CITY OF CLEVELAND

CLIMATE ACTION PLAN 2025

CITY OF CLEVELAND
Mayor Justin M. Bibb

MAYOR'S OFFICE OF SUSTAINABILITY

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Table of Contents

Figures and Tables

Figures

Tables

Land Acknowledgment

The City of Cleveland acknowledges that our boundaries exist on the ancestral homelands of Indigenous Peoples. We recognize the tribes and nations forcibly removed through treaties negotiated in bad faith and other acts of displacement, including the Odawa, Ojibwe, Potawatomi, Delaware, Seneca, Cayuga (Iroquois); Myaamia (Miami); Kaskaskia, Piankeshaw, Wea, Shawnee, and Wyandotte peoples. These lands also hold the histories of the Erie and Whittlesey peoples, whose deep connections to the land and water are integral to the identity and heritage of this region.

Cleveland sits along the shores of Lake Erie, the fourth largest of the Great Lakes and the City's biggest natural asset. Lake Erie is named after the Erie people. The Cuyahoga River, a defining feature of Cleveland's landscape is named after the Mohawk word "Cayagaga," meaning "crooked river," reflecting the winding, serpentine path the river takes through the land. Interconnected in their natural beauty, these waters remain vital to the health and well-being of the community.

Environmental sustainability is essential to Indigenous stewardship practices, rooted in respect, balance, and reciprocity. These teachings remind us to care for the Earth in harmony with its natural cycles, ensuring a sustainable and equitable future for generations to come. The City of Cleveland honors these connections by striving to protect and sustain our land, water, and air by advancing environmental stewardship and climate resilience.

We invite reflection on this shared history and encourage meaningful dialogue to promote reconciliation, environmental stewardship, and the celebration of resilience and strength in the past, present, and future.

This land acknowledgement was reviewed by members of the Lake Erie Native American Council (LENAC), whose insights and guidance were greatly appreciated.

Acronyms

AAFA
Asthma and Allergy Foundation of America

ACEEE
American Alliance for an Energy Efficient Economy

AOC
Area of Concern

ARPA
American Recovery Plan Act

BASC
Bloomberg American Sustainable Cities

BAU
Business as Usual

BF-BOF
Blast furnace-basic oxygen furnace

BRT
Bus Rapid Transit

CAP
Climate Action Plan

CBOs
Community-Based Organizations

CDAQ
Cleveland Division of Air Quality

CDC
U.S. Center for Disease Control and Prevention

CDCs
Community Development Corporations

CEAC
Cleveland Environmental Advocacy Coalition

CEJST
Climate and Economic Justice Screening Tool

CGS
Complete and Green Streets ordinance

CH_4
Methane

CHaMP
Climate Hazard and Mitigation Planning Tool

CHEERS
Cleveland Harbor Eastern Embayment Resilience Strategy

CHIF
Cleveland Housing Investment Fund

CMSD
Cleveland Metropolitan School District

CO_2
Carbon Dioxide

COBRA
Co-Benefits Risk Assessment

CPP
Cleveland Public Power

CPRG
Climate Pollution Reduction Grant

CRS
Center for Regenerative Solutions

CRVA
Climate Risk and Vulnerability Assessment

CSO
Combined Sewer Overflow

CWRU
Case Western Reserve University

DERs
Distributed Energy Resources

DOE
United States Department of Energy

EER
Evolved-Energy Research

EVs
Electric Vehicles

FBCs
Form-Based Codes

GCoM
Global Covenant of Mayors for Climate and Energy

GCP
Greater Cleveland Partnership

GCRTA
Greater Cleveland Regional Transit Authority

GDP
Gross Domestic Product

GETs
Grid Enhancing Technologies

GHG
Greenhouse Gas

GRP
Gross Regional Product

GW
Gigawatts

GWP
Global Warming Potential

HABs
Harmful Algal Blooms

HUTC
Healthy Urban Tree Canopy Grant

IEA
International Energy Agency

IHSC
The Industrial Heartland Solar Coalition

IIJA
Infrastructure Investment and Jobs Act

IPCC
Intergovernmental Panel on Climate Change

IPPU
Industrial Processes and Product Use

IRA
Inflation Reduction Act

Lbs/MWh
pounds per megawatt hour

LEAD
Low-Income Energy Affordability Data Tool

LEED
Leadership in Energy and Environmental Design

LEEDCo
Lake Erie Energy Development Company

LIDAC
Low-Income and Disadvantaged Communities

LISC
Local Initiatives Support Coalition

LMI
Low- and moderate-income

LOS
Level of Service

MAP
Municipal Action Plan

MOS
Mayor's Office of Sustainability

MPG
Miles per gallon

MRCC
Midwestern Regional Climate Center

MSA
Metropolitan Statistical Area

$MtCO_2e$
Metric tons of CO_2 equivalent emissions

MW
Megawatts

N_2O
Nitrous Oxide

NCCOS
National Centers for Coastal Ocean Science

NEMAC
National Environmental Modeling & Analysis Center

NEOBHC
Northeast Ohio Black Health Coalition

NEORSD
Northeast Ohio Regional Sewer District

NOAA
National Oceanic and Atmospheric Administration

NOACA
Northeast Ohio Areawide Coordinating Agency

NSF
National Science Foundation

O_3
Ozone

ODOT
Ohio Department of Transportation

OEC
Ohio Environmental Council

PCFO
Power a Clean Future Ohio

PPB
Parts per Billion

PPM
Parts per Million

R&D
Research and Development

RDF
Regional Decarbonization Framework

SBT
Science-Based Target

SBTN
Science-Based Targets Network

SCA
Student Conservation Association

SDSN
Sustainable Development Solutions Network

SMEs
Small and Medium Enterprises

SO_2
Sulfur Dioxide

SOV
Single Occupant Vehicle

SUN
Solar United Neighbors

SYATT
See You at the Top

TCR
The Climate Registry

TDM
Transportation Demand Management

U.S. EIA
U.S. Energy Information Administration

U.S. EPA
U.S. Environmental Protection Agency

UNEP
United Nations Environment Programme

USDA
U.S. Department of Agriculture

USGBC
U.S. Green Building Council

VMT
Vehicle Miles Traveled

VPP
Virtual Power Plant

VRU
Vulnerable Road User

Glossary

Business as Usual (BAU) Scenario
Scenario that considers what will happen if no additional climate actions are taken.

Carbon Emissions
Projected Changes in Climate Conditions in Cleveland through 2100.

Climate Adaptation
The process of adjusting to actual or expected climate change and its effects. Climate adaptation can include changing agricultural practices, building sea walls, or developing drought-resistant crops.

Climate Change
Change in the average conditions — such as temperature and rainfall — in a region over a long period of time.

Climate Hazard
A natural or human-induced event or trend that has the potential to cause harm to people, property, or the environment. Climate hazards can be caused by climate change, but other factors, such as extreme weather events or natural disasters can also cause them.

Climate Justice
Being fair when dealing with climate change. It recognizes that some communities, especially those who did not cause the problem, are hurt the most. Climate justice focuses on protecting the people most at risk, making sure everyone is treated equally, and helping those who need it the most. It also supports moving to cleaner energy and creating a healthier, fairer future for everyone.

Climate Resilience
The ability of a human or natural system to adapt to climate change and minimize its negative impacts. Climate resilience can be enhanced by reducing greenhouse gas emissions, improving infrastructure, and protecting natural resources.

Climate Risk and Vulnerability Assessment (CRVA)
Process to understand the current and future climate risks facing the region.

Decarbonization
The process of switching from the use of fossil fuels such as coal, natural gas, or oil to renewable energy sources such as solar.

Deforestation
The action of removing or cutting down a wide area of trees.

Environmental Justice
Environmental justice means making sure everyone - regardless of race, color, national origin, gender, religion, or income - is treated fairly and has a say in decisions about the environment. It aims to fix unfair treatment from the past and ensure all communities share the benefits of clean air, water, and land without being harmed more than others.

Equitable
Fair and reasonable in a way that gives equal treatment to everyone, while also accounting for differing circumstances.

Extreme Heat
Abnormally hot weather causing heat-related illnesses and death. The marker for extreme heat is above 90°F in temperature.

Extreme Weather Event
A weather event that is rare or unusual for a particular location. Extreme weather events include heat waves, droughts, floods, storms, and wildfires.

Fossil Fuels
Non-renewable energy sources such as coal, petroleum, and natural gas.

Greenhouse Effect
The process by which radiation from a planet's atmosphere warms the planet's surface. The greenhouse effect is caused by gases in the atmosphere that trap energy in the form of heat.

Greenhouse Gas
Types of gases that trap heat from the sun and contribute to global warming. The primary greenhouse gases in Earth's atmosphere are water vapor (H_2O), carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), and some fluorinated gases.

Heat Wave
Abnormally high temperatures heat (90°F or above) for three days or more days in a row.

Heavy Precipitation and Flooding
Flooding occurs when there is a lot of rain or snow in a short period of time.

Industrialization
The process of changing the economy from mostly farming to making things in factories.

Invasive Plant Species
Plants that are not native to a particular area and that can cause harm to the environment or to human health.

Precipitation
Any form of water that falls to the Earth's surface from the atmosphere, including rain, snow, sleet, and hail.

Public Health
The health of a community or population. Public health is concerned with preventing disease and promoting health and well-being.

Resilience
The potential or ability of a system to adopt climate adaptation measures.

Science-Based Targets
Defined scientific targets that reduce greenhouse gas emissions in line with limiting global warming to 1.5°C.

Severe Summer Storms
Thunderstorms that produce heavy rain, strong winds, hail, or tornadoes.

Sulfur Dioxide (SO_2)
Sulfur dioxide is a colorless, reactive air pollutant with a strong odor. This gas can be a threat to plant life, and human & animal health. The main sources of sulfur dioxide emissions are from fossil fuel combustion and natural volcanic activity.

Temperature
The degree of hotness or coldness of a body or substance.

Urbanization
The process of making an area more urban - large numbers of people in one area.

Vulnerability
The tendency or susceptibility to suffer negative impacts from hazards. Vulnerability encompasses several things, including a sensitivity to harm and a lack of capacity to cope and adapt to those harms.

Letter from Mayor Justin Bibb

It is with great enthusiasm that **I unveil the City of Cleveland's updated Climate Action Plan (CAP), which lays out the City's framework to reduce climate pollution, enhance our environment, create good-paying jobs, improve public health, and benefit the quality of life for all of Cleveland's residents.**

Over the past 18 months, City of Cleveland staff, led by my Mayor's Office of Sustainability, have engaged closely with stakeholders, partners, and residents to assess the challenge that climate change poses to our City and chart a path forward to a carbon neutral future where Cleveland achieves its promise as a green city on a blue lake.

> **The result is a comprehensive plan with ambitious but achievable goals, clear actions, and performance measures to guide implementation and track progress.**

This CAP includes six key focus areas: Built Environment, Clean Energy, Clean Transportation, Nature-Based Solutions, Resilient People, and Circular Industry. It also considers how goals and actions touch issues that cut across focus areas, including circularity, empowerment, equity, and job creation.

Through a comprehensive strategy that identifies critical actions for the City and our partners across the public, private, and nonprofit sectors, **we aim to cut citywide greenhouse gas (GHG) emissions by 63.3% through 2030 and achieve net zero emissions by 2050**.

These targets further **enshrine Cleveland as a climate leader** and a City committed to creating a future where all residents are resilient to the impacts of climate hazards, where we can redress long-standing environmental inequities, and where residents and businesses do not have to choose between economic prosperity and environmental quality.

Cleveland has long committed to making itself a green city on a blue lake, and this CAP moves the City closer to that goal. The actions outlined in this CAP form the backbone that will enable and empower the City and our partners to address the climate crisis, which is the greatest challenge that we have ever faced. The past few years have demonstrated the threats that climate change poses to our City, from poor air quality to extreme heat to torrential rainfall to severe storms and tornadoes.

There can be no mistaking it – no city, including Cleveland, is "safe" from a changing climate. But, **given our prime location along Lake Erie and our city's many human, economic, cultural, and natural resources, Cleveland can use this crisis as an opportunity to become a more prosperous, equitable, and growing city.**

I encourage you to study the details of this plan and imagine the possibilities as we strive to tackle climate change together. It is only with collective strength, resolve, and commitment that we can make Cleveland the city we all aspire for it to be. I look forward to embarking on this journey with you, shaping a future we can all be proud of.

Sincerely,

Justin Bibb
Mayor of Cleveland

Letter from Director Sarah O'Keeffe

Dear Clevelanders,

Welcome to the 2024 Cleveland Climate Action Plan (CAP)—the updated guide for our community to collectively strengthen into a more sustainable and resilient city. **Cleveland's longstanding commitment to climate action is driven by our dedication to protecting the health, safety, and quality of life of all residents.**

Guided by Mayor Justin M. Bibb's leadership and community direction, the CAP focuses on six key areas: Built Environment, Circular Industry, Clean Energy, Clean Transportation, Nature-Based Solutions, and Resilient People.

Each focus area addresses **vital community needs**, from improvements to buildings, housing, and energy, to cleaner and active transportation options and more access to natural resources like trees, green spaces and waterways—all while continuing to decrease pollution, increase available jobs and secure walkable and vibrant neighborhoods.

Since the last update, **Cleveland has seen substantial investments and made significant strides toward sustainability and clean energy access.** Key federal support includes:

- Transportation and Northcoast Initiatives: Federal grants to improve infrastructure and sustainable transit options.
- **$340,000 USDA Food Scrap Composting Pilot Program**: Promotes sustainable waste management practices in Cleveland neighborhoods.

- **$10 Million in ARPA Funding** for Green Workforce Development: Advances workforce development in Cleveland's green economy.
- **$3.4 Million Urban Forestry Grant**: Expands the city's tree canopy to reduce urban heat, improve air quality, and enhance environmental health across Cleveland.

The updated CAP is more than a commitment to addressing climate change and environmental injustices—it's a roadmap to a future where Cleveland thrives. A future where every resident benefits from a cleaner, safer, and more sustainable environment.

Through concrete actions and sustainable solutions, this plan lays the foundation for a city that is not only more resilient to climate impacts but also more prosperous, equitable, and healthy.

Our updated plan reflects the priorities voiced by Clevelanders; as we move forward with implementation, we invite you to stay connected, participate in upcoming events, and share your input. You are crucial to shaping Cleveland's climate initiatives. **By working together, we can create a healthier, more prosperous Cleveland that benefits every resident.**

Sarah E. O'Keeffe
Director of Sustainability & Climate Justice,
City of Cleveland

Executive Summary

There has never been a better time for Cleveland to act on climate change.

Over the past 10 years, the region has united to address this crisis, and the federal government has delivered the biggest investments in climate action ever.

But Cleveland still faces challenges that can slow down progress, like efforts to promote fossil fuels. This updated Climate Action Plan (CAP) is an ambitious strategy to make Cleveland a leader on climate justice, but the City knows that we cannot reach our goals without support from everyone.

The time for climate action is now.
Cleveland can't wait.

Climate change is a crisis that is already harming Cleveland.

2024 was the warmest year on record globally and in Cleveland. Temperatures are currently 1.5°C warmer than normal, and every month from May 2023 to August 2024 was the warmest such month ever.

The impacts of climate change on Cleveland are clear.

The City suffered its worst air quality on record in June 2023 due to wildfire smoke from Canada. Cleveland experienced its first tornado in nearly 30 years on August 23, 2023, and a group of tornadoes knocked out power for tens of thousands on August 6, 2024. The City also had its mildest winter ever in 2023-2024, with ice cover reaching record lows on the Great Lakes.

Cleveland has made progress since 2010, but we have a lot of work left.

Since 2010, emissions of the pollution that causes climate change have gone down by 26% in Cleveland, 2.5 times faster than the rest of the country. **But Cleveland is not on track to meet our ambitious targets**, which call for us to cut emissions by 63.3% through 2030 and have no emissions by 2050.

Completing the actions in this plan will narrow the gap by lowering climate pollution by 47% through 2030 and by 79% through 2050. This will be a big achievement, but **meeting our science-based targets will take extra action from all Clevelanders starting today.**

Climate action can improve the lives of Clevelanders.

Lowering climate pollution also creates a lot of other benefits, such as better air quality, cost savings, and green jobs.

The air quality benefits from climate action are larger than the costs of the actions.

If Cleveland completes our CAP actions by 2050, 50-91 fewer Clevelanders would die each year and residents would have 170 fewer asthma attacks from breathing cleaner air. These health benefits would be worth more than $1.2 billion each year.

Through 2030, the CAP would also **save Clevelanders almost $2.3 million in energy costs and create more than 1,200 jobs per year.**

Increasing the amount of clean energy we create and use is the key to this plan.

Giving all Clevelanders access to affordable clean energy is central to this plan. In 2022, energy use caused 55% of climate pollution in Cleveland. We get 39% of our electricity from clean energy today, but **we must reach 100% from pollution-free sources, such as solar, wind, and batteries.**

This switch will lower costs, improve health, and cut pollution. We also need to prepare the electric grid for more demand from things like electric vehicles and data centers to reduce power outages.

source (of GHGs)

An activity type or process that produces GHG emissions. Examples include using electricity to power a computer or burning natural gas to heat your home.

The buildings that Clevelanders live and work in cause more than half of climate pollution emissions.

Most of this pollution comes from using natural gas for heating.

Currently, buildings in the City, particularly houses, are old and leaky, making Clevelanders spend extra money on wasted water and energy. Helping Cleveland's residents and businesses upgrade their homes and workplaces and replace gas appliances like furnaces, water heaters and stoves with newer, electric models, will **make Clevelanders healthier and save them money on energy.**

Cutting energy costs is important, because half of Cleveland residents spend over 6% of their income on heating, cooling, and powering their homes.

We have to improve the way Clevelanders travel around our city.

Transportation makes up almost 20% of climate pollution in Cleveland, and pollution from the vehicles we use to get around has barely changed since 2010.

The COVID-19 pandemic changed how Clevelanders travel, moving a lot of people away from public transit and towards working from home. Although getting around the City quickly and cheaply is important, it also causes problems, like air pollution and traffic crashes.

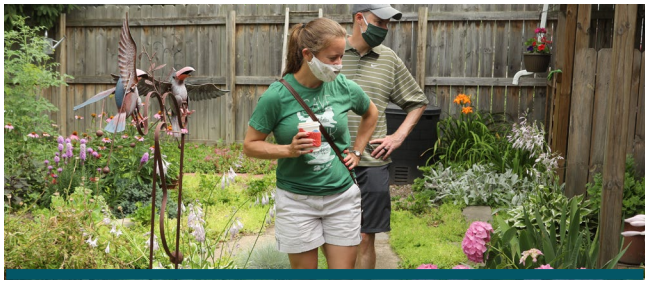
Cleveland must continue to invest in increasing public transit service, expanding safe bike lanes and sidewalks for everyone, and replacing our cars and trucks with electric vehicles.

Nature gives us models to follow to lower pollution and increase resilience.

Climate change and human actions have harmed our natural environmental a lot, but nature also gives us examples that we can follow to address climate change.

Nature-based solutions like protecting plants and animals, planting more trees, improving access to parks and green space, and helping Clevelanders compost food waste are important pieces of this plan, and are actions the city has already started taking.

By following nature's lead, we reduce climate pollution and make our City cleaner, greener, and cooler. This addresses climate change and makes residents less likely to suffer from extreme heat and flooding.



We must focus on the main reasons Clevelanders are vulnerable, including poverty and homelessness.

We know that Cleveland's residents and our infrastructure—our roads, bridges, homes, schools, hospitals, etc.—are at risk from climate hazards.

More than 85% of Clevelanders say that climate hazards have already made it hard for them to do daily tasks like get to work or buy food.

A lot of Clevelanders are very vulnerable to climate change because they are unhoused, have health problems or disabilities, are very young or elderly, have low incomes, or spend a lot of time outside.

Because so many residents have one or more of these identities, Cleveland is at a much higher risk from climate change than we might think. The City is already focusing on these root causes of vulnerability to build a thriving community.

Action like giving housing to unhoused residents, teaching Clevelanders about climate change, and turning recreation centers into places people can go for cooling, heating, and electricity can make this vision real.

Cutting pollution from industry is vital for climate action.

The economy in Cleveland has been based on industry and manufacturing for years. While these businesses provide jobs and opportunities for a lot of Clevelanders, they have also left large amounts of pollution behind.

Industry creates a large amount of climate pollution in Cleveland, and the City cannot meet its climate targets unless industry moves away from fossil fuels.

Because Cleveland does not control the industrial sector, the City is committed to educating businesses about climate solutions, helping businesses share information with each other, attracting money to pay for actions, and creating rules and systems to protect residents from industrial pollution.

sector

Component of the community or economy that is associated with GHG emissions, such as the residential sector or solid waste.

This CAP is focused on climate justice, and all Clevelanders have a role to play.

We know that the people who have done the least to cause climate change are the people who will suffer the most from its impacts.

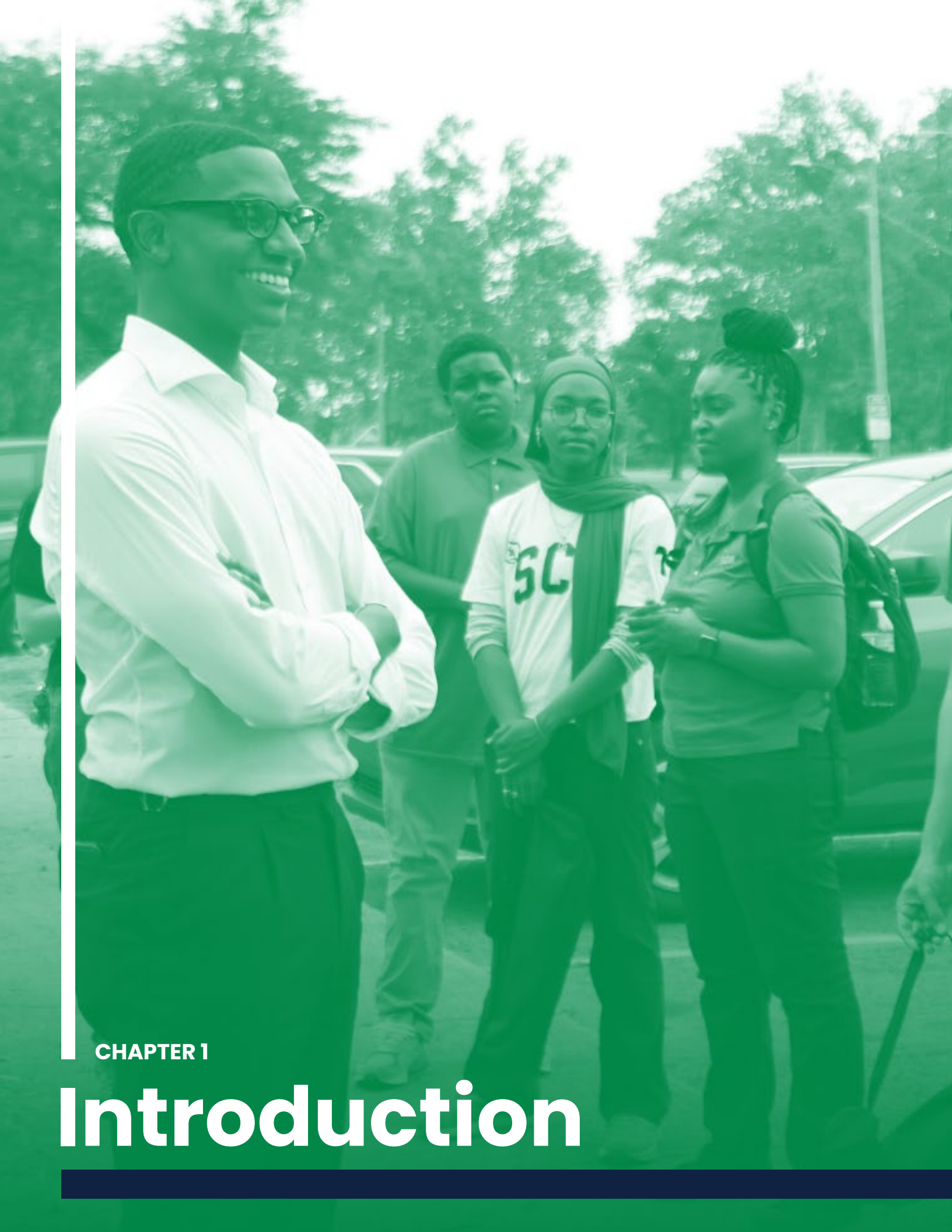
We also know that the climate crisis can make people feel small and helpless.

How can one person or business make a real difference on a global issue that takes place over decades?

This plan is focused on actions that will improve justice and equity, such as investing in alternatives to driving and maintaining and planting trees in low-income areas.

The City understands that meeting our targets will take action from all of us, and we want to help all Clevelanders take climate action in their homes, workplaces, schools, and communities.

No one can do everything, but everyone can do something.



CHAPTER 1

Introduction

The City of Cleveland has long struggled with environmental challenges presented by urbanization and industrialization, including deforestation and air, water, and soil pollution.

Forests once covered nearly 99% of Cleveland's land area, but, by 2017, tree cover had fallen to just 17.9%, leaving the city vulnerable to extreme climate hazards.[1]

When Congress passed the 1970 Clean Air Act, Cleveland failed to meet federal air quality standards.

Pollution was so bad that sulfur dioxide (SO_2) levels were more than seven times higher than today's safety standards. Additionally, similar to rivers in other industrial cities, the Cuyahoga River was treated as an open sewer for all manner of chemicals, contributing to at least 13 major fires on the river.

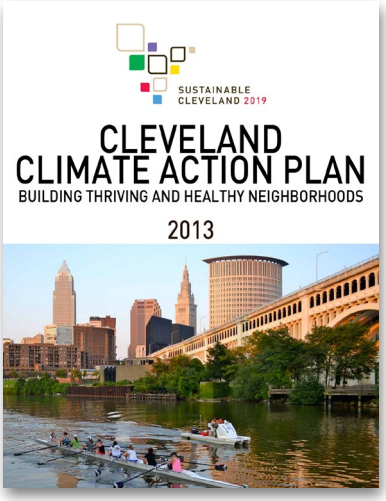
But Cleveland also has a long history of environmental action and advocacy.

In 1882, the City passed its first ordinance to reduce air pollution and was among the first to create a department dedicated to addressing this challenge.[2] Since the 1970s, air quality has greatly improved with SO_2 levels dropping by nearly 90%.[3] Water quality has also improved, with the U.S. Environmental Protection Agency (U.S. EPA) removing four of nine beneficial use impairments from the Cuyahoga River.[4] In 2019, the City celebrated the 50th anniversary of the 1969 Cuyahoga River fire, marking half a century of progress.

