMMERCIAL ENERGY CONSERVATION AND RENEWABLE ENERGY GOAL: Erie County will move toward net-zero-carbon-emissions commercial buildings and support the transition to a decarbonized electrical grid.					
STRATEGY 1: Building Performance & Efficiency Education					
9.1.1: Create and maintain a website to connect the community to key local and industry resources (including case studies) related to building energy performance.	Short-Term	Direct	DEP, DPW	AIA, USGBC, WNY SBR, NYSERDA, Buffalo & Erie County Library	Energy, Engagement
9.1.2: Advocate for utility companies to include energy performance ratings on energy bills.	Medium-Term/ Long-Term	Indirect	DEP, DPW	Utilities, NYSAC, PSC	Energy, Engagement, Law & Policy
9.1.3: Advocate for building performance information requirements and resources to address building efficiency be provided to homebuyers and renters at time of closing or leasing.	Medium-Term/ Long-Term	Indirect	DEP, DPW	Energy Performance Contractors, Utilities, NYSERDA, Association of Realtors, County Clerk's Office	Energy, Engagement, Equity, Law & Policy
9.1.4: Advocate for public benchmarking and disclosure of commercial building energy consumption for larger buildings.	Long-Term	Indirect	DEP	NYS, local municipalities, NYSERDA, WNY SBR	Energy, Engagement, Law & Policy
9.1.5: Educate developers on funding and financing opportunities, including Property Assessed Clean Energy (PACE) financing.	Short-Term/ Medium-Term	Direct	DEP, DPW	Local financial institutions, EIC NY	Energy, Engagement, Funding
9.1.6: Use high performing County-owned buildings and facilities to educate the community on building efficiency opportunities.	Short-Term/ Medium-Term	Direct	DEP, DPW	NYSERDA, Arc, USGBC	Energy, Engagement
9.1.7: Work with IDAs to incentivize high-performing buildings.	Short-Term/ Medium-Term	Indirect	DEP; Office of Economic Development	ECIDA, regional IDAs, Chambers of Commerce	Energy, Funding, Law & Policy
STRATEGY 2: Decarbonized Power Sector					
9.2.1: Work with renewable energy developers, land owners, local governments, residents, and other stakeholders to foster the broad deployment of renewable energy, including wind power, solar energy, and hydropower.	Short-Term/ Long-Term	Indirect	DEP	Local municipalities, developers, NYSERDA, WNY SBR	Energy, Engagement
9.2.2: Educate and train municipal leaders on how to plan and permit renewable energy development.	Short-Term/ Long-Term	Direct	DEP	UBRI, NYSERDA, NYSDOS, local municipalities	Energy, Engagement, Infrastructure
9.2.3: Emphasize projects that conserve energy in the County's CDBG program.	Short-Term/ Long-Term	Indirect	DEP	HUD, local municipalities, WNY SBR	Energy, Equity
9.2.4: Promote finance programs, such as PILOT and PACE for renewable energy projects.	Short-Term/ Long-Term	Indirect	DEP	County IDAs, businesses, WNY SBR, developers, NYSERDA	Economy & Workforce, Energy, Equity, Funding
9.2.5: Support the alignment of economic development policy and incentives for renewable energy with climate goals.	Short-Term/ Long-Term	Indirect	DEP; Office of Economic Development	County IDAs, local municipalities, developers, WNY SBR, NYSERDA	Economy & Workforce, Energy, Funding, Law & Policy
9.2.6: Coordinate with the NYSDEC to raise awareness about the New York Works Well Plugging Initiative as well as the importance of identifying and plugging wells.	Short-Term/ Long-Term	Indirect	DEP	NYSDEC, Erie County SWCD, WNYLC	Energy, Engagement
STRATEGY 3: Energy Code					
9.3.1: Educate local governments on energy and building codes, including NYStretch Code and American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).	Short-Term/ Ongoing	Direct	DEP	NYSDOS, NYSERDA, utilities, UBRI, BOMA, Association of Local Governments	Energy, Engagement, Law & Policy
9.3.2: Provide direct technical support to local governments for Energy Code compliance and implementation.	Short-Term/ Ongoing	Direct	DEP	Association of Local Governments, IDAs, Construction Exchange, AIA, NYCOM, NYSAC	Energy, Engagement, Law & Policy
