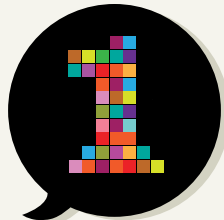ONE REGION FORWARD

CLIMATE ACTION 1

BUFFALO NIAGARA'S
PRIORITY CLIMATE
ACTION PLAN

MARCH 2024

The Buffalo-Niagara Falls Metropolitan Statistical Area (Buffalo Niagara) is a region of 64 municipalities across 2 counties (Erie and Niagara) on the western edge of New York State. Situated on the border with Ontario, Canada, the region lies at the confluence of two Great Lakes and is home to Niagara Falls, one of the wonders of the natural world and the source for New York's biggest clean energy producer.

Home to ~1.2 million residents, Buffalo Niagara has two central cities: the City of Buffalo (New York's second largest urban area) and the City of Niagara Falls. Surrounding are a collection of towns, villages, and small cities, each with their own unique characteristics and local identities. Collectively, the region continues to find new ways to work together to address the big challenges of the 21st century, including addressing climate change and a transforming energy economy.
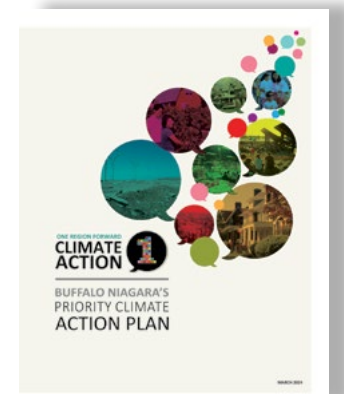

ONE REGION FORWARD
CLIMATE ACTION

One Region for Climate Action (1RF CA) is a regional planning initiative focused on identifying actionable steps Buffalo Niagara (Erie and Niagara counties) can take to reduce greenhouse gas emissions. It was launched in November 2023 through a grant from the US Environmental Protection Agency (EPA) Climate Pollution Reduction Grant (CPRG) program and is supporting various planning activities through 2027. This multi-year program will build on existing planning, promote collaboration, and prepare the region to take action on the climate challenges of today and tomorrow.

ABOUT THIS REPORT

This Priority Climate Action Plan (PCAP) represents the first deliverable of **One Region for Climate Action**. It outlines a baseline of the causes of greenhouse gas emissions from the region, describes key issues and priorities to ensure regional climate action addresses the needs of disadvantaged and underrepresented communities, and identifies priority measures the region can take between now and 2030 to advance regional, state, and federal goals for climate mitigation.

The plan was developed over a four-month period (November 2023 - February 2024) and was informed by guidance from the One Region Forward Implementation Council, the One Region for Climate Action (1RF CA) Climate Justice Working Group, 11 listening sessions with key municipal and nonprofit partners, and 39 project concepts submitted as part of a six-week call for projects. It also builds heavily on other regional and local climate action plans or initiatives, including the recently completed Erie County Climate Community Climate Action Plan (2023).

WHO IS GUIDING THIS PROCESS?

One Region for Climate Action is **led by the Greater Buffalo-Niagara Regional Transportation Council (GBNRTC)** with guidance from the One Region Forward Implementation Council. This regional planning advisory group grew out of the One Region Forward planning effort and has been advancing regional sustainability for over a decade through its strong ties to municipal and city governments. **The University at Buffalo Regional Institute (UBRI)**, a research center at UB's School of Architecture and Planning is designing and executing the planning process for this initiative and will work with diverse community groups, stakeholders, and residents to generate a series of community-driven planning documents and resources for local implementation. The analysis of climate justice issues and potential impacts of climate action on Low-Income and Disadvantaged communities (LIDACs) was guided by the Climate Justice Working Group, made up of 18 municipal and non-profit sector leaders with strong professional or personal connection to disadvantaged communities within the region.

One Region Forward Implementation Council | Climate Action Steering Committee

Co-Chairs	**Robert Shibley,** UB School of Architecture and Planning
	Hal Morse, GBNRTC
Buffalo Niagara Waterkeeper	Jeanne Beiter
City of Buffalo	Crystal Middleton
	Kelley St. John
City of Niagara Falls	Kevin Forma
Erie County	Daniel Castle
	Bonnie Lawrence
	Josh Wilson
	Tracy Skalski
GBNRTC	Michael Finn
	Kelly Dixon
	Angelica Gonzalez
Local Initiatives Support Corp. NY	Tyra Johnson-Hux
Niagara Frontier Transportation Authority	Darren Kempner
	Ashley Smith
NYS Department of Transportation	James Cuozzo
Niagara County	Nathaniel Bonafede
	Dawn Timm
	Savannah Betkowski
	John "Duffy" Johnston
UBRI	Bart Roberts
	Josh McClain
University at Buffalo	Ryan McPherson

Climate Justice Working Group

City of Buffalo	Geraldine Ford
	Daniela Leon
	Kelley St. John
Clean Air Coalition of WNY	Bridge Rauch
Community Foundation for Greater Buffalo	Cara Matteliano
	Allie Urbanski
Cornell Cooperative Extension Niagara County	Amanda Henning
GBNRTC	Kelly Dixon
GObike Buffalo	Brendan Seney
Monarch of Infinite Possibilities LLC	Faustenia L. Morrow
Niagara County Center for Economic Development	Nathaniel Bonafede
Niagara Orleans Regional Land Improvement Corp.	Matthew Chavez
NYSERDA	Brittany Perez
Open Buffalo	Tendaji Ya'ukuu
PUSH Buffalo	Dawn Wells-Clyburn
Providence Farm Collective	Kristin Heltman-Weiss
Seventh Generation Cultural Resources	Melissa Leonard
UB Sustainability	Derek Nichols
WNY Youth Climate Council	Valerie Juang

Acronyms featured in this Plan

PCAP- Priority Climate Action Plan

CEJST- Climate and Economic Justice Screening Tool

CLCPA- Climate Leadership and Community Protection Act

CCAP- Comprehensive Climate Action Plan

CPRG- Climate Pollution Reduction Grants

LIDAC- Low Income & Disadvantaged Communities

BIPOC- Black, Indigenous, and People of Color

CDBG- Community Development Block Grant

US EPA- United States Environmental Protection Agency

GBNRTC/ GBNRTC TDMS- Greater Buffalo Niagara Regional Transportation Council/ Transportation Data Management System

UBRI- University at Buffalo Regional Institute

NYSDEC- New York State Department of Environmental Conservation

NYSERDA- New York State Energy Research and Development Authority

CSC/CEC- Clean Smart Communities/ Clean Energy Communities

SBR- Western New York Sustainable Business Roundtable

NYPA- New York Power Authority

PACE- Property Assessed Clean Energy

NFTA- Niagara Frontier Transportation Authority

DPW- Department of Public Works, Parks & Streets (DPW)

TOD- Transit-Oriented Development

PUSH- People United For Sustainable Housing

BUFFALO NIAGARA'S
PRIORITY CLIMATE
ACTION PLAN

ONE REGION FORWARD
CLIMATE ACTION 1

NEXT STEPS IN THE PROCESS...

WE ARE HERE

NOV. 2023 TO FEB. 2024

1

What are the region's priorities by 2030?

PRIORITY CLIMATE ACTION PLAN

This document is the required first deliverable of the CPRG planning grant funding this initiative. It is intended to serve as a starting point for more detailed and comprehensive planning and analysis to follow.

MAR. 2024 TO OCT. 2025

2

What climate actions do we need to set in motion for the next 25 years?

COMPREHENSIVE CLIMATE ACTION PLAN

Launching in March 2024, a more comprehensive climate action planning process will unfold that will build on this report and dig deeper on long-term actions

NOV. 2025 TO OCT. 2027

3

How do we prepare our region to implement the work we set out to do?

SOME PLANNING FOUNDATIONS

This plan is focused on near- term actions that can reduce greenhouse gases (GHGs) being emitted in Buffalo Niagara. Yet, it also acknowledges there are cross-cutting or adjacent strategies that can complement and expedite mitigation goals while also advancing the region's overall sustainability and competitiveness. Embracing smart growth, protecting our waterways, focusing on equitable economic development, and integrating resiliency are all essential to ensuring potential benefits of this plan are shared broadly and do not come at the expense of other important goals critical to regional sustainability. While each of these strategies are broad in their scope, they address dynamics that are specific to the socio-economic context and natural environment of the Buffalo Niagara region. Integrating these strategies into climate action can help to both protect the region's assets and redress historical harms.

SMART GROWTH IS A CROSS-CUTTING STRATEGY FOR ALL OF THIS WORK.

Principles of smart growth (i.e. compact and mixed-use development, walkability, transit-oriented development, open space/farmland protection, etc.) reduce greenhouse gas emissions by promoting efficient use of land, energy, and natural resources. Reducing sprawl and using less land for development allows us to conserve natural and agricultural areas, which can help cool the environment and sequester carbon. Compact and mixed-use development, when coupled with multi-modal transportation infrastructure, create environments that promote active mobility and reduce the reliance on individual car travel (especially for short trips), which reduces transportation emissions.

In the decade since the initial One Region Forward plan launched, smart growth has increasingly been embraced by both local and regional planning efforts and integrated into the region's priorities for economic development. Despite this progress, sprawl remains a threat. For the region to achieve significant GHG emission reductions, it will need to continue emphasizing smart growth and stop the trend of converting open space and agricultural land to residential, commercial, and industrial development.

OUR WATERWAYS ARE AMONG THE REGION'S GREATEST ASSETS.

Buffalo Niagara's identity as a Great Lakes region is an important part of our culture, economy, and quality of life. As the region continues to remake its economy and environment for the 21st century and beyond, the health and vibrancy of our waterways are paramount. Abundant access to fresh water has also contributed to the region being spotlighted as a potential "climate refuge" and protecting the Great Lakes ecosystem is critical to ensuring the region is a welcoming destination for persons displaced by climate impacts in other areas. Even as mitigating the impact of climate change is important to a healthy watershed, climate actions must complement (and not come at the expense of) water quality management, habitat restoration, invasive species control, and more.

CLIMATE ACTION CAN HELP CREATE A MORE JUST AND PROSPEROUS REGION.

This plan is predicated on the premise that regional action to mitigate climate change can and should advance our economy in ways that lift up vulnerable and underserved communities, particularly in light of the region's persistent problems of concentrated poverty, racial disparities, and other forms of inequity. The section in this plan focusing on Low Income and Disadvantaged Communities (LIDACs) outlines some of the issues facing vulnerable communities in our region, as well as ways in which climate action can promote more equitable economic, health, and social outcomes. However, it is also important to recognize that climate mitigation work alone cannot address deeply rooted issues of disparate environmental impacts and unequal access to opportunities. Repairing the scars left by historic practices like redlining or land use decisions that allowed highway construction and polluting industries to be placed adjacent to neighborhoods will continue to require comprehensive solutions, of which climate mitigation is a piece of the puzzle.

RESILIENCY MUST GO HAND-IN-HAND WITH CLIMATE MITIGATION.

Although priorities in this plan are focused on reducing greenhouse gas emissions (climate mitigation), the region knows that the collective work needed to combat climate change will require adapting and being prepared to manage the impacts of warmer temperatures, extreme weather events, and more. Strategies that incorporate resiliency and view climate adaptation as complementary to mitigation are practical, needed, and are best positioned to produce co-benefits for communities.

BUILDING BLOCKS FOR REGIONAL CLIMATE ACTION PLANNING

One Region for Climate Action builds on a strong base of climate action planning and programs in Buffalo Niagara. Described below, these efforts are instrumental in the approach of this document and will continue to serve as building blocks for the region's climate action planning.

Erie County Community Climate Action Plan

In December 2023, Erie County released its Community Climate Action Plan, a roadmap for community-facing efforts to combat climate change in New York's most populous county outside of New York City and Long Island. Produced over a three-year period with guidance from 100+ stakeholders, the plan builds on the County's climate action programming for governmental operations and identifies priority actions for 2024 and beyond.

Informing One Region for Climate Action...

With Erie County representing 82% of the region's population, their recently completed Community Climate Action Plan is an important building block for the One Region for Climate Action two-county planning effort. The priorities, recommended actions, and community support included in the County's plan serve as one of the key inputs for this document. Further, this plan and subsequent planning documents of this initiative will be geared toward helping Erie County implement the goals and strategies set out in its plan.

New York's Scoping Plan

In 2019, New York State passed one of the most rigorous climate action laws in the United States. Known as the Climate Leadership and Community Protection Act (CLCPA), it lays out a roadmap for New York to transition the state's energy economy to create new jobs, spur innovation, and advance resiliency across the state. The main policy document that guides implementation of the CLCPA is the NYS Scoping Plan, which serves as a framework for how the state plans to reduce greenhouse gas emissions, reach net-zero emissions, grow renewable energy use, and ensure all communities (especially those identified as disadvantaged) benefit in the clean energy transition.

Informing One Region for Climate Action...

Because the CLCPA and New York's Scoping Plan is guiding state policies, regulations, incentives, and climate initiatives, it plays an important role in shaping local and regional priorities and opportunities. In developing regional climate mitigation priorities for the region, efforts were made to identify what the region would need to advance to contribute to statewide goals. This is especially important for the region if CLCPA will influence further regulations, mandates, and programs.

NYSERDA Clean Energy Communities program

In 2016, the New York Energy Research and Development Authority (NYSERDA) launched the Clean Energy Communities program to help local NYS municipalities embrace clean energy projects, programs, and policies. With the assistance of a technical support team at the UB Regional Institute, over 40 municipalities in Erie and Niagara Counties have engaged with this program since its inception. NYSERDA estimates actions taken through the program have reduced emissions by 126,000 tons annually.

Informing One Region for Climate Action...

Although NYSERDA's Clean Energy Communities program only represents a snapshot of regional climate action, participating communities have shown their willingness to take on meaningful projects that reduce government operations GHGs. The program also encourages community participation, provides education and training opportunities for municipal staff and residents while simultaneously creating pathways for residents and businesses to participate in the expanding clean energy economy.

NYSDEC Climate Smart Communities program

The Climate Smart Communities (CSC) Certification program provides local governments with a robust framework to guide their climate action and recognizes high performing communities for their leadership. Participation is free and voluntary. Designed around the ten CSC pledge elements, the certification program recognizes communities for their accomplishments through a rating system leading to three levels of award: bronze, silver, and gold, and is supported by the Technical Assistance team at UBRI.

Informing One Region for Climate Action...

The NYS Climate Smart Communities program provides a framework for municipal climate action. The program also provides funding for municipalities to take on projects that improve our local response to climate change and improve our regional resilience. Many program elements will likely appear as recommendations for how local municipalities can reduce GHG emissions while planning for the future impacts of climate change.

Local municipal and institutional climate action planning

Across the region, local municipalities and institutions are integrating climate mitigation and resilience into planning documents and frameworks. The City of Buffalo will soon get started with a climate action plan and has identified this work as a policy priority, as evidenced in its 4-Year Strategic Plan. Smaller communities, from North Tonawanda to the Village of Lancaster are developing climate action plans. At the institutional level, the University at Buffalo recently completed its campus-wide "10 in 10" climate action plan to achieve climate neutrality by 2030. Buffalo Niagara Waterkeeper has and continues to lead regional climate resiliency planning and capacity support for local implementation.

Informing One Region for Climate Action...

Development of local climate action plans help our region prepare for the impacts of climate change on the local level. Providing data to communities and working with them to prioritize resiliency efforts that address the current and future impacts of climate change will allow individual communities and residents be better prepared for the foreseeable impacts of climate change.

WNY Regional Clean Energy Hub

Funded by NYSERDA, and implemented by local non-profit PUSH Green, the Western New York Regional Clean Energy Hub is a community-based energy efficiency and clean energy program serving Allegany, Cattaraugus, Chautauqua, Erie, and Niagara counties. They advise individuals, small businesses, and whole communities about resources to make their homes and businesses more energy efficient and clean energy ready.

Informing One Region for Climate Action...

With years of experience and success implementing home energy programs within low-income communities, the Western New York Clean Energy Hub provides a crucial connection to ensuring regional clean energy programming is reaching those most impacted by the impacts of climate change. Their programming and community connections can help recommendations of this plan reach and meet the needs of Low Income & Disadvantaged Communities (LIDAC) and Black, Indigenous, and People of Color (BIPOC) communities in the region.

WNY Sustainable Business Roundtable

The Western New York Sustainable Business Roundtable (SBR) is a member-driven organization that provides education, resources, and networking opportunities for businesses to implement sustainable initiatives that deliver tangible financial, social, and environmental returns. SBR enables it's 75+ dues paying members to capitalize on the economic value and business case for sustainability and climate action, which creates a competitive advantage and enhanced long-term viability. The organization also empowers businesses to identify and mitigate environmental, social, and governance risks through assessing megatrends, understanding new and future regulations, and sharing more resilient business practices.

Informing One Region for Climate Action...

WNY Sustainable Business Roundtable and their membership have been thought leaders in reducing waste and emissions in some of the region's largest employers and manufacturers. Engaging with the sustainable business leaders will allow this plan to reflect the priorities of major employers like the University at Buffalo, Erie County, Roswell Park Cancer Institute, Buffalo Niagara Medical Campus, Rich Products, M&T Bank, New York Power Authority, National Grid, SUNY Erie, Catholic Health and numerous other major institutions in the region.

WHAT ARE THE SOURCES OF GHG IN BUFFALO NIAGARA?

In 2010, the New York State Energy and Research & Development Authority (NYSERDA) supported creation of development of regional greenhouse gas inventories across the State of New York. The findings of those analyses have guided both state and regional GHG reduction priorities for the past decade.

The 2010 analysis for Buffalo Niagara serves as the starting point for this planning process. This is currently the most recent GHG inventory available for the region. In 2024 an updated regional GHG inventory will be developed, allowing Buffalo Niagara to measure progress and provide a new baseline of emission sources for the region.