Cleveland's History of Climate Action

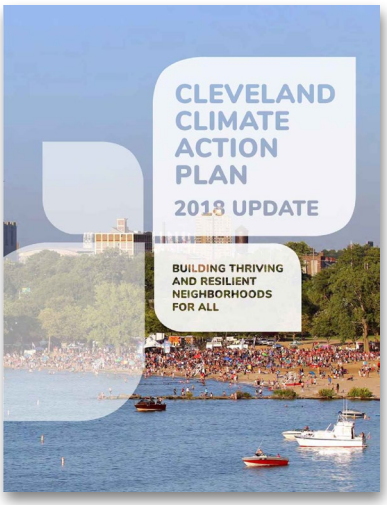
In 2005, Cleveland created the Office of Sustainability, showcasing its commitment to long-term environmental stewardship. This office published Cleveland's first Climate Action Plan (CAP) in 2013, which laid out the goals for building a thriving and healthy community.

A few other highlights of the city's early leadership in tackling environmental challenges include:



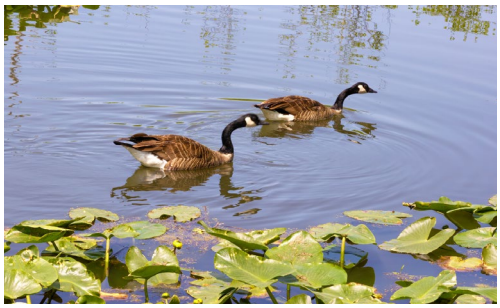
2013

Publishing the City's First Community Climate Action Plan (CAP) & Municipal Action Plan (MAP). Comprehensive community and city operations roadmaps for reducing greenhouse gas emissions, improving energy efficiency, and increasing resilience to the effects of climate change.



2018

Climate Action Plan Update. This updated community plan expanded on the original CAP's goals, setting measurable targets including those for renewable energy adoption, energy efficiency, sustainable transportation, and green spaces.



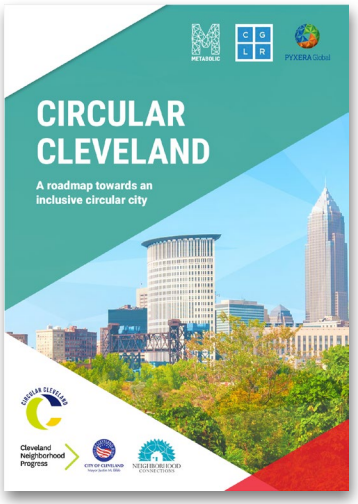
2019

Celebrating the Cuyahoga River's Recovery. Cleveland marked the 50th anniversary of the last Cuyahoga River fire, a turning point that spurred national environmental legislation, including the Clean Water Act.

2021

Achieving LEED Silver Certification. The City was designated as a LEED Silver City by the U.S. Green Building Council highlighing its commitment to creating a sustainable urban environment.

Cleveland's Clean and Equitable Energy Report. Cleveland is the first city in Ohio to commit to using 100% clean and renewable energy sources by 2050, and this document outlines pathways to achieve this goal.



2022

Circular Cleveland Roadmap. Circular Cleveland is a collaborative effort to refashion the whole of our local economy by promoting efficiency, limiting waste, and creating a healthier, more sustainable environment.

greenhouse gases

Gases that absorb and trap heat from the sun in the atmosphere, warming the planet. The main GHGs produced by human activities that are warming the planet are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and some fluorinated gases.

Cleveland's Climate Action Timeline

Showcasing the City's climate progress towards sustainability and resilience.

Figure 1: Cleveland's Climate Action Timeline, 2005-Present

The Climate Crisis: Challenges and Opportunities

Despite the progress Cleveland has made, **the effects of climate change are accelerating.**

As the Climate Risk and Vulnerability Assessment (CRVA) illustrates, rising temperatures are worsening air quality, causing heatwaves and increasing ground-level ozone. Heavier rainstorms are leading to flash floods and water pollution, including harmful algal blooms (HABs) on Lake Erie. These changes are putting local wildlife, plants, and ecosystems at risk.

The climate crisis represents the greatest environmental threat the City of Cleveland has ever experienced, and this challenge has only accelerated in recent years.

In the summer of 2023, smoke from Canadian wildfires blanketed the city, causing hazardous air quality for days. In August 2024, tornadoes struck the region, causing widespread damage and power outages. These events are becoming more frequent and severe, and they disproportionately harm Cleveland's most vulnerable residents, including seniors, children, and low-income families.

However, Cleveland has a unique opportunity to turn these challenges into opportunities.

The Inflation Reduction Act (IRA) and the Infrastructure Investment and Jobs Act (IIJA) have delivered historic levels of funding to help cities transition to clean energy, improve infrastructure, and create good-paying jobs in the green economy.

With these resources, Cleveland is well-positioned to build a cleaner, healthier, and more resilient community.

Cleveland's Top Climate Hazards

- **POOR AIR QUALITY**
- **EXTREME HEAT**
- **HEAVY PRECIPITATION & FLOODING**
- **SEVERE SUMMER STORMS**

Why the Time for Action is Now

There has never been a better time for Cleveland to act on climate change.

Over the past decade, the region has united to address the climate crisis, with the Cities of Cleveland Heights

What is Climate Change?

Climate change is a long-term change in the average weather patterns that define Earth's local, regional, and global climates. These changes have a broad range of observed effects, including rising temperatures (global warming), changes to rain and snowfall patterns, changes in the size and area of glaciers and sea ice, and changes in sea levels. Climate change is directly tied to the level of greenhouse gases (GHGs) in the atmosphere. GHGs are a type of gases that trap heat from the sun through a process known as the greenhouse effect. Eunice Foote, first described the greenhouse effect in 1856.[5]

Since the start of the Industrial Revolution in the late 1700s, the amount of GHGs in the planet's atmosphere has more than doubled.[6] According to the Intergovernmental Panel on Climate Change (IPCC), **human activities "have unequivocally caused global warming" of 1.1°C above pre-industrial levels, with human activities responsible for all of the observed warming during that period.[7]**

and Lakewood, Cuyahoga County, the Greater Cleveland Partnership (GCP), the Greater Cleveland Regional Transit Authority (GCRTA), and the Northeast Ohio Areawide Coordinating Agency (NOACA), and the Port of Cleveland, as well as large employers such as the Cleveland Clinic and Cleveland-Cliffs, all joining the commitment to climate action since 2018.

Stakeholders from a number of these institutions, community-based organizations and advocacy groups served on the Steering Committee, Advisory Council, and working groups that guided the development of this plan.

The federal government has also laid the foundation for success, as **the Inflation Reduction Act (IRA) and the Infrastructure Investment and Jobs Act (IIJA) are the largest investments in climate action ever.**

The tools and resources available for legacy industrial Great Lakes cities like Cleveland to continue to take equitable and meaningful action on climate and to make our community more resilient are available, but not guaranteed.

Despite recent historical alignment, Cleveland still faces tremendous headwinds and challenges, including some groups pushing to keep fossil fuels as the primary energy source, which threatens to slow down progress.

Transitioning to clean energy and building resilient systems won't happen automatically—it requires leadership, commitment, and action.

> ***We are the first generation to feel the impact of climate change, and the last generation that can do something about it.***[8]
>
> *— President Barack Obama*

This updated Climate Action Plan is designed to guide its stakeholders on implementation to position our city as a climate leader, ensuring that our community can overcome obstacles and achieve our ambitious climate goals.

At the heart of this plan is a commitment to climate justice.

Historic inequities have left some neighborhoods more vulnerable to the impacts of climate change, such as flooding, heatwaves, and poor air quality. This CAP is the roadmap to help Cleveland achieve our ambitious climate

targets for 2030, while building on the tremendous progress we have already made.

The rest of this plan proceeds as follows.

Chapter 2 outlines the City's public engagement and outreach efforts that informed the development of this plan over the past year.

Chapter 3 describes the process that the City of Cleveland followed to develop this plan, including developing updated Science-Based Targets.

Chapter 4 reviews the source of climate pollution in Cleveland during 2022 and how these have changed since the 2018 CAP, and **Chapter 5** considers the main threats that climate change poses to the Cleveland community.

Chapter 6 discusses the process that the City and its partners used to evaluate different actions for the CAP.

Chapter 7 goes into detail on the goals, objectives, and actions that Cleveland and its partners intend to complete to place the City on a path to net zero emissions by 2050.

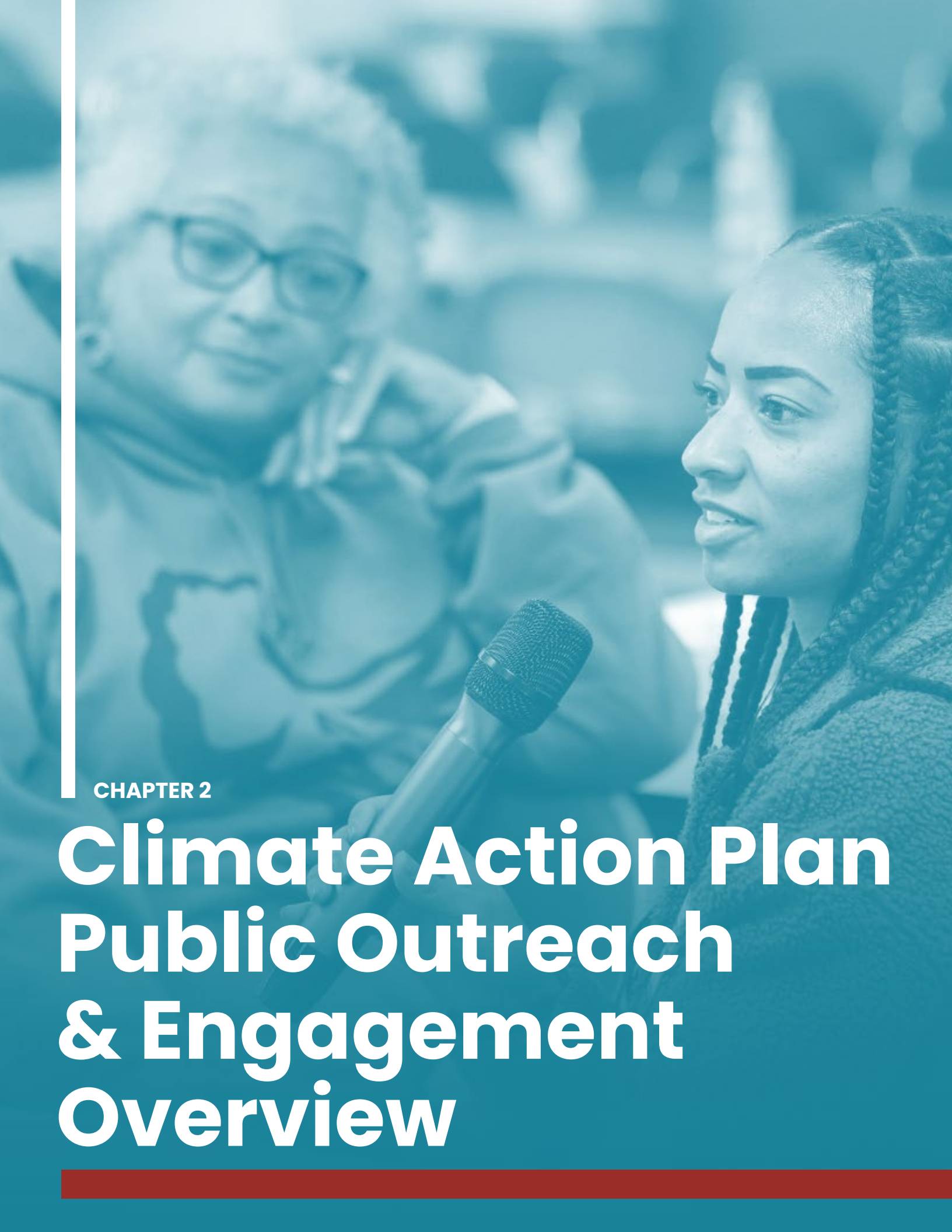
Chapter 8 outlines the ways that the City will implement those actions, as well as it will track and report out on progress and **Chapter 9** serves as a conclusion.

This CAP presents a comprehensive, ambitious strategy to help Cleveland continue to be a leader on climate justice, but the City knows that we cannot meet our climate targets without an all-hands-on-deck approach from everyone.

Damage from the August 6, 2024 tornadoes. Courtesy of David Petkiewicz, Cleveland.com.

The time for climate action is now. Cleveland can't wait.

> ***The climate crisis is an existential threat. We absolutely must invest public funds to protect the health and well-being of our communities, or they will cease to exist.*** *What else is government for?*
>
> *— Broadway-Slavic Village Resident*



CHAPTER 2

Climate Action Plan Public Outreach & Engagement Overview

Over the course of a year, the City of Cleveland conducted extensive public engagement both online and in person across Cleveland's neighborhoods to gather input and feedback for the development of this CAP.

From October 2023-October 2024, the Mayor's Office of Sustainability (MOS) conducted two surveys that collected 767 total responses from people who live and/or work in Cleveland, conducted 10 in-person engagement sessions that attracted 268 attendees, and held four unique educational workshops that engaged an additional 114 people.

In total, Cleveland's CAP engagement efforts engaged more than 1,000 people, including residents from all of Cleveland's neighborhoods and workers from the surrounding region.

The detailed, thoughtful, and highly diverse input that these participants provided was essential for defining the scope of this CAP, determining which climate change impacts affect Cleveland's neighborhoods most directly, identifying and honing the goals and actions included in this plan, and helping to ground Cleveland's climate work directly in the lived experience of Clevelanders.

Climate Risk and Vulnerability Assessment (CRVA) Engagement (Fall 2023)

The Mayor's Office of Sustainability (MOS) kicked off the CAP community engagement process during Fall 2023 as part of the update of the City's CRVA.

The MOS prioritized intentional and strategic efforts to engage residents in historically disinvested communities. It also worked to adapt to feedback from residents and partners throughout the process.

The MOS used multiple engagement strategies to **gain input on how Cleveland communities experience climate hazards.** It conducted a public survey and held four in-person public engagement sessions to gain input from populations that were not represented in the survey process.

Cleveland Climate Risk and Vulnerability Assessment Survey

The MOS first created and distributed a community survey on the impacts of climate change via both paper and online formats.

MOS and its community partners included communications materials and recordings that walked residents through how to complete the survey and explained why it was important for community members to provide their input.

MOS staff also sent the electronic survey and PDF versions of the survey to both external partners and internal City contacts (including the Community Development Department, City Council, and the Community Relations Board). MOS collected survey responses from October 9 – November 17, 2023.

A majority (52%) of responses came from residents of low-income and disadvantaged communities (LIDAC).

CRVA Survey Respondants: At a Glance

The City of Cleveland received 399 complete and valid responses.

GENDER IDENTITY

48% MALE

45% FEMALE

4% GENDER NON-BINARY

AGE GROUPS

77% between the ages of 18–49

- Under 18 (1%)
- 18-24 (14%)
- 25-34 (38%)
- 35-49 (25%)
- 50-65 (11%)
- 65+ (10%)

RACE/ETHNICITY

62% WHITE

11% BLACK or AFRICAN AMERICAN

9% ASIAN or ASIAN AMERICAN

5% NATIVE HAWAIIAN or PACIFIC ISLANDER

4% AMERICAN INDIAN or ALASKA NATIVE

4% HISPANIC or LATINO

ANNUAL INCOME

10% $0–$24,999

23% $25,000–$49,999

37% $50,000–$74,999

14% $75,000–$99,999

11% OVER $100,000

4% PREFER NOT TO SAY

EDUCATION

48% BACHELOR'S DEGREE

35% SOME COLLEGE OR ASSOCIATE'S DEGREE

15% HIGH SCHOOL DIPLOMA

1% DID NOT COMPLETE HIGH SCHOOL

Cleveland Climate Risk and Vulnerability Assessment

In addition to the survey, from November–December 2023, MOS scheduled **four public engagement sessions** for residents to provide input for the CRVA.

MOS staff recognized that the demographics of survey respondents did not closely mirror those of Cleveland residents as a whole, so **staff targeted these sessions in neighborhoods that had lower survey response rates or were more vulnerable to key hazards**. Sessions took place in the Central-Fairfax, Clark-Futon, Downtown, and Union-Miles neighborhoods.

> **MOS worked with stakeholders in each neighborhood to ensure that low-income and disadvantaged Clevelanders could participate fully in each session.**

Local community organizations familiar with the area and skilled in outreach helped to promote each session to members of the community. A Spanish interpreter was available at the engagement session located in Clark-Fulton.

The majority (56%) of participants in these sessions were residents of LIDAC areas.

MOS Staff and consultants introduced the concept of climate change and encouraged open discussion on the climate hazards affecting Cleveland.

Cleveland Community Climate Action Engagement (Summer-Fall 2024)

During the Summer and Fall of 2024, the City of Cleveland conducted a **second phase of CAP engagement to identify the community's priorities for this CAP and ensure that the plan reflected both the needs and the aspirations of Cleveland's residents.**

This work, which lasted from July-October, involved three different engagement phases:

1. Cleveland Community Climate Action Survey: Draft Goals & Actions (July 22-August 16)
2. Community Roundtables: Needs & Aspirations (August 21-September 7)
3. Educational Workshops: Diving Into Climate Action (September 14-October 23)

Cleveland Community Climate Action Survey

MOS conducted the Cleveland Community Climate Action Survey from July 22-August 16. The survey, available in English and Spanish both online and via paper copy, included 17 questions that gathered information about respondents, measured community support for goals and actions that may make it into the CAP, and ranked factors that the City of Cleveland and its partners might use to evaluate and prioritize climate actions.

Survey responses included a number a themes, such as:

- A desire to increase **access to greenspaces**;
- The need for more focus on equitable access to local food and agriculture to **address food deserts**

and insecurity;

- Calls to promote economic and job development **opportunities within climate initiatives**;
- Increased emphasis on **climate education and literacy**;
- Plans for improved access to **alternate transportation methods**; and
- Focus on **litter cleanup and better waste management** practices.

This analysis gave the MOS a strong first look into what issues are most important to Clevelanders and enabled the process of refining and whittling down the original list of climate actions.

The analysis also highlighted areas where Clevelanders were not yet represented in providing feedback; a key guide for organizing in-person Community Roundtables.

Community Roundtables

The City of Cleveland next held **six community roundtables in low-income and disadvantaged communities (LIDAC)** around Cleveland.

The City targeted these engagements in neighborhoods that had lower rates of survey responses, were likely to benefit from climate actions, and did not host CRVA engagement sessions in 2023.

Community Roundtables were held in Tremont and Cuyahoga Valley, Stockyards, Buckeye-Shaker/Buckeye-Woodhill, Glenville and Collinwood-Nottingham, St. Clair-Superior, and Mt. Pleasant and Lee-Harvard.

The City engaged community-based organizations (CBOs) to help plan and promote each roundtable. These partners included the Ohio Environmental Council (OEC), H.E.A.L Buckeye, Young Latino Network, Organic Connects, Village Family Farms, and See You at the Top (SYATT).

Stockyards Community Roundtable, August 2024

Climate Action Survey Respondants: At a Glance

The City of Cleveland received 368 complete and valid responses.

GENDER IDENTITY

62% FEMALE

36% MALE

2% GENDER NON-BINARY

AGE GROUPS

53% between the ages of 25-49

18-24 (7%)
25-34 (24%)
35-49 (28%)
50-65 (27%)
65+ (12%)

ANNUAL INCOME

25% $25,000-$49,999

43% $50,000-$100,000

32% OVER $100,000

RACE/ETHNICITY

73% WHITE

18% BLACK or AFRICAN AMERICAN

4% ASIAN or ASIAN AMERICAN

4% HISPANIC or LATINO

EDUCATION

76% BACHELOR'S DEGREE

17% SOME COLLEGE OR ASSOCIATE'S DEGREE

7% HIGH SCHOOL DIPLOMA

Overall, respondents expressed strong support for the potential climate goals and actions included in the survey, with each category of goal receiving at least 85% support.

These CBOs also identified and distributed incentives to participants. The City provided a Spanish interpreter for one session that took place in a community with a large Spanish-speaking population (Stockyards).

Each roundtable lasted 90 minutes. After a 30-minute period for socialization, the City facilitated discussions on the impacts of climate change in the given neighborhood, then reviewed participants' aspirations for their neighborhoods.

Next, participants selected one of the CAP focus areas and discussed priority actions, potential barriers to action, and likely blind spots the City may experience in climate planning.

At the end of the session, participants completed a brief exit survey that helped identify their top priorities for climate action in Cleveland.

A complete report discussing these roundtables and summarizing feedback from participants is available in Appendix A (bit.ly/CAP_AppendixA).

Participants described their concerns about the effect of climate change, which included impacts from storms, flooding, damage to plants and trees, and invasive species.

Roundtable Participants: At a Glance

In total, 109 participants attended the six community roundtables.

RESIDENCY

82%
City of Cleveland Residents

RACE/ETHNICITY

65%
BLACK

14.5%
HISPANIC or LATINO

ANNUAL INCOME

50+%
Less than $50,000

Community members were most concerned about damages to infrastructure and housing. In the exit survey, participants identified clean water, clean air, more trees and green space, and financial assistance for home improvements as the most important benefits of climate action.

Exit survey respondents also stated that they want the City to prioritize educating and informing communities on climate, providing financial resources for climate action, and improving litter and trash collection.

Educational Workshops

For the **third phase of engagement**, the City of Cleveland hosted **four educational workshops** that shared information about the CAP and gathered feedback on how to conduct climate action engagement going forward.

The City again partnered with CBOs to organize and execute these workshops, with each session focusing on different topics and communities.

> ***This was a very educating and empowering program.*** *Thank you.*
>
> *— Roundtable Participant*

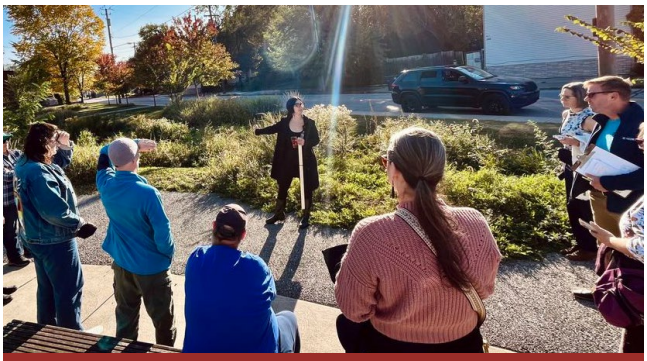
The workshops, which took place from September-October 2024, included the following:

FreshFest

The City partnered with the OEC to share information about the CAP and **learn how to remain engaged with residents** going forward.

Nature-Based Solutions Walking Tour of Slavic Village

MOS worked with Slavic Village Development, Westcreek Reservation, and the Northeast Ohio Regional Sewer District (NEORSD) to host a **90-minute guided tour of nature-based solutions projects throughout the neighborhood**, including Morgana Bluffs Wetland and Nature Preserve, the Fleet Avenue Complete and Green Street project, Arch Park Stormwater Basin, and the NEORSD Union Infrastructure Project.



Nature-Based Solution Walking Tour, October 2024.

Food, Mobility, and Climate Justice Forum, October 2024.

Food, Mobility, and Climate Justice Forum

The City partnered with CBO My Grow Connect, the Cuyahoga County Food Policy Coalition, and Cleveland Planning Commission to discuss the intersections of **food, mobility, and climate justice** at Gunning Recreation Center.

The forum focused on existing climate planning and food system efforts, how to keep engaging stakeholders throughout CAP implementation, and how this work related to Cleveland MOVES, the City's mobility plan. **Two members of the Cuyahoga County Food Policy Coalition shared their experiences with priorities for local food producers around climate change.**

Youth Climate Action Educational Forum

Lastly, MOS coordinated with the Cleveland Public Library and an array of community partners to host a youth engagement session with 61 Cleveland Metropolitan School District (CMSD) and other high school students.

This strategic gathering brought together diverse expertise to **engage and educate Cleveland youth about local environmental issues and the Climate Action Plan** (CAP) update process, as well as gather youth input and perspectives to inform CAP priorities and foster a sense of ownership in shaping Cleveland's sustainable future.

Youth Climate Action Educational Forum, October 2024.

Youth Climate Action Educational Forum, October 2024.

CHAPTER 3

Developing the Climate Action Plan

The City of Cleveland has addressed the climate crisis for over a decade. Cleveland released its first CAP in 2013 and updated it in 2018.

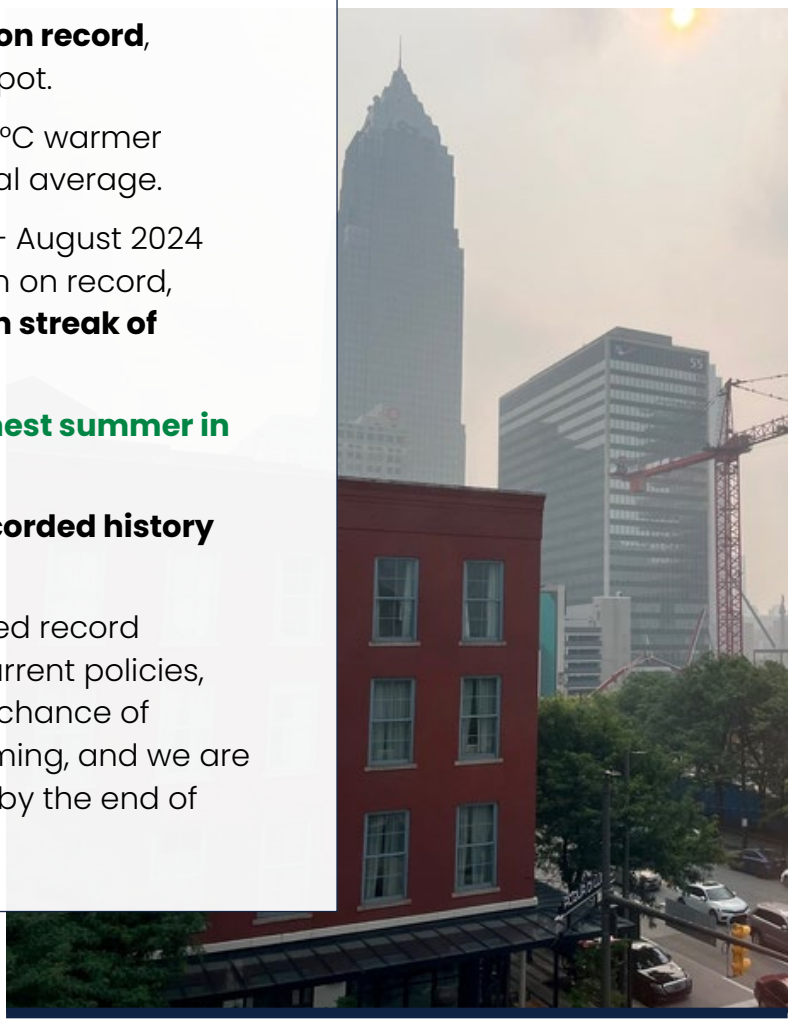
Over the years since that initial CAP, conditions have changed significantly, and the City has updated its work to reflect these changes. The City has also strived to ensure that its climate planning process has remained clear, consistent, and grounded in the principles of engagement, equity, justice, and transparency.