STRATEGY 4: Energy Storage & Demand Management					
9.4.1: Educate commercial, industrial, residential, and school building owners about battery storage and load shifting options.	Short-Term/ Medium-Term	Direct	DEP, DPW	BOMA, WNY SBR, NYSERDA, NYPA, NY State Assembly & Senate, NYSAC	Economy & Workforce, Energy, Engagement
9.4.2: Educate municipal officials about battery storage for formulation of ordinances and codes protecting life and property, while valuing climate justice.	Short-Term/ Medium-Term	Direct	DEP	NYDOS, NYSERDA, ECEMC	Energy, Engagement, Equity, Landscapes & Ecosystems, Law & Policy, Public Health
9.4.3: Incorporate battery storage and load shifting into the County's heat emergency plan and other resilience plans.	Medium-Term	Direct	DEP, Emergency Services, ECDOH	Libraries	Energy, Equity, Resilience

ACTION ITEM	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS	KEY WORDS
NATURE-BASED SOLUTIONS GOAL: Erie County will promote equitable nature-based solutions to protect intact landscapes, restore degraded ecosystems, and improve equitable access to green infrastructure, tree canopy, and open space for all residents.					
STRATEGY 1: Skilled Labor Jobs					
10.1.1: Partner with interested parties to collaborate on training needs and opportunities.	Short-Term	Indirect	DEP	High schools and colleges, Corps Groups, state and federal agencies, non-profits, BOCES programs, Workforce Investment Board, job training facilities, local municipalities, businesses, unions, community-based organizations and block clubs, Live Well Erie	Engagement, Economy & Workforce, Landscapes & Ecosystems
10.1.2: Provide skilled labor job training for nature-based projects.	Short-Term	Indirect	DEP	High schools and colleges, Corps Groups, state and federal agencies, non-profits, BOCES programs, Workforce Investment Board, job training facilities, local municipalities, businesses, unions, community-based organizations and block clubs, Live Well Erie	Economy & Workforce, Equity, Landscapes & Ecosystems
10.1.3: Hire workers from trainings.	Medium-Term	Direct	Parks, DPW, DSM	Local businesses, unions, non-profits	Economy & Workforce
10.1.4: Pursue on-going preventive and maintenance efforts for nature-based projects.	Medium-Term	Direct	Parks, DPW	Community-based organizations	Landscapes & Ecosystems
STRATEGY 2: Conserve Resilient Lands, Waterways, & Priority Habitats					
10.2.1: Map the most climate resilient lands in Erie County and prioritize them for protection.	Short-Term	Direct	DEP	NYSDEC, WNYLC, Buffalo Niagara Waterkeeper, LEWPA	Landscapes & Ecosystems, Resilience
10.2.2: Create a Conservation Plan for Erie County that prioritizes areas for protection and ensures equitable access to open space, connectivity, and green infrastructure.	Short-Term	Indirect	DEP	Local municipalities, NYSDEC, WNYLC, Buffalo Niagara Waterkeeper, LEWPA	Equity, Infrastructure, Landscapes & Ecosystems, Law & Policy
10.2.3: Work with partners and residents to protect priority lands through outreach and education.	Medium-Term	Direct/ Indirect	DEP	Local municipalities, NYSDEC, WNYLC, Buffalo Niagara Waterkeeper, LEWPA	Engagement, Landscapes & Ecosystems
STRATEGY 3: Restoration Strategies					
10.3.1: Identify and prioritize degraded lands, including shorelines, for implementation projects.	Short-Term	Direct	DEP	LEWPA, Erie County SWCD, NYSDEC, PRISM, WNYLC, Buffalo Niagara Waterkeeper, ECEMC, local municipalities, Erie County Parks	Engagement, Landscapes & Ecosystems, Resilience
10.3.2: Identify lead organizations for implementation projects and funding sources.	Short-Term	Direct	DEP	LEWPA, Erie County SWCD, NYSDEC, PRISM, WNYLC, Buffalo Niagara Waterkeeper, ECEMC, local municipalities, Erie County Parks	Engagement, Funding