Greenhouse Gas Emissions
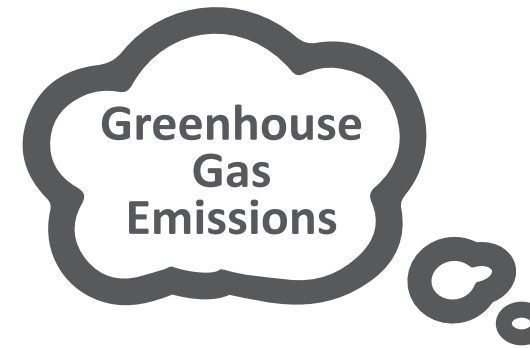
WHY MEASURE GHG EMISSIONS?

Greenhouse gases are produced as a byproduct of burning fossil fuels for energy and through various industrial and agricultural processes. The increasing concentration of these gases in the planet's atmosphere leads to climate change impacts that pose threats to the health and safety of humans and other species, including rising global temperatures and more extreme weather events.[1] When it comes to climate action planning to minimize these impacts, a GHG inventory provides the ultimate measurement for action and is critical to data-driven strategy development. Because so much of GHG emissions are related to how we develop our land and connect places to each other, many of the solutions are grounded in planning. The GHG inventory allows us to define a baseline of current emissions, track progress over time, set targets and goals, and create strategies that specifically address causes of GHG emissions.

HOW WAS THIS GHG INVENTORY CONDUCTED?

As part of the NYSERDA Cleaner Greener Communities initiative, a GHG Inventory Protocol Working Group was established to create a uniform method for developing the 2010 regional GHG inventories across New York State. The group developed a Tier 2 inventory, which uses county-specific or industry-specific emission factors. The inventory was performed for a 5-county region, but since the analysis was performed at the county level, the GHG figures in this plan are isolated for the Buffalo Niagara Falls MSA (Erie and Niagara Counties).

A detailed description of the GHG inventory and its methods can be found here: https://climatesmart.ny.gov/fileadmin/csc/documents/GHG_Inventories/wnyghg.pdf
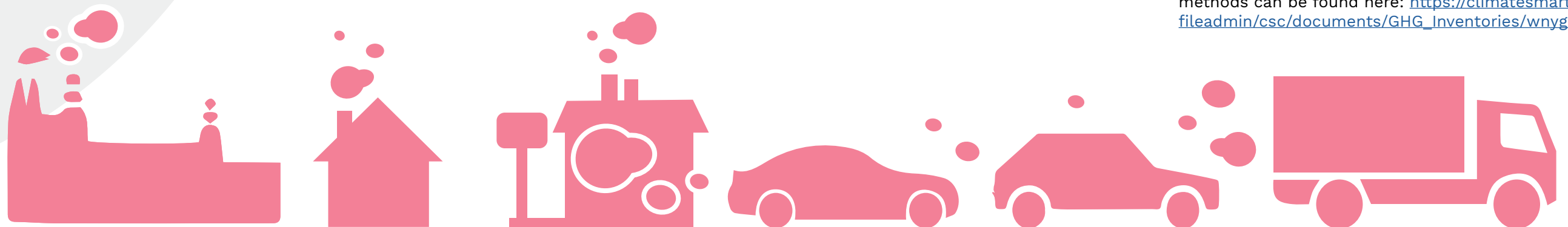
WHAT DOES THE BUFFALO NIAGARA **GHG INVENTORY** TELL US?

2010 BUFFALO NIAGARA GHG EMISSIONS BY SECTORS

The region's emissions in 2010…

12,658,256 MT CO2e

11 MT CO2e per resident

This impact represents…

0.2% of all US emissions

6.0% of all NYS emissions[2]

2/3 comes from Transportation and Housing

1% come from **energy generation & fugitive emissions** — Including energy losses during transmission & distribution of electricity and natural gas.

1% come from **agriculture.** — This primarily involves non-energy emissions from crops & livestock (e.g., methane & nitrous oxide emissions from fertilizers).

42% come from transportation.

These emissions are primarily caused by energy consumed from on-road vehicles (cars, trucks, buses, etc.), and also includes emissions from aircraft, rail, and marine vessels, construction equipment, landscaping equipment, and recreational vehicles (like boats and snowmobiles).

24% come from residential energy consumption.

These emissions are from the energy used to heat, cool, and power with electricity the homes and apartments in the region.

16% come from commercial buildings energy consumption.

These emissions are from the energy used to heat, cool, and power with electricity the office buildings, retail establishments, and other commercial buildings in the region.

9% come from waste.

These include non-energy process emissions from landfills & wastewater treatment plants or septic systems.

7% come from industry.

These emissions include both industrial energy consumption (3%) and industrial processes (4%), which covers non-energy emissions from industrial activity and fugitive emissions from fuel systems (e.g., C02 from cement production, A/C coolants, & leakages).

HOW DOES CLIMATE POLLUTION CONTRIBUTE TO INJUSTICE IN THE REGION?

HOW DOES CLIMATE POLLUTION CONTRIBUTE TO INJUSTICE IN THE REGION?

HOW DOES CLIMATE POLLUTION CONTRIBUTE TO INJUSTICE?

As the impacts of climate change become more apparent, so has the fact that these impacts are not experienced equally among people or communities. In fact, the low income and disadvantaged communities (LIDAC) that have historically contributed less per person to the energy consumption and GHG emissions that are the drivers of climate change are the most impacted by the negative impacts of shifting climactic patterns.[3]

Low-income communities across the US tend to be more vulnerable to climate hazards due to neighborhood conditions like quality of infrastructure, health care, and social capital. So disadvantaged communities often have limited resilience or community capacity to adapt or bounce back from the negative impacts of climate related events.[4]

In Buffalo Niagara, many new residents (especially foreign-born immigrants and refugees) reside in the region's LIDAC areas.[5] Preparing the region for the prospect of welcoming more people displaced by climate impacts or other causes will require planning for how to safeguard the region's environmental assets and develop resilience at the local level, especially within disadvantaged communities.

The disparity between the proportionally low contribution to the causes of climate change and high exposure to the harms associated with climate change experienced by disadvantaged communities is central to the concept of Climate Injustice. Conversely, the term "Climate Justice" is used to refer to efforts to reduce these disparities by applying an equity lens to planning and decision-making related to climate action. This section seeks to identify areas of climate injustice within the Buffalo Niagara region and to set out guiding principles for integrating benefits for disadvantaged communities into climate action initiatives.

ANALYSIS OF CLIMATE INJUSTICE

1RF Climate Justice Working Group

Formed by **18 municipal and non-profit sector leaders** with strong professional or personal connection to disadvantaged communities within the region.

3 meetings over the course of the development of the PCAP.

The Working Group gave input on **climate justice issues and their locations** in the Buffalo Niagara region

Identified **guiding principles** for ensuring benefits to disadvantaged communities

This information was foundational to identifying and refining the **priority measures** identified in this plan.
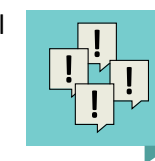
The Working Group had the opportunity to **review and provide feedback** on the analysis of climate justice issues and how the priority measures identified within the PCAP can most effectively **provide benefits for disadvantaged communities.**

LOW INCOME & DISADVANTAGED COMMUNITIES (LIDAC) IN BUFFALO NIAGARA

NYS CLCPA Disadvantaged Communities
Top 35th percentile of census tracts based on an index score combining 45 social/environmental/climate indicators.
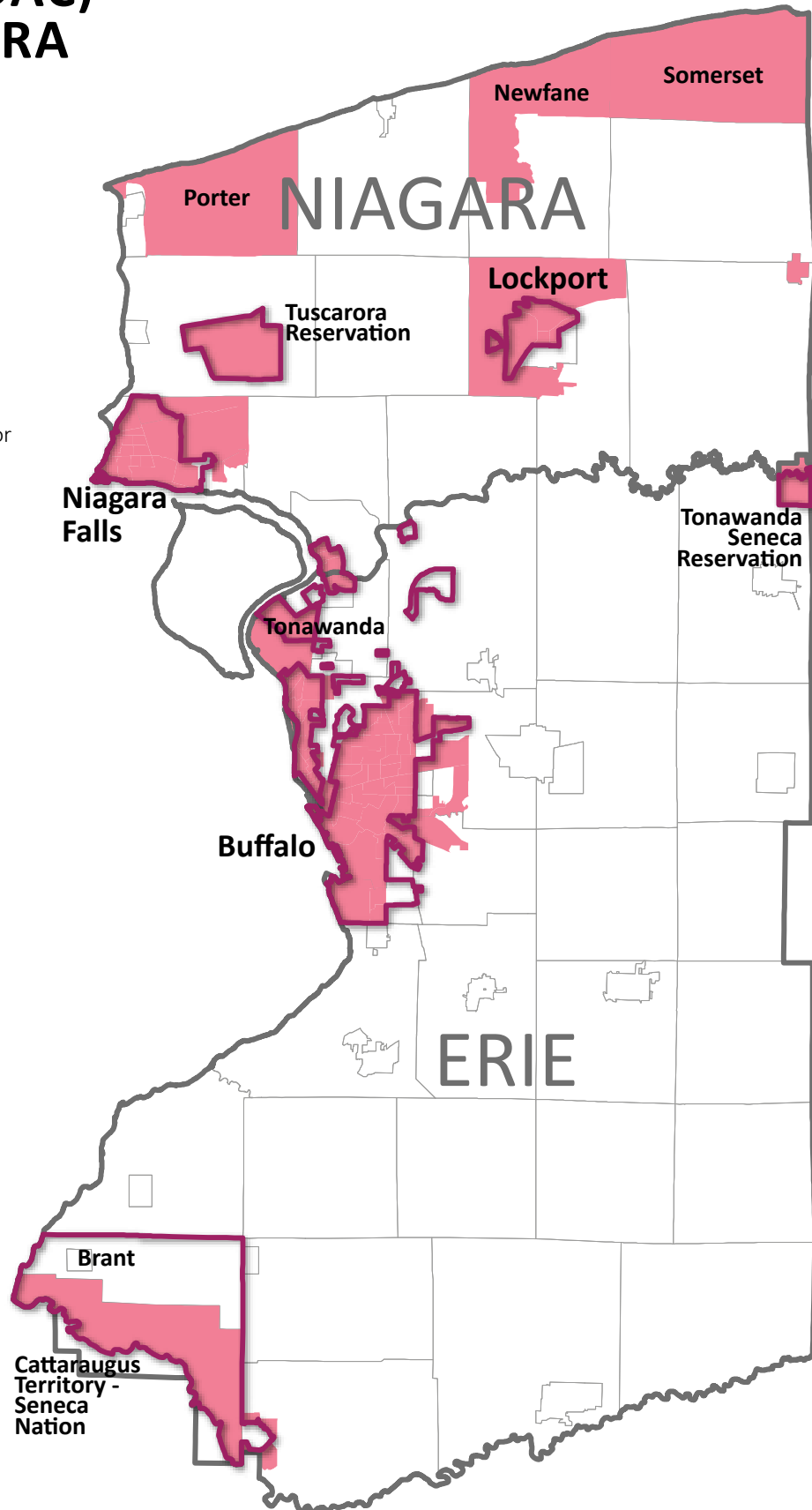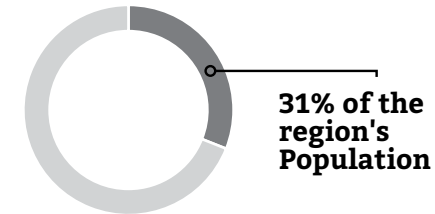
EPA Disadvantaged Communities
Census tracts with >90th percentile in one or more of eight social/environmental/climate categories and >65th percentile for low-income households.

To identify LIDAC census tracts for the analysis of climate justice issues in the Buffalo Niagara MSA region, two maps with distinct methodologies were considered: the **EPA's Climate & Economic Justice Screening Tool (CEJST) map** and **New York State's DAC map** developed in the roll-out of the Climate Leadership and Community Protection Act. Though there is considerable overlap in the census tracts and block groups identified as LIDAC via these two different methods, the NYS map includes several rural communities that are not on the CEJST map. For the purposes of this planning process, areas covered by either map are identified as LIDAC, which allows for the Buffalo Niagara's definition to be inclusive and considerate of the work used to define disadvantaged communities by New York's process.[6]

NIAGARA

Somerset
Newfane
Porter
Lockport
Tuscarora Reservation
Niagara Falls
Tonawanda Seneca Reservation
Tonawanda
Buffalo
ERIE
Brant
Cattaraugus Territory - Seneca Nation

LIDACs By the Numbers

365,263
LIDACs total population

31% of the region's Population

Sources: US Census, American Community Survey (ACS), 5-year estimates, 2022.

35%
less Median household income in LIDACs

than the regional median ($43,303 vs. $67,093)

Source: US Census, ACS, 5-year estimates, 2022.

Over half (52%) of LIDAC households are renters

Compared to 34% for the region overall

Source: US Census, ACS, 5-year estimates, 2022.

Residents in LIDACs are...

3.6x
...more likely to live in **poverty**

...more likely to **not have a household vehicle**

Compared to those living in other parts of the region.

Source: US Census, ACS, 5-year estimates, 2022.

Only
20%
of jobs in LIDACs **are held by people of color**

Source: US Census, LEHD, OnTheMap Application, 2021.

LIDACs make up
65%
of all the people of color that live in the region.

That is 186,756 total people of color living in LIDACs

Source: US Census, ACS, 5-year estimates, 2022.

Residents in LIDACs are...

1.5x		a home built **before 1960**
2.5x	... more likely to live in...	areas with **High Proximity to Superfund and Hazardous Waste Sites**
2.8x		areas near a **highway or high-traffic road**
15x		an area with **high asthma rates** (above the regional average)
35x		areas with a **high concentration of airborne toxins**

Compared to those living in other parts of the region.

Sources: US Census, ACS, 5-year estimates, 2022; US EPA, EJScreen Data, 2023; US Centers for Disease Control (CDC), PLACES, Asthma rates, 2021. See Endnote 7.

Behind the LIDACs Numbers

The areas designated as Low Income and Disadvantaged Communities (LIDAC) in Buffalo Niagara include the region's urban centers, but also encompass smaller cities, suburban areas, tribal territories, and several rural communities. These LIDAC areas reflect aspects of the region's history as a center of industry followed by decades of deindustrialization, and how these factors have impacted communities, the natural environment, and land use patterns in the present-day. This section features input from 1RF Climate Justice Working Group on some of the on-the-ground climate justice issues facing these places within the LIDAC map.

Buffalo's East Side (East Buffalo) covers over 1/3 of the area of the City of Buffalo. Rates of poverty within these neighborhoods are among the highest in the region.[8] Infrastructure for electrification is constrained, limiting some of the needed transition work in the area. The tree canopy in this area has been reduced over time, increasing heat island effects.[9] The Kensington Expressway (NY-33) is an urban freeway that cuts through East Side neighborhoods, impacting air quality, mobility, and quality of life.

City of Niagara Falls developed as a hub of heavy industry in the 19th Century, annexing the adjacent villages of Niagara and LaSalle over time. This led to an industrial zone between the three residential areas composed of a mix of active and inactive industrial sites, resulting in areas of blight, contamination, and continued emissions in close proximity to residential neighborhoods. There are several closed industrial landfills in the city, as well as an active waste incinerator.

Buffalo's West Side (West Buffalo) is located near the Interstate 190 and the Peace Bridge Plaza at the international border to Canada. The area has reported high levels of asthma and respiratory illness among residents, who are predominantly people of color, including many foreign-born residents.[10, 11] Electrical infrastructure on the West Side was also identified by the CJWG as a limiting factor for electrification of homes and cars.

Lockport (the City and parts of the surrounding town) contains numerous brownfields and EPA regulated sites from past and current industrial activity. Like other LIDAC areas, social and health outcomes are below regional averages, with some census tracts exceeding the 90th percentile nationally for low-income households, unemployment, and low life expectancy.[12]

City of North Tonawanda LIDAC area includes portions of the city's downtown, waterfront, and some residential neighborhoods that are in close proximity to numerous contaminated sites created by shuttered industries.[13]

Town of Tonawanda LIDAC area includes the town's industrial riverfront, which contains a mix of active and shuttered industrial sites. The former Huntley Coal Plant, within this area, was retired in 2015 and provides a regional case study in "just transition" that is still unfolding.

Rural communities of northern Niagara County, including parts of the towns of Porter, Newfane, and Somerset have been impacted by shoreline erosion due to storms and higher water levels in Lake Ontario. The town of Somerset also experienced significant economic impacts from the closure of the AES Somerset coal power plant.

Cattaraugus Territory of the Seneca Nation, Tonawanda Seneca Reservation and Tuscarora Reservation are territories of federally-recognized tribal nations. The US EPA consulted with tribal nations prior to listing their land on its disadvantaged communities map, and designated CPRG funds for tribal nations. The Seneca Nation of Indians accepted this funding and is currently developing its PCAP. CJWG members noted that the land reserved for tribal nations in our region throughout history has been of marginal value and geographically isolated, leading to ongoing health and infrastructural challenges.

The Town of Brant, north of the Cattaraugus Territory of the Seneca Nation, is also classified as a disadvantaged community by the EPA based on its percent of low-income population and high transportation barriers (time, cost).

KEY CLIMATE JUSTICE ISSUES IN THE REGION

Vulnerability to climate impacts manifests itself in many ways and throughout the course of everyday life. While the depth and extent of these challenges are far reaching, the One Region for Climate Justice Working Group identified five themes regarding climate risks that disproportionately impact disadvantaged communities (and populations) in Buffalo Niagara. In forming climate mitigation solutions for the region, addressing and acknowledging these issues is critical.

Older, Less Efficient Housing

Buffalo Niagara's housing stock is one of the oldest in the country. This is especially true in LIDAC areas where the median home is 17 years older than housing in the region as a whole.[14] The older homes in LIDAC areas, many which are wood framed and lack weatherization, pass on high energy cost burdens to residents.