What Has Changed Since 2018?

Conditions have changed considerably since the City of Cleveland's last CAP in 2018.

The climate crisis has become clearer.

- 2024 was the **warmest year on record**, surpassing 2023 for the top spot.
- Global temperatures were 1.5°C warmer during 2024 than the historical average.
- Every month from May 2023 – August 2024 was the warmest such month on record, an **unprecedented 16-month streak of record heat**.
- **Summer 2023 was the warmest summer in at least 2000 years.**
- The **three hottest days in recorded history** occurred on July 21-23, 2024.
- Global GHG emissions reached record highs again in 2023. Under current policies, the planet has a nearly 100% chance of exceeding 2°C of global warming, and we are currently on pace to hit 3.1°C by the end of the century.[9]



The impact of climate change has hit home in Cleveland.

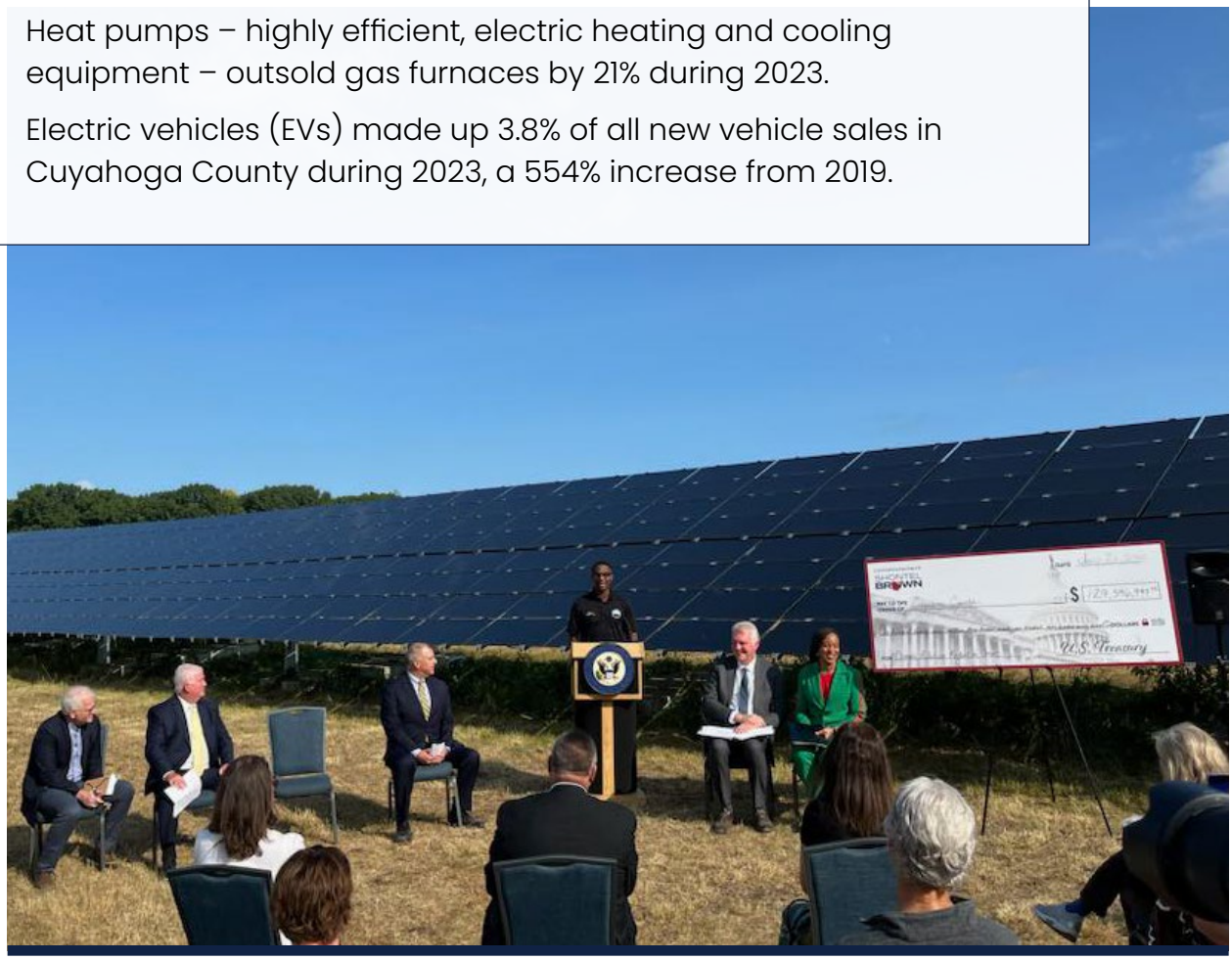
- Cleveland endured its **worst air quality on record** in June 2023 due to wildfire smoke from Canada.
- Cleveland experienced its **first tornado in nearly 30 years** on August 23, 2023. A cluster of five tornadoes also affected the City significantly on August 6, 2024, knocking out power for tens of thousands of residents.
- The City experienced its **mildest and second mildest winters on record** in 2023-2024 and 2022-2023, respectively. Ice cover reached historic lows on the Great Lakes during the winter of 2023-2024.
- Nearly four inches of rain fell on Cleveland on Labor Day 2020, causing severe flash flooding across the City.

Local, state, and federal partners are aligned to tackle the climate crisis.

- President Biden signed the Inflation Reduction Act (IRA) on August 16, 2022. **The IRA invested $370 billion in climate action, the single largest climate investment in global history.**
- **Cuyahoga County adopted its first CAP** in May 2019, committing the County to cut GHGs 45% by 2030 and achieve net zero emissions by 2050.
- The **Greater Cleveland Regional Transit Authority (GCRTA) developed its own CAP** in April 2022, pledging to achieve net zero emissions by 2050.
- The Northeast Ohio Areawide Coordinating Agency (NOACA), in partnership with the City of Cleveland, **published the Cleveland-Elyria Metropolitan Statistical Area (MSA) Priority Climate Action Plan**, which identifies the actions the region needs to implement to achieve net zero emissions by 2050.

Climate solutions are more affordable and obtainable.

- The cost to install solar power has fallen by nearly 50% over the past decade, and **solar has become the "cheapest electricity in history."**[10]
- Clean energy (solar, wind, and battery storage) made up **92% of all new energy generation installed during 2024**, up from 37% during 2018.
- Through 2018, the U.S. had installed just 800 megawatts (MW) of battery storage; by September 2024, that had increased 27-fold to 22.48 gigawatts (GW).
- Heat pumps – highly efficient, electric heating and cooling equipment – outsold gas furnaces by 21% during 2023.
- Electric vehicles (EVs) made up 3.8% of all new vehicle sales in Cuyahoga County during 2023, a 554% increase from 2019.



The following section outlines the steps that the City of Cleveland has followed to develop this CAP. Wherever possible, the City has used the same methods as the 2013 and 2018 CAP in order to ensure consistency and make it easier to compare progress over time.

GHG inventory

Tools that communities use to measure, calculate, and assess emissions of GHGs associated with activities and sources occurring within a community.

Step 1: Establish Baseline GHG Inventory

As part of its first CAP in 2013, the City of Cleveland developed its initial greenhouse gas (GHG) inventory, which covered all GHG emissions occurring in and related to activities within the borders of the City during 2010.[11] To date, the City has used this 2010 inventory as its baseline against which we measure progress. However, in the process of updating its climate targets, the City adopted a revised 2018 emissions baseline.[12] Going forward, the City of Cleveland will measure its GHG emissions reductions progress against this 2018 baseline, and the GHG Inventory section, below, uses this as its reference point.

Step 2: Adopt a Target

The City of Cleveland adopted climate targets when it created its first CAP in 2013. These targets called for the City to cut emissions by:

- 16% by 2020
- 40% by 2030
- 80% by 2050

While these targets were appropriate at the time, they did not place the City on a path to achieve net zero emissions by 2050. Mayor Bibb has committed to decarbonize our city, block by block; as a result, it is essential for the City to adopt updated targets that align with this goal.

Beginning in April 2024, the City of Cleveland collected feedback from a wide array of stakeholders, including the CAP Steering Committee and Advisory Council, on potential climate targets. Based on this feedback, **the City adopted an updated Science-Based Target (SBT).** According to the Science-Based Targets Network (SBTN), SBTs are "measurable, actionable, and time-bound objectives, based on the best available science, that allow actors to align with Earth's limits and societal sustainability goals."[13]

By adopting a SBT, Cleveland joins nearly 1,150 cities that are committed to quickly and equitably achieving net zero emissions.

Cleveland's SBT, which accounts for the City's historical GHG emissions and its current levels of social and economic development, **calls for the City to cut emissions by 63.3% by 2030, from 2018 levels, and achieve net zero emissions by 2050.** This updated target establishes Cleveland as a leader on climate action throughout the Midwest, reiterates the City's commitment to advancing climate justice for its residents, and furthers Mayor Bibb's goal of decarbonizing the City block by block.

This CAP outlines approaches to help the broader City community achieve these ambitious targets, but the City cannot achieve such goals without everyone doing their part. The City of Cleveland government has limited direct control over GHGs occurring in its boundaries, as emissions from City operations accounted for just 2.3% of total GHGs during 2022.[14]

While city leadership is necessarily all in on climate action, eliminating carbon emissions will require an all-hands-on-deck approach. With the U.S. again withdrawing from the Paris Agreement, this approach becomes even more vital.

Why a Climate Crisis?

As former President Joe Biden stated in 2023, climate change is "the ultimate threat to humanity."[15] Because the global climate influences every aspect of our lives, changes to it create severe and widespread impacts. Extreme heat, more severe storms, rising sea levels, more intense and prolonged droughts, worsening air quality, and more severe wildfires are just some of the consequences of climate change.

Climate change has already reaped enormous costs; from 2000-2019, extreme weather events tied to climate change cost the world $2.86 trillion, or $143 billion per year.[16] These costs will only increase in the coming years, with one estimate suggesting that, if we do not act to cut climate pollution, climate change will cost the planet $38 trillion per year by 2050, which is larger than size of the entire U.S. economy.[17] In the U.S., climate impacts may cost the federal government $2 trillion per year by the end of the century, equal to 7% of the economy.[18]

Taking immediate and concerted action to reduce climate pollution is imperative, as each 0.1°C of additional global warming pushes another 100 million people into unprecedented and life-threatening high temperatures worldwide.[19]

Step 3: Forecast Emissions

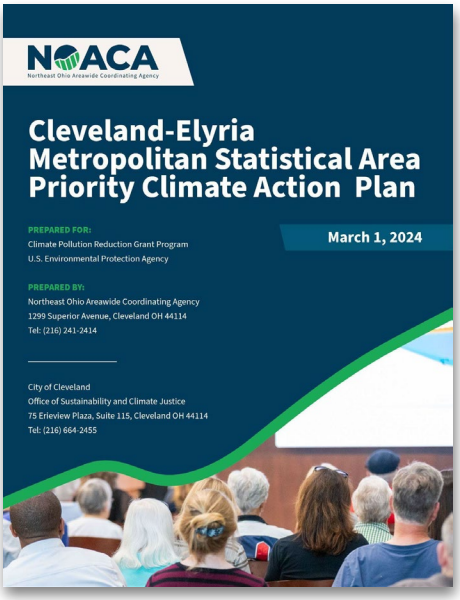
After adopting this SBT, the City of Cleveland next worked to forecast GHG emissions through 2030 and 2050 under different scenarios.

Emissions forecasts are estimates of a community's future GHG emissions, based on assumptions about how the activities in that community that produce GHG emissions may change over time.[20]

Developing emissions forecasts enables a city to determine whether it is on track to meeting its climate targets, estimate the impacts of different climate actions, and

establish an overall plan for achieving its targets.

From 2022-2023, the City of Cleveland partnered with Case Western Reserve University (CWRU), the Sustainable Development Solutions Network (SDSN), and Evolved Energy Research (EER) to develop a Regional Decarbonization Framework (RDF), which outlined the different pathways to achieve net zero GHG emissions in Northeast Ohio by 2050, under a variety of scenarios and assumptions.



The City used this analysis and the regional emissions forecasts from the Cleveland-Elyria MSA Priority Climate Action Plan to estimate GHG emissions through 2050 under both a Business As Usual (BAU) scenario, which assumes that current conditions largely continue unchanged, and an Implementation Scenario, in which the City and its partners fully implement the climate actions identified in this plan.

The BAU scenario includes a number of underlying assumptions, including:

- The City of Cleveland's population will remain constant through 2050;
- Economic growth (gross domestic product [GDP]) assumes that GDP per Cleveland resident in 2022 will remain constant through 2050;
- Electricity and natural gas use will remain constant;
- Industrial process emissions will remain constant;
- Fuel use for transportation (on-road vehicles, air travel, marine travel) will remain constant;
- The amount of solid waste created will remain constant;
- The fuel efficiency of light-duty vehicles will improve by 1.8% per year, reaching 38.8 and 55.9 miles per gallon (MPG) by 2030 and 2050, respectively.

The results of the BAU analysis are shown in Figure 2, at right. Under this

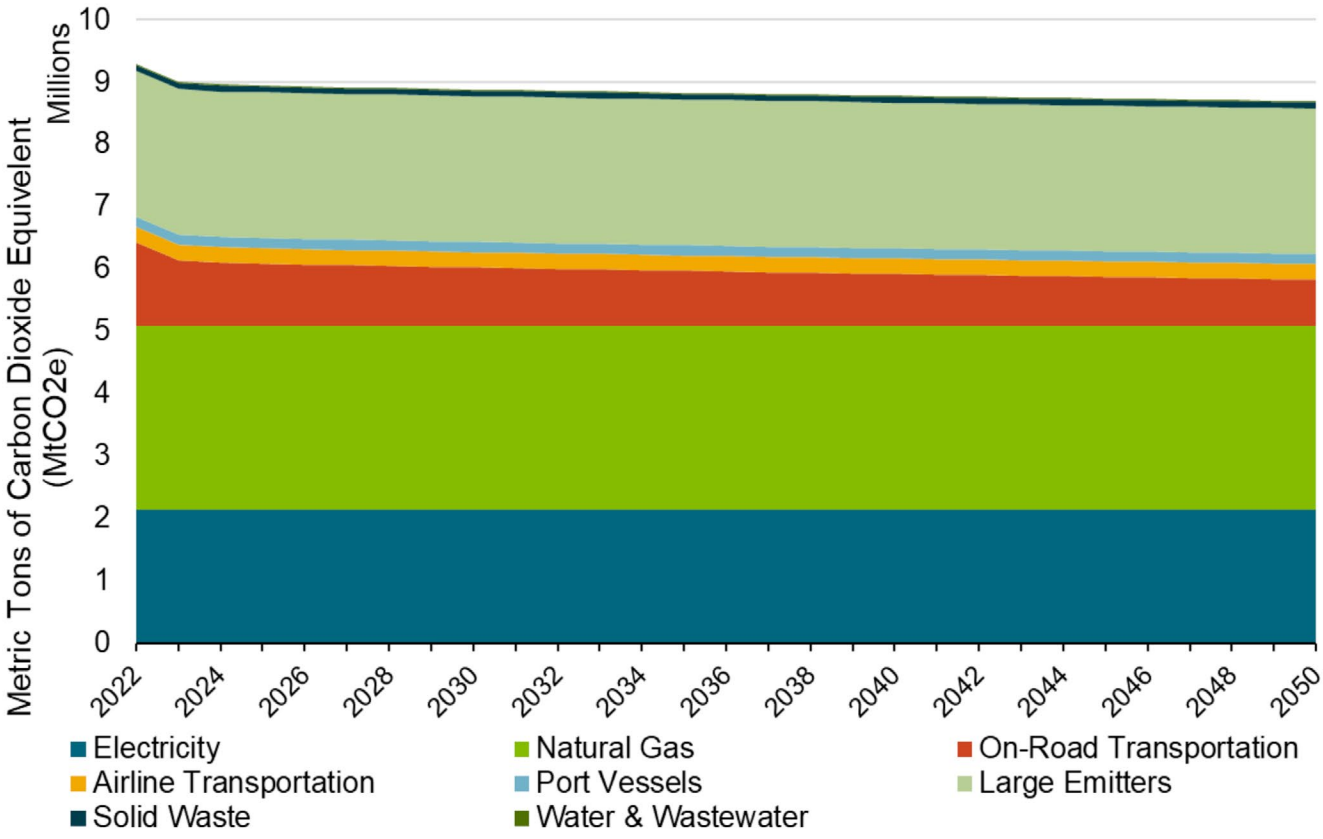
scenario, emissions would decrease from 11.66 $MMtCO_2e$ in 2018 to 8.89 $MMtCO_2e$ and 8.69 $MMtCO_2e$ in 2030 and 2050, respectively. In other words, emissions would decrease by just 4% by 2030 and 6% by 2050, compared to 2018 levels.

This analysis makes it clear that the City cannot hope to make real progress towards meeting its ambitious climate targets without taking the actions outlined in this CAP.

$MTCO_2e$

Metric ton of carbon dioxide, a common unit of measurement for tracking changes in GHG emissions. The unit "CO_2e" represents an amount of a GHG whose atmospheric impact has been standardized to that of one unit mass of CO_2, based on the global warming potential (GWP) of the gas.

Figure 2: City of Cleveland GHG Emissions Under BAU Scenario (2010-2050)



Step 4: Strategy Selection

To identify strategies to help Cleveland achieve its climate targets, the City worked with the CAP Steering Committee and Advisory Council. The Steering Committee included 22 key stakeholders and climate action experts from partner organizations, and the Advisory Council was a broader committee composed of dozens of representatives from stakeholder groups and partner organizations.

These bodies helped to form six working groups of stakeholders and subject matter experts, each of which tackled a different CAP focus area. They began meeting in February 2024 to identify the kinds of actions that Cleveland needs to take to achieve net zero emissions and increase the resilience of the City to the impacts of a changing climate.

The City of Cleveland also reviewed relevant CAPs from across Northeast Ohio and from peer cities (e.g. Cincinnati, Columbus, Detroit, Milwaukee, Minneapolis, Pittsburgh) and consulted with a wide array of additional partners and stakeholders to gather additional ideas and feedback on climate actions for the City.

After developing and revising this list of potential actions, **the City of Cleveland worked with the CAP Steering Committee and Advisory Council and a technical consultant, the Brendle Group, to evaluate and prioritize the actions that made it into this CAP.**

For more information on this evaluation process, review Chapter 6.

Step 5: Funding & Implementation

The City of Cleveland understands that a Climate Action Plan is only effective if the City and its partners commit to funding and implementing it fully.

To prepare Cleveland to act on the strategies in this plan, the City and partners worked throughout the development of this CAP to:

- **Identify the key stakeholders and partners that will be responsible for implementing climate actions**;
- Determine whether each action aligned with the existing plans and commitments from the City of Cleveland and its partners, in order to **ensure that climate action is integrated fully into ongoing work across the City**;
- Identify and **prioritize short-term and high-impact actions** that the City and its partners can quickly and effectively implement between now and 2030;
- Identify, prioritize, and (where possible) **secure funding to enable the City and its partners to implement these actions**. In particular, Cleveland and its partners have worked to take full advantage of the grants and tax credits provided through the IIJA and IRA, as there is no guarantee that those funding opportunities will remain available in the coming years.

For more information on funding and implementation, please review Chapter 6: Our Path to Net Zero, and Appendix D (bit.ly/CAP_AppendixD), which outlines these topics in more detail for all actions in this CAP.

Step 6: Monitor & Track Progress

The City of Cleveland recognizes the importance of monitoring the implementation of CAP actions and tracking its progress towards achieving the plan's ambitious goals. Over the past decade-plus, Cleveland has committed to a number of global and national efforts to report out on its progress achieving climate action.

Going forward, the City of Cleveland will continue to track and report out on its progress implementing this CAP through outside organizations and the City's own channels, such as the Cleveland Open Data portal.

For more information on implementation, please review Chapter 8, Implementation: Accountability and Transparency.

Why is the City of Cleveland Committed to Climate Action?

Cities are on the frontlines of climate change. They are already experiencing the impacts of climate hazards and extreme weather, and they are well positioned to take steps to reduce climate pollution and increase the resilience of their residents to these hazards.

More than 8 in 10 Americans live in urban areas, and these areas produce nearly three-quarters of all climate pollution.

With the U.S. federal government again stepping back from addressing the climate crisis beginning in 2025, cities like Cleveland must step in to fill this leadership void. Cities have direct and indirect control over a number of systems that affect GHG emissions and the vulnerability of their residents to climate impacts, including transportation and energy infrastructure. Because they are denser and better connected than suburban or rural areas, cities also have lower GHG emissions per capita. The average Cleveland household emits 41% less climate pollution than a household in the more rural Geauga County.[21]

The City of Cleveland has already achieved significant progress in reducing GHGs and investing in the resiliency of the community. As the City has made clear, it is all in on climate action, and it is committed to achieving the ambitious targets outlined in this CAP.

What Do We Risk Losing if We Do Not Act

While many see Cleveland as a climate refuge, safe from the worst impacts of this crisis, the fact remains that unchecked climate change will fundamentally alter life in the City.

So what does Cleveland stand to lose if we fail to tackle this crisis head on?

Cleveland has long benefited from moderate summertime temperatures. But under a high warming scenario, the City's climate would end up more like that of Arkansas, with the number of 90°F days increasing by more than 1,100% to 82 per year.

1,100%
Expected increase in number of days over 90°F per year under a high warming scenario

Extreme heat would interfere with most aspects of residents' lives.

By 2100, **Cleveland could experience more days of at least 100°F each year than it has experienced in its recorded history.**

The Cleveland Metropolitan School District will be forced to **spend tens of millions of dollars to air condition its schools** or have to close several days per year due to dangerous temperatures.[22]

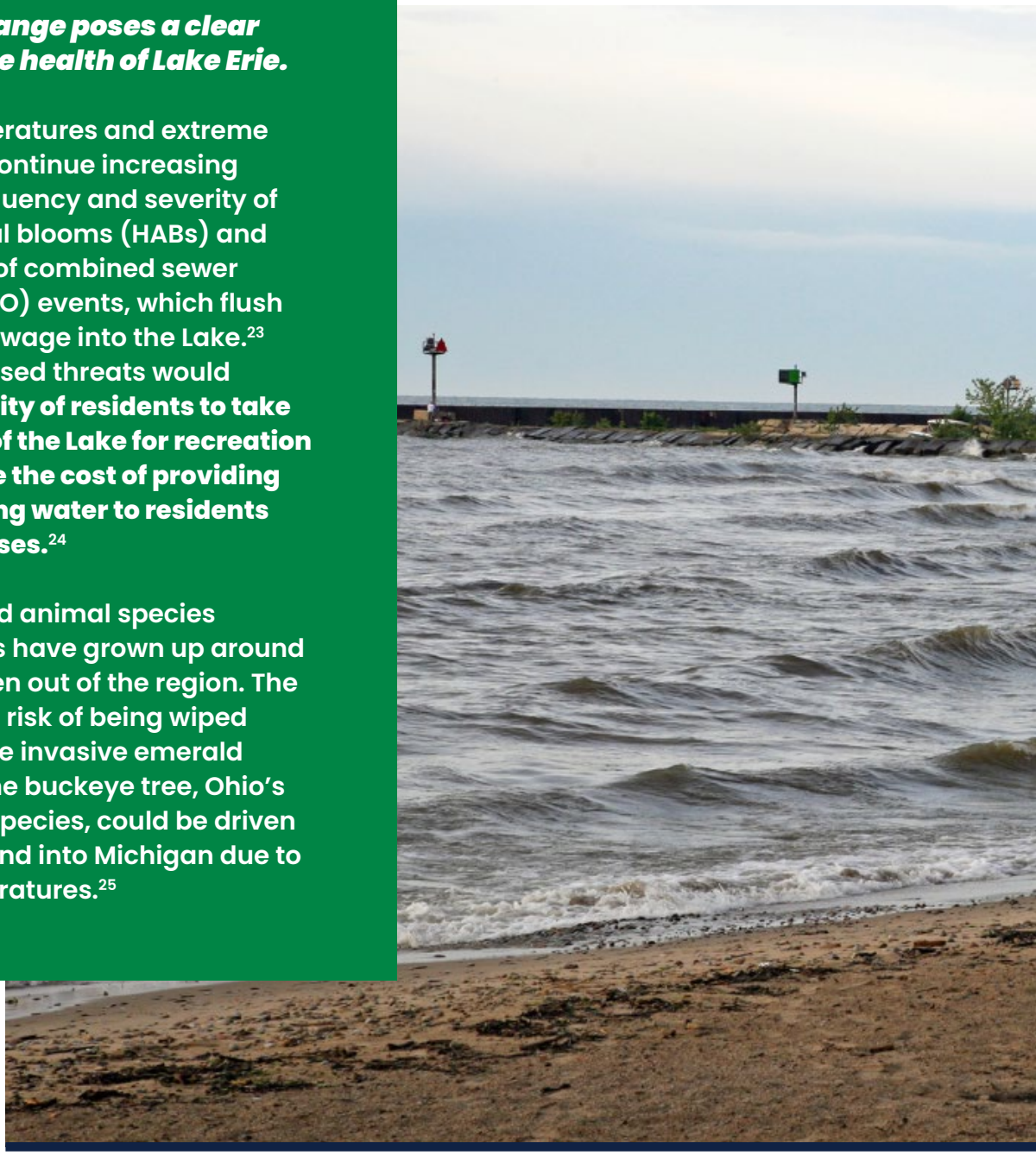
Many low-income residents, especially those on a fixed income, may have to **choose between paying for electricity to cool their homes or buying other essentials**, like food and medicine.

Deteriorating air quality will harm the health and well-being of Clevelanders, **increasing the number of residents suffering from respiratory issues like asthma.** As the number of poor air quality days increases, children, the elderly, and residents with respiratory health issues will be forced to stay indoors to protect themselves from health impacts.

Climate change poses a clear threat to the health of Lake Erie.