10.3.3: Complete habitat and living shoreline restoration, including signage, to educate the community. Focus on priority areas that address climate vulnerabilities identified for Erie County.	Medium-Term	Direct	DEP	LEWPA, Erie County SWCD, NYSDEC, PRISM, WNYLC, Buffalo Niagara Waterkeeper, ECEMC, local municipalities, Erie County Parks	Engagement, Landscapes & Ecosystems, Resilience
10.3.4: Develop protocols and mechanisms for continued monitoring and adaptive management of work completed as part of this goal.	Medium-Term	Indirect	DEP	LEWPA, Erie County SWCD, NYSDEC, PRISM, WNYLC, Buffalo Niagara Waterkeeper, ECEMC, local municipalities, Erie County Parks	Landscapes & Ecosystems, Law & Policy
STRATEGY 4: Improve Connectivity for Pollinators & Wildlife					
10.4.1: Encourage and educate the public on creating pollinator-friendly habitat.	Short-Term	Direct	DEP	ECEMC, Home for a Gnome, Citizen Coalition for Wildlife and Environment, Pollinator Conservation Association, Save the Bees WNY, CCE Master Gardeners, Buffalo Niagara Waterkeeper, NYSDEC, local municipalities	Engagement, Landscapes & Ecosystems
10.4.2: Continue habitat certification efforts through outreach and education.	Short-Term	Direct	DEP	Black Rock Riverside Alliance, The Nature Conservancy, National Wildlife Foundation	Engagement, Landscapes & Ecosystems
10.4.3: Support the planting of pollinator gardens in both urban and rural environments.	Short-Term	Indirect	DEP	Community gardens, CCE Master Gardeners, Grassroots Gardens WNY, nurseries, Pollinator Conservation Association	Engagement, Equity, Landscapes & Ecosystems

Action Item Summary

ACTION ITEM	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS	KEY WORDS
10.4.4: Support the planting of native plants in both urban and rural environments.	Short-Term	Indirect	DEP	Nurseries, garden stores, Grassroots Gardens WNY, MAP, other urban farms with Agriculture & Markets Greenhouse licenses, NYSDEC	Engagement, Equity, Landscapes & Ecosystems
10.4.5: Combat invasive species to promote biodiversity.	Short-Term	Indirect	DEP	PRISM, Erie County SWCD, LEWPA, WNYLC, Let's Goat Buffalo	Landscapes & Ecosystems, Public Health
10.4.6: Educate the public about nature-based residential lawn care.	Short-Term	Direct	DEP	CCE Master Gardeners, ECEMC, Home for a Gnome, Black Rock Riverside Alliance	Engagement, Landscapes & Ecosystems, Public Health
STRATEGY 5: Increase and Preserve Tree Canopy					
10.5.1: Establish and maintain a living list of native and climate resilient tree and shrub species of all sizes that can thrive in current and future climate conditions projected for the region, paired with a list of complementary best practices for planting and maintenance.	Short-Term	Indirect	DEP	CCE, Erie County SWCD, NYSDEC, local municipalities, USDA	Landscapes & Ecosystems, Resilience
10.5.2: Map and assess the demographic and geographic disparities in tree canopy, including a timeline with 2030 and 2050 goals, thereby establishing priority communities for tree canopy preservation and expansion.	Short-Term	Direct	DEP	CCE, Erie County SWCD, NYSDEC, local municipalities, colleges and universities, USDA	Economy & Workforce, Landscapes & Ecosystems, Law & Policy
10.5.3: Establish mechanisms for ongoing care and maintenance of canopy trees.	Short-Term	Indirect	DEP	CCE, Erie County SWCD, NYSDEC, local municipalities, block clubs, USDA	Economy & Workforce, Landscapes & Ecosystems, Law & Policy
10.5.4: Encourage developers, builders, homeowners, and municipalities to plant and grow shade trees effectively.	Short-Term	Indirect	DEP	CCE, Erie County SWCD, NYSDEC, local municipalities, block clubs, WNY SBR, USDA	Economy & Workforce, Engagement, Equity, Landscapes & Ecosystems, Public Health, Resilience
AGRICULTURE AND FOOD SYSTEMS GOAL: Erie County will promote agriculture and food system solutions that advance farmland and environmental protection; strengthen ecosystem health; improve equitable access to healthy, local food; mitigate the impacts of climate change; and increase climate resiliency.					