Many of these homes still use radiant heat and are not easily converted for central air conditioning, so the impacts of extreme heat has a greater impact on residents in these areas. These problems are particularly challenging for renters, who are disproportionately concentrated in LIDAC areas. Even as rents rise in many LIDAC areas, CJWG members indicated that investments in weatherization and heating/cooling upgrades have been limited, as has regular maintenance and upgrades of homes/apartments.[15]

Car-centric Transportation System

Decades of sprawling development patterns with population stagnation have contributed to the region being overly dependent on personal vehicles for transportation, resulting in increased vehicular emissions. Compared to the region, households in LIDAC areas are nearly twice as likely to not have a car.[16] This limits residents' ability to access jobs, opportunities, and basic necessities.

Although the NFTA operates a light rail system and an extensive bus network (primarily serving the urban population centers), trips to employment destinations outside of the city often require long and burdensome commutes. This burden is also felt by many rural LIDAC residents without cars. Additionally, reducing vehicular emissions through the transition to electric vehicles may be a less realistic goal in disadvantaged communities due to the higher cost of EVs, necessitating a more holistic approach to multi-modal transportation (including infrastructure for cyclists and pedestrians) to enhance transportation sustainability within these communities.

Extreme Weather Vulnerability

A combination of institutional and infrastructural factors contribute to the greater climate-related vulnerability and harms suffered by disadvantaged communities in Buffalo Niagara compared to other communities, as evidenced by the disproportionate hardship and loss of life in disadvantaged communities during Buffalo's historic 2022 blizzard.[17] Contributing factors include an under-developed system of warming/cooling centers within disadvantaged neighborhoods and less reliable electrical infrastructure in areas such as Buffalo's East Side, along with the older housing and fewer transportation options discussed in this section. Loss of density in the urban tree canopy also exacerbates heat island impacts in urban neighborhoods, particularly on the East Side of Buffalo, where residents may face relatively higher temperatures in neighborhoods with fewer resources for their safety and comfort during extreme heat episodes.[18]

Negative Health Outcomes

The "social determinants of health" are factors related to the physical and social environment in which a person lives that contribute directly to individual and population health outcomes. There is a significant overlap between the location of disadvantaged communities in Buffalo Niagara and major sources of point and non-point air pollution, such as industrial sites and highway traffic, contributing to higher levels of asthma within LIDAC census tracts in the region.[19, 20] This effect is expected to increase as global temperatures become warmer.[21] Heat-related illness and death also affect disadvantaged communities unequally, and minority and low-income households are more likely than their counterparts to reside in areas where temperatures are projected to increase the most due to climactic factors.[22]

Loss of Greenspace

The conversion of undeveloped greenspace and agricultural land into new residential and commercial development replaces natural carbon sinks (in the case of forested greenspace and certain agricultural methods) and adds to new emissions from construction activities and the ongoing energy use of buildings. This phenomenon in Buffalo Niagara has been described as "sprawl without growth," because of the stagnation of the regional population over the past several decades that accompanied continual ex-urban expansion. This situation impacts residents of rural communities most directly, many of whom desire to maintain the rural and agrarian character of their communities, which in some cases has carried over to opposition toward siting renewable energy projects in these communities as well. As food production moves farther from population centers due to the loss of agricultural land, the regional food system becomes less efficient and less resilient, which may increase food insecurity among vulnerable households.

HOW CAN WE
ENSURING
CLIMATE ACTION
BENEFITS
LIDAC COMMUNITIES

A top-down approach to reducing regional greenhouse gas emissions runs the risk of exacerbating the economic and environmental inequities that exist within disadvantaged communities.

The 1RF Climate Justice Working Group was tasked with identifying a set of 'guiding principles' that can inform the design of projects and investments so that low-income and disadvantaged communities share in the benefits derived from future climate action. This process began with open-ended dialogue on this topic and over time the list of principles was categorized and condensed, with ongoing revision from the working group.

4 GUIDING PRINCIPLES

Achieve equitable goals through equitable processes.

Planning processes that seek to provide benefits for disadvantaged communities must center the knowledge and experience of people from these communities, promoting leadership and decision-making power from within the communities in question. Stakeholders who are not from disadvantaged communities should commit to listening and understanding the values and priorities of community members before taking action. When possible, projects or investments should be implemented in ways that address past harms to disadvantaged communities, in order to rebuild trust.

Focus on everyday needs of those who live in disadvantaged communities.

People will support climate initiatives that meet them where they're at and offer tangible benefits for their day-to-day lives, such as improvements to housing and transportation systems, job opportunities with good pay and benefits, and access to neighborhood amenities and services.

Build the green economy within disadvantaged communities.

Ensure that individuals from LIDAC areas have access to new "green" jobs through a focus on workforce development and policies to attract "green" employers to locate within these communities. Creating opportunities and building capacity for entrepreneurs and businesses within LIDACs to take advantage of new public funding can help to create a multiplier effect from investments in climate action.

Target action to lower-income communities.

Investments made within disadvantaged communities can provide benefits to, and invite utilization by, other groups as well, such as improvements to a transit system that primarily benefit lower-income households but can also attract those who normally travel by car to shift to transit as well. Place-based investments in LIDAC areas may lead to revitalization of areas that attract visitors and promote new economic activity. Removing cost barriers for lower-income households within LIDACs to participate in decarbonization or energy efficiency initiatives (through incentives and programs) is a key factor in broadening participation across all economic levels.

WHAT ARE SOME REGIONAL CLIMATE ACTION PRIORITIES FROM NOW TO 2030?

WHAT ARE SOME REGIONAL CLIMATE ACTION PRIORITIES FROM NOW TO 2030?

WHAT ARE SOME **CLIMATE ACTION PRIORITIES** FOR THE REGION?

82% OF GHG EMISSIONS ARE COMING FROM THREE SECTORS[23]
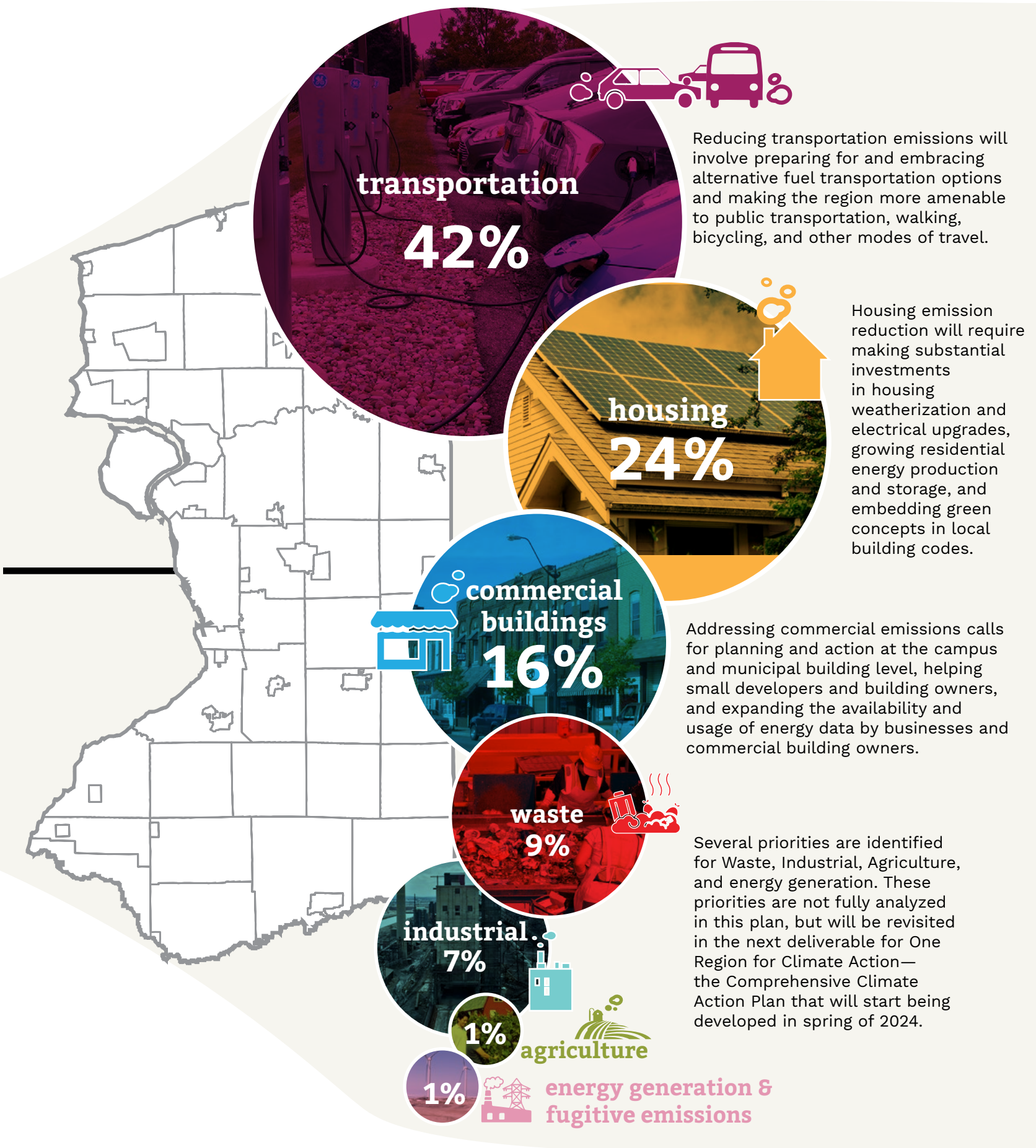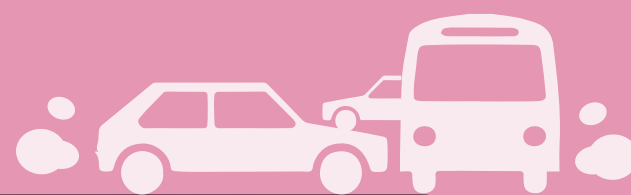
transportation **42%**

Reducing transportation emissions will involve preparing for and embracing alternative fuel transportation options and making the region more amenable to public transportation, walking, bicycling, and other modes of travel.

housing **24%**

Housing emission reduction will require making substantial investments in housing weatherization and electrical upgrades, growing residential energy production and storage, and embedding green concepts in local building codes.

commercial buildings **16%**

Addressing commercial emissions calls for planning and action at the campus and municipal building level, helping small developers and building owners, and expanding the availability and usage of energy data by businesses and commercial building owners.

waste **9%**

industrial **7%**

1% agriculture

1% energy generation & fugitive emissions

Several priorities are identified for Waste, Industrial, Agriculture, and energy generation. These priorities are not fully analyzed in this plan, but will be revisited in the next deliverable for One Region for Climate Action— the Comprehensive Climate Action Plan that will start being developed in spring of 2024.

Transportation

Transportation is the top source of climate pollution in the region—accounting for 42% of all GHGs emitted in 2010.[24] Reducing transportation emissions requires transitioning to efficient travel modes. The region has started this transition, but we continue to rely on fossil fuels for most of our travel.

While the shift to remote work reduced how much we drive since 2019, we drove nearly as much in 2022 as we did in 2011.[25] Due to the rise in remote work, fewer workers drive to work, but commuting by more efficient modes, like biking, walking and transit, is also down.[26] The region is becoming more bikeable, with 165 miles of bike lanes added since 2011.[27] Thousands of households have adopted electric vehicles, while municipal and public transit fleets have also added numerous electric vehicles.[28] However limited EV availability and affordability are persistent barriers to progress in this area.

Strategies to promote alternative transportation modes like public transit, zero emissions vehicles, innovative transportation options, and land uses that limit the need for personal vehicles, can help reduce transportation emissions. To accomplish the State's CLCPA goals and make our regional transportation system reliable, sustainable, and equitable will involve a combination of these strategies. This will require regional planning and collaboration, federal and state support, technical assistance, and active partnerships between local governments, residents, businesses, nonprofits, philanthropic organizations, schools and educational institutions, and community and environmental groups.

WHAT THE DATA TELLS US

We drive less than before COVID-19.

DAILY VEHICLE MILES TRAVELED (VMT) PER CAPITA, BUFFALO NIAGARA, 2010-2021

2010 — **21.7 miles**
2019 — **22.4 miles**
2020 — **17.2 miles**
2021 — **19.8 miles**
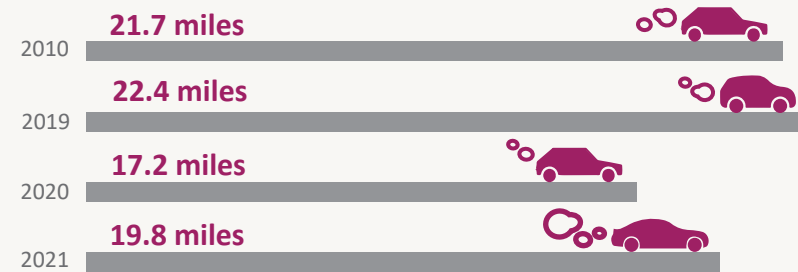
Sources: NYS Department of Transportation (DOT), 2024; US Census, 5-year estimates, 2022. See Endnote 29.

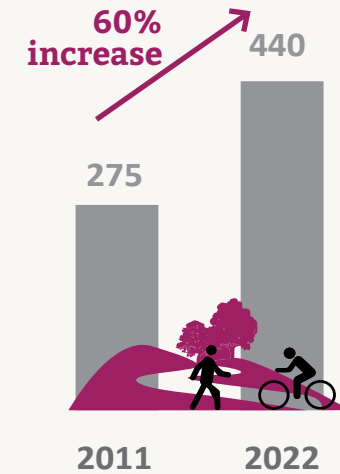## Compared to 2010, fewer workers are commuting by bike, on foot, or via transit.

% DECLINE IN # OF COMMUTERS, BUFFALO NIAGARA, 2010-2022

-8%
Walk or Bike

-19%
Public Transit
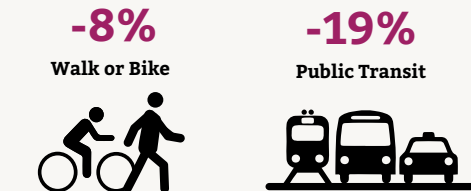
Sources: US Census, ACS, 2010 and 2022.

We added 165 miles of bike lanes and trails.

60% increase

275 (2011) → 440 (2022)

Source: GBNRTC, Bike Infrastructure data, 2022. Data does not measure the quality of bike lanes and may include lane miles that have worn away since installation.
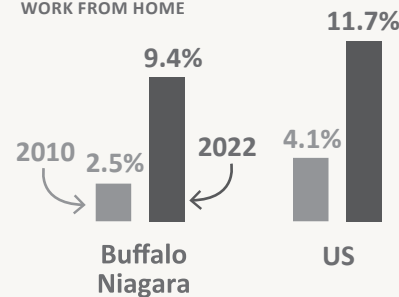

-56% in annual **public transit trips** from 2013 to 2022.

Source: US DOT, Federal Transit Authority, National Transit Dataset Public Agency Profiles, 2013 and 2022.

The share of workers who work from home since 2010, but the region still lags the US.

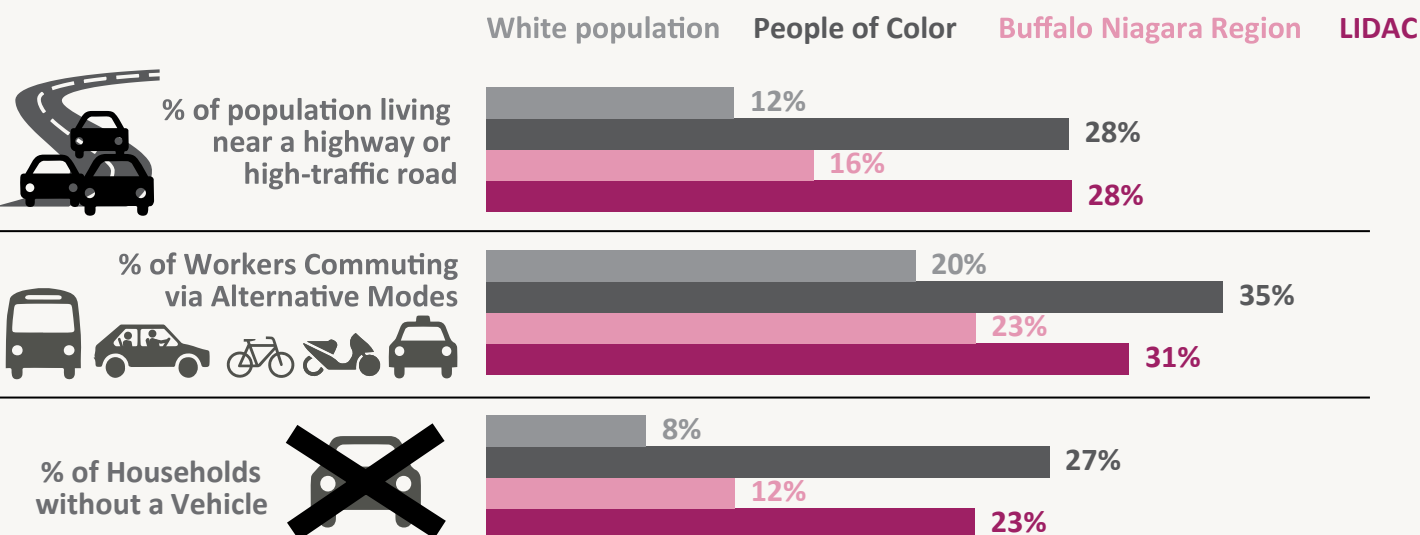**% OF WORKERS WHO WORK FROM HOME**

Buffalo Niagara: 2010 2.5% → 2022 9.4%
US: 4.1% → 11.7%

Sources: US Census, ACS, 2010 and 2022.

There are **72X more electric vehicles** in the region today than in 2011.

ELECTRIC VEHICLES AND PLUG-IN HYBRIDS REGISTERED IN BUFFALO NIAGARA

2011 | 121
2022 | 8,719

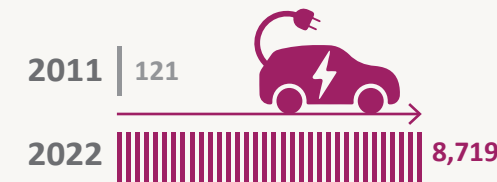Source: NYSERDA, EV Map, NYS DMV Vehicle Registrations, August, 2023.