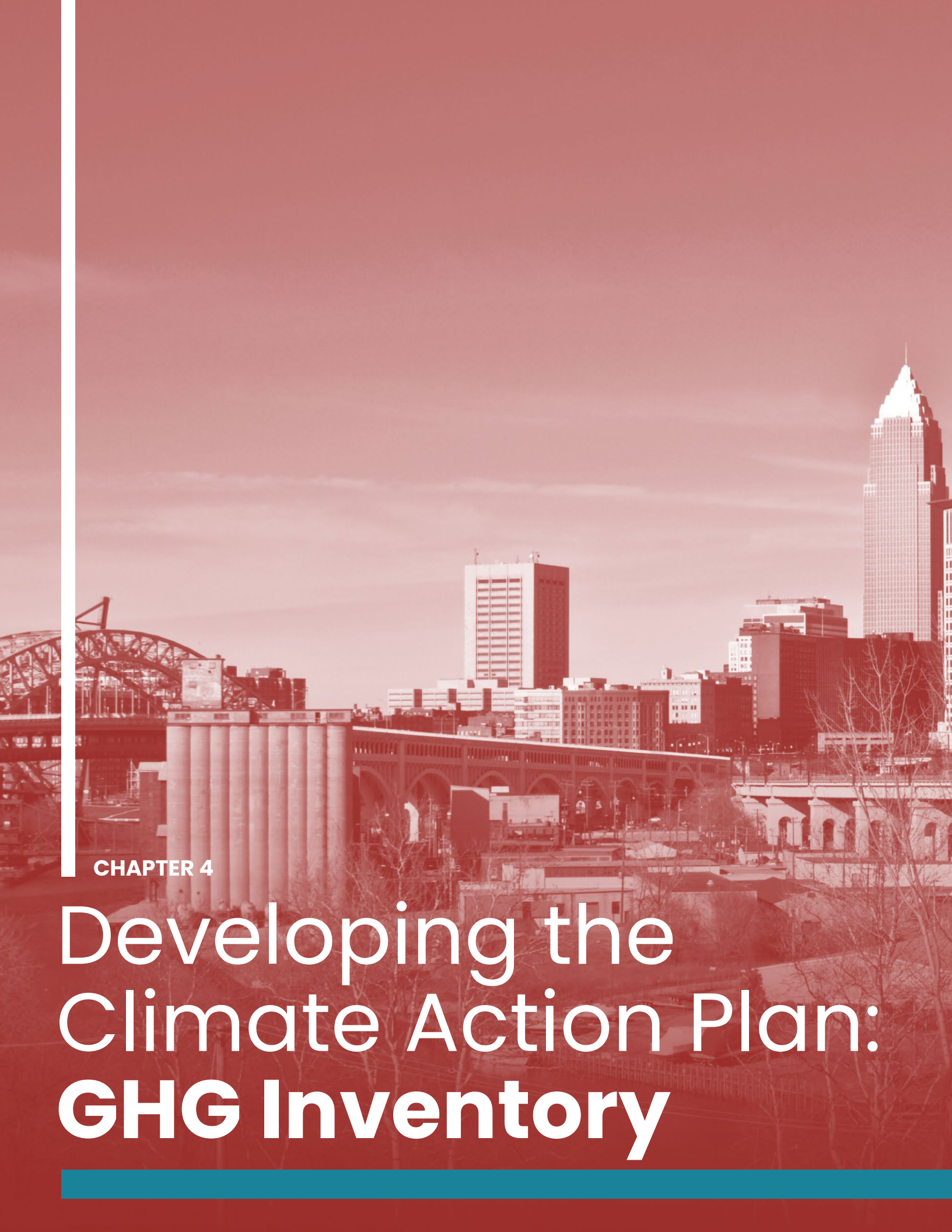
Rising temperatures and extreme rainfall will continue increasing both the frequency and severity of harmful algal blooms (HABs) and the number of combined sewer overflow (CSO) events, which flush untreated sewage into the Lake.[23] These increased threats would **limit the ability of residents to take advantage of the Lake for recreation and increase the cost of providing clean drinking water to residents and businesses.**[24]

The plant and animal species Clevelanders have grown up around may be driven out of the region. The ash tree is at risk of being wiped out due to the invasive emerald ash borer. The buckeye tree, Ohio's official tree species, could be driven out of Ohio and into Michigan due to rising temperatures.[25]



With 3°C of warming, nearly 40% of Cuyahoga County's native bird species may be pushed out of the region.[26]

Severe storms and heavy rainfall will cause additional property damages, which will impose costs for repairs and from rising insurance rates. Home insurance premiums have increased by $371 in Ohio since 2020.[27]



CHAPTER 4

Developing the Climate Action Plan: **GHG Inventory**

Since 2010, the City of Cleveland has completed an annual inventory of greenhouse gas (GHG) emissions, which allows it to review how much climate pollution is released due to the various activities occurring across the City each year.

Over the past 15 years, the City has tracked GHG emissions from four key sources[28]:

- **Energy Use:** electricity and natural gas use for buildings, including fuel leakages;
- **Industrial Processes and Product Use:** emissions related to industrial practices, such converting iron ore to steel;
- **Transportation:** fuel use for on-road vehicles, air travel, and waterborne vessels; and
- **Waste:** emissions from the disposal of solid waste and treatment of wastewater.

For this CAP, the City updated its GHG inventories for 2019-2022 to give it a clearer sense of how many GHGs are entering the atmosphere, what the major sources of those emissions are, and how much progress has Cleveland made towards meeting its climate targets.

For a more detailed review of the GHG inventory, including the methods that Cleveland uses to calculate emissions and any changes the City has made to those methods in recent years, please review Appendix B (bit.ly/CAP_AppendixB).

Cleveland's 2022 GHG Inventory

During 2022, activities occurring within the geographic boundaries of the City of Cleveland were responsible for the release of 9.4 million metric tons of carbon dioxide equivalent ($MtCO_2e$).

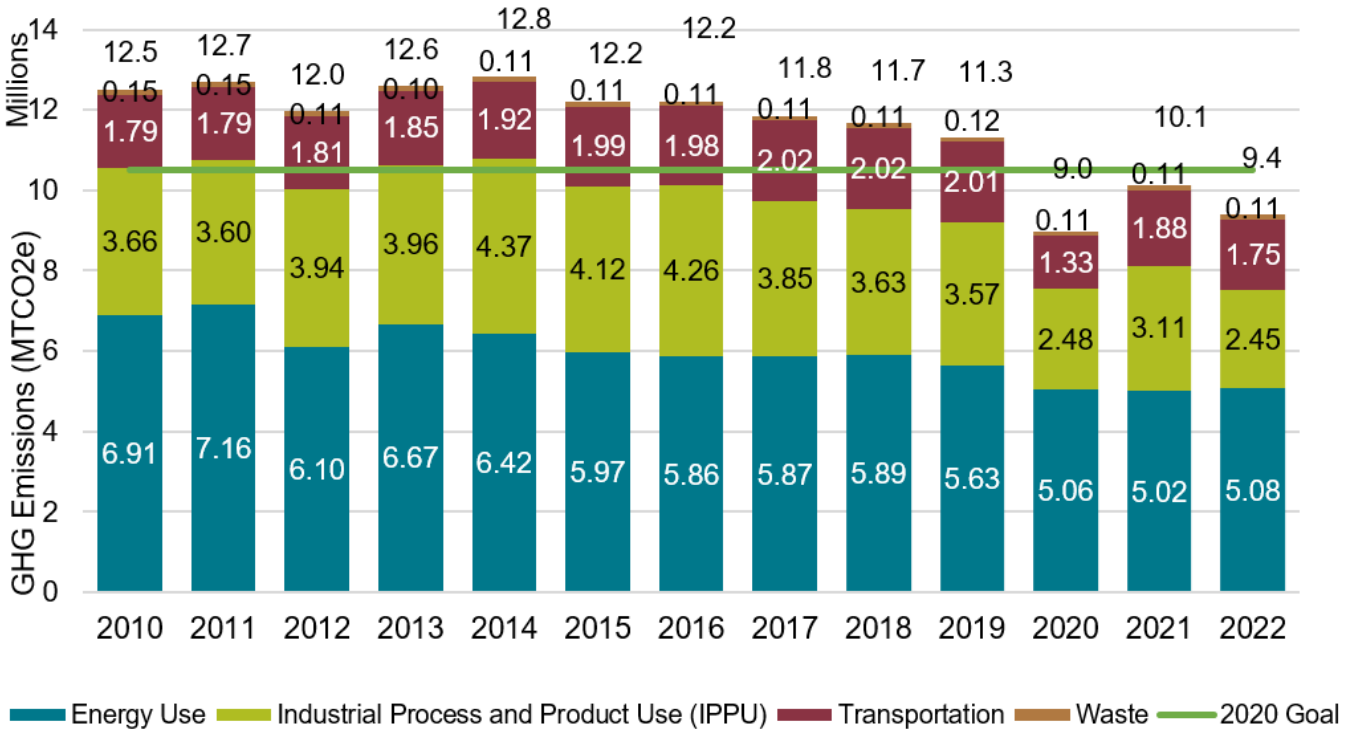
This number represents a 25% reduction from the City's original 2010 baseline and a 20% reduction from the updated 2018 baseline. While emissions were slightly higher in 2022 than in 2020, when they fell to record lows due to the effects of the COVID-19 pandemic, GHG emissions fell by 7.2% from 2021 to 2022, the second largest annual reduction on record.

The City's original climate targets, set in 2013, called for reducing GHGs by 16% from 2010 levels through 2020. As **Figure 3** shows, the City achieved this target in 2020, when emissions fell to 9.0 $MtCO_2e$.

While emissions rebounded in 2021, they have remained below this 16% reduction goal, meaning that the City did achieve its 2013 target for 2020.

In order to achieve its updated Science-Based Target (SBT), which calls for reducing emissions by 63.3% through 2030 from 2018 levels, the City would need to cut emissions by 6.5% each year from 2023 through 2030. The observed reductions during 2020 and 2022 suggest that the City could potentially meet this SBT, but it will need to accelerate its rate of implementation significantly.

Figure 3: City of Cleveland GHG Emissions 2010-2022



As the Great Recession (2007-2009) and the COVID-19 pandemic have shown, GHG emissions often fall during periods of economic decline and increase during recoveries. However, the City of Cleveland also tracks the more general trending relationship between GHG emissions and economic growth, as measured by Gross Regional Product (GRP) for Cuyahoga County.

Figure 4, on the next page, demonstrates that the City of Cleveland is successfully "decoupling" GHG emissions from economic growth.

In other words, due to technological improvements in energy efficiency and switching from higher-carbon energy sources (e.g. coal) to lower- or zero-carbon options (e.g. solar and wind power), the City has been able to grow its economy while also reducing GHGs.

GRP in Cuyahoga County grew by 21%, from $86.22 billion to $104.19 (in 2021 dollars) from 2010 to 2022, while GHGs per million dollars of GRP fell by 39%, from 145 MtCO2e to 89 $MtCO_2e$.

Figure 4: City of Cleveland Emissions Trends with Cuyahoga County GRP, 2010-2022

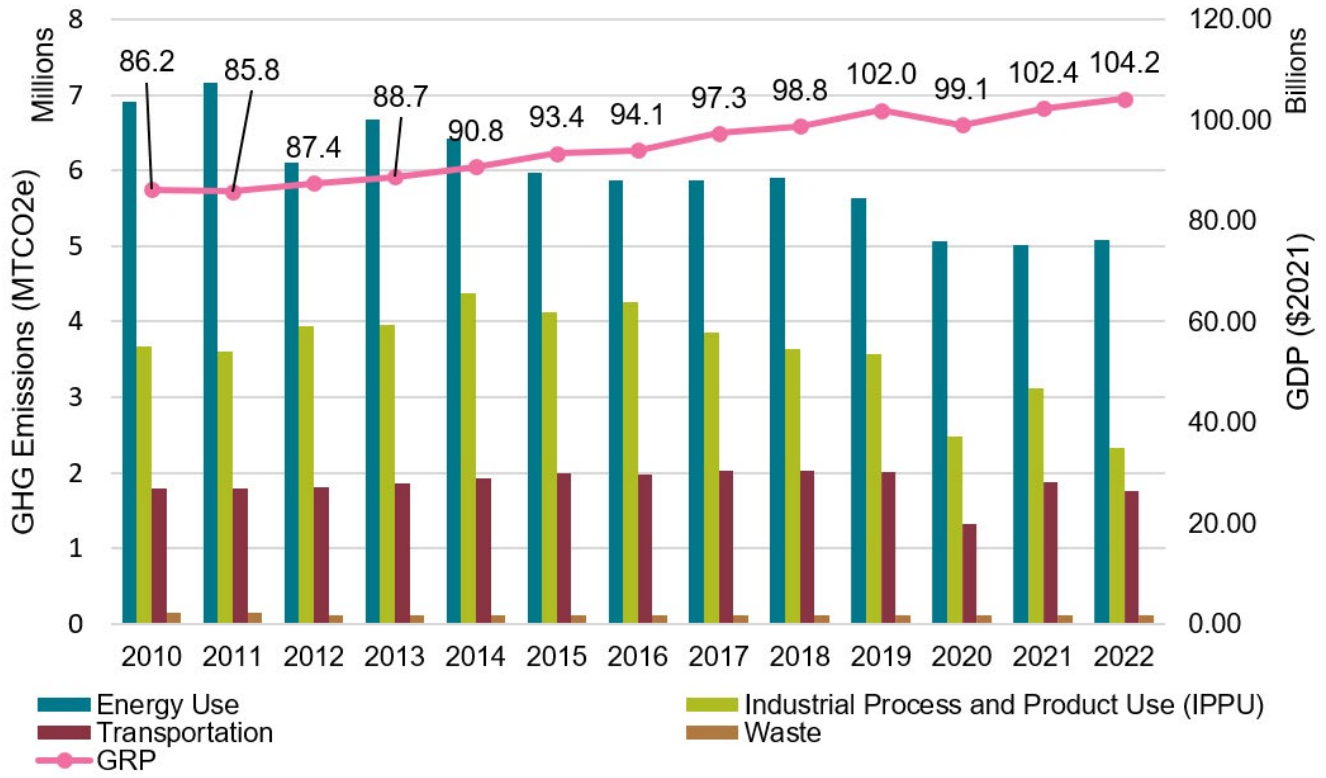
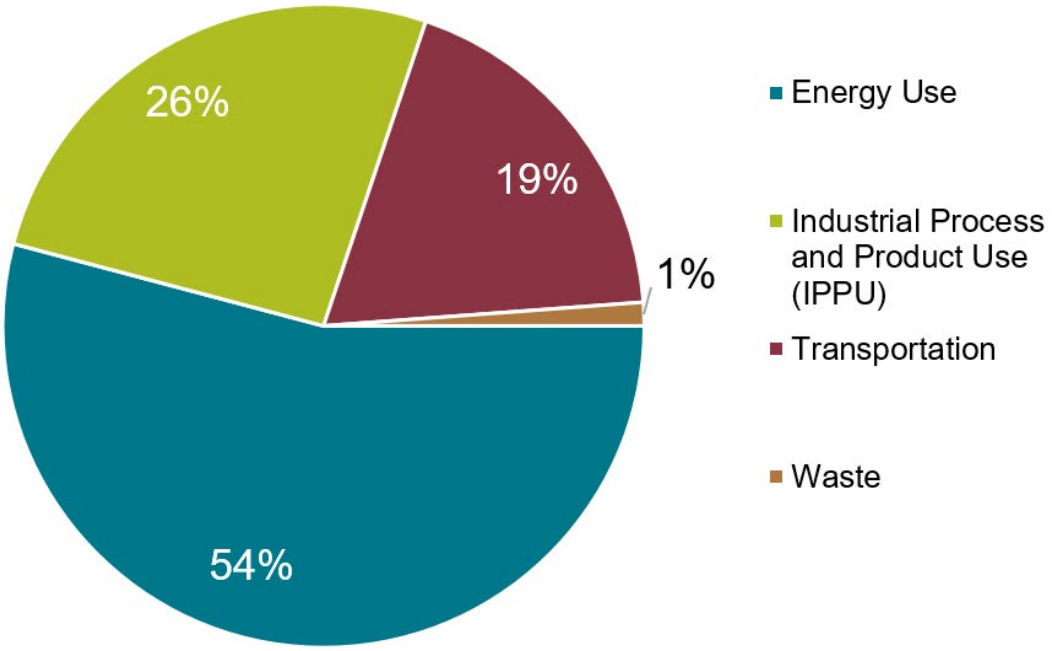


Figure 5, on the opposite page, breaks down GHGs in the City of Cleveland by source during 2022.

The majority (55%) of total emissions stem from energy use for buildings, with the majority (58%) of energy emissions being related to natural gas use and the remainder coming from electricity consumption. Industrial processes and product use (IPPU) accounted for 25% of GHGs during 2022, lower than in previous years, as IPPU emissions fell to record lows in 2022. Emissions from transportation and waste also fell during 2022, though both remained above their record low levels from 2020. Transportation and waste made up 19% and 1% of total GHGs, respectively, similar to their average shares of total emissions over time. The primary drivers of emissions reductions within Cleveland are:

- Declining IPPU emissions, which accounted for 41%,
- A 34% reduction in the carbon intensity of electricity use, which accounted for 35%; and
- Lower natural gas use, which represented 23% of the total reduction.

Figure 5: City of Cleveland GHG Emissions by Source (2022)



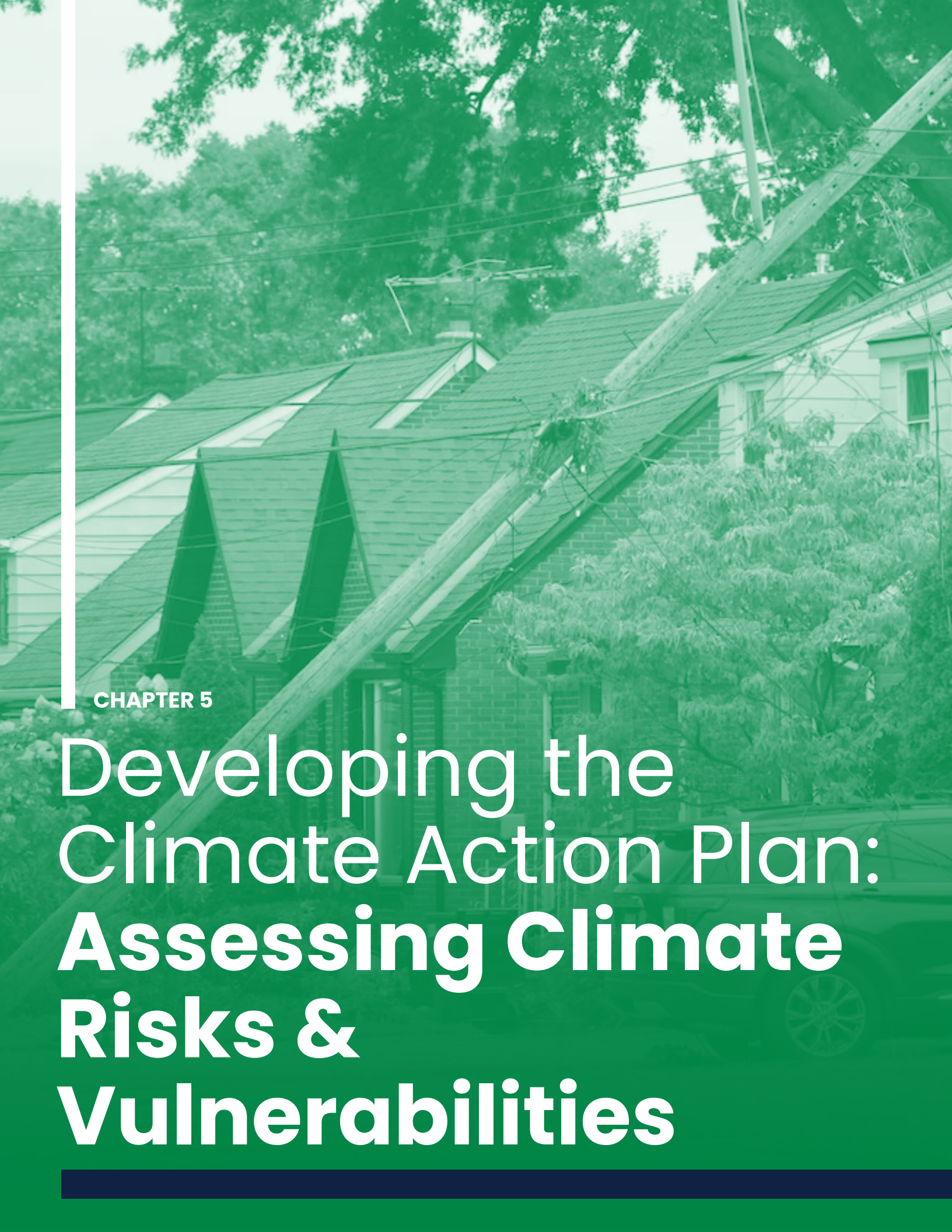
The rest was tied to improved vehicle fuel economy, reduced emissions from marine vessels, and lower emissions from solid waste generation.

Because the City of Cleveland has limited ability to directly influence emissions from the industrial sector, this CAP prioritizes actions that will reduce emissions from building energy use, transportation, and waste.

However, the City of Cleveland recognizes that it will not be possible for the City to achieve its 2030 or 2050 climate targets without significant action from industrial manufacturers. IPPU emissions account for at least one-quarter of GHGs, and industry's share of total GHGs climbs to 49% when one adds in industrial energy use.

Reduced IPPU emissions accounted for nearly half of GHG reductions in 2022; however, there is no guarantee that trend will continue. In fact, preliminary data for 2023 suggest that industrial emissions may have increased considerably.

Accordingly, the City is working with stakeholders throughout the region to identify and implement emissions reduction measures in the industrial sector, as outlined in Chapter 7.



CHAPTER 5

Developing the Climate Action Plan: **Assessing Climate Risks & Vulnerabilities**

Climate change is no longer a distant threat for the future – Clevelanders see and feel the impacts today. The City of Cleveland is already experiencing the climate crisis in the form of climate hazards such as poor air quality to extreme heat to severe storms and flooding.

Six of the 10 hottest years on record in Cleveland have occurred since 2010, with three of the top 10 years (2024, 2023, and 2021) occurring since the City's last CAP update. Since the 1950s, average annual temperatures have increased by 2.9°F in Cleveland, higher than either the U.S or the planet as a whole.[29] **Five of 10 wettest years on record have occurred since 2010, and annual precipitation has risen by nearly one-third since 1950.[30]**

Nearly all (98.5%) respondents to the City's CRVA survey indicated they have experienced at least one climate hazard in the past three years, while 85.2% stated that climate hazards have prevented them from completing essential daily tasks, such as going to school, work, or the doctor.

98.5%

Of Climate Risk Survey repondents said they experienced **at least one climate hazard** in the past three years

85%

Of repondents said **climate hazards have prevented them from doing essential daily tasks**

In Summer 2023, the City of Cleveland began updating its Climate Risk and Vulnerability Assessment (CRVA).

The CRVA traced changes in the City's climate over the past several decades; reviewed projected changes to climate hazards in the coming decades; discussed Clevelander's priority climate hazards; identified vulnerable population groups, neighborhoods, and community systems to those hazards; and discussed the factors most important for increasing or decreasing the ability of Clevelanders to cope with the impacts of a changing climate.[31]

Through this CRVA process, **Clevelanders identified three priority climate hazards: poor air quality, extreme heat, and heavy precipitation and severe storms.** This section briefly reviews these hazards and the population groups and community systems most vulnerable to them.

Poor Air Quality

While air quality has improved significantly, Cleveland continues to struggle with persistent air pollution. Cleveland regularly ranks as one of the country's "Asthma Capitals," and it has the seventh highest asthma rate in the country.[32] Across Northeast Ohio, air pollution was responsible for 639-1,439 premature deaths, 12,975 asthma attacks, and more than 63,000 lost workdays during 2016.[33]

Climate change is already worsening the City's air quality challenges. While emissions of the chemicals that form smog (ground-level ozone) continue to fall, the annual number of days with unhealthy smog levels in Cleveland has stayed roughly the same for the past 10 years. Increased wildfire activity – driven by climate change – occurring in other regions is also affecting levels of smog and soot (fine particulate matter [PM2.5]).

The impact of wildfire smoke was particularly apparent during the summer of 2023, when Cleveland experienced the worst and second worst days for air quality on record (respectively June 28 and June 29, 2023).

Climate change will continue to make air quality worse in Cleveland over the coming decades. As summer temperatures continue to rise, the City of Cleveland may see higher smog levels. Increased rainfall may lower soot (PM2.5) levels in Cleveland in the coming years, but soot levels may actually

increase under higher warming scenarios, affecting the health of Clevelanders.

Based on public feedback, the population groups most vulnerable to poor air quality are outdoor workers, people experiencing homelessness, and children; in turn, the community systems most vulnerable to poor air quality are public health and safety, ecosystems/environmental health, and community/cultural systems.

Extreme Heat

In Cleveland, "hot days" occur when the temperature reaches 90°F. Over the past 50 years (1974-2023), Cleveland experienced 7.8 hot days per year. This number has risen to **10.5 hot days annually since 2010.**[34] Record high temperatures have also become more common in recent years. Heat waves, which are periods of abnormally hot weather lasting two or more days, worsen health risks.

The frequency, duration, and intensity of heat waves have all increased in Cleveland from 1961-2021.[35] From June 17-22, 2024, Cleveland experienced an unprecedented early season heat wave, recording average daily temperatures 0.9°F warmer than any other June in recorded history.[36]

The impact of extreme heat on Cleveland will only become more apparent in future years. Average daily high temperatures in Cleveland will increase 5.3-6.7°F by 2050 and 6.8-11.8°F by 2100. The annual number of days with temperatures at or above 90°F may increase to 27-34 days by 2050 and to 41-82 by 2100. **The number of extreme heat days (days above 95°F) may also increase from just one per year currently to 8-11 by 2050** and to

15-47 per year by 2100.[37] **This increase in extreme heat will take a severe toll on the health and well-being of Cleveland residents, particularly those who lack reliable access to air conditioning.** Through the CRVA, Clevelanders identified outdoor workers, people experiencing homelessness, and people living with medical conditions and disabilities as the groups most vulnerable to extreme heat. The community systems most vulnerable are ecosystems/environmental health, public health and safety, and food and agriculture.