STRATEGY 1: Promote & Protect Agriculture					
11.1.1: Support the development of the Evans Agribusiness Park and encourage the use of locally farmed products in its operations.	Short-Term	Direct	DEP	ECIDA, Town of Evans, FPC, Invest Buffalo Niagara	Economy & Workforce, Engagement, Equity, Food
11.1.2: Use the General Municipal Law Section 239-M process to encourage the appropriate siting of developments (e.g., solar, residential) so that agricultural land is not negatively impacted.	Ongoing	Direct	DEP	Local municipalities	Energy, Landscapes & Ecosystems, Law & Policy
11.1.3: Support municipalities' enforcement of New York State's Agriculture and Markets (AGM) construction and mitigation guidelines for solar on farmland.	Ongoing	Indirect	DEP	Municipal code enforcement officers, AGM, AFPB	Economy & Workforce, Energy, Engagement, Landscapes & Ecosystems, Law & Policy
11.1.4: Advocate for expanded impact mitigation payments to farmers for smaller renewable energy projects on smaller acreages of farmland.	Short-Term	Direct	DEP	AGM, FPC	Economy & Workforce, Energy, Engagement, Equity, Funding, Landscapes & Ecosystems
11.1.5: Conduct outreach and education to municipal officials for farmland protection.	Ongoing	Direct	DEP	Local municipalities, UBRI, NRCS, Erie County SWCD, WNY Soil Health Alliance, CCE, EC Farm Bureau, LEWPA	Engagement, Landscapes & Ecosystems, Law & Policy
11.1.6: Support the protection of productive farmland with conservation easements.	Ongoing	Indirect	DEP	WNYLC, AFPB	Landscapes & Ecosystems, Law & Policy
11.1.7: Promote the use of enforceable soil safety and integrity regulations and testing to protect consumers.	Short-Term	Indirect	ECDOH	GBUG, FPC, CCE, Erie County Farm Bureau, NYFB, NOFA	Law & Policy, Landscapes & Ecosystems, Public Health
11.1.8: Maintain the geography of the Planning Policy Areas as identified in the Erie-Niagara Framework for Regional Growth through zoning, comprehensive planning, and preservation of farmland in rural areas.	Ongoing	Direct	DEP	Local municipalities	Engagement, Equity, Landscapes & Ecosystems, Law & Policy
STRATEGY 2: Protect & Restore Ecosystems					
11.2.1: Promote the reduced use of pesticides and synthetic fertilizer while advocating for alternatives that regenerate soil biology as a key to improving soil health.	Ongoing	Direct	DEP	ECDOH, Erie County SWCD, NYSDEC	Engagement, Landscapes & Ecosystems, Public Health
11.2.2: Provide regular training to municipal officials and the community at large on the proper use of the State Environmental Quality Review Act (SEQRA) and project review tools, with consideration of a proposed project's ecological and climate impacts.	Ongoing	Direct	DEP	NYSDEC, NYSDOS, local municipalities	Economy & Workforce, Engagement, Equity, Landscapes & Ecosystems, Law & Policy

ACTION ITEM	HORIZON	SPHERE OF INFLUENCE	LEAD COUNTY ENTITY	PARTNERS	KEY WORDS
11.2.3: Provide stable and enhanced support for agencies and organizations with missions and functions that help reinforce agroecosystem restoration, protection, and enhancement.	Ongoing	Indirect	DEP	CCE, FPC, Erie County SWCD	Economy & Workforce, Engagement, Equity, Funding, Landscapes & Ecosystems, Law & Policy, Resilience