People of color and LIDACs are less likely to use or have access to a car, but more likely to live near a high-traffic roadway that could pose health risks

White population | People of Color | Buffalo Niagara Region | LIDAC

% of population living near a highway or high-traffic road
- 12%
- 28%
- 16%
- 28%

% of Workers Commuting via Alternative Modes
- 20%
- 35%
- 23%
- 31%

% of Households without a Vehicle
- 8%
- 27%
- 12%
- 23%

Sources: US Census, ACS, 2022; IPUMS USA, 2022 (Alternative modes by race/ethnicity); US EPA, EJScreen, 2023 (living near highway/high-traffic). See Endnote 30.
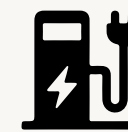
305 alternative fueling stations in Buffalo Niagara installed since 2010

307 total stations

Source: NYSERDA Alternative Fueling Stations, August, 2023.

THE CHALLENGE

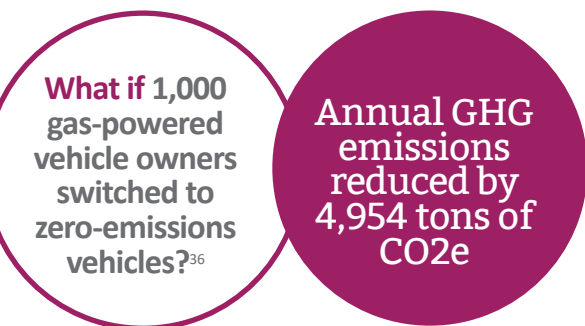|	Goals set by NYS	What this would look like in the region
By 2030…	All new light-duty vehicle sales and almost half of new medium- and heavy-duty vehicle sales will be zero-emission A substantial portion of personal transportation in urbanized areas will shift to public transportation	Each year, about 53,000 light-duty vehicles and 2,600 heavy-duty vehicles are purchased—100% would be zero-emission vehicles. Today, about 2% of new vehicles are electric.[31] Even if 39,500 more workers use transit to get to work, transit would account for only 10% of all work trips.[32]
By 2050…	Nearly all vehicles in NYS will have zero tailpipe emissions, and New Yorkers will have substantially greater access to low-carbon modes of transportation, including public transportation.	There are 866,360 registered vehicles in Buffalo Niagara, or 1.7 vehicles per household that would need to be converted to zero emissions. The share of the population living in areas with transit access would have to double for most residents to have access to public transit.[33]

HOW WILL WE GET THERE?

Transportation priorities

Make the region ready for transitioning to zero-emission vehicles.

With over 8,700 electric vehicles, the region is beginning to shift to zero emission vehicles.[34] But to achieve the CLCPA goal of transitioning virtually all personal vehicles to zero emission in the future, will require significant investments. Many individuals will need financial incentives and support to purchase low emissions vehicles. Increased availability of medium- and heavy-duty low-emission vehicles is also needed to meet existing market demand.

Shifting to electric vehicles also demands significant infrastructure investments. There are over 300 alternative fueling stations in the region, but nearly twice as many gas stations (598).[35] Along with personal automobiles, shifting non-road vehicles to zero emissions, like tractors, boats, and construction equipment will also require substantial planning, technical support, and funding.

What if 1,000 gas-powered vehicle owners switched to zero-emissions vehicles?[36]

Annual GHG emissions reduced by 4,954 tons of CO2e

We will need to...

Build implementation capacity.

To expedite vehicle electrification in our region, investments in infrastructure should be accompanied by public outreach to increase adoption of the new technology. Some key partners will be:

- County, and local governments to plan, finance, and implement infrastructure upgrades for EV charging.
- State government can encourage adoption of EVs by providing user-friendly rebates and incentives to consumers and municipalities.
- Non-profit partners to assist with community education about new technology and incentive programs.

Make this work for climate justice...

- Ensure new EV charging stations are distributed across the entire region, including within LIDACs.
- Expand criteria for incentives for low-income households to purchase EVs, including used or plug-in hybrid options.
- Prioritize grid-constrained neighborhoods for utility upgrades to allow for more EV charging capacity within LIDACs.
- Provide EV carshare programs in LIDACs, and establish incentives to encourage carshare services to transition their fleet to ZEVs.
- Create workforce development opportunities for underrepresented community members in regional EV manufacturing and associated jobs.
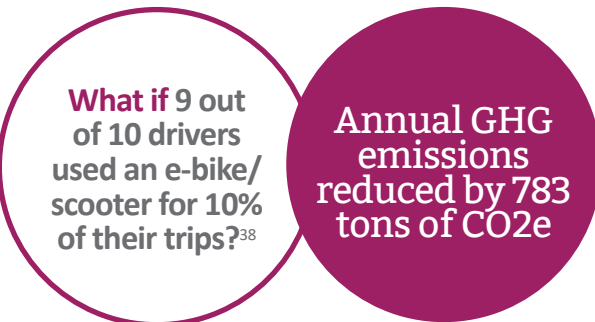
Set metrics.

- Increase the number of EVs on the road in Buffalo Niagara
- Increase the number of EV charging stations
- Aim for at least 1 EV charging station in each municipality in Erie & Niagara Counties

Track progress

- Track number of EV vehicle registrations from NYS DMV.
- Track EV charging station registries via NYSERDA EV Station Locator.

Continue to make the region more walkable, bikeable, and conducive to all forms of mobility (including emerging ones)

In addition to transitioning to zero emissions vehicles, the region needs to reduce Vehicle Miles Traveled (VMT) by providing safe and efficient means of active mobility as an alternative to vehicular travel. This will involve improving and maintaining bike lanes and sidewalks within and between urban activity centers and building more protected bike lanes and recreational trails. We currently have 185 miles of protected bike lanes and 256 miles of off-street trails.[37] It is also important to plan and design transportation options for emerging travel technologies, such as electric bikes and scooters that can contribute to reductions in VMT but can also fit uneasily within existing transportation systems.

What if 9 out of 10 drivers used an e-bike/scooter for 10% of their trips?[38]

Annual GHG emissions reduced by 783 tons of CO2e

We will need to...

Build implementation capacity.

Expediting projects and systems that make it easier and cost effective for residents to meet mobility needs without relying solely on the car will require coordination across many partners. Some key actors include:

- Local and county governments' departments of public works
- Greater Buffalo Niagara Regional Transportation Council
- GObike Buffalo
- Reddy Bikeshare, East Side Bike Library, and other micro-mobility initiatives

Make this work for climate justice...

- Engage with community members and use data to identify the areas within LIDACs with unsafe or inadequate biking and walking infrastructure and establish plans for improvements to be made.
- Continue to increase the miles of protected bike lanes and expand recreational trail network throughout urban and rural LIDAC areas.
- Collaborate with businesses and non-profit partners to locate affordable bike and e-mobility options within and around LIDAC areas.
- Partner with regional employers to provide incentives for employees who walk or bike to work.
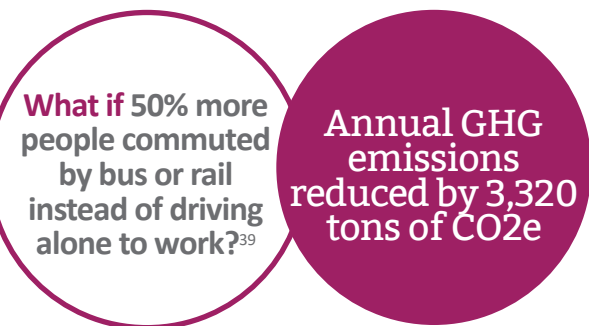
Set metrics.

- Decrease regional VMT
- Increase utilization of bike and e-bike sharing programs
- Increase miles of protected bike lanes and off-street recreational trails

Track progress

- Annual VMT data for Erie & Niagara Counties collected by GBNRTC.
- Track utilization of Reddy Bikeshare and other bikeshare services on an annual basis.
- GBNRTC Online Bicycle Map.

Expand the availability, efficiency, and prominence of public transportation in the region.

The Buffalo Niagara region is served by a system of public buses, paratransit, and a 6.4 mile light rail system. Existing NFTA-Metro transit service is concentrated in the region's densest centers of employment and population. In recent decades, sprawling development patterns have contributed to reduced densities and job growth in more remote locations without access to public transportation service. These conditions increase the region's reliance on cars for travel and resultant GHG emissions. Future investments in transportation should be complemented by land use and development policies that prioritize smart growth, transit-oriented development and urban densification.

What if 50% more people commuted by bus or rail instead of driving alone to work?[39]

Annual GHG emissions reduced by 3,320 tons of CO2e

We will need to...

Build implementation capacity.

To build a regional public transportation system that is energy efficient and an attractive alternative to car travel, the regional transit authority (NFTA) should continue to transition its fleet to low- or no-emissions vehicles and to add charging/fueling capacity. NFTA should also continue to make service improvements to align with residential and employment patterns, and develop 'special' services to connect residents with events and attractions. Public transit advocates and municipal partners should communicate to the public about the benefits of transit ridership versus car travel. Municipalities and the NFTA should collaborate to plan transit-oriented development along the Metro train line and bus routes within vital economic corridors.

Make this work for climate justice...

- Increase transit access and frequency to areas with newly concentrated employment activity and incentivize concentration of employment and transit-oriented development along existing transit routes, in collaboration with regional economic and workforce development agencies.
- The NFTA, GBNRTC, and workforce development partners should plan and implement new programs for "last mile" connectivity between transit stops and jobs/home, including e-mobility options.
- Invest in workforce development programs to train fleet mechanics and technicians who reside in LIDAC census areas.
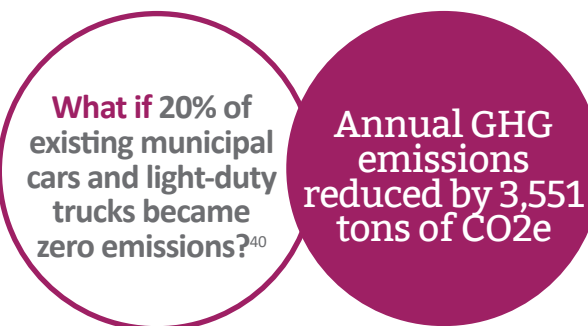
Set metrics.

- Increase NFTA ridership by 2030
- Transition the region's public bus fleet toward low- or no-emissions vehicles.

Track progress

- Track annual NFTA ridership data
- NFTA fleet inventory

Develop resources and capacity to help transition the fleets of local municipalities, transportation entities, and other local public agencies.

New resources and assistance will be needed to address infrastructural and market barriers to fleet conversion. EV options, particularly for heavy-duty and non-road equipment, are often more expensive and in short supply, and may be perceived as less reliable in extreme circumstances, so more resources could be channeled to research and development and scaled-up production of heavy-duty EVs. Planning tools and financial resources will be needed to equip municipal facilities with fleet charging infrastructure, along with workforce development for technicians. Education and technical assistance about fleet transition to municipal agencies will help to gain buy-in and address barriers.

What if 20% of existing municipal cars and light-duty trucks became zero emissions?[40]

Annual GHG emissions reduced by 3,551 tons of CO2e

We will need to...

Build implementation capacity.

Support for municipalities and public agencies to transition their fleets can be provided through a variety of measures:

- Utilities and state agencies can provide grant funding for fleet planning and installation of charging infrastructure.
- Expand technical assistance to municipalities through Clean Energy Communities or other initiatives.
- Invest in research and development within the academic and private sectors to continually improve heavy-duty and non-road EV performance.
- Pilot program opportunities for municipalities to "test run" new vehicles/equipment with lower risk and cost.

Make this work for climate justice...

- Residents of LIDACs should be recruited for workforce development and up-skilling opportunities for municipal fleet operators and technicians as new vehicle types and technologies are adopted.
- Capital improvement to public facilities should be implemented in ways that provide benefits to disadvantaged communities whenever possible, such as free or low-cost EV charging at municipal properties or enhancements to grid capacity at a neighborhood scale.
- Consideration should be given to funding applications for capacity building or capital improvements submitted by municipalities that are wholly or partly within LIDACs.

Set metrics.

- Aim for all municipalities in Buffalo Niagara to have a fleet conversion plan by 2030
- Increase use of lower-emissions heavy-duty and off-road vehicles by 2030
- Increase the number of light-duty EVs in municipal fleets by 2030

Track progress

- Data for tracking the targets for this measure could be obtained through the NYSERDA Clean Energy Communities fleet inventories that municipalities complete to gain points in the CEC program.

MOMENTUM TO BUILD ON

Active transportation options and the regional trail system are the focus of new planning initiatives and investments that will encourage non-vehicular travel, with additional benefits for public health and improved quality of life within neighborhoods as recreational options are built out. The East Side Trails project will improve two segments of multi-use trail in Buffalo's East Side, and connect them to the regional trail system.

Project lead: GObike Buffalo
For more information: https://gobikebuffalo.org/project_category/trail-greenway-planning/

The Cheektowaga Trails planning project is another significant active transportation project. It includes analysis of three sections of trail located in Erie County: The Scajaquada Creek Extension to Cheektowaga, Clarence Pathway Buffalo Extension, and the Lancaster Heritage Trail West Extension. These three trails, which have been identified as high-priority segments for the regional trail system, would close off-road trail gaps between the existing Lancaster Heritage Trail (Lancaster), Lehigh Valley Railroad Rail Trail in Cheektowaga, and the Clarence Pathway in Clarence.

Project lead: GBNRTC
For more information: https://gobikebuffalo.org/project/cheektowaga-trails-feasibility-study/

Bailey Avenue Bus Rapid Transit Corridor would construct bus rapid transit stations and streetscape improvements along Bailey Avenue, one of the most highly utilized transit corridors in the region, connecting northern and southern sections of the City of Buffalo. New battery-electric buses would be used to provide an express service in addition to the local route. The BRT projects is anticipated to increase ridership and catalyze economic activity along the corridor.

Project lead: NFTA

Building EV charging infrastructure is an ongoing process with multiple agencies involved. NYPA has an active EV Make-ready program that provides pre-work for EV charging during capital projects in parking areas, and installs and operates DC Fast-charging at business sites through host site agreements. Erie County's Department of Public Works has installed L2 charging at county-owned parks, which are well utilized.

Project lead: NYPA, Erie County DPW

Bus and shuttle service to special events and regional attractions help to alleviate traffic congestion and emissions from idling cars. The City of Niagara Falls has established the Discover Niagara Shuttle, a free shuttle service running between popular destinations within its National Heritage Area, and is seeking to expand the service to benefit both residents and visitors. The Niagara Frontier Transit Authority (NFTA) has added special routes to provide access to major sporting events, state and county parks, and throughout downtown Niagara Falls.

Project lead: City of Niagara Falls, NFTA
For more information:
https://www.niagarafallsusa.com/planning-tools/transportation/trolleys/;
https://metro.nfta.com/programs

Conversion of Public Transportation Fleet to Low or No Emission Vehicles is underway in Buffalo Niagara. The NFTA has begun electrification of one of its three garages and the buses based there. A second garage and its fleet operate on Compressed Natural Gas. The NFTA is currently scoping options for the conversion of its third garage for a low- or no-emission fleet. Future fleet conversions will allow the NFTA to increase the proportion of its fleet that are low- or no-emission vehicles, reducing GHG emissions and air quality impacts in the areas adjacent to bus routes and the garages.

Project lead: NFTA

EV Carshare programs provide individuals who don't own a car with the opportunity to affordably access a vehicle when needed. Mobility Development has implemented "community-controlled mobility networks" in cities across the country, including upstate NY, using a model that provides affordable carshare services as an extension of a city's transit system. This model seeks to make EV carshare accessible to lower-income households and to complement, rather than compete with, traditional transit services.

Project lead: Mobility Development Group
For more information: https://mdocarshare.org/

Expanding e-mobility options beyond cars is happening through the development of e-bike rental and bikeshare programs. Reddy Bikeshare, the region's public bike rental system is adding e-bikes at its rental stations to increase riders' range and the program's clientele. The same company operates an e-bike library in lower income neighborhoods that it is seeking to expand. The e-bike library partners with community organizations and ambassadors to ensure the program meets the community's needs.

Project lead: Shared Mobility Inc.
For more information: https://www.sharedmobility.org/ebike-libraries

Expressway Downgrades, such as the City of Niagara Falls (NY) has undertaken with the Robert Moses Parkway and LaSalle Expressway, can enhance the non-vehicular and recreational transportation system and reduce emissions by slowing traffic. The downgraded LaSalle Expressway and removal of sections of the Robert Moses Parkway has allowed the reconnection of Niagara Falls neighborhoods with the Niagara River shoreline and nearby amenities, and opened new opportunities for the development of parks and other waterfront attractions.

Project Lead: City of Niagara Falls
For more information:
https://niagarafallsusa.com/niagara-gorge-corridor-robert-moses-parkway-removal-main-street-to-findlay-drive-niagara-falls-new-york/

NFTA Metro Rail Expansion will expand Buffalo Niagara's existing Metro rail line northward to connect to areas of high residential density and emerging activity centers in the towns of Amherst and Tonawanda. The project creates opportunities for transit-oriented development near the rail corridor by providing a fast and easy transit connection between downtown Buffalo and the city's northern suburbs.

Project lead: NFTA

Transit-Oriented Development (TOD) creates areas of dense, mixed-use development in close proximity to transit to increase ridership and creating vibrant, walkable environments. GBNRTC and NFTA's "Comprehensive Transit-Oriented Development Strategic Implementation Plan-Planning Program Phase II Report," is guiding the development of TOD projects in Buffalo Niagara. These include upgrades to the region's light rail stations and surrounding blocks in downtown Buffalo and the Buffalo Niagara Medical Campus, as well as future plans for the DL&W Station on the city's waterfront, LaSalle Station area in partnership with the City of Buffalo, and the proposed Metro rail expansion to the towns of Amherst and Tonawanda.