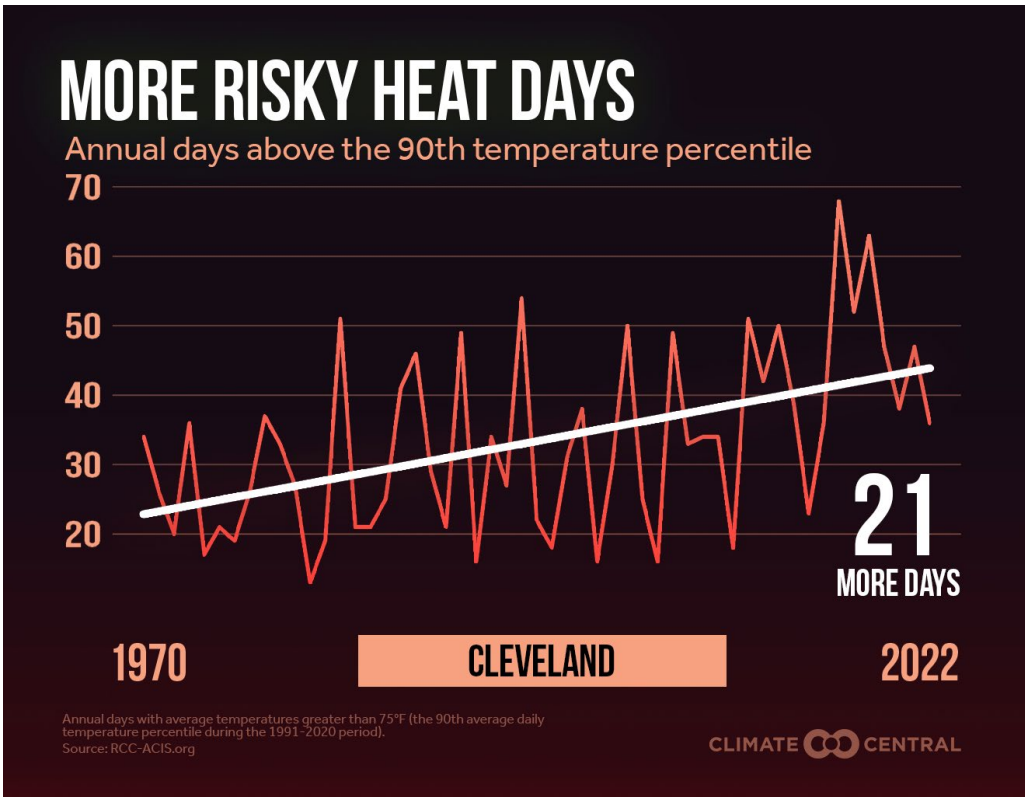
+6°F

Expected **increase in average daily temperature** by 2050

31

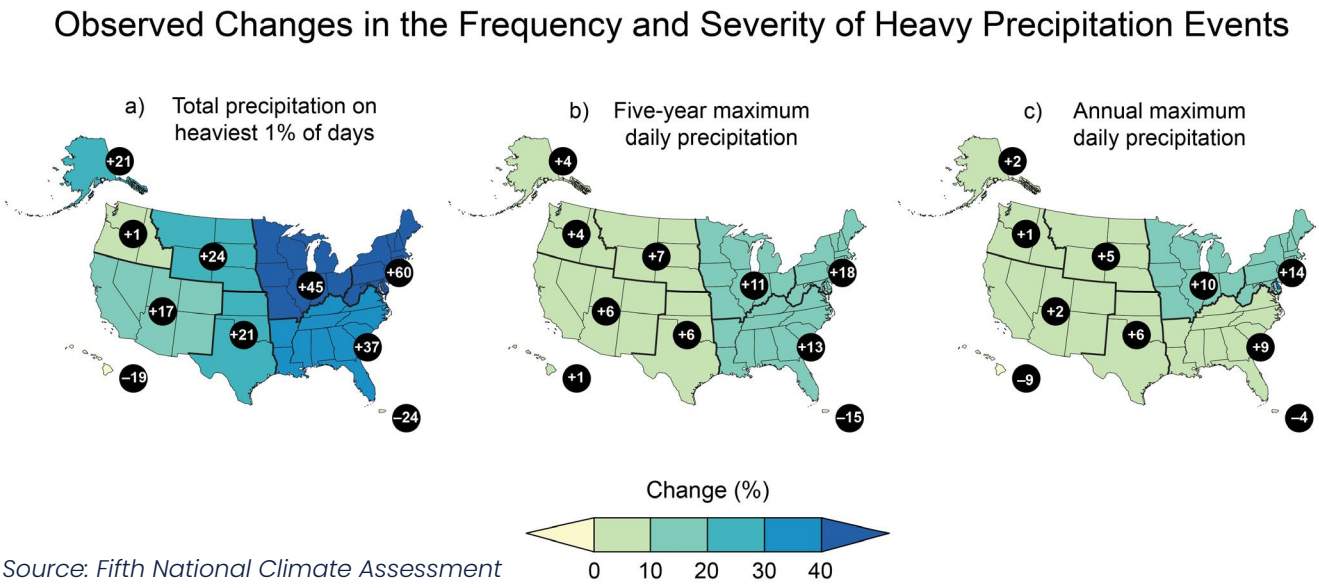
Expected number of **days per year with temperatures over 90°F** by 2050

Figure 6: Number of Days with Dangerous High Temperatures in Cleveland (1970-2022)



Source: Climate Central

Figure 7: Changes in the Frequency & Severity of Heavy Precipitation Events



Source: Fifth National Climate Assessment

Heavy Precipitation & Flooding and Severe Summer Storms

Since 1950, rainfall in Cleveland has increased by more than 10 inches a year, and this additional rainfall is increasingly falling during heavy storms.[38] Of the 12 days with at least three inches of rainfall in Cleveland, seven have occurred since 2005.[39]

According to Flood Factor, **Cleveland is a major flood risk: one in six properties have a greater than 26% chance of being severely affected by flooding in the next 30 years.** Critical infrastructure, such as airports, hospitals, fire stations and wastewater treatment facilities are at an even higher risk.[40]

Severe summer storms have also taken a toll on Cleveland. **From 2013-2022, Cleveland experienced 38 episodes of damaging winds and thunderstorms. These storms caused a total of $2.2 million in damages.**[41]

Climate change will further increase heavy precipitation, flooding, and severe summer storms in Cleveland. Annual precipitation will increase to 60.3-61.6 inches by 2050 and to as much as 86.6 inches by 2100. Heavy rainfall events will also increase. The amount of rain falling in the heaviest storms may increase by another 20-40%.[42] **Risk Factor predicts that the share of properties at flood risk will increase by 8% through 2050.**[43]

Clevelanders feel that people experiencing homelessness, outdoor workers, and people living in low-income and disinvested communities are the groups most vulnerable to this hazard. The most vulnerable community systems are ecosystems/environmental health, food and agriculture, and public health and safety.

Table 1, to the right, charts observed and projected changes in Cleveland's climatic conditions through the end of the century. The data show clearly that Cleveland's weather will become warmer, wilder, and wetter. Nevertheless, the data also demonstrate that the extent and impact of these changes are responsive to our taking action to curb climate pollution.

While Cleveland may experience 41 extreme heat days per year by 2100 under a lower warming scenario, that number would double to 82 days per year under a higher warming scenario. **This 1,110% increase over the historical average would take a serious toll on Cleveland residents, as heat-related mortality would rise by over 1,700%, more than double the impact of a lower warming scenario.**

Under a lower warming scenario, soot pollution may decrease in Cleveland; however, if warming exceeds 3°C pollution levels would increase, leading to more cases of asthma and more premature deaths. By 2080, the climate of Cleveland would more closely resemble Harrisburg, Pennsylvania under a lower warming scenario; but **if we fail to curb climate pollution, Cleveland could end up with the climate of Hartman, Arkansas, a town more than 760 miles to our southwest.**[44]

These indicators make it clear that Cleveland will not be some refuge from the impacts of the climate crisis. On the contrary, recent events have dispelled the notion that certain places will be climate havens. From Hurricane Hillary causing the first tropical storm watch in Southern California's history in August 2023 to the Hurricane Helene devastating wide swathes of western North Carolina in October 2024 to historic drought leading to wildfires in New York and New Jersey in November 2024, the climatic conditions that we have become accustomed to have changed fundamentally.

> **Climate change will spare no region, including the Great Lakes, and evidence suggests that the residents of many of Cleveland's neighborhoods are nearly as vulnerable to climate hazards as are people living in areas like the Gulf Coast.**

The City of Cleveland recognizes that its location along Lake Erie provides many

advantages, but the City also knows that it must act quickly and decisively to prepare for the impacts of climate hazards and to enhance the resilience of its residents, community systems, and physical infrastructure. The actions outlined in Chapter 7 will go a long way to both limiting GHG emissions and helping to better position the City to withstand the effects of the climate crisis.

Table 1: Projected Changes in Climate Conditions in Cleveland through 2100

Warmer Temperatures (Hot Days Over 90°F)
Summer days could be **6-19% hotter** than in the past.
High heat days (90F+) could increase to **40+ days per year** under a low warming scenario, **80+ days per year** under a high warming scenario.
Fewer Freezing Days (<32°F)
121 freezing days per year in the past.
Number of freezing days could **drop to about 86 days** by mid-century.
By 2100, could drop to **less than 60 freezing days** a year.
More Heavy Rain and Floods
In the past, there were about 3-4 days per year where more than 1 inch of rain fell in a single day.
By 2100, it could be 5+ days per year—that's a **44% increase** in extreme rainfall events!
More heavy rain days (over 1 inch in a day) expected.

CHAPTER 6

Evaluating Climate Actions

The City of Cleveland created an evaluative framework to help it review, score, and rank potential actions that it was considering for this CAP. In order to develop this framework, the City reviewed the 2013 and 2018 CAPs, along with similar plans from a number of peer cities.

The City considered what elements these different plans had in common and determined which components were most relevant and important for the City to include in its framework.

Through this review, the City identified several potential elements that it could include in its assessment of climate actions. To ensure that the public played a direct role in this process, the City included a question in the Cleveland Community Climate Action Survey (for more information on the survey, review Chapter 2) that asked the public to rank these elements from most to least important.

Based upon this feedback, the City created a draft evaluative framework beginning in August 2021, which was revised and finalized after consulting with the CAP Steering Committee and Advisory Council at their August 21 meeting.

The final evaluative framework grouped 19 individual factors under four categories:

1. **Impact:** to what extent can each action reduce GHG emissions over both the short- (by 2030) and long-term (by 2050);
2. **Funding:** what are the upfront costs and cost savings for the City, residents, and businesses, and is there funding available to help pay for implementing each action;
3. **Feasibility:** how likely is it that the City of Cleveland and/or its key partners can implement each action readily, does each action align with other plans and priorities within Northeast Ohio, and has the public expressed support for each action; and
4. **Action Co-Benefits:** how likely is it that each action will deliver important benefits besides GHG reductions, such as enhancing equity, improving resilience, supporting local businesses, and benefiting public health and well-being?

The City of Cleveland reviewed the actions that stakeholders and residents proposed for each of the six focus areas and scored them out of a potential 55 total points. In addition, the City identified whether each action advanced the following key cross-cutting priorities.

Circular Economy

Our current economy can be described as TAKE-MAKE-WASTE. We take resources from the ground (take), create a product or item (make), then throw it away (waste).

This *linear economy* is extremely resource intensive and dependent on fossil fuels. **In a *circular economy*, we reduce or eliminate waste and pollution, keep products and materials in use as resources, and restore and renew nature.**

The principles of a circular economy can be applied in a number of ways, e.g. in the initial design of a product or in the reuse, repair, or remanufacture of a product. Whereas in a linear economy people think about reducing, reusing, and recycling, a circular economy incorporates several other Rs, including recover, remanufacture, redistribute, refuse, rethink, etc. Because cities generate large amounts of waste, they must play a central role in the transition to a circular economy. Cities also offer an abundance of resources and opportunities for new business models for reducing waste and pollution. Education for all stakeholders

on the principles of the circular economy is important in the transition to use and manage our resources more efficiently. All sectors and stakeholders can play a role in this transition.

Empowerment

The climate crisis can make people feel extremely small and helpless. How can one person or business or city truly make a difference when this issue is global in nature and its impacts are felt over the course of decades? Why not have leaders simply hand down solutions from above to swap our existing fossil fuel-based economic and political systems with ones powered by clean energy?

> ***It is important that individuals are supported by their local governments so that they are able to cope with climate change.*** *People are not always in positions to cope with climate change on their own, so the government has an important opportunity to support its citizens.*
>
> *— Downtown Resident*

However, **the climate crisis also represents an opportunity to provide greater voice and control over these decisions to Clevelanders.** Ensuring that Cleveland residents have a direct role in creating and implementing this CAP is not just a nice idea, it also increases the likelihood that climate actions will address their daily needs and that residents and businesses will actually want to implement these actions.

Climate empowerment can come in many forms. **According to the United Nations, there are six elements of climate empowerment: education, public awareness, training, public participation, public access to information, and cooperation.**[45]

The City of Cleveland can advance these six elements through the implementation of this CAP by educating residents, businesses, and local officials about the climate crisis in Cleveland; raising awareness about this issue through outreach, communications, and engagement efforts; providing trainings, and sharing information with the public in an open and transparent manner, as discussed in Chapter 8.

The City is also committed to ensuring the public plays an active and key role in implementing these actions.

Equity

The individuals and communities that are least responsible for the climate crisis are those who are most likely to suffer its impacts. They are also far less likely to be able to recover from the impacts. In this way, **the climate crisis widens existing gaps in health and wealth.** In Cleveland:

- People of color are exposed to 10.2% more fine particle pollution[46];
- Black, Latino, and Asian-American residents are more likely to live in communities with less tree cover and with more land uses that worsen climate hazards[47];
- Formerly redlined neighborhoods are 4.7°F warmer than other parts of the City[48];
- Neighborhoods with larger shares of Black residents have lower life expectancies, with residents of the 44118 zip code expected to live 24 years longer than those of 44016.[49]

Climate actions can address this problem by tackling issues driving these gaps. Expanding alternatives to driving and electrifying vehicles will reduce air pollution, which could help to reduce the existing gap in pollution exposure and health impacts. Nature-based solutions, such as tree maintenance and planting and expanding access to green space, can reduce the impacts of the urban heat island and lower risks of flash floods. Weatherizing and electrifying homes can reduce energy costs and improve indoor air quality for Cleveland's families.

> ***Climate change will exacerbate challenges in already disadvantaged communities, so the City of Cleveland should help those residents to ensure that inequality doesn't worsen in the city.***
>
> *— University Resident*

Good, Green Jobs

Transitioning to a clean energy future will benefit Clevelanders in a number of ways, but the lasting impact will be limited if Clevelanders cannot participate fully in that transition.

As Cleveland shifts away from an economy dependent on fossil fuels, it must work to ensure that residents, particularly those from historically marginalized communities, can play an active role by gaining access to good jobs in these sectors.

Cleveland has long suffered from chronic unemployment and underemployment. The unemployment rate in Cleveland is more than double the State of Ohio's.[50] Providing pathways to good paying, sustainable, safe jobs in clean energy and related fields is vital for Cleveland to achieve its climate targets.

Cleveland's business community must also play an active role in this transition. Cleveland currently spends billions of dollars outside of the region by purchasing fossil fuels. Shifting to clean energy, particularly energy based in Northeast Ohio, will help to keep those dollars in our local economy. Moreover, recent federal policies have sparked over $910 billion in private investments in manufacturing. Nearly $60 billion in investments in manufacturing and clean energy have come to Ohio in recent years, helping to create more than 345,000 quality jobs.[51]

> ***Start with the people, and jobs. Once there's an educated, trained workforce, you have more tools to implement.***
>
> *— Downtown Resident*

The U.S. is experiencing a renaissance in manufacturing, and Cleveland can tap into this by **developing clean energy, providing workforce development and training opportunities, and partnering with labor organizations to ensure green jobs are also good jobs.**

The City has already started this work through a $10 million investment of ARPA funds, creating a "Built Environment Collaborative" that seeks to recruit 3,000 Clevelanders into job training programs for the built environment by 2026.

Resilience

Climate resilience is the ability a person, community, business, or the natural environment has to prevent, withstand, respond to, and recover from a climate-related disruption. As noted earlier, **many of Cleveland's residents and neighborhoods are highly vulnerable to the impacts of climate change due to preexisting challenges such as poverty, chronic health issues and disabilities, and poor quality and unstable housing.**

While Clevelanders are less exposed to climate hazards than other communities, these underlying vulnerabilities leave them just as susceptible to the effects of the climate crisis. Consider extreme heat. Residents of the 44103 zip code experience the same number of extreme heat days per year (13) as the average American, but other factors, such as chronic health issues, poverty, and low tree cover mean that this zip code ranks in the 99.7th percentile, nationally, for health risks from extreme heat.[52]

Taking actions to invest in clean energy and reduce GHG emissions will go a long way towards reducing climate risks in Cleveland, but addressing these underlying vulnerabilities will do more to enhance the resilience of Clevelanders in the near term.

> ***Cleveland has the potential for strong resilience due to the proximity of Lake Erie, but yet we are not prepared for severe weather and the impacts of climate change.***
>
> *— Brooklyn Centre Resident*

For a complete listing of all actions that the City evaluated, along with their scores, please review Appendix D (bit.ly/CAP_AppendixD).

CHAPTER 7

Cleveland's Community Path to Net Zero

The City of Cleveland, in partnership with dozens of stakeholder organizations and hundreds of residents, have developed this action plan to achieve net zero emissions and make Cleveland resilient to the impacts of climate change by 2050.

This action plan includes 16 goals, 43 objectives, and more than 150 concrete actions divided across six focus areas.

Focus Areas are the main organizing structure of the Climate Action Plan. Each focus area relates to a significant component of climate action, such as an economic sector or activity type that is essential for tackling the climate crisis in Cleveland. The six focus areas are:

- Built Environment
- Clean Energy
- Clean Transportation
- Nature-Based Solutions
- Resilient People
- Circular Industry

Within each Focus Area, the City of Cleveland has identified a set of goals, objectives, and actions which define the steps the City and its partners will take to address climate change through 2030 and beyond.

Goals are broad vision statements that outline the desires Clevelanders have for each focus area. They are both aspirational and clear enough to allow the City to track its progress over time and to ensure we are moving in the right direction.

Objectives are high-level, specific statements that help break down these goals into clearer, quantifiable approaches. Objectives align with the Regional Decarbonization Framework and the Climate Risk and Vulnerability Assessment that the City developed as part of this CAP update process.

Actions are clear, specific, actionable steps that the City, its partners, and its residents can take to complete objectives and put our community on the path to meeting our goals. The City of Cleveland has analyzed each action using the Evaluative Framework laid out in the previous chapter.

The City and stakeholders involved in developing this CAP have identified a handful of Priority Actions within each Focus Area that the City will focus on implementing immediately.

In addition to its Focus Areas, the City of Cleveland has identified a set of **Cross-Cutting Priorities, which are issues essential for advancing climate justice and which span across Focus Areas.** These themes are:


Circular Economy (CE)


Empowerment (EM)


Equity (E)


Good, Green Jobs (GJ)


Resilience (R)

If an action advances one or more of these priorities, the icon for that priority is listed next to it. The table to the right identifies each goal, objective, and action by focus area.

Table 2: Complete List of Climate Actions

Built Environment – 0.1 MMtCO_2e reduced by 2030
Make existing commercial and residential buildings more comfortable, healthy, and energy efficient.
All new buildings should have net zero emissions by 2050.
Work to ensure that sales of new fossil fuel heating systems cease by 2035 and existing systems are converted to electric heating by 2050.
Encourage adaptive reuse or renovation of properties.
Commercial and residential buildings will adopt circular construction and demolition principles.
Reduce solid waste generation waste sent to landfills by residents and businesses by 50% by 2035.
Implement land use policies that prioritize non-automobile travel modes.
Adopt built environment policies that advance transportation electrification.
Clean Energy – 0.7 MMtCO_2e reduced by 2030
While guaranteeing affordability and accessibility, CPP will source at least 75% of its electricity from clean energy by 2035, 85% by 2040, and 100% by 2050.
CPP takes advantage of new technologies and innovative practices to improve grid reliability and resilience.
Develop programs to ensure CPP customers can access affordable, clean electricity and support for energy efficiency.
Minimize the number of households with an energy burden at or above 6% by 2035.

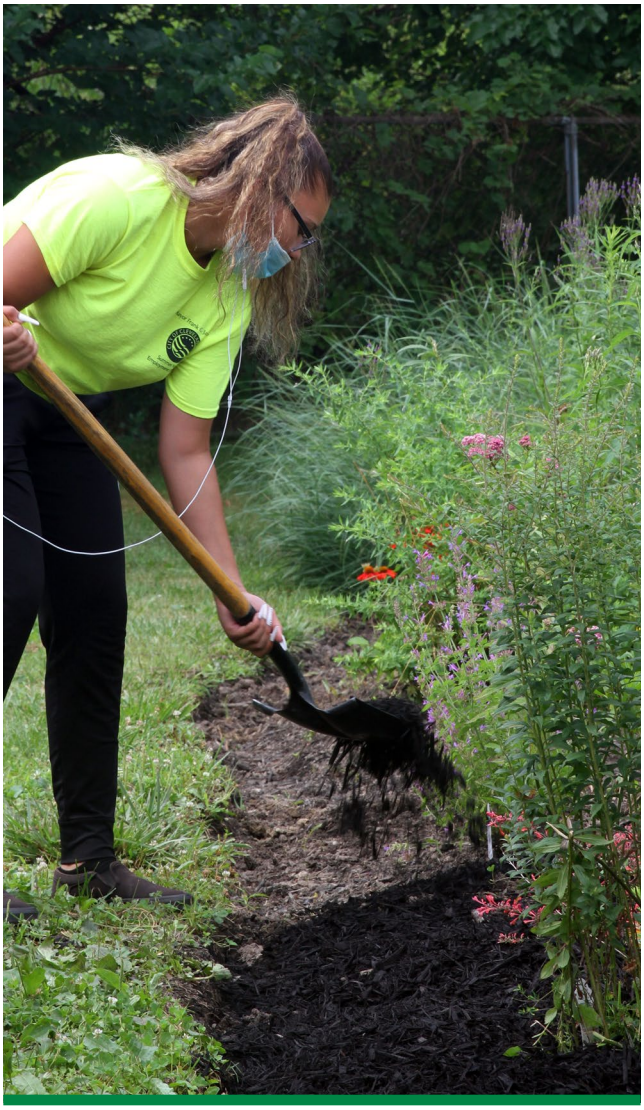
Establish strategies and programs to help Clevelanders participate in the green economy.
Work with private utilities and policymakers to deliver 100% carbon-free power and heat by 2045.
Eliminate barriers to providing 100% clean energy by 2045.
Clean Transportation - 0.2 MMtCO_2e reduced by 2030
Make public transportation a better and more convenient option to increase ridership 50% by 2030.
Transform Cleveland into a 15-minute city by creating safe, accessible environments that improve and support walkability.
Make Cleveland a gold or platinum level bicycle friendly community recognized by the League of American Bicyclists.
Prioritize and improve roadway safety to achieve Vision Zero and transportation decarbonization.
At least 50% of light-duty vehicle sales are zero emissions vehicles by 2030, reaching 100% by 2040.
At least 15% of fleet vehicles are zero emissions vehicles by 2030, reaching 100% by 2045.
Transition non-road vehicles (air, marine, rail) to zero emission alternatives by 2050.
Create programs that make sustainable transportation modes affordable and accessible for all Clevelanders.
Minimize the environmental health costs of the transportation system, particularly for overburdened communities.

Nature-Based Solutions - <0.1 MMtCO$_2$e reduced by 2030
Optimize funding opportunities and development patterns to increase Cleveland's capacity to absorb stormwater by 25%.
Support a resilient and accessible Lake Erie.
By 2030, promote the implementation of sustainable management of our urban forest and reduce deforestation of our tree canopy.
Increase access to and ownership of high-quality green space.
Utilize discarded materials from City and business operations to reduce emissions, regenerate urban land, and create economic opportunity.
Improve understanding of climate challenges and solutions within the nature-based solutions sector.
Support regenerative urban agriculture and local food systems.
Resilient People
Limit the impacts of poor air quality on the health and well-being of Clevelanders.
Develop and implement comprehensive strategies to mitigate the risk of extreme heat.
Reduce Cleveland's vulnerability to extreme precipitation and flooding.
Empower residents to take climate action in their communities.
Engage and empower residents to increase climate resilience within their communities.
Expand programs to address underlying causes of climate vulnerability for frontline communities.

Enhance the resilience of Clevelanders experiencing homelessness by providing essential resources and supports.
Foster a just, inclusive transition towards a sustainable economic system in Cleveland.
Circular Industry - 1.7 MMtCO_2e reduced by 2030
Improve energy productivity and decarbonize industrial operations in Cleveland by 30% by 2030.
Identify funding and investments for the transition to a Circular Economy.
Reduce waste in industrial settings by 30% by 2030.
Educate businesses and industrials on the business value, principles and, practices of the Circular Economy.

Impact & Benefits of Cleveland's CAP

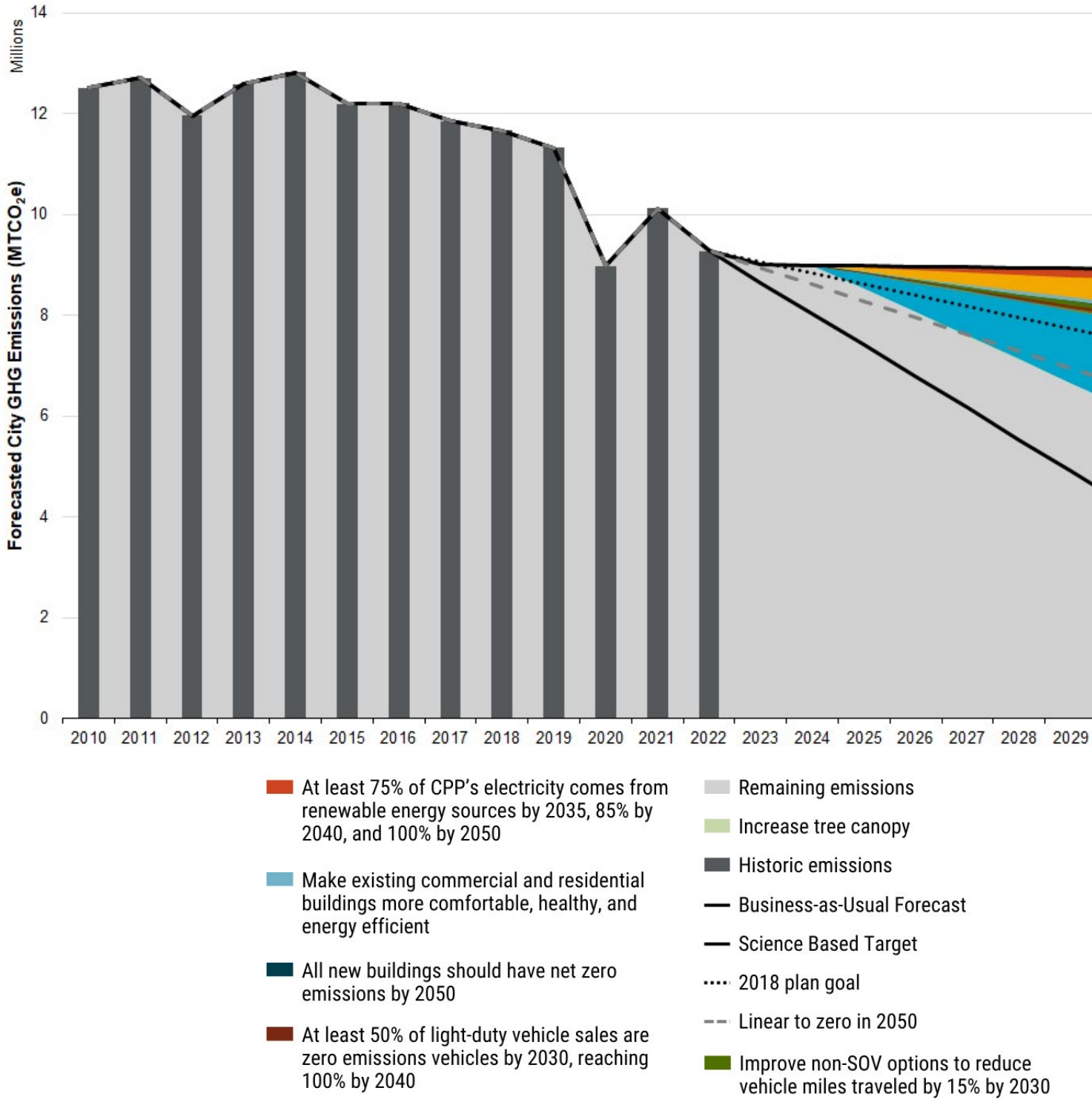
Figure 8 shows the GHG reductions from each of the CAP objectives. Overall, this CAP will cut GHG emissions by 47% and 79% by 2030 and 2050, respectively, from 2018 levels. Figures 9-10, on page 89, breaks down the GHG reductions by CAP focus area.