11.2.4: Promote sustainable forest management to increase carbon sequestration and climate resiliency while protecting forest ecosystems.	Ongoing	Direct	Parks	Erie County SWCD, NYSDEC, NRCS, CCE, private sector businesses	Engagement, Landscapes & Ecosystems, Resilience
STRATEGY 3: Access to Healthy Food					
11.3.1: Support the sale and consumption of locally produced foods by supporting relevant legislation and programming, such as value-based procurement and the Good Food Purchasing Program.	Ongoing	Indirect	DEP, ECDOH	FPC, AFPB, NYFB, GBUG, NYS Senate, Good Food Buffalo, Erie Grown, PPG	Economy & Workforce, Equity, Food, Law & Policy, Waste & Resource Management
11.3.2: Promote the Healthy Community Store Initiative to provide healthy options at corner stores, especially those in food insecure neighborhoods.	Ongoing	Indirect	ECDOH	CCE, FPC	Economy & Workforce, Engagement, Equity, Food, Public Health
11.3.3: Promote incentives for food retailers in food insecure, disadvantaged communities who provide fresh produce, locally sourced meats, and culturally appropriate food.	Ongoing	Indirect	ECDOH	NYSDOH, AGM, USDA, NRCS, Field & Fork, FPC, American Heart Association	Economy & Workforce, Engagement, Equity, Food, Public Health
11.3.4: Improve the existing food donation network and increase food security by incorporating surplus prepared foods.	Long-Term	Indirect	ECDOH	FeedMore WNY, AGM, FPC	Economy & Workforce, Equity, Food, Public Health, Waste & Resource Management
11.3.5: Encourage regulatory authorities to prioritize helping small-scale food producers overcome food safety regulation hurdles.	Medium-Term	Indirect	ECDOH	FPC, UB Food Lab, USDA, FSIS, CCE, AGM	Economy & Workforce, Equity, Food, Law & Policy
11.3.6: Enhance educational campaigns to educate consumers on the impacts that their food choices have on nutrition and waste.	Short-Term	Direct	ECDOH	NRCS, Erie County SWCD, CCE, Urban Fruits and Veggies, West Side Promise Neighborhood, African Heritage Food Cooperative, MAP	Engagement, Food, Public Health, Waste & Resource Management
11.3.7: Support expanded educational programming on at-home canning and other food preservation techniques, as well as eating seasonally to increase the shelf life of local foods and incentivize local purchasing.	Short-Term	Indirect	ECDOH	FPC, CCE	Economy & Workforce, Engagement, Food, Waste & Resource Management
11.3.8: Explore participation in the Good Food Purchasing Program.	Short-Term	Direct	Purchasing	Local municipalities, school districts	Economy & Workforce, Equity, Food, Public Health, Resilience
11.3.9: Build support for and recommend changes to policies and health codes that support and encourage food waste recovery infrastructure and diversion.	Short-Term	Indirect	ECDOH	FPC, NYSDEC, local municipalities	Food, Law & Policy, Waste & Resource Management
STRATEGY 4: Mitigate the Impacts of Climate Change					
11.4.1: Establish a renewable energy siting policy (e.g., PILOT or community benefit agreement) that protects farmland while supporting renewable energy development.	Short-Term	Direct	DEP	RPTS, Law Department	Energy, Landscapes & Ecosystems, Law & Policy
11.4.2: Conduct outreach and education to farmers about the importance of adapting to climate change.	Ongoing	Direct	DEP	NRCS, Erie County SWCD, CCE	Engagement, Resilience
11.4.3: Update the Erie County Agricultural and Farmland Protection Plan to include climate resiliency, mitigation, and adaptation initiatives.	Short-Term	Direct	DEP	AFPB	Landscapes & Ecosystems, Law & Policy, Resilience