Project Lead: NFTA, GBNRTC
For more information: https://www.gbnrtc.org

Transitioning municipal fleets to ZEVs is a challenge due to the range of duties that municipal vehicles must be equipped to handle. Many municipalities have taken advantage of grants from NYSERDA's Clean Energy Communities program to install EV charging at their facilities. Erie County DPW and Niagara County DPW have identified the need to undertake scoping studies to ensure that fleet electrification is handled in a well-planned fashion and that charging capacity meets demand as new EVs are added to their fleets.

Project lead: Municipal DPWs

Housing

Housing is the life blood of Buffalo Niagara and its communities. It represents 42% of the region's land area and over 493,000 households.[41, 42] Housing influences our health, shapes opportunities, and helps tell our region's history and its unique architectural heritage.

From a climate action perspective, our housing stock collectively represents one of the major sources of GHG emissions. It commands 24% of all energy consumed in the region to heat and cool residential spaces and water and to power appliances like stoves, refrigerators, air conditioners, computers, televisions, etc.[43]

Achieving measurable GHG emission reduction in the residential sector is no small feat. It means making significant investments in one of the oldest housing stocks in the country. It will involve working directly with tens of thousands of individual property owners, 64 municipalities, dozens of community based organizations, and more.

The scale (and likely cost) of such an effort is daunting, but we have lots of momentum to build upon. Each year, more than 3,000 residential energy efficiency projects and over 300 rooftop solar projects are completed in the region (on average).[44] Programs and incentives at the federal and state levels continue to grow, as does the capacity to support local implementation.

This section identifies some measures the region can aim toward over the next 6 years, looking toward 2030. Progress on these measures will enable the region to make significant inroads in GHG goals while also setting it up for long-term sustainability.

WHAT THE DATA TELLS US

% of Homes Built before 1960

Buffalo Niagara **56%**

73% LIDACs

US **27%**

More than **7 out of 10** houses within the LIDACs were built before 1960.

We have 2 times more houses built before 1960 than the US overall.

Source: US Census, American Community Survey, 2022

We've built homes in areas that are environmentally sensitive or with limited infrastructure access.

Homes built from 2011-2022

Outside of Urbanized Areas

On Forests Wetlands & Floodplains

4,033

3,770
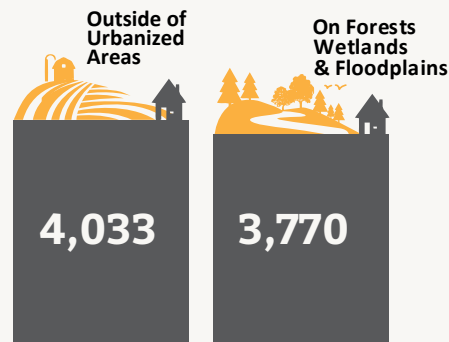
Source: UBRI analysis of NYS ORPTS Tax Parcel data, 2022; FEMA 100-year floodplains, 2015; NYS DEC Wetlands, 2015; US FWS Wetlands, 2015; USGS Land Cover data, 2021, US Census Urbanized Area (2010); Sewer districts from municipalities and counties (2013). See Endnote 45.

We build bigger homes for smaller households.

	1980-1989	2011-2022
AVERAGE SIZE OF HOMES	**1,845 SQ FT**	**2,227 SQ FT**
AVERAGE SIZE OF HOUSEHOLD	**2.8** people per household	**2.3** people per household

The homes we built since 2010 are **21% bigger than** those built in the 1980s. But the **average household size today is 18% smaller** than it was in 1980.

Source: US Census, 1980; ACS, 5-year estimates, 2022; NYS Department of Tax and Finance ORPTS, Tax Parcels, 2022. Home size numbers are for existing homes built from 1980 to 1989 and 2011 to 2022.

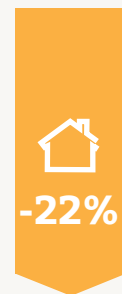## We are more likely to use gas for heat in our homes.

Nearly

9 out of 10 Homes
in Buffalo Niagara use gas for heat, compared to about half of homes across the US.

US   NYS   Buffalo Niagara

Source: US Census, ACS, 2022.

From 2010 to 2022, the number of **vacant housing** units in Buffalo Niagara **declined by 22%** and by twice as much in LIDACs (-44%).

-22%

Source: US Census, ACS, 2010 and 2022.

We are installing residential solar.

4,066
Residential Solar Projects, 2011-2023

192,361
Total Solar Panels Installed

66.3 Million
Expected KWh Annual Production

The same energy produced by burning 26,329 tons of coal.

Sources: NYSERDA, Solar Electric Programs, 2011-2023; US EPA, Greenhouse gas equivalencies calculator, 2024.

We are making our homes more energy efficient.

Energy Efficiency Projects in Existing Homes, 2011-2022

36,021
Housing Units

12.4 M
Annual kWh saved

Source: NYSERDA, Residential Existing Homes Program, Energy Efficiency Projects, 2011-2022.

THE CHALLENGE

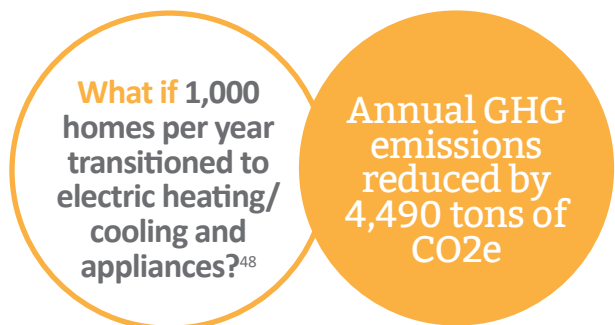|	Goals set by NYS	What this would look like in the region
By 2030...	Majority of new purchases for space and water heating will be **heatpumps**, with one to two million homes (statewide) using them Hundreds of thousands of additional homes (statewide) becoming **efficiently electrified each year**	More than 65,425 homes should use heat pumps for space and water heating by 2030. That means more than 10,900 heat pumps would be installed each year for hot water tanks and heating/cooling systems. At least 1,090 homes would be electrified each year from now until 2030.[46]
By 2050...	**85% of homes will be electrified** with a diverse mix of energy-efficient heat pump technologies and thermal energy networks	422,900 existing homes should be electrified by 2050. That's more than all the homes in Erie County. On average, about 16,265 homes would need to be electrified each year to meet this goal.[47]

HOW WILL WE GET THERE?

Housing priorities

Large scale efforts to make our homes "ready" for electrification.

Most homes in the region rely on natural gas for space and water heating, and many also use it to fuel appliances (i.e. clothes dryers, stoves, artificial fireplaces, etc.). A large scale movement to transition away from natural gas in residential buildings (what is being called for by New York's Climate Leadership and Community Protection Act) will require incentives and subsidies that make integrating new technology fiscally attractive to homeowners, landlords, and renters. It will also require significant investments in the electrical capacity and weatherization for the region's housing stock.

Given the age of the region's housing stock, weatherization is a critical preliminary step to making heat pump technology work for residential heating and cooling and to not burden residents with high energy costs. Upgrades to service panels and installation of new circuits need to be made in many cases to prepare homes for the transition. Programs can help property owners make informed upgrades to their electrical systems and to purchase new appliances and heating/cooling systems before the old ones fail, saving money, preventing inconvenience, and promoting energy efficiency.

What if 1,000 homes per year transitioned to electric heating/ cooling and appliances?[48]

Annual GHG emissions reduced by 4,490 tons of CO2e

We will need to...

Grow implementation capacity.
The region includes 329,530 homeowners and nearly 168,000 renter-occupied housing units. Getting homeowners and landlords to participate in this action *en masse* will require extensive and well-resourced programming, incentives, and outreach. Some key partners will include:

• County and local governments
• PUSH Buffalo Sustainability Workforce Training Center
• WNY Regional Energy Hub and community based organizations
• HVAC and electric contractors and unions

This work should be coordinated with efforts to expand the transmission capacity and resilience of the region's electrical grid.

Make this work for climate justice...

• Many homes in LIDAC areas are inefficient, lack electrical capacity, and are led by householders with scarce resources to make upgrades. Programming needs to have resources specifically for property owners in LIDAC areas.
• Programs developed will need to engage community-based organizations and champions from disadvantaged communities to be part of the solution and invest in outreach and education to community members in these areas.
• Workforce development will need to create pathways for underrepresented groups to participate in weatherization, electrification, and policy development activities.

Set metrics.
Between 2024 - 2026, existing programs should be leveraged with the goal of identifying funding (and additional capacity) to scale up efforts between 2027 and 2030, including Erie County's proposal to integrate this concept into Community Development Block Grant programs.

Track progress
• Increase in weatherization activities performed
• Increase in homes using electric for heating/ cooling

Adopt building codes that make renewables and electrification the standard.

On average, approximately 1,600 residential building permits get issued annually across the 64 municipalities in Erie and Niagara counties.[49] Embedding "net zero" concepts (electrification, renewable energy, battery storage, etc.) into building codes can ensure all new housing that gets built contributes to goals of decarbonizing the housing sector. New York State's All Electric Building Law, which will require most new buildings in New York to use electric heat and appliances, instead of fossil fuels, will be a key player in this. However, there are additional building code and zoning measures related to solar panels, insulation, energy conservation, etc. that can come into play.

What if 80% of new residential units built over the next six years are net zero?[50]

GHG emissions reduced by 9,686 tons of CO2e by 2030.

We will need to...

Build implementation capacity.
Building and energy codes are adopted and enforced at the local municipal level. Although there are some municipalities that share code enforcement officers (which can create efficiencies), action for this measure will require enhanced capacity support for all local levels. Key partners may include:

• County and local governments
• NYSERDA and NYS Department of State
• UBRI Clean Energy Communities technical assistance team
• Associations of trades and code enforcement professionals

Make this work for climate justice...

• Integrate net zero into newly built or retrofitted affordable housing projects.
• Develop culturally-competent approaches to code enforcement that prioritize resident health and safety.
• Target new homes on vacant lots in disadvantaged communities.
• Create workforce development opportunities for underrepresented community members in the building trades and code enforcement field.

Set metrics.
Between 2024 - 2025, leverage existing outreach and programming of NYSERDA Clean Energy Communities to expand adoption of NYStretch and cultivate new capacity. From 2026 - 2030, develop expanded programming with dedicated staff in county government to support local code enforcement officers.

Track progress
• Increase in municipalities that adopt NYS's Stretch Code
• Increase in number of code enforcement officers who have completed training
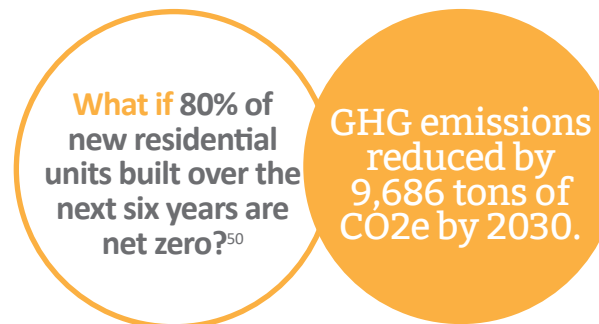
Expand residential energy production (i.e. solar) and battery storage.

Growing the use of residential energy production, primarily through roof and ground-mounted solar, will help the region's residences to get to net-zero and move toward energy independence. Coupling solar panels with energy storage systems allows homeowners to store excess energy for later use, providing a reliable power source even during cloudy days or power outages. This is especially important during times of energy crises or disruptions, which could be more common as winter storms become more frequent and severe in the region.

What if 5,000 additional homes installed solar panels to their roofs?[51]

Annual GHG emissions reduced by 38,897 tons CO2e

We will need to...

Grow implementation capacity.
This work will require working across the spectrum of public, private, and nonprofit sectors. Some key partners will involve:
- WNY Clean Energy Hub and Clean Energy Communities Technical Assistance teams
- Local municipalities and community-based organizations
- Workforce development agencies (i.e Northland Workforce Training Center)
- Electrical companies and solar installers
- Local unions (i.e. Buffalo and Niagara County Building and Construction Trades Council, IBEW Local 41)

Make this work for climate justice.
- Expand existing programs that prioritize community and rooftop solar for LIDAC areas.
- Continue growing the workforce development pipeline in the solar installation field.
- Ensure programs and incentives include a focus on benefits to renters, especially those in LIDAC communities.

Set metrics.

Start tracking rooftop solar installations (2024) through CPRG planning process; map out strategies and program alignments to grow installations (2025 - 2026); develop programming to support residential battery storage in the region (2027 - 2030)

Track progress
- Increase number of rooftop solar installations;
- Increase number of subscriptions to Community Solar campaigns

MOMENTUM TO BUILD ON

Western New York Regional Clean Energy Hub is a team of community-based organizations funded by NYSERDA to assist individuals, small businesses, and affordable housing owners with information and resources on clean energy, reducing energy use/costs, and making informed energy decisions. The program is specifically focused on supporting needs of low- to moderate-income communities.
Project lead: PUSH Buffalo
For more information: www. PushGreen.org

Erie County Low-Income Program for Sustainable Energy (ECLIPSE) creates solutions to reduce the energy burden for low and moderate income residents, increase access to clean, renewable energy, and promotes energy efficiency and weatherization. One aspect involves recruiting residents enrolled in the Housing Energy Assistance Program (HEAP) to participate in community solar.
Project lead: Erie County, NY
For more information:
www3.erie.gov/environment/ climate-action-and-sustainability Erie County, NY

PUSH Green Development Zone is a 25-block area on Buffalo's West Side that brings together sustainable affordable housing, community-based renewable energy projects, weatherization initiatives, green job training, green infrastructure, vacant land reclamation, and more.
Project lead: PUSH Buffalo
For more information: https://www.pushbuffalo.org/ green-development-zone/

NYS "Stretch Code" is a model energy code that can be adopted by municipalities that exceeds the energy efficiency standards of the base code for new building construction and renovation, allowing municipalities to achieve significant emissions reduction throughout their stock of housing and commercial buildings. NYSERDA provides training for code enforcement officers to assist with the understanding and enforcement of the code.
Project lead: NYSERDA

Community Development Block Grant and NYS Empower+ funds could be leveraged to support residential "make-ready" programs for low and moderate income households. Erie County is seeking to integrate energy efficiency goals within its CDBG program. The Empower+ program could be adapted to allow for upfront home electrical upgrades that are prohibitive when gas appliances are replaced at the time of failure.
Project lead: Erie County

Smart Growth & Infill Development can allow municipalities to capitalize on existing infrastructure and revitalized neighborhoods by focusing development on areas with vacant land or buildings. The City of Buffalo is conducting a planning effort sponsored by the NYS Department of State that looks at prioritizing housing and commercial development in areas of Buffalo's East Side with high rates of vacancy.
Project lead: City of Buffalo
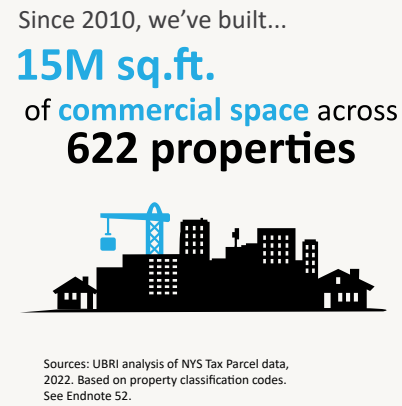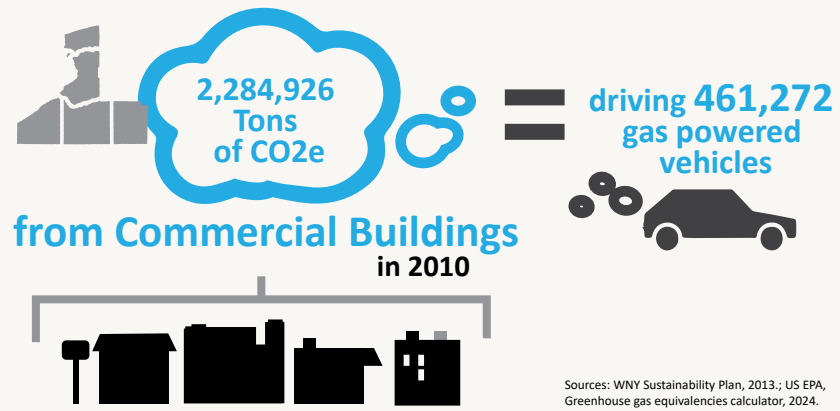
Commercial
buildings

Commercial buildings cover a wide range of uses in our region - offices, food stores, retail shops, restaurants, etc. - and for the purposes of this plan, it also includes medical facilities, municipal buildings, college campuses, and more.

Given the diversity of types, uses, size, and ownership structures involved in this sector, moving the needle on greenhouse gas emissions for commercial buildings will require significant investments/incentives and resources to support widespread implementation. Additionally, because this sector essentially involves buildings, some of the priority measures (and programming solutions) related to housing have a strong overlap with commercial buildings.

Focusing on the present through 2030, the region can look to continue to build momentum related to embracing energy efficiency, on-site renewables, electrification, and other decarbonization strategies in its commercial sector (as well as in education and municipal buildings). Priorities identified in this plan include expanding a focus on municipal buildings and campuses (educational, medical, etc.), supporting smaller commercial building owners to ensure they are equipped with the resources to move toward decarbonization, and expanding the use of data and technology for energy use management and tracking in the private sector.

WHAT THE DATA TELLS US

THE CHALLENGE

Our commercial building sector is a major source of GHG emissions.