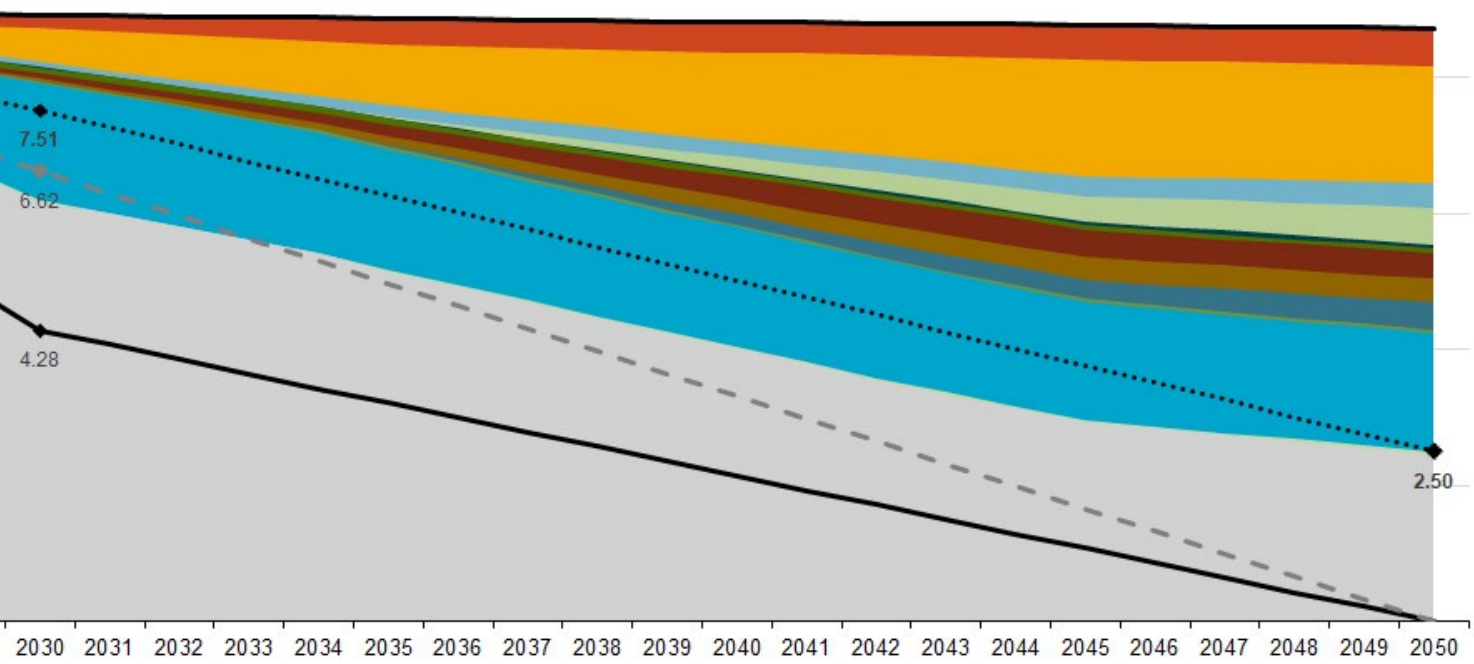


While the actions in this CAP update are not enough on their own to achieve the City's SBT, as shown by the "remaining" column in **Figures 9-10**, they would provide substantial benefits for Clevelanders. Compared to the BAU scenario, outlined in Chapter 3, these actions would prevent the release of 105.7 $MMtCO_2e$ through 2050 and provide combined social benefits of $22.9 billion.[53] Put another way, completing the actions in this CAP would prevent melting more than 68.7 gigatonnes of ice, an amount that would cover the entire City of Cleveland in 1,120 feet or the height of 1.6 Terminal Towers.[54] This 18.1 trillion gallons of avoided ice melt is equal to 14% of the water in Lake Erie. Alternatively, this CAP's actions would also be enough to offset the emissions of 25 million passenger cars or 28 coal-fired power plants.[55]

As noted earlier, **the City of Cleveland directly controls just 2.3% of citywide emissions, illustrating the need for all Clevelanders – businesses, institutions and residents – to commit to tackling this climate crisis together.**

Figure 8: Projected GHG Savings from Cleveland CAP Actions through 2050





- Transition non-road vehicles (air, marine, rail) to zero emission alternatives by 2050
- Improve energy productivity and decarbonize industrial operations in Cleveland by 30% by 2030
- Work with private utilities and policymakers to deliver 100% carbon-free power and heat by 2045
- At least 15% of fleet vehicles are zero emissions vehicles by 2030, reaching 100% by 2045
- Reduce solid waste generation and waste sent to landfills by residents and businesses by 50% by 2035
- Work to ensure that sales of new fossil fuel heating systems cease by 2035 and existing systems are converted to electric

Figure 9: GHG Emissions Impact by Focus Area (2030)

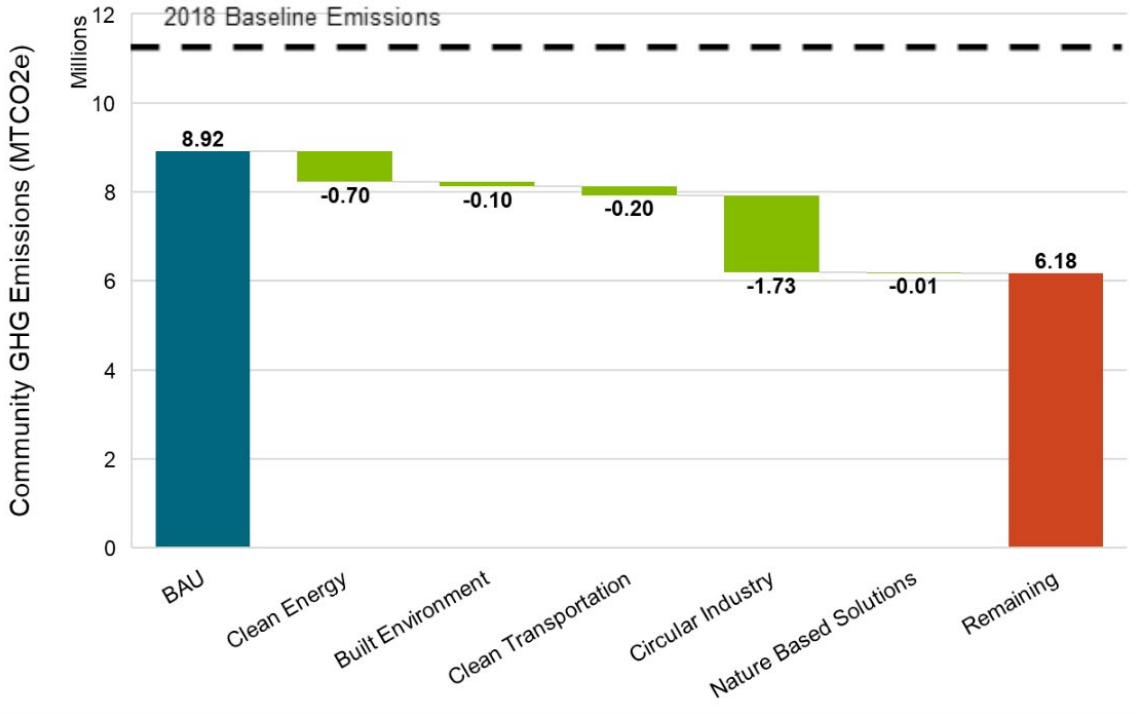
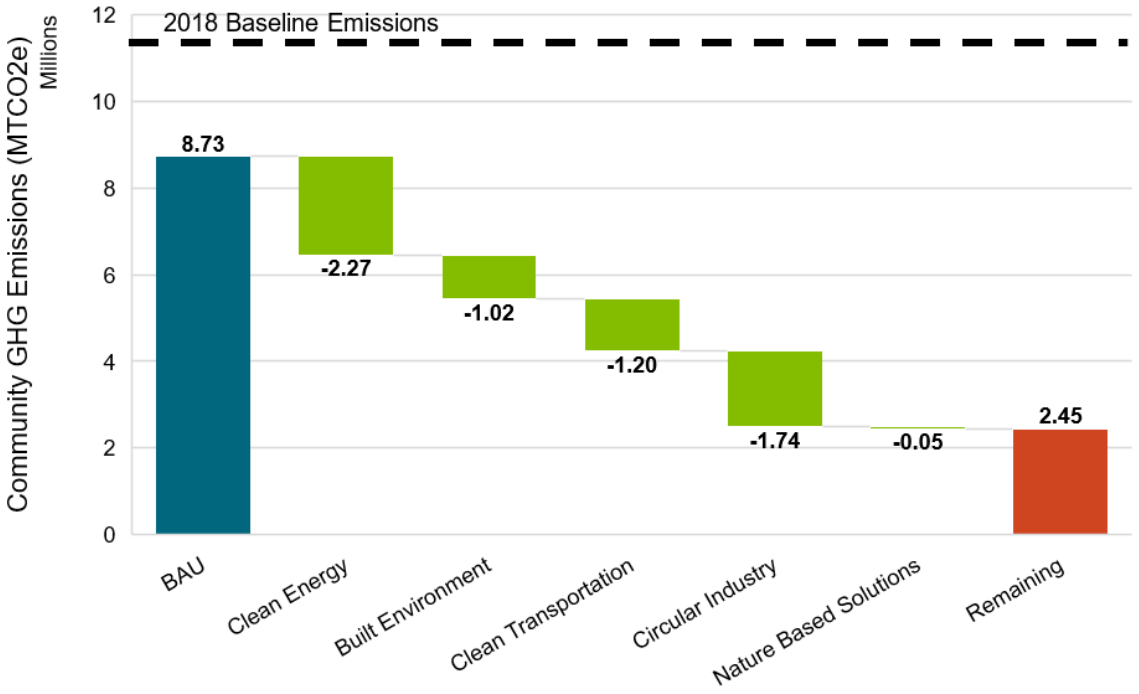


Figure 10: GHG Emissions Impact by Focus Area (2050)



Because the City is committed to transparency and accountability, we are sharing information both on the limitations of this CAP and the steps needed to bridge this emissions gap. To get a better sense of what is necessary to achieve its ambitious SBTs, the City analyzed a range of additional actions.

68.7
Billion Tonnes
Amount of ice melt avoided by implementing CAP actions

24.6
Million
Number of cars' worth of GHGs eliminated by this CAP

28
Number of coal-fired power plants offset by implementing CAP actions

Based on this analysis, meeting Cleveland's community 2030 SBT would require:

- Providing **100% clean electricity** to all users,
- Ensuring that 100% of vehicle sales are for **electric vehicles (EVs)**,
- **Retrofitting 5% of all residential and commercial buildings** each year, and
- Capturing and storing **20% of GHG emissions** from industrial processes by 2030.

Achieving these outcomes would be extremely difficult, but the additional benefits are dramatic. If the Cleveland community achieved its SBTs, it would prevent the release of 155.88 MMtCO_2e through 2050, 36% more than the actions outlined below. **This outcome would provide total benefits of $33.3 billion through 2050.**

The avoided emissions from the SBTs would be equivalent to:

- Removing 37.2 million passenger cars from the road,
- Closing 40 coal-fired power plants,
- Installing more than 41,000 wind turbines, or
- Planting nearly 2.6 billion trees

In other terms, achieving these SBTs would be equivalent to preventing 101.3 metric gigatons of ice melt, which would be enough to cover the City of Cleveland in 1,652 feet of water, 2.3 times the height of the Terminal Tower. The 26.8 trillion gallons of ice melt avoided could raise the level of Lake Erie by almost 13 feet.

Co-Benefits of the CAP

While reducing GHG emissions and increasing resilience are the primary focuses of this plan, they are far from the only benefits of climate action. **Shifting away from fossil fuels and reducing the vulnerability of residents to climate hazards will create a number of co-benefits**, including:

- **Improving air, water, and soil quality**;
- **Reducing energy costs**, particularly for electricity, heating, and transportation;
- Making residential and commercial **buildings more comfortable and healthier**;
- **Strengthening the economy** by keeping more money in Northeast Ohio and creating good, green jobs;
- **Enhancing mental health** by addressing external stressors and lowering climate-related anxiety;
- **Reducing traffic crashes** by encouraging people to use alternative travel modes; and
- **Minimizing habitat loss**/providing additional habitat for plant and animal species.

It is not possible to quantify all of the potential benefits of climate action in Cleveland; however, the City has attempted to provide values for benefits where tools make it possible to do so. In particular, the City has worked to quantify the air quality benefits of reducing GHG emissions using U.S. EPA's CO-Benefits Risk Assessment (COBRA) Health Impacts Screening and Mapping Tool.[56]

Table 3, below, outlines the air quality benefits associated with the actions identified in this CAP, and the SBT through 2030 and 2050. These estimates represent a range of annual benefits, compared to the BAU scenario - benefits that would not occur without these additional climate actions. The City of Cleveland would reap these benefits every year from 2030 and 2050 on.

Table 3: Estimated Annual Public Health Benefits from Air Quality Improvements of Implementing CAP Actions in City of Cleveland

Scenario (Target Year)	Avoided Premature Deaths	Avoided Heart Attacks	Avoided Cases of Asthma	Total Health Benefits (Low)	Total Health Benefits (High)
CAP Actions (47% reduction by 2030)	22-41	9	76	$304.3 million	$537.6 million
CAP Actions (79% reduction by 2050)	50-91	19	170	$678.9 million	$1.2 billion
SBT (63% reduction by 2030)	38-68	14	127	$509.9 million	$900.6 million
SBT (Net Zero by 2050)	71-129	27	240	$962.5 million	$1.7 billion

The results in **Table 3** demonstrate that Cleveland would benefit considerably from climate action. They also illustrate the **significant impacts that reliance on fossil fuels place on the health and well-being of Cleveland's residents.**

The benefits outlined above only include improvements in outdoor air quality. Accordingly, they do not reflect the full range of health improvements from improving indoor air quality. Research indicates, for instance, that the use of gas for heating and cooking increases the risk of developing childhood asthma.[57] In Ohio, up to 10% of all cases of childhood asthma may be the result of indoor air pollution from using gas stoves.[58]

> **Clearly, climate action presents one of the most important public health opportunities in Cleveland's history, even when just considering one aspect of its positive impact, clean air.**

More broadly, public health benefits would offset the costs of climate action on their own, with one recent study finding that public health benefits are 5 to 25 times larger than the costs of climate action in the U.S; 80% of these benefits stem from improved air quality.[59]

The actions in this plan would also provide tremendous financial and economic benefits for Clevelanders, as **Table 4**, below, illustrates. Retrofitting homes to improve energy efficiency and electrify appliances will substantially lower monthly energy bills for Cleveland's residents. The average retrofitted household will see its energy costs decrease by more than one-third, saving them more than $620 annually.[60]

Through 2030, Cleveland's residents would save a combined $15 million on their energy costs, and these upgrades would lower the number of households experiencing a high energy burden by over one-third by 2035.

The electrification of vehicles in Cleveland, including passenger vehicles and medium- and heavy-duty trucks, would also create significant cost savings, as EVs cost significantly less to own and operate. Cleveland's residents and businesses would save nearly $2.3 million in combined fuel costs through 2030.[61]

Moreover, this CAP would also help to boost Cleveland's economy and create quality job opportunities for residents. Generating the clean energy needed to meet the goals in this plan would create hundreds of good, green jobs each year, as **clean energy generates more jobs per megawatt (MW) than fossil fuels.[62]**

Table 4: Total Cost Savings & Jobs Created from CAP Actions through 2030

Focus Area	Average Annual Cost Savings	Total Cost Savings through 2030	Average Annual Jobs Created	Total Jobs Created through 2030
Built Environment	$1.9 million	$15.4 million	250-335	2,050-2,700
Clean Energy	$90,000	$0.5 million	735	5,900
Clean Transportation	$0.3 million	$2.1 million	100-250	800-2,000
Total	**$2.3 million**	**$18.1 million**	**1,100-1,300**	**8,750-10,600**

Energy efficiency also provides a large number of quality jobs that cannot be outsourced or automated, as does the development of bike and pedestrian infrastructure and the installation of EV charging stations.

Through 2030, the actions identified in this plan would create roughly 1,200 jobs per year.[63] These jobs would also be of better quality, as clean energy jobs pay 25% higher wages, are more likely to offer benefits, and have higher rates of unionization.[64]

The following sections delve into the goals, objectives, and actions for each Focus Area in detail. They provide an overview of the challenges Cleveland faces in each area, the progress the City has made since the 2018 CAP update, success stories that will position the City for continued progress, and the GHG reductions and co-benefits associated with the actions.

For a complete breakdown of each action, including key implementing actors, funding sources, implementation timeline, its overall evaluation score, whether it is a community priority, and what Cross-Cutting Priorities it advances, please review Appendix D (bit.ly/CAP_AppendixD).

Deep Dive: Goals, Objectives, and Actions by Focus Area

BUILT ENVIRONMENT

The built environment, which describes any human-made or modified structures where people live, work, play, recreate, or socialize, is central to tackling climate change in Cleveland.

Cleveland's commercial and residential buildings accounted for 61% of GHGs from natural gas use and 40% of GHGs from electricity use during 2022. In total, commercial and residential buildings made up 52% of emissions from energy use in Cleveland during 2022, with the remainder coming from the industrial sector. Since 2010, energy use from these buildings have accounted for half of all energy-related GHG emissions and nearly one-quarter of all GHGs in the City.

Historically, gas use has been the largest source of GHG emissions from buildings, as it requires far more energy to heat a building during a Cleveland winter than it does to cool a building during a Cleveland summer. Going forward, however, rising temperatures and the shift towards building electrification will increase electricity's share of energy use. Because electricity is currently more expensive, on average, than natural gas in Ohio, it will be important to take steps to buffer Clevelanders from rising energy costs, such as by investing in weatherization and energy efficiency.

But electrification itself is a form of energy efficiency, as it is far more efficient and less wasteful than natural gas systems. The average electric heat pump is at least twice as energy efficient as a gas furnace, even in cold climates.[65] Electrifying buildings can reduce total energy use by more than 50% without sacrificing output or comfort.[66]

Buildings are also closely linked to solid waste, water use, and wastewater. Residential and commercial buildings produced 65% and 42% of the solid waste

sent to landfills and recycled in Cleveland during 2022, respectively. While emissions from solid waste make up just 1% of overall GHGs, they did decrease slightly from 2018 to 2022.

Adopting circular economy principles by shifting away from the TAKE-MAKE-WASTE approach towards a mindset that limits or eliminates waste at all points will be crucial for reducing emissions in this area.

Reducing waste and improving efficiency in building water use will also help to reduce emissions from water and wastewater treatment. While this was responsible for less than 1% of GHGs in 2022, enhancing water use efficiency can also provide significant cost savings for Cleveland's residents and businesses.

KEY FACTS

- Energy use in commercial and residential buildings produced 24% of climate pollution emissions in Cleveland during 2022. More than 60% of these emissions came from natural gas use.
- Eighty percent of Cleveland's households rely on fossil fuels to heat their homes, with most of this from natural gas.[67]
- Cleveland's residential and commercial buildings produced 354,180 tons of solid waste during 2022, down 1% from 2018 levels and 3% from 2010 levels.
- There were nearly 11,000 people employed in energy efficiency in Cuyahoga County during 2023, ranking it 37th among counties in the U.S.[68]

CHALLENGES

- The City of Cleveland has an aging and poorly maintained housing stock. The average house was built in 1920, and just 10% of houses have been built since 2000. Less than 60% of occupied houses are rated in excellent or good condition, while 6% are in deteriorated or hazardous condition.[69]
- Cleveland's housing stock contributes to a wide array of health issues for residents, including respiratory issues from poor indoor air quality. Cleveland has the seventh highest rate of asthma in the U.S.[70]
- Half of Cleveland's households have very high household energy burdens, meaning they spend at least 6% of their income on energy costs.[71]
- Electricity and natural gas prices increased by 10% and 80%, respectively from 2018 to 2022 in Ohio.[72]
- Cleveland residents recycled and composted just 6% of their total waste during 2023, far lower than the countywide average of 29%.[73]

SUCCESS STORIES *(since 2018)*

The U.S. Green Building Council (USGBC) recognized **Cleveland as a Leadership in Energy and Environmental Design (LEED) Silver Certified City** in 2021, as a result of the city having a number of programs that aim to improve the built environment.

Due to energy efficiency and conservation, Cleveland residents and businesses used 3% and 9% less electricity in 2022 than during 2018, respectively. Clevelanders also reduced residential and commercial natural gas consumption by 8% and 5% during that period, respectively.

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The Cleveland 2030 District, which promotes energy and water use efficiency in commercial buildings, has **expanded to cover more than 73 million square feet of building space in downtown Cleveland and University Circle.** Through 2023, members have reduced their energy use by 28% and water use by 35% from baseline levels.[74]

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BIG WINS *(since 2018)*

- The Cities of Cleveland, Cincinnati, Columbus, and Dayton received a **$10 million grant from DOE** to support the development of voluntary building performance standards and create the Ohio High Performance Building Hub to help commercial building owners reduce energy use and GHG emissions.
- Cleveland has allocated $10 million in funding from the American Recovery Plan Act (ARPA) to work with partners, including the Cleveland-Cuyahoga Workforce Development Board, on its Built Environment Collaborative. **This program will provide workforce development opportunities for more than 3,000 residents**, particularly those from historically marginalized communities, to pursue careers in built environment fields.
- In March 2024, Cleveland was selected by Bloomberg Philanthropies as **one of 25 U.S. cities to join the Bloomberg American Sustainable Cities (BASC) program.** BASC is a three-year initiative that will leverage federal funding to implement transformative local solutions to build low-carbon, resilient, and economically thriving communities. Cleveland's program will focus on providing affordable, healthy, decarbonized housing.
- MetroHealth and Community Housing Solutions received a **$17.2 million Community Change grant from U.S. EPA** to improve indoor air quality at the homes of 1,200 Cleveland-area households that have at least one resident with asthma.

introduced residential
ecycling collection
22. Nearly half of
s (73,000) have opted
ogram, and the City
ed recyclables weighing
s 133 airplanes since
m relaunched, with a
mination rate.

here are 129 LEED
ertified buildings in
leveland, a 30% increase
ompared to 2017.[75]

GOALS

1. **Commercial and residential buildings achieve net zero emissions by 2050.**
2. **The built environment will fully embrace a circular economy by 2035.**
3. **Transition Cleveland's existing land use patterns to reduce car dependency and increase transportation choice.**

BENEFITS

- **$15.4 million in total household energy cost savings through 2030.**
- **33% reduction in average household energy costs for retrofitted homes.**
- **34% reduction in number of households experiencing very high energy burdens.**
- **2,050–2,700 total jobs created through 2030.**

GOAL 1

All commercial and residential buildings achieve net zero emissions by 2050.

OBJECTIVE 1

Make existing commercial and residential buildings more comfortable, healthy, and energy efficient.

Impact: 72,000 $MtCO_2e$ reduced by 2030; 366,000 $MtCO_2e$ reduced by 2050.

ACTION 1 Establish baselines for energy and water use among Cleveland's commercial and residential buildings.

ACTION 2 Provide education sessions to help building owners and managers understand how they can make their properties more efficient and cost effective.

ACTION 3 Explore the creation of local incentives for building owners and developers to promote energy and water efficiency for existing commercial and residential buildings.

ACTION 4

COMMUNITY PRIORITY

Engage professional partners to offer deeply discounted audit programs that assist building owners to complete building retrofits for energy efficiency and decarbonization.

ACTION 5

Create and implement a building performance standard policy to ensure compliance for commercial buildings in Cleveland.

ACTION 6

Work with local partners to increase the number of contractors trained and certified in building decarbonization.

> ***It's especially important to replace current cooling systems with less climate-damaging refrigerants and responsibly dispose of current ones.***
>
> *— Buckeye-Shaker Resident*

ACTION 7

Educate homeowners and property owners to properly manage refrigerants, including control leakage and ensuring recovery, reclaiming, recycling and destruction of refrigerants at end of appliance life.

> ***I believe that there are things they should do to help. Like provide free energy audits to all and simple and doable instructions on how to fix any energy sucking issues. Like making window inserts or providing them.***
>
> *— Detroit-Shoreway Resident*

OBJECTIVE 2

All new buildings should have net zero emissions by 2050.

Impact: 4,000 $MtCO_2e$ reduced by 2030; 69,000 $MtCO_2e$ reduced by 2050.

ACTION 8 Explore joining the Net Zero Carbon Buildings Commitment.

ACTION 9 Update Cleveland's existing Green Building Standard to incorporate new codes, support higher performance building, and advance social equity.

ACTION 10 Ensure energy efficiency and resiliency are prioritized in the construction and retrofitting of new school buildings.

ACTION 11

Incentivize all buildings seeking City funding to implement energy benchmarking, building performance management practices, increase their resilience to climate hazards, and invest in enhancing the resilience of the surrounding community.

OBJECTIVE 3

Work to ensure that sales of new fossil fuel heating systems cease by 2035 and existing systems are converted to electric heating by 2050.

Impact: 539,000 $MtCO_2e$ reduced by 2050.

ACTION 12

Engage select professional partners to offer discounts for decarbonized heating systems and develop robust marketing and outreach programs for residents, particularly low-income and disadvantaged communities.

ACTION 13

COMMUNITY PRIORITY

Work with local partners to create a one-stop-shop for consumers seeking information and resources on home electrification.

ACTION 14

Assist public and nonprofit organizations to access tax incentives, including direct pay, to electrify their properties.