STRATEGY 5: Coordination					
11.5.1: Work with existing food hubs to expand opportunities and connections between farmers, restaurants, and retailers.	Ongoing	Indirect	DEP	Buffalo Go Green, African Heritage Food Cooperative, MAP, PFC, Feed Buffalo, Alliance Butchery, FPC, CCE	Economy & Workforce, Engagement, Equity, Food
11.5.2: Create an Erie County one-stop-shop of agriculture and food system programs and resources.	Short-Term	Direct	DEP, ECDOH	Erie County SWCD, NRCS, FPC	Economy & Workforce, Engagement, Equity, Food
11.5.3: Promote and share examples of regenerative agriculture practices being conducted in our region.	Ongoing	Direct	DEP	Erie County SWCD, CCE, MAP	Engagement, Landscapes & Ecosystems

Key Words

Key Words	Action Items
Economy & Workforce	**Chapter 5 - Consumption and Waste** 5.1.3, 5.1.5, 5.2.1, 5.3.1, 5.3.3, 5.3.4
	Chapter 6 - Transportation 6.1.4(A), 6.3.5, 6.3.8, 6.4.3, 6.4.4
	Chapter 7 - Housing and Neighborhood Resiliency 7.1.6, 7.1.7, 7.4.1, 7.4.7
	Chapter 8 - Economic and Workforce Development 8.1.1, 8.1.2, 8.1.3, 8.1.4, 8.1.5, 8.2.1, 8.2.2, 8.2.3, 8.2.4, 8.2.5, 8.2.6, 8.2.7, 8.2.8, 8.3.1, 8.3.2, 8.3.3
	Chapter 9 - Commercial Energy Conservation and Renewable Energy 9.2.4, 9.2.5, 9.4.1
	Chapter 10 - Nature-based Solutions 10.1.1, 10.1.2, 10.1.3, 10.5.2, 10.5.3, 10.5.4
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Energy	**Chapter 3 - Climate Resilience** 3.1.2
	Chapter 5 - Consumption and Waste 5.1.5, 5.1.7, 5.2.5
	Chapter 6 - Transportation 6.3.1, 6.3.2, 6.3.3, 6.3.4, 6.3.5, 6.3.6, 6.3.7, 6.3.8, 6.3.9
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	Chapter 8 - Economic and Workforce Development 8.2.2, 8.2.4, 8.2.6
	Chapter 9 - Commercial Energy Conservation and Renewable Energy 9.1.1, 9.1.2, 9.1.3, 9.1.4, 9.1.5, 9.1.6, 9.1.7, 9.2.1, 9.2.2, 9.2.3, 9.2.4, 9.2.5, 9.2.6, 9.3.1, 9.3.2, 9.4.1, 9.4.2, 9.4.3
	Chapter 11 - Agriculture and Food Systems 11.1.2, 11.1.3, 11.1.4, 11.4.1

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List of Definitions

TERM	DEFINITION
Active transportation	A means of transportation that is human-powered, primarily walking or bicycling.
Agrivoltaics	The simultaneous use of land for solar photovoltaic power generation and agricultural production.
Agroecosystem	Communities of plants and animals interacting with their physical and chemical environments that have been modified by people to produce food, fiber, fuel, and other products for human consumption and processing.
Biodiversity	The variety of living species on Earth, including plants, animals, bacteria, and fungi.
Broadband	High-capacity electronic transmission technique using a wide-range of frequencies and internet traffic types, which enables a large number of messages to be communicated simultaneously and is used in fast internet connections.
Brownfield	A property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.
Carbon footprint	The total amount of GHGs that are emitted due to the consumption of fossil fuels from an individual, event, organization, service, place, or product.
Carbon sequestration	The process of capturing and storing atmospheric carbon dioxide.
Carbon sink	Anything that absorbs more carbon from the atmosphere than it releases (e.g., plants, the ocean, and the soil).