2,284,926 Tons of CO2e

from Commercial Buildings in 2010
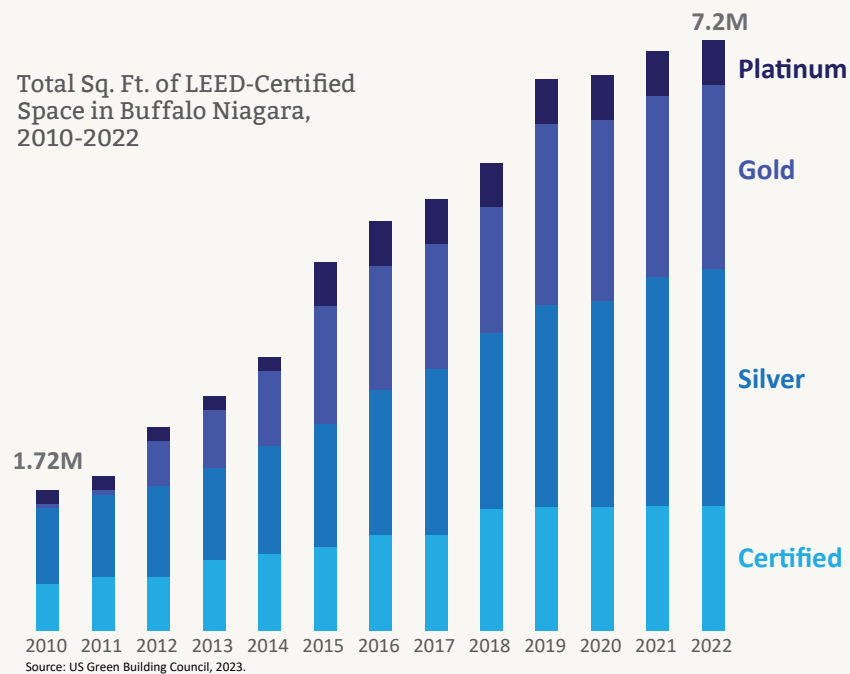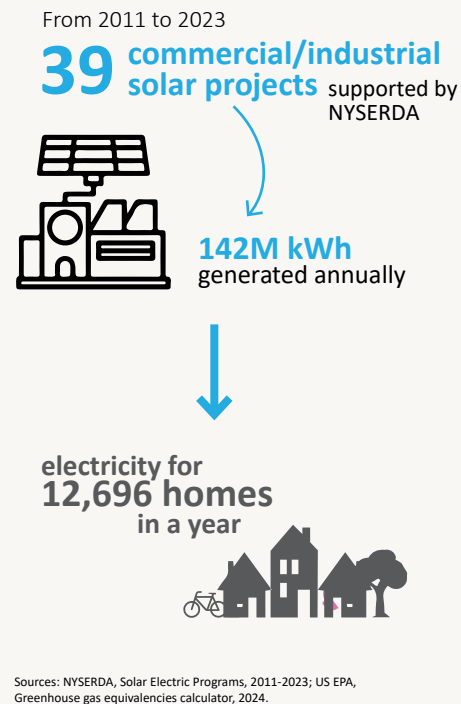
= driving **461,272 gas powered vehicles**

Sources: WNY Sustainability Plan, 2013.; US EPA, Greenhouse gas equivalencies calculator, 2024.

Since 2010, we've built...
15M sq.ft. of **commercial space** across **622 properties**

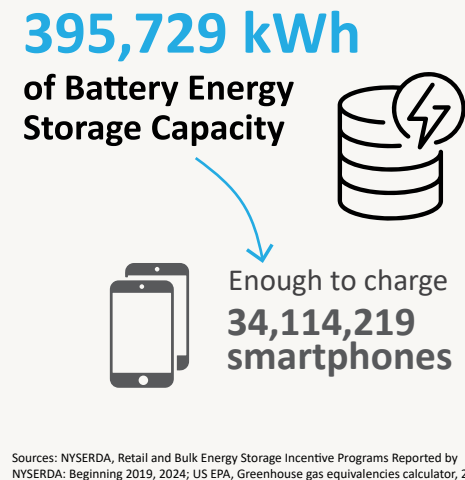Sources: UBRI analysis of NYS Tax Parcel data, 2022. Based on property classification codes. See Endnote 52.

We're making our commercial buildings more energy-efficient, increasing LEED-certified space by 4X since 2010...

Total Sq. Ft. of LEED-Certified Space in Buffalo Niagara, 2010-2022

1.72M

7.2M

Platinum
Gold
Silver
Certified

2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022

Source: US Green Building Council, 2023.

We're expanding commercial solar and limiting regional GHG emissions...

From 2011 to 2023
39 commercial/industrial solar projects supported by NYSERDA

142M kWh generated annually

electricity for **12,696 homes** in a year

Sources: NYSERDA, Solar Electric Programs, 2011-2023; US EPA, Greenhouse gas equivalencies calculator, 2024.

We are starting to unlock the potential for brownfields to generate renewable energy...

3 Brownfields/landfills with solar projects supported by NYSERDA since 2010

17.49 M kWh generated annually

same energy produced by burning **164 tanker truckloads** of gasoline

Sources: NYSERDA, Solar Electric Programs, 2011-2023; US EPA, Greenhouse gas equivalencies calculator, 2024.

We are beginning to leverage battery storage to help stabilize the grid...

395,729 kWh
of Battery Energy Storage Capacity

Enough to charge **34,114,219 smartphones**

Sources: NYSERDA, Retail and Bulk Energy Storage Incentive Programs Reported by NYSERDA: Beginning 2019, 2024; US EPA, Greenhouse gas equivalencies calculator, 2024.

|	Goals set by NYS	What this would look like in the region
By 2030...	10% - 20% of commercial spaces will use heatpumps for heating and cooling by 2030	3,792 to 7,583 commercial spaces should use heat pumps for space and water heating by 2030
	Hundreds of thousands of additional commercial buildings (statewide) becoming **efficiently electrified each year**	At least 4,924 commercial spaces would be electrified each year[53]
By 2050...	**85% of commercial spaces will be electrified** with a diverse mix of energy-efficient heat pump technologies and thermal energy networks	32,229 existing commercial spaces should be electrified by 2050[54]

HOW WILL WE GET THERE?

Commercial priorities

Plan and implement decarbonizing of campuses and municipal buildings.

The region is home to twelve colleges and universities and hosts hundreds of municipal and school buildings with facilities in each city, town, and village in the region.[55] Continuous efforts to weatherize, electrify, and decarbonize these public or non-profit spaces presents a tremendous opportunity to reduce energy costs of these entities. Additionally, because these types of buildings are places where the public and students come to learn or access services, there is an opportunity to integrate educational components about what clean energy technology can mean in terms of cost savings, environmental impact, and other benefits.
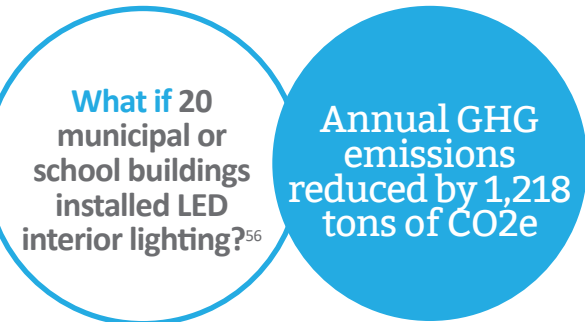
We will need to...

Grow implementation capacity.
Taking advantage of resources, funding opportunities, and best practices will benefit from coordination and shared learning among:
- Local and county governments
- Clean Energy Communities technical assistance team
- Colleges and universities
- WNY Sustainable Business Roundtable
- Medical campuses

Make this work for climate justice...
- Prioritize municipal buildings, especially community centers and schools, in LIDAC areas and integrate community resiliency programming as part of these investments.
- Identify opportunities to extend benefits from campus investments into surrounding communities.
- Find ways to pass on energy cost savings generated by investments in public buildings to LIDAC communities.

Set metrics.
Between 2024 - 2026, leverage Clean Energy Communities program to catalyze implementation; between 2027 - 2030, supplement CEC programming with other opportunities; get all colleges, universities, and schools engaged in decarbonization planning.

Track progress
- Increase in colleges/ universities with sustainability plans
- Increase in number of municipal buildings undergoing energy efficiency and decarbonization activities

What if 20 municipal or school buildings installed LED interior lighting?[56]

Annual GHG emissions reduced by 1,218 tons of CO2e

Assemble the financial supports and technical assistance to help commercial buildings move toward decarbonization.

37,917 commercial spaces exist across the region - on Main streets, commercial corridors, downtowns, office parks, etc.[57] Though moving commercial spaces to the type of heating/cooling/cooking technology called for by New York State will be a challenge felt by all commercial property owners, it will be especially difficult for small businesses, small scale developers, and individuals owning commercial buildings. These challenges will be even more pronounced along commercial corridors in LIDAC communities. Concerted efforts to support these property owners and help them navigate tax rebates, incentives, and the technical requirements associated with this transition will be essential.
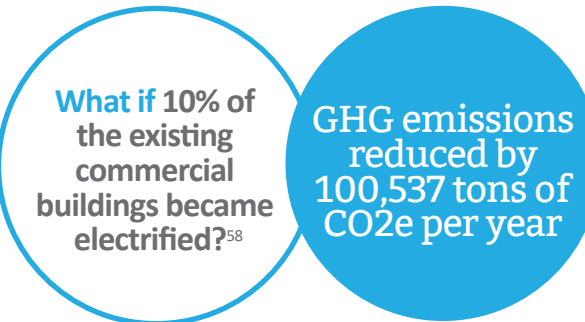
We will need to...

Grow implementation capacity.
Some of the partners that can be instrumental in advancing this work include:
- Community based organizations and business associations
- NYS Housing and Community Renewal
- Economic development agencies
- Local municipalities

Existing opportunities available through NY Green Bank and Commercial PACE programs can be leveraged by businesses and developers to finance building decarbonization and renewable energy projects.

Make this work for climate justice...
- Pair decarbonization investments with existing programming to rehabilitate commercial buildings on corridors in LIDAC areas.
- Engage community-based organizations and champions from disadvantaged communities in outreach and program implementation.
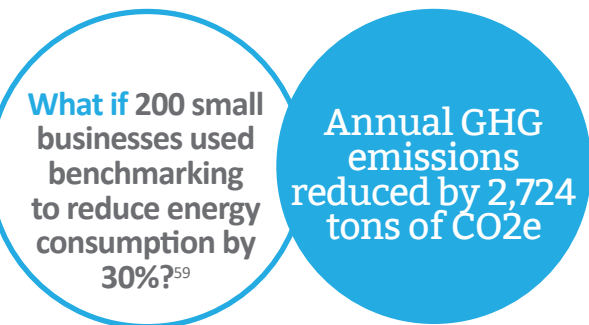- Cultivate workforce development and M/WBE opportunities for implementation.

Set metrics.
Between 2024 - 2026, existing programs should be leveraged with the goal of identifying funding (and additional capacity) to scale up efforts between 2027 and 2030.

Track progress
- Increase in # of commercial buildings using electrified heating/ cooling systems.

What if 10% of the existing commercial buildings became electrified?[58]

GHG emissions reduced by 100,537 tons of CO2e per year

Grow the use of renewable energy generation and energy benchmarking in private buildings and businesses.

Employing data and tracking energy usage can be instrumental to identifying measures to make buildings more efficient and estimate short- and long-term cost implications of such investments. Through the practice of "benchmarking," many municipalities are embracing this concept, which not only allows energy usage to be tracked, but also estimates the impact energy usage (and efficiencies) have on GHG emissions. While some communities have adopted legislation that requires building owners to participate in benchmarking, even a campaign that promotes the voluntary adoption of energy tracking in privately owned commercial buildings could help move the region toward goals set out by CLCPA. It can also be promoted as a tool that allows businesses to demonstrate to its customers, employees, and community at large its commitment to climate action.

What if 200 small businesses used benchmarking to reduce energy consumption by 30%?[59]

Annual GHG emissions reduced by 2,724 tons of CO2e

We will need to...

Grow implementation capacity.

Getting businesses to adopt (and see the benefit of) benchmarking will require outreach and technical assistance. Some partners could include:

- WNY Sustainable Business Roundtable
- WNY Regional Energy Hub and community based organizations
- Business Support Organizations (i.e. Exchange at Beverly Gray)
- UB Sustainability
- Clean Energy Communities technical assistance team

Make this work for climate justice...

- In developing programs and outreach, create focused implementation goals and approaches for helping businesses in LIDAC areas.
- Develop programming that provides energy audits and technical assistance for benchmarking adoption for LIDAC communities.

Set metrics.

Between 2024 - 2026, work to develop plan and campaign to advance private sector benchmarking; between 2027 and 2030, implement program, including technical assistance to support benchmarking adoption.

Track progress

- Increase # of businesses adopting benchmarking
- Increase # of municipalities adopting legislation encouraging energy benchmarking

MOMENTUM TO BUILD ON

Municipal Benchmarking through Clean Energy Communities program is a preliminary step towards reducing energy use that allows municipalities to measure and share data on buildings energy use over time. This data serves as a decision-making tool for how to cut energy waste and costs within the operation of municipal buildings. Nineteen municipalities in Buffalo Niagara have participated in energy benchmarking through the CEC program, and Niagara County is developing plans to conduct energy audits across its municipal buildings.

Clean Energy Upgrades at Municipal Buildings have been implemented at various scales at sites across the Buffalo Niagara region. Erie County DPW is approaching the completion of the electrification of its Board of Elections building, having disconnected from a steam boiler system. It also replaced all propane heating systems at its county parks buildings with air source heat pumps, and has solicited funding to install a green roof and solar array at its flagship library building in downtown Buffalo. Numerous other municipalities have installed energy-efficient lighting fixtures and heating/cooling systems through the Clean Energy Communities program.

WNY Sustainable Business Roundtable is a group of business leaders from within the Buffalo-Niagara region that focuses on identifying and implementing sustainable business practices. The group is strategic for disseminating promising practices related to reducing energy consumption to the business community, and creates a network of support for businesses seeking to create efficiencies and move toward decarbonization.

University at Buffalo Clean Energy Master Plan lays out a plan for the electrification of the university's South Campus over the next decade, which will include a district geothermal heating/cooling system. The plan is already underway in four active buildings. UB has also adopted a Decarbonization Plan to identify opportunities to reduce energy consumption and emissions, and is expanding its portfolio of on-site solar on North Campus to complement its award-winning "Solar Strand."

Buffalo Niagara Medical Campus Microgrid is a concept that was studied in 2017 to address grid constraint, provide clean energy, and add resilience to ensure uninterrupted operations of the healthcare and research facilities within the BNMC and parts of the adjacent Fruit Belt community. The proposed project would utilize energy efficient HVAC technology, renewables, energy storage, alternative fuel/generation, and controllable loads.

Though these additional sectors collectively represent less than 20% of regional GHG emissions, they provide important opportunities for regional climate action.[60] These sectors and priority actions will be explored in greater depth in this process's next phase, to start in the spring of 2024.

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AGRICULTURE/ OPEN SPACE

Conserving and promoting open/green space and trees can contribute to carbon sequestration, or the process of removing CO2 from the atmosphere and storing it in "sinks," like forests and vegetation. Agriculture processes related to the cultivation, management, and processing of livestock and crops can generate GHG emissions. Exploring ways to limit agricultural emissions will be looked at in the Comprehensive Climate Action Plan, to start in 2024.

INDUSTRIAL

p 58

The region's industrial sector represents 7% of measured greenhouse gases.[62] This sector can contribute to regional decarbonization efforts by increasing efficiencies in their processes and relying on energy storage to address demand. Industrial processes often require high intensity energy demand at a moment's notice, and grid coordination/ smart grids and load shifting can help mitigate these demands on the larger electrical grid.