MetroHealth Community Change Grant

One in five Clevelanders suffers from asthma. **The Asthma and Allergy Foundation of America ranks Cleveland as one of the most challenging places to live with the condition** because of high levels of air pollution as well as inadequate access to healthcare. Poor indoor air quality is one of the main causes of this health crisis, and gas appliances are a major source of asthma, particularly among children.

Knowing the connection between asthma complications and the use of gas ranges, **MetroHealth secured a $17.2 million Community Change grant from U.S. EPA in July 2024.** The hospital will work with community partners to replace gas ranges with electric ones in 1,200 homes where at least one resident lives with asthma. The work will also include upgrades to improve homes' electrical systems and ventilation and allow participants to install EV charging stations at their homes.

"We're excited to work on this project, which has the potential to reduce indoor air pollution, improve asthma control and improve quality of life," said Dr. Ash Sehgal, who is managing the program for Metro. "We're grateful for this opportunity to help our local community. And our intention is to continue to be a strong voice in the national and international conversations surrounding this critical topic."

MetroHealth is working with several community organizations, including Community Housing Solutions, Rebuilding Together Northeast Ohio, Metro West Community Development Organization, Tremont West Development Corporation, Old Brooklyn Community Development Corporation, Slavic Village Development, and Ohio City Incorporated.

GOAL 2

The built environment in Cleveland will fully embrace a circular economy by 2035.

OBJECTIVE 4

Encourage adaptive reuse or renovation of properties.

ACTION 15

Review and revise the building code, as appropriate, to promote the transformation and renovation of existing buildings.

ACTION 16

Coordinate with developers/ construction firms to ensure they design buildings for long-term use and for flexibility for future use.

ACTION 17

Provide educational resources to developers to promote the adaptive reuse/renovation of existing buildings.

ACTION 18

Partner with organizations that professionally sell recycled construction/design materials in order to establish a local market.

Circular Economy in the Built Environment

There are significant opportunities in the circular economy to reduce the impact of the built environment. Incorporating the principles of the circular economy, such as reuse, repurpose, and repair, into all phases of a building's life cycle can drastically reduce the environmental impacts and costs associated with construction and demolition.

OBJECTIVE 5

Commercial and residential buildings will adopt circular construction and demolition principles.

ACTION 19

Publish and disseminate a Cleveland handbook on circular design and construction principles and use the handbook to provide education sessions to developers, contractors, building owners, and businesses.

> ***I feel that working toward addressing climate change in my chosen field (architecture) is the sole importance of my career,*** *but I often have a hard time finding firms and organizations that align with my values and do work that directly concentrates on sustainable design in the built environment.*
>
> — *Ohio City Resident*

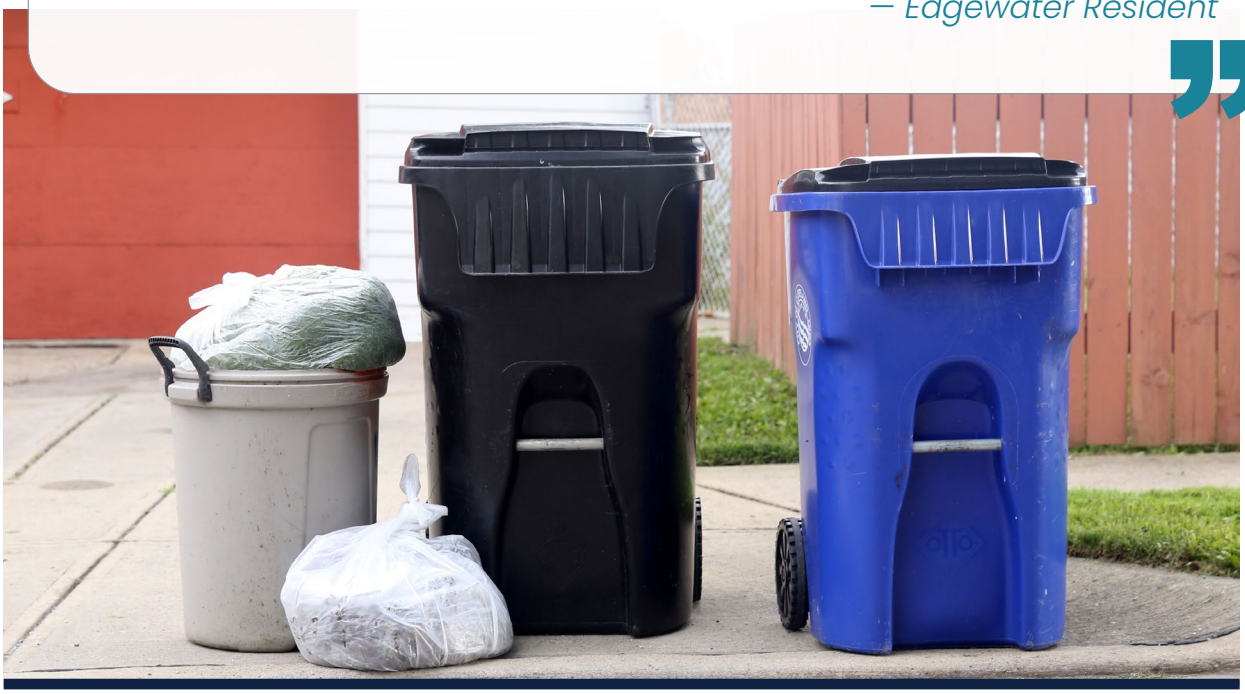
ACTION 20

Create local incentives and disincentives for building owners and developers to follow the circular design and construction principles.

ACTION 21

Pilot reporting for material/product recovery and diversion from landfill in demolition projects by 2030.

> ***The city needs to put renewed effort into expanding recycling to the renting community.*** *At present there are zero options for renters in multifamily properties which account for more than half of the population of Cleveland. I understand that the bins did not work well with dumping, but something else needs to surface as an option.*
>
> *— Edgewater Resident*



OBJECTIVE 6

Reduce solid waste generation waste sent to landfills by residents and businesses by 50% by 2035.

Impact: 25,000 $MtCO_2e$ reduced by 2030; 45,000 $MtCO_2e$ reduced by 2050

ACTION 22

COMMUNITY PRIORITY

Require all new residential and commercial properties to have the infrastructure for recycling and food waste collection containers, along with their trash containers, and provide guidance retrofitting existing properties to meet these requirements.

ACTION 23

Encourage businesses to achieve certification through programs such as the Cuyahoga County Solid Waste District's Business Resource Champions program.

GOAL 3

Transition Cleveland's existing land use patterns to reduce car dependency and increase transportation choice.

OBJECTIVE 7

Implement land use policies that prioritize non-automobile travel modes.

ACTION 24

Expand Cleveland's Form Based Code pilot to other neighborhoods.

What is a Form Based Code?

Cleveland's current zoning code regulates land according to use. Regulations are the same for each district, regardless of neighborhood context. Form-Based Codes (FBCs) allow for mixing of land uses, which reduces reliance on cars to get around, and offers more equitable options in housing and transportation. Cleveland began working on a FBC in 2019, and the Cleveland Planning Commission rolled it out to four neighborhoods in mid-2024: Detroit-Shoreway/Cudell, Fairfax, Hough, and the area around the Opportunity Corridor.

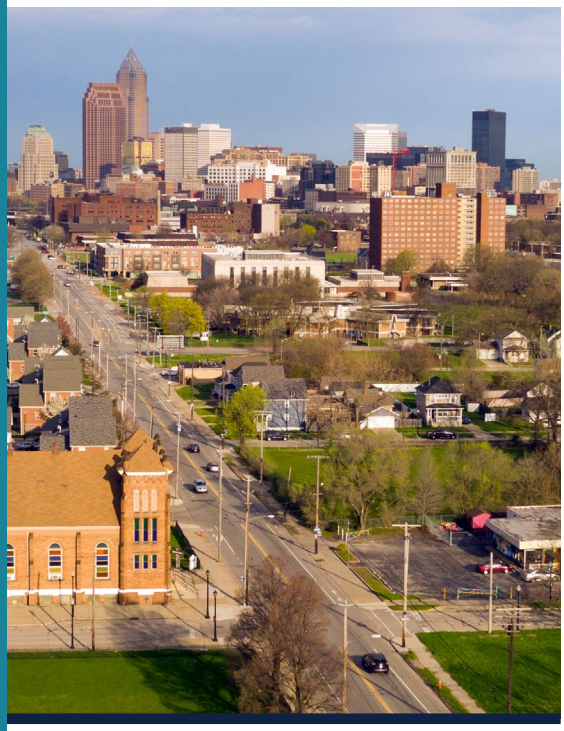
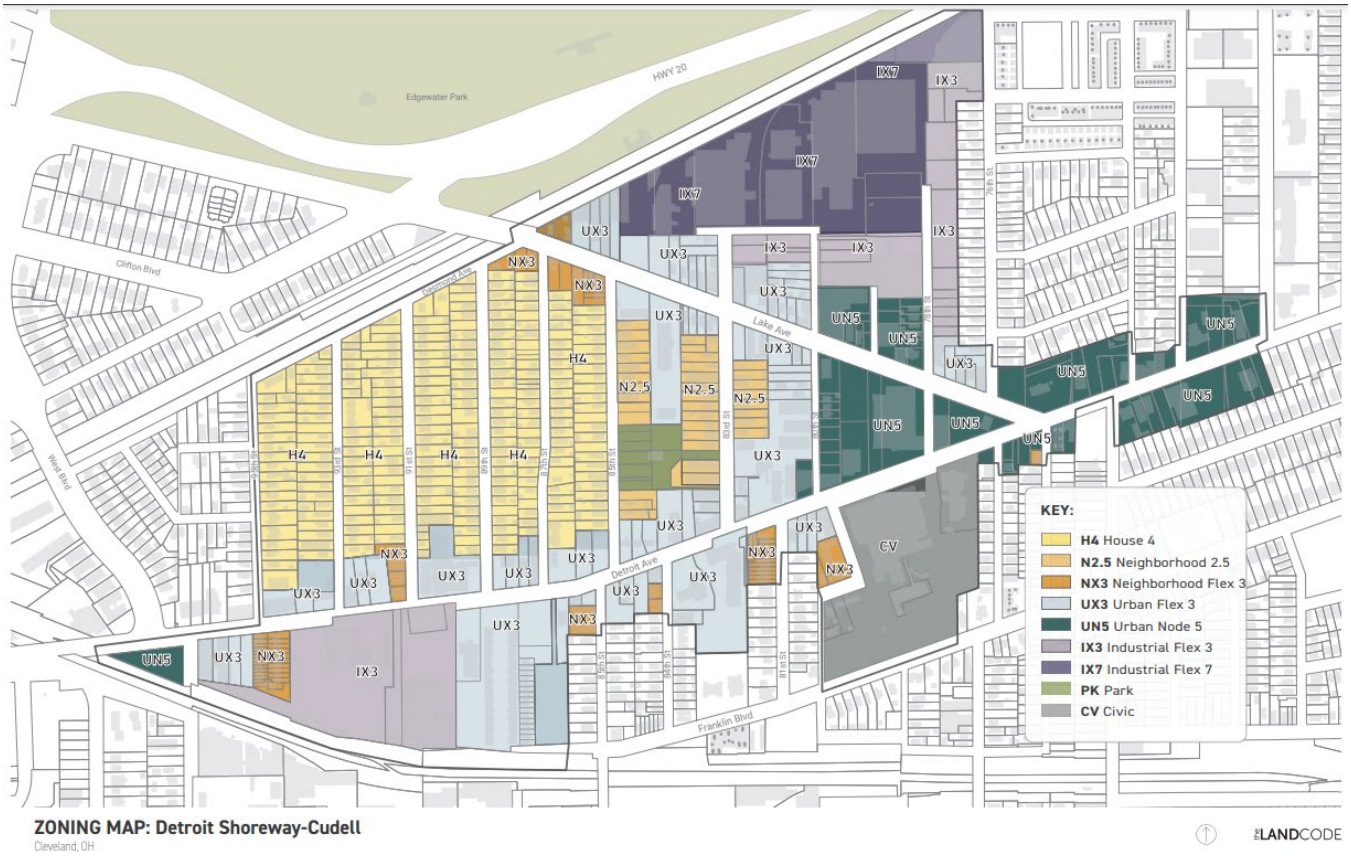


Figure 11: Form Based Code Zoning Map for Detroit-Shoreway/Cudell Neighborhood



ACTION 25

Update City zoning code to encourage dense, mixed use, walkable neighborhoods to increase transportation choice and accessibility.

ACTION 26

Implement, expand, and adjust Cleveland's transportation demand management (TDM) policy.

ACTION 27

Create a quantifiable density goal around transit centers.

ACTION 28

Evaluate options to limit the development of automobile-oriented uses such as new gas stations, car washes, and drive-thrus and utilize planning code to use existing gas stations to advance multimodal transportation and vehicle electrification.

> ***Land use and transportation are two areas the city has direct control over, or can collaborate with federal and state agencies to change for the better. Reducing sprawl, car pollution, surface parking lots would help with the issues we face every day that are likely to get worse in the future.***
>
> *— Edgewater Resident*

OBJECTIVE 8

Adopt built environment policies that advance transportation electrification.

ACTION 29 Create incentives to encourage new or renovated buildings to be EV-ready.

ACTION 30 Develop training programs for local contractors to support EV charging installation and service.

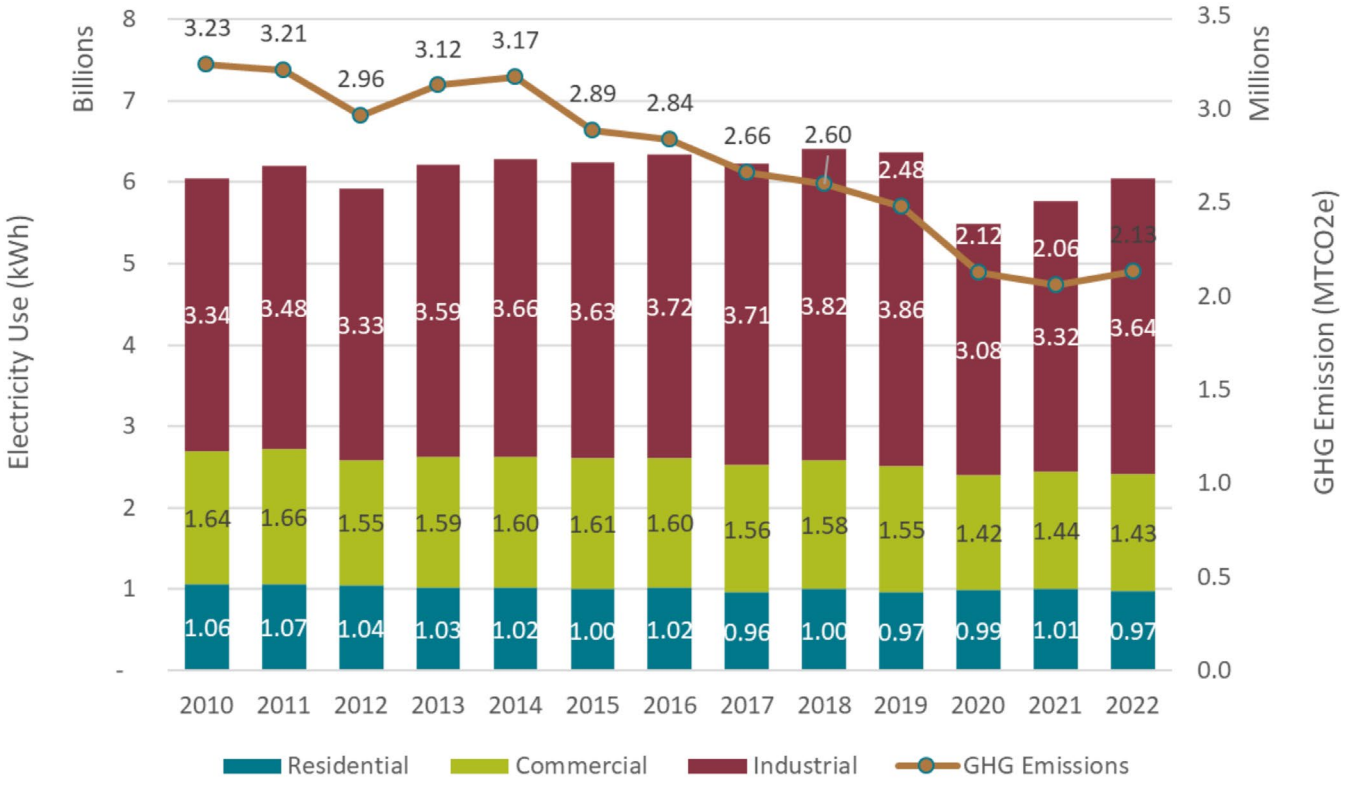
ACTION 31 Create programs to support EV infrastructure development at community sites including libraries, schools, grocery stores, multifamily housing.

CLEAN ENERGY

Without ensuring that the energy it uses to heat and power activities within the City comes entirely from carbon-free sources, the Cleveland community cannot hope to meet its climate targets. Given this fact, **clean energy is the foundation upon which this entire CAP is built.**

Energy use (electricity and natural gas) was responsible for the majority of GHG emissions in Cleveland during 2022, which is consistent with previous years. From 2010 to 2022, energy use accounted for 51.7% of citywide GHGs, on average, emphasizing the intricate connection between clean energy and decarbonization in Cleveland.

Figure 12: Electricity Use and GHG Emissions in Cleveland (2010-2022)

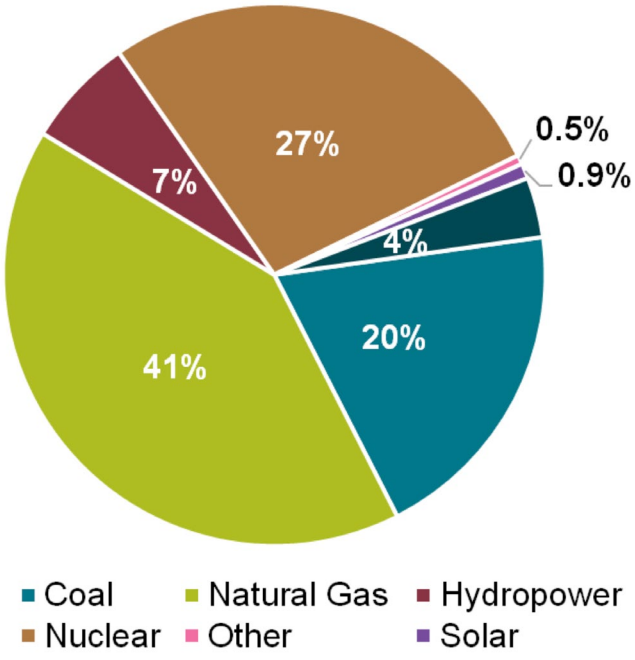


Looking specifically at electricity, GHG emissions fell by 18% from 2018 to 2022, with the largest reduction stemming from commercial electricity (-9%) and industrial electricity (-5%). Reduced emissions from electricity generation and consumption accounted for nearly 20% of the total reduction in GHG emissions in Cleveland from 2018 to 2022, with much of this related the shift away from coal-fired electricity generation.

Clean energy sources have emerged as the lowest cost options for new energy generation in recent years. According to the International Energy Agency, **solar power is now the cheapest form of electricity in history**, and energy markets have responded by swapping out fossil fuels for clean energy sources.[76]

However, Cleveland's continued dependence on natural gas for heating, along with the increased demand for electricity for transportation, industrial processes, and other activities, mean the City and its partners must expand access to clean electricity at an unprecedented pace in the coming years.

Figure 13: Share of Electricity by Source (2022)



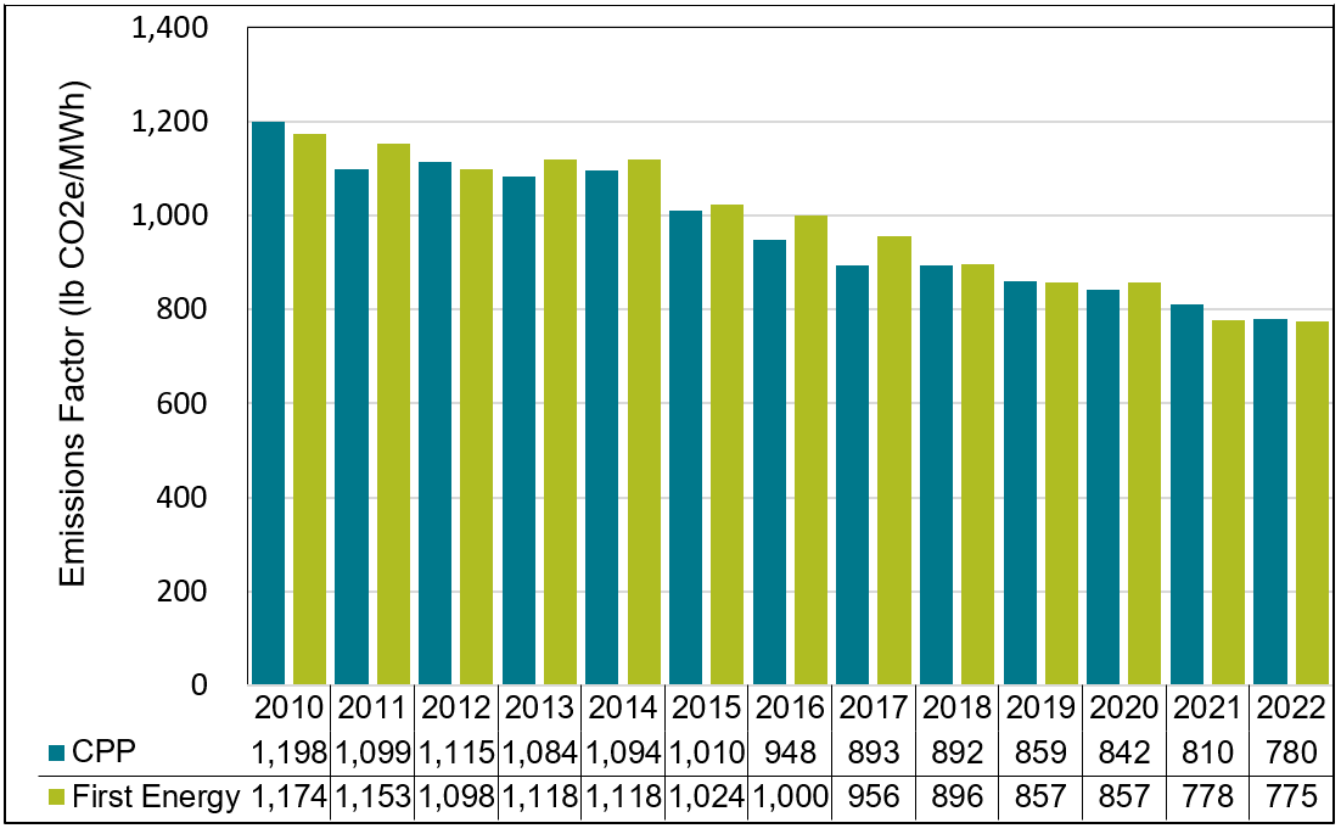
KEY FACTS

- Energy use makes up 55% of total GHGs in Cleveland, with natural gas use making up the majority.
- The majority (61%) of electricity used in Cleveland comes from fossil fuel sources. The largest source of carbon-free electricity in the City is nuclear power (27%), with renewable sources – including hydropower, solar, and wind – making up 12%.
- Total electricity use fell by 18% from 2018 to 2022, while natural gas use decreased by 12%.
- Cuyahoga County is home to 13,732 clean energy jobs, approximately 10% of which are in clean energy generation and distribution.[77]

CHALLENGES

- The State of Ohio has further rolled back its clean energy standards and put its thumb on the scale for fossil fuels. House Bill 6, which the State passed in 2019, dramatically weakened Ohio's renewable portfolio standards and forced ratepayers to directly subsidize again, uncompetitive coal plants.
- The Lake Erie Energy Development Company (LEEDCo) suspended its Icebreaker project, which would have installed offshore wind turbines in Lake Erie. As of October 2023, the U.S. Department of Energy (DOE) is not issuing additional funds to it.
- FirstEnergy, which provides nearly three-quarters of the electricity used in the City, rolled back its goal of reducing its GHG emissions by 30% through 2030, due to its continued reliance on coal-fired power.[78]
- It takes multiple years, on average, to connect clean energy to the electricity grid in Ohio, making it difficult to replace fossil fuels with cleaner electricity. This trend has also made electricity prices more unpredictable, leading to multiple price spikes for Clevelanders.

Figure 14: Carbon Intensity of Electricity in Cleveland (2010-2022)



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
CPP	1,198	1,099	1,115	1,084	1,094	1,010	948	893	892	859	842	810	780
First Energy	1,174	1,153	1,098	1,118	1,118	1,024	1,000	956	896	857	857	778	775

SUCCESS STORIES *(since 2018)*

Cleveland Public Power (CPP) achieved its Advanced Energy Portfolio Standard goal of getting 25% of its electricity from renewable energy by 2025 during 2021, when it **provided more than 26% of its total electricity from hydropower, solar, and wind.** In partnership with Cuyahoga County, CPP opened its 4 megawatt (MW) Brooklyn Landfill Solar Farm in late 2018.

The **carbon intensity of electricity in Cleveland fell by 13%** to 777 pounds per megawatt hour (lbs/MWh) in 2022 from 894 lbs/MWh in 2018.

U.S. EPA has recognized Cleveland as a **Green Power Community** (GPC), meaning it provided a minimum amount of its electricity from green power sources.

SUCCESS STORIES *(continued)*

Cleveland has partnered with Habitat for Humanity and Solar United Neighbors (SUN) Ohio to install rooftop solar on seven low- and moderate income (LMI) households. This project **will save participating households $95,000 on energy bills** and eliminate 42.4 million pounds of GHG emissions.

Cleveland has continued to operate its Community Choice Aggregation program to provide 100% Green-e certified clean electricity to FirstEnergy customers. During the first year of its current program, **Clevelanders saved over $13 million, equal to roughly $250 per enrolled account.**

Cuyahoga County completed its microgrid study and established Cuyahoga Green Energy (CGE), the first microgrid electrical utility in the country, during 2021. CGE is working on developing its first three microgrid projects, one of which is projected to be located near the Cleveland Hopkins International Airport.