Carbon-free	Energy is produced by a resource that generates no carbon emissions.
Clean energy	Energy that is produced through methods that do not release GHGs or any other pollutants.
Climate change	Long-term shifts in temperatures and weather patterns.
Climate justice	Acknowledging and addressing how climate change has disproportionate, adverse impacts on the social, economic, and public health of historically disadvantaged communities such as Black, Indigenous, People of Color (BIPOC), and low-income communities.
Climate resilience	The capacity to prepare for, respond to, and recover from significant climate-related threats.
Damage-based approach	Provides a monetary estimate of the impacts on society from activities that are a source GHG emissions.
Decarbonize	Reducing GHG emissions and capturing carbon emissions.
Disadvantaged community	Those that bear the burdens of negative public health effects, environmental pollution, impacts of climate change, and possess certain socioeconomic criteria, or comprise high-concentrations of low- to moderate-income households.
Distributed renewable energy	A distributed electric generator powered by sustainable renewable energy or alternative renewable energy that supplies electric power to an electric power service company, is used for on-site consumption, or is sold to third-parties.
Distribution system	The flow of procedures, systems, and activities that are designed and linked to facilitate and monitor the movement of goods and services from the source to the consumer.

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TERM	DEFINITION
Diversion	Actions that target the removal of materials from waste streams that are currently destined for landfills or incinerators so they can be recycled and remade into useful products.
Ecosystem services	Ways that people benefit from their surrounding environment.
Electrification	Replacing technologies that use fossil fuels with technologies that use electricity as a source of energy.
Energy burden	The percentage of household income that goes toward energy costs (electricity, home heating).
Environmental racism	The disproportionate impact of environmental hazards on BIPOC communities.
Equality	Everyone receives an equal amount of support.
Equity	Ensuring each person with the type and amount of support to meet their individual needs.
E-waste	Electrical or electronic equipment that's been discarded.
Extended Producer Responsibility (EPR)	A policy approach under which producers are given significant financial and/or physical responsibility for the treatment or disposal of post-consumer products.
Food injustice	The disproportionate burden of environmental barriers to healthy food experience on disadvantaged and BIPOC communities.
Food web	Consists of all the food chains in a single ecosystem.
Geothermal power	Electrical power generated from geothermal energy, which is heat produced deep in the Earth's core.
Green economy	An economy that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. It is low carbon, resource efficient, and socially inclusive.
Green infrastructure	An approach to water management that protects, restores, and mimics the natural water cycle.
Green jobs	Labor related to renewable energy, energy conservation, tree planting, green infrastructure, building new homes while renovating existing ones, and upgrades to utilities.
Greenhouse gas (GHG)	Gases that trap heat in the atmosphere, such as carbon dioxide, methane, and nitrous oxide.
Greenhouse gas inventory	A list of emission sources and the associated emissions quantified using standardized methods.
Gross income	The total income earned by an individual on a paycheck before taxes and other deductions.
Harmful algal blooms	Overgrowth of algae in water, which hurts the environment, public health, and local economies. Some blooms produce dangerous toxins in fresh and marine water.
Heat pump	A device for heating or cooling by transferring heat mechanically from or to an external reservoir, such as the ground, water, or outside air.

TERM	DEFINITION
Invasive species	A species that is non-native to an ecosystem under consideration and whose introduction causes, or is likely to cause, economic or environmental harm or harm to human health.
Just transition	A process that builds connections, creates opportunity, and ensures a good quality of life for all.
Life cycle of a product	The course of the life of a product, from when the product is in development to when the product has been removed from the market.
Load shifting	An electricity load management technique in which load demand is shifted from peak hours to off-peak hours of the day.
Maker spaces	Places that have the tools, equipment, and permitting to make items and sell to others.
Microclimates	A small or restricted area of land where the climate differs from the surrounding area.
Microgrid	A local energy grid with control capability, which means it can disconnect from the traditional grid and operate autonomously.