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POWER GENERATION

Buffalo Niagara is known for renewable power generation through hydroelectricity at Niagara Falls and the Robert Moses Hydropower Facility in Lewiston, but we will increasingly need to focus on developing additional renewable energy sources to support regional goals to decarbonize the electric grid. These developments should prioritize brownfields and former industrial sites in order to help preserve our natural spaces and agricultural resources.
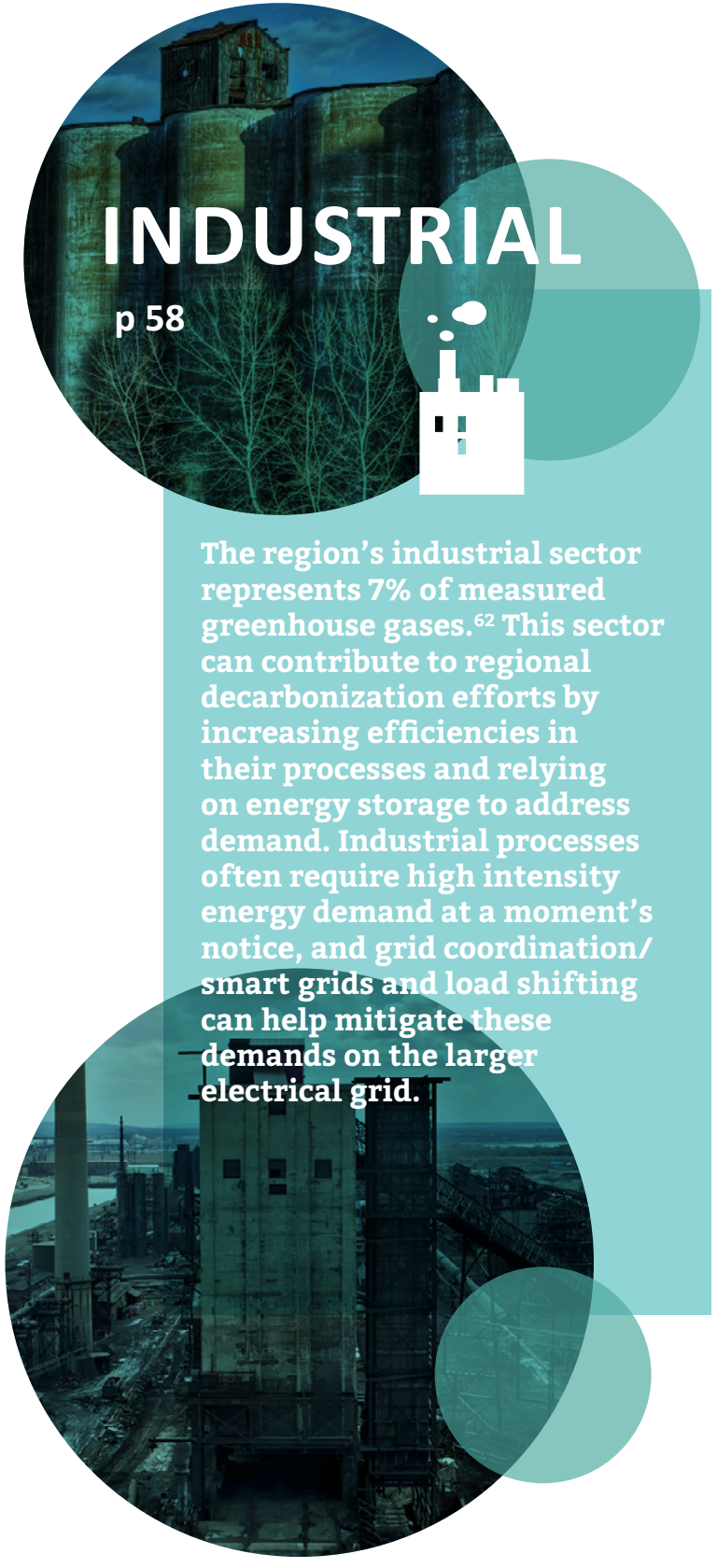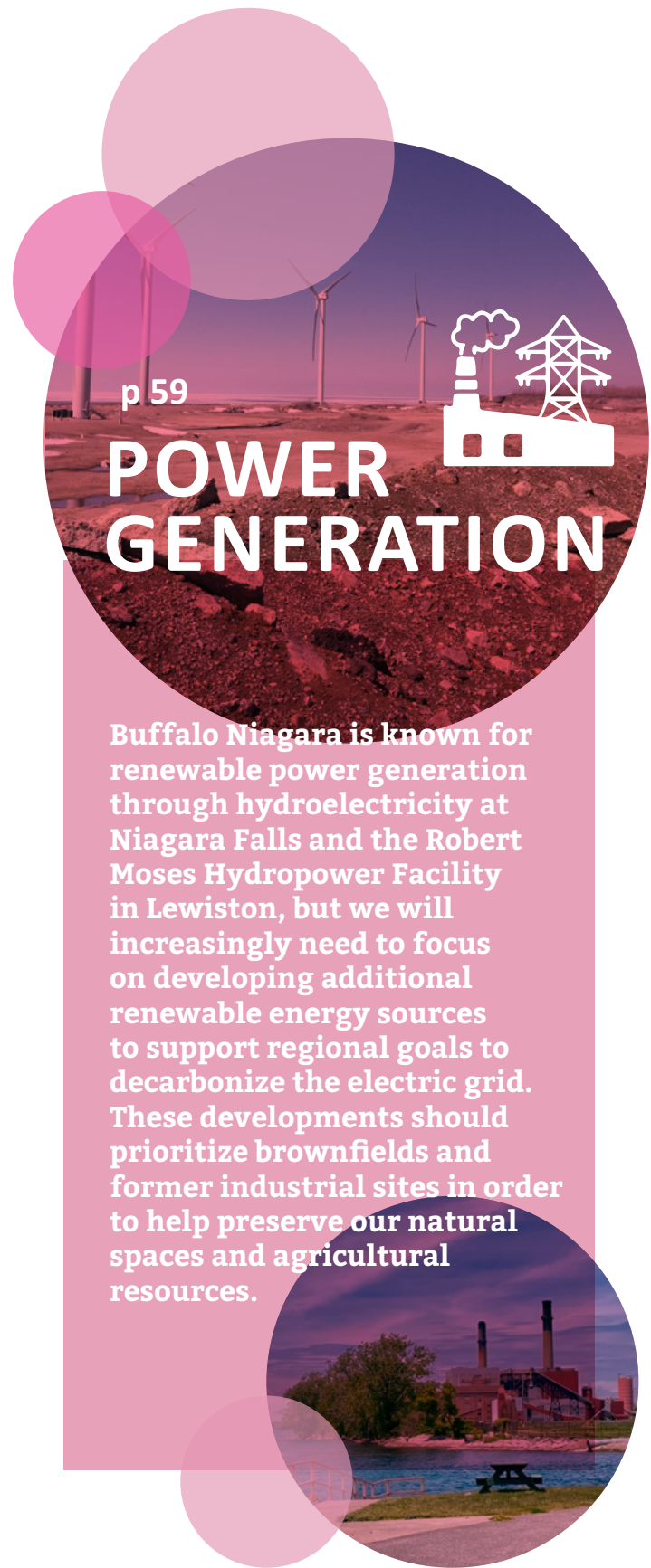
p 54

WASTE

Solid waste accounts for 9% of regional emissions.[61] One of the main sources of waste emissions comes from methane created when organic materials decompose in landfills without sufficient oxygen. Methane is also a major off-gas of wastewater treatment. Growing the use of organic composting and wastewater co-generation (the process of re-using waste to generate bio-gas to fuel wastewater treatment activities) represent some priorities between now and 2030.

WASTE

 priesities

Make organic collection a standard part of local residential and commercial waste management.

The composting of organic waste is beginning to take off in the region as several municipalities, including the City of Buffalo, have begun pilot programs to collect organic waste (i.e. food scraps) to be composted. Given the funding parameters supporting these efforts, these programs only have the capacity to serve a very limited amount of residences on a trial basis.

Looking to 2030, the region should aim to scale up efforts to significantly reduce the amount of organic waste that reaches landfills and releases methane into the atmosphere. This could involve municipalities adopting a full scale curbside collection program, expanded organic waste drop-off sites, and workforce development and entrepreneurial efforts to build the infrastructure needed to scale up.

Grow the use of cogeneration among wastewater treatment facilities in the region.

The region's wastewater treatment facilities account for the largest municipal energy burden over all other municipal facilities. Many of the energy demands are due to outdated, and oversized facilities built to handle quantities of wastewater for much larger populations. Maintenance and upgrades to these facilities are costly and do not always make the facilities more efficient due to the oversized nature of the region's wastewater treatment facilities.

Due to their processes, there is an opportunity to reduce purchased electricity while reducing harmful methane gas emissions by encouraging methane gas capture for on-site energy production. Some facilities may capture enough methane gas to completely offset their purchased energy consumption, and would save taxpayer dollars by reducing the cost of operations for local municipalities. By allowing co-generation at wastewater treatment facilities and including on-site renewable energy generation, we have a major opportunity to reduce GHG from the region's waste stream.

MOMENTUM TO BUILD ON

Residential Food Scraps Recycling Program is a collaboration between Farmer Pirates and the City of Buffalo that provides curbside pickup of food scraps and other organic waste. The program has been rolled out as a pilot, and now has a waitlist of potential participants in some districts. Erie County DPW has recently developed an Organics Management Plan, with NYS Climate Smart Communities funding, and is seeking to establish organic waste drop-off sites in five municipalities across the county.

Project Lead: City of Buffalo and Farmer Pirates Compost

For more information:
https://www.farmerpirates.com/scrapitcurbside

The Tool Library is a local non-profit organization that provides an array of tools that members can borrow for household projects, along with training and resources to repair household items as an alternative to replacement and diverting waste from landfills. These programs seek to foster a model of 'circular economy' that promotes equitable distribution of resources, reduced consumption, and increased community resilience.

Project Lead: The Tool Library
For more information:
https://thetoollibrary.org/

Niagara County Re-Use Center is a project envisioned by the Niagara County DPW to establish a center where residents could drop off household items and appliances that could be repaired, diverting them from the waste stream. The program would generate income by re-selling the refurbished items at low cost, and would incorporate job training for community members employed in the repair and resale process.

Project Lead: Niagara County DPW

Co-generation at Buffalo's Wastewater Treatment Plant is a process that captures methane generated from anaerobic digestion of wastewater to use as fuel for incineration of the solids that result from the treatment process into ash, later in the same process. This process avoids the need to burn excess methane into the air without using its energy. The Buffalo Sewer Authority has also identified the future possibility of generating hydroelectricity by installing turbines at outflow points where treated water from the plant is discharged into the Niagara River.

Project Lead: Buffalo Sewer Authority

Environmental Justice Corps is an NY AmeriCorps service and job training program, run by The Service Collaborative of WNY, in collaboration with the Buffalo Center for Health Equity and Buffalo Sewer Authority. Each year 20 members are employed to help install and maintain green infrastructure within the City of Buffalo. These installations help the city to manage stormwater runoff, reducing combined sewer overflows and reducing the energy requirements for sewer system pumping stations.

Project Lead: The Service Collaborative of WNY
For more information:
https://www.tscwny.org/eoc

AGRICULTURE/ OPEN SPACE

priorities

Advance landscape scale conservation efforts and agricultural protection to maximize carbon sequestration opportunities and prevent sprawl.

Land conservation and agriculture protection play critical roles in sequestering carbon, preserving biodiversity, and limiting sprawling development often correlated with higher transportation and residential emissions. Organizations like the WNY Land Conservancy employ a variety of tools to conserve land and ensure it does not get developed in perpetuity.

Increasingly, land conservation organizations have focused efforts on strategies that consider projects across large, interconnected areas or landscapes. Known as "landscape-scale conservation," this approach can have even greater contributions to climate mitigation (and resilience/adaptation) goals.

Farmland protection strategies can take many forms including agricultural zoning and buffer zones, agricultural conservation easements, and more. Both counties have active farmland protection plans and boards that play important roles in prioritizing the conservation of prime agricultural lands in the region.

Expand the tree canopy in urban areas to mitigate extreme heat and sequester carbon.

Once known as the "City of Trees," Buffalo (and other regional urban areas like Niagara Falls) include numerous neighborhoods with significant gaps in their tree canopies. These trends are more pronounced in LIDAC areas, where neighborhoods are not afforded the same quality of life and cooling benefits that luscious tree canopies offer in more affluent areas.[63]

Beyond aesthetics and quality of life, trees can absorb carbon dioxide (CO_2) from the atmosphere and store it as carbon in their roots, stems, leaves, and branches. Known as carbon sequestration, this process can be maximized by planting the right types of trees and committing to their health, maintenance, and longevity.

Campaigns and programs focused on re-treeing underserved areas should be launched and integrated into other types of projects, including streetscape enhancements, green infrastructure investments, and more.

MOMENTUM TO BUILD ON

The WNY Wildway is a landscape-scale conservation initiative led by WNY Land Conservancy to create a network of protected lands and corridors from the Allegheny Plateau of Appalachia to the Great Lakes and beyond. The project has mapped out the most intact and climate-resilient core areas of natural land in the eight counties of WNY and identified the corridors or linkages that wildlife use to move between them. Through partnership with municipalities, non-profit organizations, and private landowners, this initiative will preserve large sections of the region's forests for carbon sequestration and ecosystem services.

Project Lead: WNY Land Conservancy

For More Info: https://www.wnylc.org/wnywildway

State and federal 30x30 legislation commit the federal government and New York State to the conservation of at least 30% of its land and water resources, ensuring significant carbon sequestration and maintaining environmental services. The Western New York Environmental Alliance has envisioned a campaign to raise awareness of 30x30 legislation among the public and elected officials, and strategizing action for municipalities, non-profit partners, and academic researchers to ensure the 30x30 goals area fulfilled.

Project Lead: WNY Environmental Alliance

For More Information: http://www.wnyea.org/30-x-30.html

WNY Farmland Access Support Network is an initiative led by Providence Farm Collective that seeks to preserve farmland and enable future generations of small-scale farmers from diverse communities to access agricultural land. The program promotes emissions reductions through sustainable agricultural practices and a stronger local food system and carbon sequestration by preserving agricultural land and rural greenspace from development pressure leading to sprawl.

Project Lead: Providence Farm Collective

For More Information: https://providencefarmcollective.org/

Urban Forestry initiatives are slated to expand through USDA grants awarded to the City of Buffalo and Erie County. These programs will engage with community partners to support nursery and tree-planting operations with a focus on workforce development and restoring the urban tree canopy to minimize heat island impacts. The Erie County Department of Environment and Planning recently developed a Tree Management Plan that was intentionally aligned with the county's Heat Mitigation Plan to lay out a roadmap for these activities.

Project Lead: City of Buffalo Bureau of Forestry, Erie County Department of Environment and Planning

For More Information: https://www.buffalony.gov/358/Bureau-of-Forestry; https://www3.erie.gov/environment/

INDUSTRIAL

priority

Promote the use of renewable generation, demand management and energy management planning for industrial users.

Industry and manufacturing are important to the region's economy. They also can demand intense energy use throughout the day for operations and processes. Demand management techniques can allow for the energy used at industrial sites to be consumed more efficiently even in high-demand situations, such as during extreme heat events when air-conditioning use is at its peak.

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 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.

MOMENTUM TO BUILD ON

Energy management plans adopted by energy-intensive industries within the Buffalo Niagara region have been used as a tool by NYPA and municipal partners to promote energy efficient practices, and as a requisite to access affordable hydroelectric power through NYPA.

Lead Organization: NYPA

For More Info: services.nypa.gov/Services/Power-Programs/Hydropower

POWER GENERATION
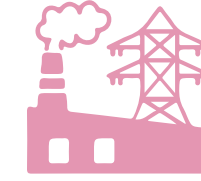
priority

Build grid resilience and grow the amount of renewable distributed energy generation with a focus on brownfields and former industrial sites.

As more buildings and vehicles turn to electricity for their energy source, the demands on the existing grid will grow. The region will need to continue to study, expand, and optimize the use of distributed renewable energy to meet growing demand, increase resilience, and reduce transmission losses.

Balancing open space and farmland goals with the climate and economic benefits of solar and wind energy development is a regional priority. Buffalo Niagara will need to continue encouraging development of renewables on marginal lands, brownfields, and rooftops while protecting prime farmland, and encouraging the use of agrivoltaics where practicable. It will be important for local municipalities to work with utilities and other partners to identify strategic locations for renewable energy development. It is also important that proposed new energy production facilities be examined and analyzed for potential impacts on waterways and ground water.

Distributed energy generation may also lead to increased grid resiliency, as projections show climate change could drive increases in temperature and precipitation patterns and exacerbate a range of extreme weather events such as heat waves, flooding, and storms resulting in high wind gusts and icing. All of these extreme weather events may pose a threat to our current electrical grid, adding further value of distributed energy production.

MOMENTUM TO BUILD ON

Strategic siting of solar arrays is being advanced through several initiatives, all of which seek to preserve prime agricultural land in rural communities for agricultural production and develop solar arrays on land with fewer viable future uses. Niagara County has partnered with NYSERDA's Build Ready program to identify capped landfills with the potential to host solar arrays. The City of Niagara Falls has identified urban brownfields and power line corridors as potential solar sites. Erie County's Department of Environment and Planning has proposed a pilot program to install solar arrays on parking shelters in large parking lots, using incentives for developers or property owners.

Project Lead: NYSERDA Build Ready Program, Niagara County, Erie County

For More Info: https://www.nyserda.ny.gov/All-Programs/Build-Ready-Program

Renewable Energy Workforce Training is being advanced by a collaborative effort across four SUNY institutions, led by the UB Center for Industrial Effectiveness. The initiative raises awareness of renewable energy career opportunities and education paths for underrepresented groups and displaced workers in Western New York through collaboration with employers, workforce boards, organized labor, and community-based organizations.

Project Lead: University at Buffalo Center for Industrial Effectiveness

For more information: https://www.buffalo.edu/tcie.html

HOW CAN WE BUILD CAPACITY TO IMPLEMENT?

Implementing the priorities outlined in this plan at the scale and scope needed to make significant GHG emission reductions will be no small feat. It will require substantial investments, planning, program development, technical assistance, and outreach/education. As highlighted in this document, there are plenty of agencies and organizations across the region working on these issues who can lead and contribute to implementing these priorities. But scaling up will require expanding capacity, broadening the tent of organizations working in this space, and building new (or strengthening existing) collaborations.

This document does not provide a prescriptive roadmap for how this gets done, nor does it assign tasks to specific entities to take ownership of implementation. Rather, the plan is designed to set out some priorities for climate action, assess the needed authority to implement, and offer some key overarching strategies to advance this work.

1 Leverage County government to implement new programming

County governments are uniquely positioned to help their local municipalities advance this work, even as they embrace climate mitigation strategies in their own governmental operations. In Erie County, the Department of Environment and Planning has made substantial commitments to being a leader in regional climate action. Niagara County is also committed to climate action that can reduce energy consumption, and alleviate tax burdens for its residents and businesses. Through this planning process, both governments have identified some priorities for implementation in their respective counties and expressed interest in finding ways to work together when feasible.

Erie County is exploring leveraging Community Development Block Grant (CDBG) funds to support LIDAC participants to take better advantage of existing State and federal clean energy and weatherization resources, as well as prepare homes for electrification through a "Make-Ready" initiative. If funded, this program could be a scalable model to be replicated across the State and country. Erie County is also looking to develop programming that can assist the code enforcement officers across its 43 municipalities with energy code compliance, enforcement, and NYStretch energy code adoption.

While there are opportunities for Niagara County to collaborate with Erie County on these initiatives, Niagara County has also identified needs specific to its own operations and its communities. This includes: planning needs to assess current public sector buildings and municipal fleets to determine opportunities to decarbonize and save energy costs; exploring electric grid load and capacity for electrifying residences (particularly in LIDAC areas); enhancing its successful brownfield redevelopment program by integrating prioritization of renewable energy (i.e. solar arrays) on former landfills to limit large solar projects on prime agricultural land; and developing a reuse facility that can accept quality used items for refurbishment and resale back into the community.

Continue regional technical assistance programs to support municipal action 2

New York State has invested in regional climate action technical assistance teams through NYSERDA's Clean Energy Communities and NYSDEC's Climate Smart Communities programs. The regional coordination teams are housed at the UB Regional Institute and work with more than 40 municipalities across the two county region. Continuation of these programs will help municipalities implement many of the priorities identified in this plan.