Micromobility	Transportation using lightweight, usually single-person vehicles, such as bicycles, scooters, e-bikes, and e-scooters.
Microtransit	A method of shared transit that uses small-scale vehicles, such as shuttles, minibuses, or regular cars, to deliver transportation to the public.
Mindful consumption	When buying practices are driven by a commitment to making purchasing decisions that have positive social, economic, and environmental impact. Examples include only buying what you need, buying secondhand, and opting for reusable products over single-use products.
Multi-modal transportation	Supports the needs of all users whether they choose to walk, bike, use transit, or drive.
Native species	A species that originated and developed in its surrounding habitat and has adapted to living in that particular environment. For North America, is one that was found within (as a component of) the ecosystem under consideration pre-European settlement.
Nature-based solutions	Actions to create features that mimic natural features and processes.
Net-zero-carbon-emissions	Achieving a balance between GHGs produced and GHGs taken out of the atmosphere. No more GHGs can be put into the atmosphere than taken out.
Pay-as-you-throw garbage	A usage-pricing model for disposing of municipal solid waste. Users are charged a rate based on how much waste they present for collection to the municipality or local authority.
Procurement	The act of obtaining or purchasing goods or services.
Recovery and collection infrastructure	Community infrastructure that collects, repurposes, donates, borrows, reuses, and recycles materials.
Redlining	A discriminatory practice of banks and government agencies from the 1930s to the 1960s that systemically denied financial services such as mortgages and insurance loans to residents of certain areas based on their race or ethnicity.
Regenerative agriculture	The agricultural practices that not only regenerate the land health (soils and plants), but also regenerate the businesses and communities that engage with that land (both economically and socially).
Regenerative economy	An economy that works to regenerate goods and/or services that are required for, or contribute to, public health and well-being.

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TERM	DEFINITION
Renewable energy	Energy produced from sources that are naturally replenished and do not run out, such as solar, wind, hydro, and geothermal energy.
Resiliency	The capacity to withstand or to recover quickly from difficulties.
Resilient lands	An area of land where high microclimatic diversity and low levels of human modification provide species with connected, diverse climatic conditions that they will need to persist and adapt to changing regional climates.
Retrofit	The process of modifying something after it has been manufactured.
Seiche	A temporary disturbance or oscillation in the water level of a lake or partially enclosed body of water, especially one caused by changes in atmospheric pressure.
Single occupancy vehicle	When a privately-operated vehicle is only occupied by the driver.
Smart grid	An electricity supply network that uses digital communications technology to detect and react to local changes in usage.
Smart growth	Planned economic and community development that attempts to avoid urban sprawl and worsening environmental conditions. Covers a range of development and conservation strategies that help protect our health and natural environment and make our communities more attractive, economically stronger, and more socially diverse.
Smart meter	Provides detailed information on consumption in order to reduce electricity bills and increase knowledge about the status of the electricity grid.
Social vulnerability	The susceptibility of social groups to the adverse impacts of natural hazards, including disproportionate death, injury, loss, or disruption of livelihood.
Socio-demographic	A combination of social and demographic factors that define people in a specific group or population.
Socioeconomic	Relating to or concerned with the interaction of social and economic factors within the population.
Solar systems	The integrated use of solar devices for the functions of collection, transfer, storage, and distribution of solar energy.
Sustainable agriculture	An agricultural method that seeks to sustain farmers, resources, and communities by promoting farming practices and methods that are profitable, environmentally sound, and good for communities.
Sustainability	To create and maintain the conditions under which humans and nature can exist in productive harmony to support present and future generations.
Symbiotic	Interaction between two different organisms living in close physical association.
Urban sprawl	The rapid expansion of urban areas on undeveloped land near a city.
Weatherization	Protecting a building and its interior from the elements, particularly from sunlight, precipitation, and wind, and modifying a building to reduce energy consumption and optimize energy efficiency.
Zero carbon	No carbon emissions are being produced from a product or service.
Zero-emission	An engine, motor, process, or other energy source that emits no waste products that pollute the environment or disrupt the climate.

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