3 **Expand capacity in community-based organizations to advance this work in LIDAC areas**

Advancing climate justice will require significant and continued investments in programs, incentives, and capital improvements in LIDAC areas. It will also require expanding the capacity of existing community-based organizations to work with end users: residents, businesses, property owners, and more. The WNY Clean Energy Hub is positioned well to serve as a lead for this work. Scaling up will likely require continued funding and support so that it can grow and expand its reach, capacities, and network of community-based organizations it works with. Building out the ecosystem to support implementation in LIDAC areas also means supporting projects like the Open Buffalo Urban Ecology Center, and other initiatives that advance the priorities identified by the 1RF Climate Justice Working Group.

Build and fund existing collaborations to support pressing gaps 4

For some priorities identified in this plan, the capacity supports in the region are either not being tackled already or are inadequately funded to make the impact called for in the CLCPA. As an example, promoting smart growth and development that does not require as much use of the automobile is a massive undertaking. It requires zoning, land use and transportation planning, etc. Even as some entities work on aspects of this issue, such as GObike Buffalo's work to make the region more bikeable and walkable, there is a need for more expansive support to advance smart growth. Another example involves capacity to support communities to move toward clean fleets. Though the NYSERDA Clean Energy Communities program provides some limited support for this, the scale and scope of this challenge calls for a dedicated program or collaboration focused on working with municipalities, school districts, public authorities, and transit agencies on fleet conversion.

5 **Develop large-scale outreach and communications strategies**

Across all of the priorities, outreach, communications, and education need to be front and center. Even as the general public becomes more aware of (and exposed to) the impacts of climate change on everyday life, the solutions are complicated and are often met with concerted disinformation efforts intended to sow confusion. Akin to a public health campaign, a broad based communications strategy that identifies education and outreach actions, determines target audiences, sets goals and objectives, and identifies barriers is needed. Such a campaign could utilize funding to create informational programs for all sectors of the community, including individuals, businesses, not-for-profit organizations, and local municipalities. Where applicable, the programs could build off existing programs, such as the EPA Myths vs. Facts sites that are geared toward debunking climate action misinformation. Additionally, such programming would need to invest heavily in on-the-ground outreach and culturally and linguistically relevant approaches to ensure all segments of the region are reached.

DATA SOURCES AND NOTES

What are the sources of GHG in Buffalo Niagara?

1. Intergovernmental Panel on Climate Change (IPCC), 2023: Summary for Policymakers. In: Climate Change 2023: Synthesis Report.Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 1-34, doi: 10.59327/IPCC/AR6-9789291691647.001

2. US and NYS emissions from US Environmental Protection Agency (EPA), GHG Inventory Data Explorer, 2010. Region emissions from WNY 2013 Regional Sustainability Plan, 2010 GHG Inventory.

3. IPCC, 2023: Summary for Policymakers. In: Climate Change 2023: [H. Lee and J. Romero (eds.)], pp. 5, 31.

4. Gamble, J.L., et al. (2016). Ch. 9: Populations of concern. In: The impacts of climate change on human health in the United States: A scientific assessment. U.S. Global Change Research Program, Washington, DC, p. 252.

5. US Census, American Community Survey (ACS), 5-year estimates, 2022. 55% of the region's foreign born residents that came to the US after 2010.

6. Low Income Disadvantaged Communities (LIDACs) in this plan include all census tracts identified as potential disadvantaged communities by NYSERDA or the US EPA. NYSERDA used 45 indicators to designate census tracts in New York as disadvantaged communities. https://climate.ny.gov/Resources/Disadvantaged-Communities-Criteria

The US EPA developed the Climate and Economic Justice Screening Tool (CEJST) to identify census tracts as LIDACs for the Climate Pollution Reduction Grants (CPRG). https://screeningtool.geoplatform.gov/

Buffalo Niagara LIDACs also include additional block groups that are at or above the 90th percentile for any of the US EPA's EJScreen's Supplemental Indexes as LIDACs, as suggested by the US EPA for CPRG recipients. More on EJScreen's Supplemental Indexes is here - https://www.epa.gov/ejscreen/ej-and-supplemental-indexes-ejscreen

Erie County LIDACs: Census Tracts: 1.1, 2, 5, 10, 11, 14.03, 14.04, 15, 16.01, 16.02, 17, 19, 23, 24, 25.02, 27.03, 27.04, 28.01, 28.02, 29, 30, 31, 33.01, 33.02, 34, 35.01, 35.02, 36, 37, 38, 39.01, 40.02, 40.03, 41, 42, 43, 44.01, 44.02, 47.01, 47.02, 50, 51, 52.02, 55, 56, 57, 58.01, 58.02, 59, 61, 67.01, 69.01, 69.03, 69.04, 70, 71.02, 71.03, 71.04, 83, 84, 91.12, 101.02, 102.02, 103, 104, 105, 107, 109.02, 110, 113, 114, 123, 124, 125.01, 156, 163, 164, 165, 166, 167, 168.01, 168.02, 170, 171, 172, 174, 175.01, 9400, 9401, 9803, 9805; Block Groups (BG): Tract 9 BG 2, Tract 53 BG 2, Tract 66.01 BG 3, Tract 77 BG 2, Tract 78 BG 2, Tract 80.01 BG 3, Tract 82.02 BG 5, Tract 87 BG 4, Tract 91.07 BG 1, Tract 91.15 BG 3, Tract 93.01 BG 3, Tract 162 BG 1, Tract 169 BG 3

Niagara County LIDACs: Census Tracts: 202, 203, 204, 205, 206, 207, 209, 210, 211, 212, 213, 214, 217, 220, 223, 225, 226.01, 226.02, 230.01, 231, 232, 234.01, 235, 236, 237, 238, 240.02, 241.02, 242.02, 245.02, 9400.01, 9401; Block Group 2 in Tract 221

7. Areas with high-asthma rates are those above the regional average (12%), based on US CDC Places Data. Areas of highly concentrated airborne toxins (ranked in the top 20th percentile of all block groups in the US) determined by EPA's EJSCREEN Data (2023). This includes high-ranking measures for any of the following: (1) Particulate Matter 2.5 (PM2.5) concentrations, (2) Ozone concentrations, (3) Airborne toxics cancer risk, (4) Airborne toxics respiratory hazard index, (5) toxic releases to air. Areas with high exposure to superfund/hazardous waste sites are in the top 20th percentile for all block groups in the US in terms of proximity to Superfund sites or proximity to hazardous waste sites (EJ Screen); Population living close to a highway or high traffic road is given by EPA's EJSCREEN Data (2023) as being above the 80th percentile of all block groups in the US in traffic proximity and volume, based on the level of vehicular traffic nearby and distance from roads. More information on EJScreen here: https://www.epa.gov/ejscreen/technical-information-about-ejscreen

8. US Census, ACS, 5-year estimates, 2022. 33% of East Side residents live on incomes below the Federal Poverty Line, compared to 14% for the region.

9. Elizabeth Licata, "Inequity extends to Buffalo's tree canopy," The Buffalo News, July 31, 2023.

10. Centers for Disease Control and Prevention (CDC), National Center for Chronic Disease Prevention and Health Promotion, Division of Population Health PLACES: Local Data for Better Health, Census Tract Data 2023 release. Asthma rates are from 2021 data.

11. US Census, ACS, 2022. (People of color and foreign)

12. US Environmental Protection Agency EJScreen Mapping Tool, version 2.2, 2023.

13. NYS Department of Environmental Conservation (DEC), Chemical Bulk Storage Facilities program, 2023.

Key Climate Issues in the Region

14. US Census, ACS, 5-year estimates, 2022.

15. Ibid.

16. Ibid.

17. Charlie Specht, "A cascading failure blizzard that left tens of thousands without heat hit some in Buffalo," The Buffalo News, December 31, 2022; Juan-Pablo Velez, Steven Lapage, Max Shron, "How implementing the Climate Leadership & Community Protection Act will make Buffalo safer in future blizzards," Win Climate, 2023.

18. Licata, "Inequity extends to Buffalo's tree canopy," The Buffalo News, July 31, 2023.

19. US EPA EJScreen 2.2, 2023. (Proximity to pollution)

20. CDC, PLACES: Local Data for Better Health, Census Tract Data 2023 release. Asthma rates are 2021 data.

21. Climate Change and Social Vulnerability in the US: A Focus on Six Impacts. US Environmental Protection Agency, EPA, 2021 430-R-21-003. www.epa.gov/cira/social-vulnerability-report

22. Ibid.

23. WNY Regional Sustainability Plan, 2013. 2010 GHG Inventory.

Transportation

24. Ibid.

25. NYS Department of Transportation (DOT), VMT data, 2011-2022; US Census, ACS, 5-year estimates, 2011-2022. NYSDOT estimates annualized average daily vehicle miles traveled using on-road sensors and modeled estimates. VMT data are divided by total population (ACS) to estimate VMT per capita by year.

26. US Census, ACS, 5-year estimates, 2011 and 2022.

27. Greater Buffalo Niagara Regional Transportation Council (GBNRTC) Bike infrastructure data from 2011 and 2022. Calculated in ArcGIS (NY West State Plane Coordinate System).

28. NYS Department of Motor Vehicles (DMV), Vehicle Registrations, January 2024

29. NYS DOT, VMT; ACS. See note 24.

30. US Census, ACS, 2022 (Vehicles available, alternative modes by geography); IPUMS USA, University of Minnesota, www.ipums.org. (Alternative modes by race/ethnicity); US EPA, EJScreen, 2023 (living near highway/high-traffic). For the percentage of population living close to a highway or high traffic roads, see Endnote 7.

31. NYS DMV, Vehicle Registrations, January 2024. Annualized estimates based on number of registered 2023 and 2024 model vehicles in the region as of January 2024. EPA classifies vehicles as Light Duty (GVWR < 8,500 lb) or Heavy Duty (GVWR > 8,501 lb).

32. US Census ACS, 2022. Currently under 3% of workers commute by transit (15,835 workers). 39,457 additional transit commuters would be needed to reach a 10% share of all workers (55,382).

33. NYS DMV, Vehicle Registrations, January 2024. US Census ACS, 2022; 1RF Report Card (2018). In the 1RF Report Card, 25% of the region's population lives in areas accessible by transit (2015). This share would have to more than double for at least 50% of the population to have transit access (within ½ mile of a frequent service transit stop where wait times during peak weekday travel hours are less than 15 minutes).

34. NYS DMV Vehicle Registration data (2011-2022) accessed through NYSERDA EV Map. Alternative fueling stations: NYSERDA Alternative Fueling Stations, August, 2023.

35. NYS Energy Research and Development Agency (NYSERDA) Alternative Fueling Stations, August, 2023; Data Axle, Reference USA Business Database, 2024. Gas stations defined by SIC code (554101), includes convenience stores with gas stations.

36. US EPA, GHG Equivalencies Calculator, 2024. https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

37. GBNRTC, Bike Infrastructure data, 2022.

38. UBRI, "Methods to Estimate Environmental Impacts of E-bikes and E-scooters in Upstate NY." 2021. Assumes 89% of drivers replace 8.8% of VMT with an e-bike/scooter. Estimates of EMM trip replacement based on local survey data. Modeled using EPA Moves software. Represents net reduction in GHG emissions (i.e., factors for GHGs induced by e-bikes/scooters) of 710,275,733 grams of CO2e, or about 783 US tons, (0.4% of annual regional transportation emissions).

39. UBRI analysis of US Census, ACS, 2022, FHWA, NHTS, 2022, and CBO, 2022. The average commute time in Buffalo Niagara is 19.45 minutes (ACS, 2022). According to the National Household Transportation Survey (Federal Highway Administration, 2022), the average vehicle commute speed is 26.2 mph for similarly sized mid-Atlantic metros. These figures (average commute time and average commute speed) are multiplied to estimate the average daily commute length to be 17 miles two-way). A 2022 report from the US Congressional Budget Office titled "Emissions of Carbon Dioxide in the Transportation Sector," estimated per passenger mile emissions for various modes, including personal vehicles (0.47 lbs of CO2e), bus (0.39 lbs of CO2e), and rail (0.17 lbs of CO2e). These values are multiplied by the average daily commute length in miles to estimate the average daily commute emissions per mode. These values are multiplied by 260 (# of work days per year) to estimate the average annual emissions. The figure shown represents the difference in emissions between passenger vehicles and the average of bus-rail. This per person GHG reduction is multiplied by the increase in transit users to find total GHG reductions, or 50% of the region's 15,835 transit commuters (ACS, 2022).

40. UBRI analysis of NYS DMV, 2024; Oak Ridge National Laboratory, Transportation Energy Data Book: Edition 40, 2022; and EPA GHG Emissions Equivalencies Calculator; There are 3,236 light-duty cars and trucks registered to municipalities (registration class is PSD and vehicle weight is less than 8,500 lbs, NYS DMV, 2024). The ORNL Transportation Energy Data Book reports that there are 656,724 vehicles in the federal government's fleet which consumed a combined 367.78 million gallons of gasoline, or about 560 gallons of gasoline equivalent consumed per vehicle in municipal fleets. This number is multiplied by 20% of the light-duty vehicles in the region to estimate the total gallons of gasoline consumed by light-duty municipal fleets (560 *3,236 *0.2= 362,450). This estimate of total gallons consumed by light-duty vehicles registered to municipalities in the region is entered into the EPA's GHG Equivalencies Calculator to estimate the total GHG emissions reductions.

Housing

41. Erie and Niagara counties, Tax Parcel data, 2022. Based on land area of tax parcels classified as residential.

42. US Census, ACS, 2022 (households).

43. WNY Regional Sustainability Plan, 2013.

44. NYSERDA, Solar Electric Programs, 2011-2023.

45. NYS Tax Parcel data, 2022. Homes built since 2010 are selected by residential property class codes (200s) and year built. Numbers represent aggregate number of tax parcel points that intersect geospatial data: urbanized areas (US Census, 2010) or sewer districts (1RF, various municipalities, 2013); and 100-year floodplains (FEMA), forests (US Geological Survey. National Land Cover Dataset, 2021), or wetlands (NYS Department of Environmental Conservation (DEC), Regulated Wetlands, 2015; US Fish and Wildlife Service, National Wetland Inventory, 2015).

46. US Census, ACS, 2022. Based on number of households in the region. The region accounts for 6.5% of all households across New York State. Figures represent the region contributing an equal share (6.5%) to the statewide goals.

47. Ibid.

48. WNY Sustainability Plan, 2013, GHG Inventory; US Census, ACS, 2022; Pistochini, Dichter, Chakraborty, Dichter, and Aboud, "Greenhouse gas emission forecasts for electrification of space heating in residential homes in the US," Energy Policy 163 (2022). Pistochini et al (2022) estimate that, compared to gas powered heating/cooling systems, heat pumps reduce CO2 emissions by 60% or more in the Northeast region. The US Census, ACS shows that 415,136 households in Buffalo Niagara used natural gas for heat in 2010. The 2010 GHG inventory for the WNY Sustainability Plan estimated that 2,818,028 metric tons of CO2e are burned annually in the two-county region by using natural gas to heat/cool homes, or about 6.8 metric tons of CO2e per household. If 1,000 households reduced heating energy use by 60%, it would result in 4,490 US tons of CO2e (1,000*0.6*6.8) Metric tons are converted to US tons (1=1.10231)

49. US Census Residential Building Permits, 2019-2023.

50. WNY Sustainability Plan, 2013, GHG Inventory; US Census, ACS, 2022; and US Census Residential Building Permits, 2019-2023. See methods for page 40. The estimated average annual regional home energy use (6.8 metric ton of CO2e per household) is multiplied by 80% of the estimated homes that would be built in the region over the next six years, applying the average number of residential permits from 2011 to 2022 (1,618) (GHG reduction estimate = 0.80*1,600*6.8 metric tons of CO2e) .

51. NYSERDA Solar Energy Projects used to estimate the average annual kWh production from residential rooftop solar projects in the region. This is multiplied by 5,000 and the total energy produced in kWh is entered into the EPA GHG Emissions Equivalencies calculator to give the figure shown.

Commercial Buildings

52. Commercial properties built since 2010 are selected from NYS Tax Parcel Data (2022) by year built and property class codes (400s, excluding living accommodations (410, 411, 416)).

53. US Department of Housing and Urban Development, HUD Aggregated USPS Administrative Data On Address Vacancies, Q1, 2023. Includes all commercial addresses (vacant and occupied). Applies percentage goals to total number of commercial addresses in the region (37,917) and NYS (769,986). Buffalo Niagara makes up 4.924% of the total commercial addresses across NYS, so if 100,000 commercial properties were electrified statewide, the region would need to electrify 4,924 to meet its share.

54. Ibid.

55. National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), 2023. Number of 2- and 4-year degree granting institutions.

56. UBRI analysis of NYSERDA, Clean Energy Communities program tracker data, municipal building upgrades, 2023. The NYSERDA CEC program supported 17 projects where municipal buildings installed interior LED lighting and occupancy sensors. The average estimated annual GHG emissions saved for each of these projects was 60.9 tons of CO2e/year. This average value is multiplied by 20 to estimate the total GHG emission saved if 20 additional municipal buildings were to install LED interior lighting with occupancy sensors.

57. HUD Aggregated USPS Administrative Data On Address Vacancies, Q1, 2023.

58. WNY Sustainability plan, 2013. GHG Inventory data. Takes 10% of total commercial building emissions from the 2010 inventory and applies a 44% reduction on emissions. A 2020 ACEE report found that electrifying heating/cooling in commercial buildings can reduce GHG emissions by 44% (Nadel and Perry, "Electrifying space heating in existing commercial buildings: opportunities and challenges; American Council for an Energy Efficient Economy, Research report October 2020.)

59. US Department of Energy, Energy Information Administration (EIA), Commercial Buildings Energy Consumption Survey, 2018. The EIA Commercial Building Energy data shows that businesses with under 10 employees average 64,067 kWh in annual energy consumption. This number is multiplied by 200 and 30% to estimate the reduction in energy usage in kWh, and then converted to US tons of CO2e using the EPA GHG equivalencies calculator.

Other Sectors

60. WNY Regional Sustainability Plan, 2013.

61. Ibid.

62. Ibid.

63. Licata, "Inequity extends to Buffalo's tree canopy," The Buffalo News, July 31, 2023.

ONE REGION FORWARD

CLIMATE
ACTION