BIG WINS *(since 2018)*

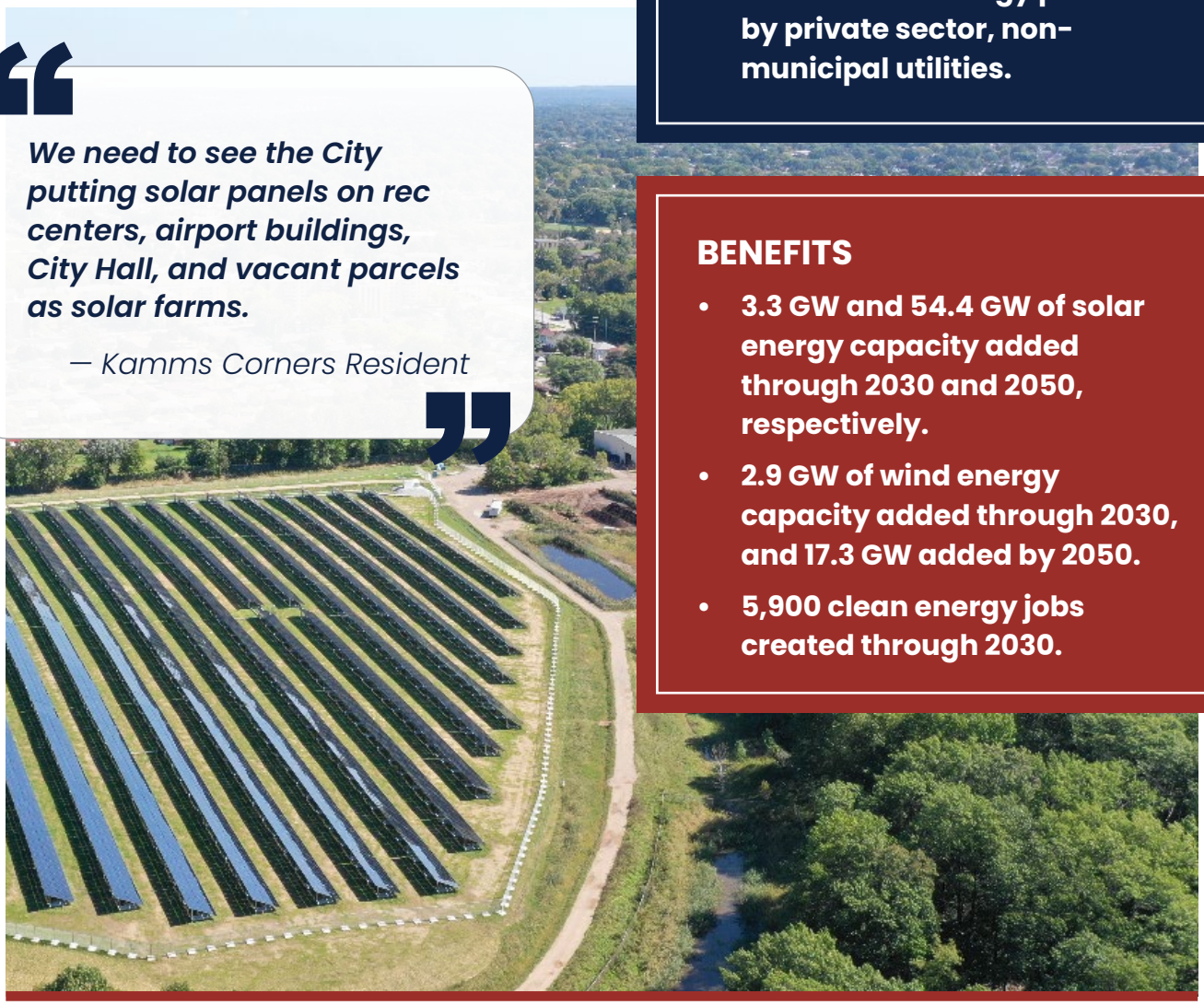
- Cuyahoga County, the City of Cleveland, and the City of Painesville **received $129.4 million in Climate Pollution Reduction Grant (CPRG) implementation funds** from U.S. EPA during 2024 for its Municipal Empowerment for Clean Energy and Conservation program. This program proposes to install approximately 63 MW of solar energy and 10 MW of battery storage across Northeast Ohio, including roughly 13 MW on landfills in the City of Cleveland.
- The Industrial Heartland Solar Coalition (IHSC), a coalition of 31 communities across eight states led by Cleveland-based Growth Opportunity Partners **received a $156 million grant from U.S. EPA's Solar For All program** during 2024. As part of this program, the City of Cleveland and Cuyahoga County are projected to install 4.4 MW of residential rooftop solar for 1,100 low- and moderate-income households and implement an additional 11 MW of community solar for 2,900 households.

- In June 2024, America Is All In, supported by Bloomberg Philanthropies and in partnership with SUN Ohio and Power A Clean Future Ohio (PCFO), launched an initiative to **help homeowners and businesses in Cleveland gain awareness, and secure financial incentives and cost-savings from solar power.**

GOALS

4. **Cleveland Public Power delivers affordable, clean, reliable electricity to residents and businesses.**
5. **Ensure that all Clevelanders can benefit from the transition to clean energy.**
6. **Decarbonize energy provided by private sector, non-municipal utilities.**

> ***We need to see the City putting solar panels on rec centers, airport buildings, City Hall, and vacant parcels as solar farms.***
>
> *— Kamms Corners Resident*



BENEFITS

- **3.3 GW and 54.4 GW of solar energy capacity added through 2030 and 2050, respectively.**
- **2.9 GW of wind energy capacity added through 2030, and 17.3 GW added by 2050.**
- **5,900 clean energy jobs created through 2030.**

GOAL 4

CPP delivers affordable, clean, reliable electricity to residents and businesses.

OBJECTIVE 9

While guaranteeing affordability and accessibility, CPP will source at least 75% of its electricity from clean energy by 2035, 85% by 2040, and 100% by 2050.

Impact: 204,000 $MtCO_2e$ reduction through 2030; 555,000 $MtCO_2e$ reduction through 2050.

ACTION 32

COMMUNITY PRIORITY

Assess the potential for establishing a virtual net metering program to facilitate community solar.

ACTION 33

Identify city-owned properties, including brownfields and land bank parcels, to prioritize for CPP-owned clean energy installations.

Circular Economy in Clean Energy

In order to reach our goal of reducing greenhouse gas emissions, it is critical that we transform how we produce and use energy with a shift away from fossil fuel use. A key element of the circular economy is switching to clean renewable energy sources, such as solar, which are naturally circular, because they are continually replenished.

What is a Virtual Power Plant (VPP)?

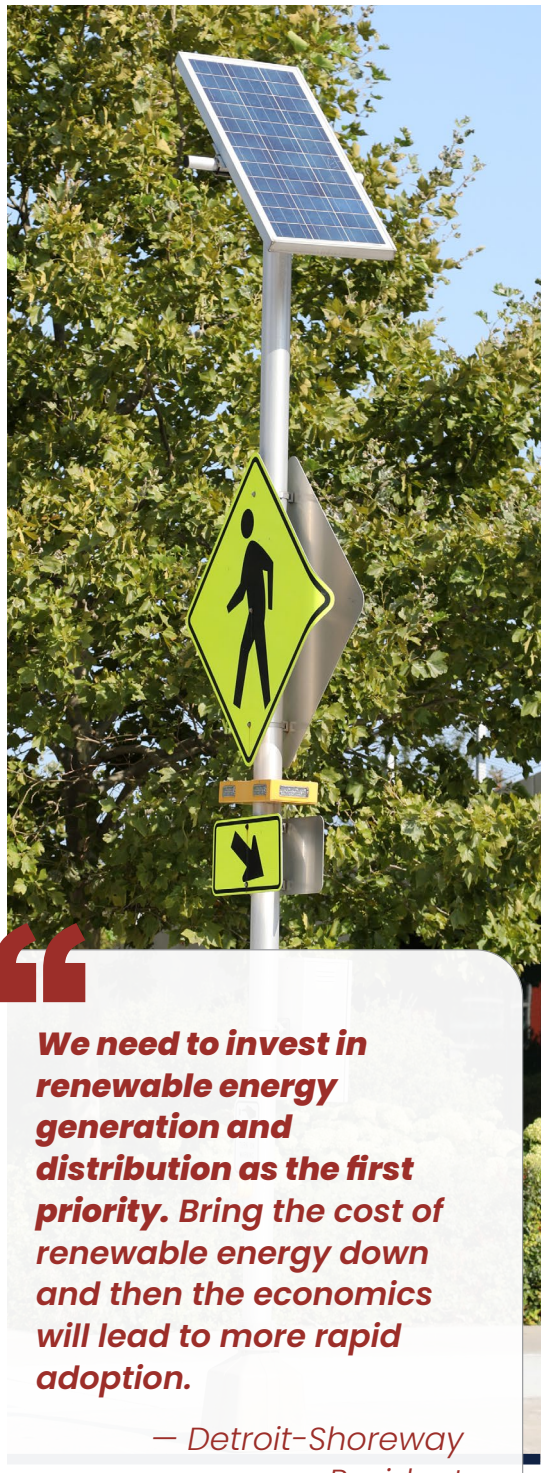
VPPs are collections of electric, devices that are connected to the grid, such as air conditioners, solar-plus-storage systems, and electric vehicles. When combined, these distributed energy resources (DERs) are able to use, store, and generate large amounts of electricity in a way that supports the grid, saves money, and reduces emissions.[79]

ACTION 34

Develop virtual power plant (VPP) pilot program using city-owned distributed energy resources.

ACTION 35

The City of Cleveland will update CPP's Advanced Energy Portfolio Standards to ensure it delivers affordable, clean, reliable electricity.



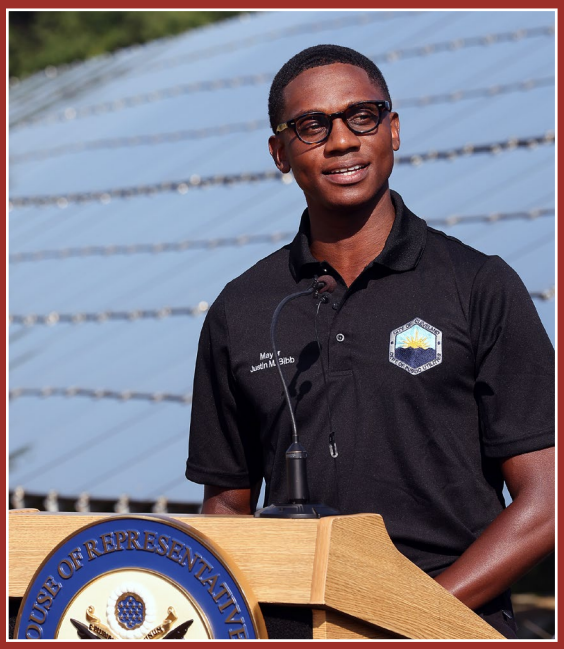
> ***We need to invest in renewable energy generation and distribution as the first priority.*** *Bring the cost of renewable energy down and then the economics will lead to more rapid adoption.*
>
> *— Detroit-Shoreway Resident*

Municipal Empowerment for Clean Energy & Conservation

On July 22, 2024, the U.S. EPA awarded Cuyahoga County, the City of Cleveland, and the City of Painesville **$129.4 million in implementation funds from the Climate Pollution Reduction Grant (CPRG) program.** This grant, which is the largest federal award in the county's history, will support the transition to clean energy in Northeast Ohio by funding approximately 63 MW of solar installations and 10 MW of battery storage on brownfields and landfills sites throughout the region.

"This historic investment in Cleveland and our municipal electric utility will reduce the cost of electricity for our residents, help power our airport operations, and benefit community members by transforming landfills and brownfields into 'brightfields' that generate power from the sun," Mayor Bibb said in a statement about the award.

The grant is projected to fund the installation of 13 MW of solar on brownfields in Cleveland and reduce GHGs by more than 650,000 $MtCO_2e$, create more than 200 clean energy jobs, and create more than 400 acres of native meadow and pollinator habits along Lake Erie. The project will also lower energy costs for CPP customers in Cleveland.



OBJECTIVE 10

CPP takes advantage of new technologies and innovative practices to improve grid reliability and resilience.

ACTION 36

In times of high power usage, send emergency text alert warning residents to reduce energy use to reduce the risk of brownouts.

ACTION 37

CPP will explore the implementation of grid enhancing technologies, including dynamic line reading and reconductoring.

ACTION 38

Roll out smart meter technologies to all CPP ratepayers to lay the foundation for other policies and projects.

OBJECTIVE 11

Develop programs to ensure CPP customers can access affordable, clean electricity and support for energy efficiency.

ACTION 39

Explore on-bill financing program for Cleveland Public Power.

ACTION 40

Take advantage of federal funding to expand existing Low- and Moderate Income Solar Program.

ACTION 41

Design new rate structures to keep energy affordable and shift demand to off-peak.

What are Grid Enhancing Technologies?

Grid enhancing technologies (GETs) are a collection of technologies that maximize the ability of the electricity grid to transmit electricity. These technologies include sensors that measure demand and weather conditions, devices that allow the grid to increase or decrease the amount of electricity quickly, and new kinds of wire that can hold higher amounts of electricity (reconductoring).

GETs allow the grid to use more clean energy without having to increase the physical size of the grid.[80] Quickly adding clean energy to the grid is important, because transmission is limiting the pace of decarbonization. There are more than 2,600 gigawatts (GW) of electricity waiting for permission to be connected to the grid, 95% of which is clean energy.[81] This is double the amount of existing electricity generation capacity in the U.S.

GOAL 5

Ensure that all Cleveland Small businesses and residents can benefit from the transition to clean energy.

OBJECTIVE 12

Minimize the number of households with an energy burden at or above 6% by 2035.

ACTION 42

COMMUNITY PRIORITY

Lobby state legislators and regulators, including the Public Utilities Commission of Ohio, to advance clean energy, energy efficiency, and energy equity.

ACTION 43

Strengthen programs, including 211 and 311, to connect residents to utility resource programs.

OBJECTIVE 13

Establish strategies and programs to help Clevelanders participate in the green economy.

ACTION 44

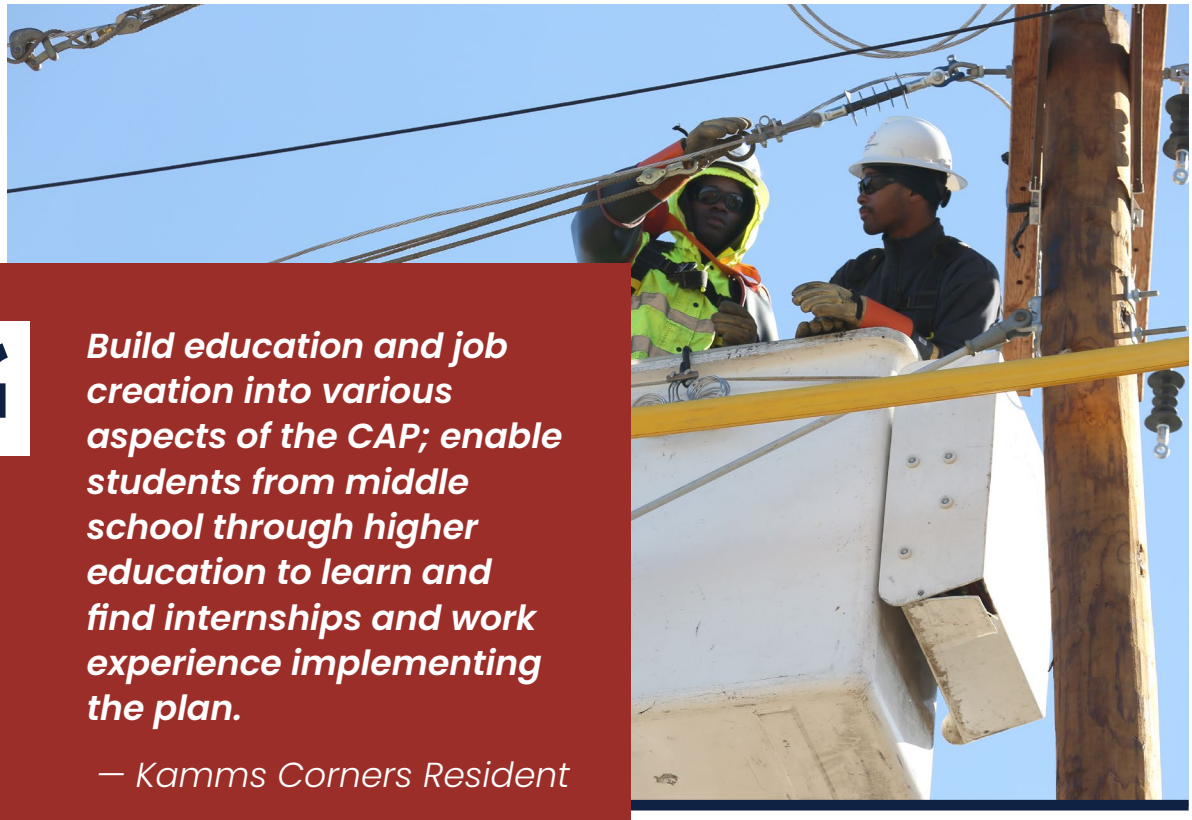
Work with stakeholders to create a workforce development strategy to enable the transition to a green economy in Cleveland.

ACTION 45

Support family-sustaining jobs through prevailing wage agreements for clean energy projects for historically marginalized communities, minorities, veterans, and immigrants seeking refuge.

ACTION 46

Establish clean energy development liaison(s) within the City of Cleveland/CPP to connect residents, businesses, and clean energy developers with necessary information and resources to take advantage of clean energy, including potential funding sources, vendors, and project fact sheets.



> ***Build education and job creation into various aspects of the CAP; enable students from middle school through higher education to learn and find internships and work experience implementing the plan.***
>
> *— Kamms Corners Resident*

GOAL 6

Decarbonize energy provided by private sector, non-municipal utilities.

OBJECTIVE 14

Work with private utilities and policymakers to deliver 100% carbon-free power and heat by 2045.

Impact: 491,000 $MtCO_2e$ reduction through 2030; 1.7 $MMtCO_2e$ reduction through 2050.

ACTION 47

COMMUNITY PRIORITY

Expand existing community choice aggregation programs to expand the share of physical clean energy, reaching 50% of aggregation load by 2045.

ACTION 48

Track, measure, and reduce methane leaks from gas infrastructure, in partnership with gas utilities.

ACTION 49

Partner with NEORSD to explore the use of wastewater for district heating and cooling.

ACTION 50

Expand use of geothermal energy for district thermal energy systems.

OBJECTIVE 15

Eliminate barriers to providing 100% clean energy by 2045.

ACTION 51

Streamline permitting processes for renewable energy installations, including achieving SolSmart Silver and adopting Distributed Wind Smart.

ACTION 52

Create guidebook for renewable energy projects to help residents, businesses, and developers better understand the process for developing clean energy in Cleveland, including guidelines for public engagement.

ACTION 53

Coordinate with PJM, FirstEnergy to identify existing grid interconnection points that developers can utilize for clean energy developments.

SolSmart & Distributed Wind Smart

Created by Interstate Renewable Energy Council (IREC) and the International City/County Management Association (ICMA), these programs provide recognition and technical assistance, such as best practices on speeding up permitting, to local governments that are working to expand solar and distributed wind generation in their communities.

CLEAN TRANSPORTATION

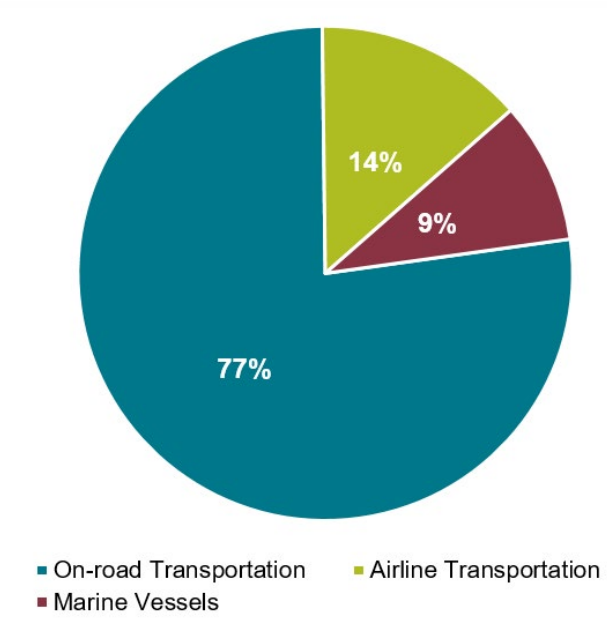
Across the country, transportation remains one of the areas that has been most difficult for any community to cut GHG emissions significantly. While transportation accounted for a smaller share of overall emissions in the City of Cleveland (19%) during 2022 than it did across Northeast Ohio (29%) or the U.S. as a whole (28%), Cleveland has had somewhat limited success reducing emissions in this area.

From 2018 to 2022, GHGs decreased by just 2% from transportation, with the largest reductions coming form on-road vehicles (-3%) and marine vessels (-16%). GHGs from air travel, in turn, increased by 18% over this period.

More than three-quarters (77%) of transportation emissions in Cleveland are tied to on-road vehicles, with passenger vehicles and heavy-duty vehicles (i.e. large trucks) making up 74% and 26% of these emissions, respectively. Air travel and marine vessels, in turn, made up 14% and 9% of emissions, respectively, during 2022.

The COVID-19 pandemic affected transportation more than any other sector in Cleveland in recent years. Emissions fell by one-third during 2020 due to COVID mitigation measures such as stay-at-home orders. Reductions occurred for all travel modes, with emissions from on-road vehicles falling by 35%, air travel by 37%, and marine vessels by 20%. Emissions jumped back up by 41% in 2021, but still remained below pre-COVID levels, likely due to the shift towards remote work that began in 2020.

Figure 15: Transportation Sector Emissions by Mode



KEY FACTS

- Transportation makes up 19% of total GHG emissions in Cleveland, with 77% of these emissions from on-road vehicles.
- The share of commuters driving alone to work fell by 6.6% from 2018 to 2022.
- The number of passengers flying out of Cleveland Hopkins Airport climbed by 2% overall from 2018 to 2023 despite falling to record lows during the pandemic.
- The number of vessels entering the Port of Cleveland fell by 21% from 2018 to 2022, and the total amount of cargo entering the Port decreased by 22% to 9.2 million tons.
- Cuyahoga County was home to nearly 1,500 jobs in clean vehicles through 2023.[82]

CHALLENGES

- Cleveland suffers from the long-term effects of urban sprawl, locking in car dependence and making it difficult to travel around the region without driving.
- The share of Cleveland residents commuting by public transit fell to 7.6% in 2022 from 10.3% in 2018. **Total Greater Cleveland Regional Transit Authority (GCRTA) transit ridership fell to just 20.7 million trips during 2023, a 34% and 70% reduction from 2018 and 2006 levels, respectively.**
- Cleveland still lags behind other cities for active transportation (walking and biking). Just 5.8% of Clevelanders walked or biked to work in 2022, and **the City ranks 646th in the U.S. on the People for Bikes City Ratings.**
- At least 550 cyclists and pedestrians were involved in traffic crashes in 2023, including 79 children. Nine residents died in these crashes. Overall, there were 59 traffic-related fatalities in Cleveland during 2023, nearly double the 33 that occurred in 2018.
- Cleveland had the **fourth lowest electric vehicle (EV) adoption rate of any major metropolitan area** through 2023.[83]

SUCCESS STORIES *(since 2018)*

The share of Clevelanders driving alone to work fell to 63.3% in 2022, down from 69.9% in 2018. The Cleveland community met its 2018 CAP goal of reducing the single occupant vehicle (SOV) rate to 65% by 2020.

The number of EVs registered in Cleveland **increased by more than 400%** from 2019 to 2023, and their share of new vehicle sales increased more than 4.5-fold to 3.8%.

The City of Cleveland installed over 100 speed tables citywide, shown to reduce vehicle speeds by an average of 8 miles per hour (2022 pilot study). Traffic calming measures like speed tables increase safety and comfort for people walking and biking.

The City of Cleveland advanced design for the Superior and Lorain Midway, both of which will address high crash corridors – making it safer to walk and bike in Cleveland.

Cleveland has **added 174 miles of bikeways** to the City network since 2018. This increase was more than double the 70 miles added from 2013 to 2018.

Total vehicle miles traveled (VMT) fell by 2% from 2018 to 2022, demonstrating that the City can decouple economic growth and job creation from driving.

Cleveland passed an updated and strengthened Complete and Green Streets Ordinance in 2022, requiring an external committee to review projects and propose elements that support non-vehicular travel in addition to green elements such as creative stormwater solutions and removing excess pavement.

The City of Cleveland **installed mini-roundabouts** along Franklin Boulevard, lowering the speed limit to 25 miles per hour and eliminating traffic lights that led to idling along the corridor. Franklin is now a low traffic stress route for people riding bikes.

BIG WINS *(since 2018)*

- Mayor Bibb elevated the City's first Senior Strategist for Transit and Mobility, and the City hired four new employees to create a mobility team focused on safety and mobility.
- The City of Cleveland received **multiple Safe Streets for All grants from the U.S. Department of Transportation** to implement projects to improve traffic safety and advance Vision Zero, valuing over $5 million. The City received a **supplementary $5 million** from the Ohio Department of Transportation for these planned safety improvements.
- GCRTA received a **$10.6 million grant from the Federal Transit Administration** to purchase battery electric buses.
- NOACA received a **$15 million grant from the Federal Highway Administration** to install dozens of public EV charging stations across the region, including in the City of Cleveland.
- Mayor Bibb committed to increasing the number of publicly accessible EV charging stations in Cleveland by 500% through 2030.
- The Port of Cleveland received **$94.2 million through the Clean Ports Program** to install solar and battery storage, add shore power, and purchase electric port equipment.

GOALS

7. **Improve non-SOV options to reduce vehicle miles traveled by 15% by 2030 and by 30% by 2050.**
8. **Decarbonize Cleveland's transportation fleet by 2050.**
9. **Increase transportation choice for all Clevelanders, regardless of age, ability, or resources.**

BENEFITS

- **$2.1 million in total transportation fuel cost savings through 2030.**
- **23 and 169 traffic fatalities avoided from reduced VMT through 2030 and 2050, respectively.[84]**
- **Create 800–2,000 total jobs from expanding active transportation and EV charging infrastructure through 2030.[85]**

GOAL 7

Improve non-single occupant vehicle (SOV) options to reduce VMT by 15% by 2030 and by 50% by 2050.

OBJECTIVE 16

Make public transportation a better and more convenient option to increase ridership by 50% by 2030.

Impact: 95,000 $MtCO_2e$ reduced by 2030.

ACTION 54

Support GCRTA to increase transit service (both capacity and frequency) in order to increase ridership. This includes expanding the Bus Rapid Transit (BRT) network through improvements such as the reallocation of vehicle lanes into bus lanes and installing signal priority technology in addition to providing rider amenities at or near GCRTA stations and stops.

ACTION 55

Lobby state and federal government to expand public transit funding and passenger rail service in Cleveland.

ACTION 56

COMMUNITY PRIORITY

Secure local funding sources to expand transit service and ridership and invest in active transportation in Cleveland, which could include a levy that supports non-vehicular travel.

> *Include public transportation that works for people with disabilities. I would use public transport more if it were easier to access. The walks are very long for someone with chronic pain.*
>
> — *Jefferson Resident*

OBJECTIVE 17

Transform Cleveland into a 15-minute city by creating safe, accessible environments that improve and support walkability.

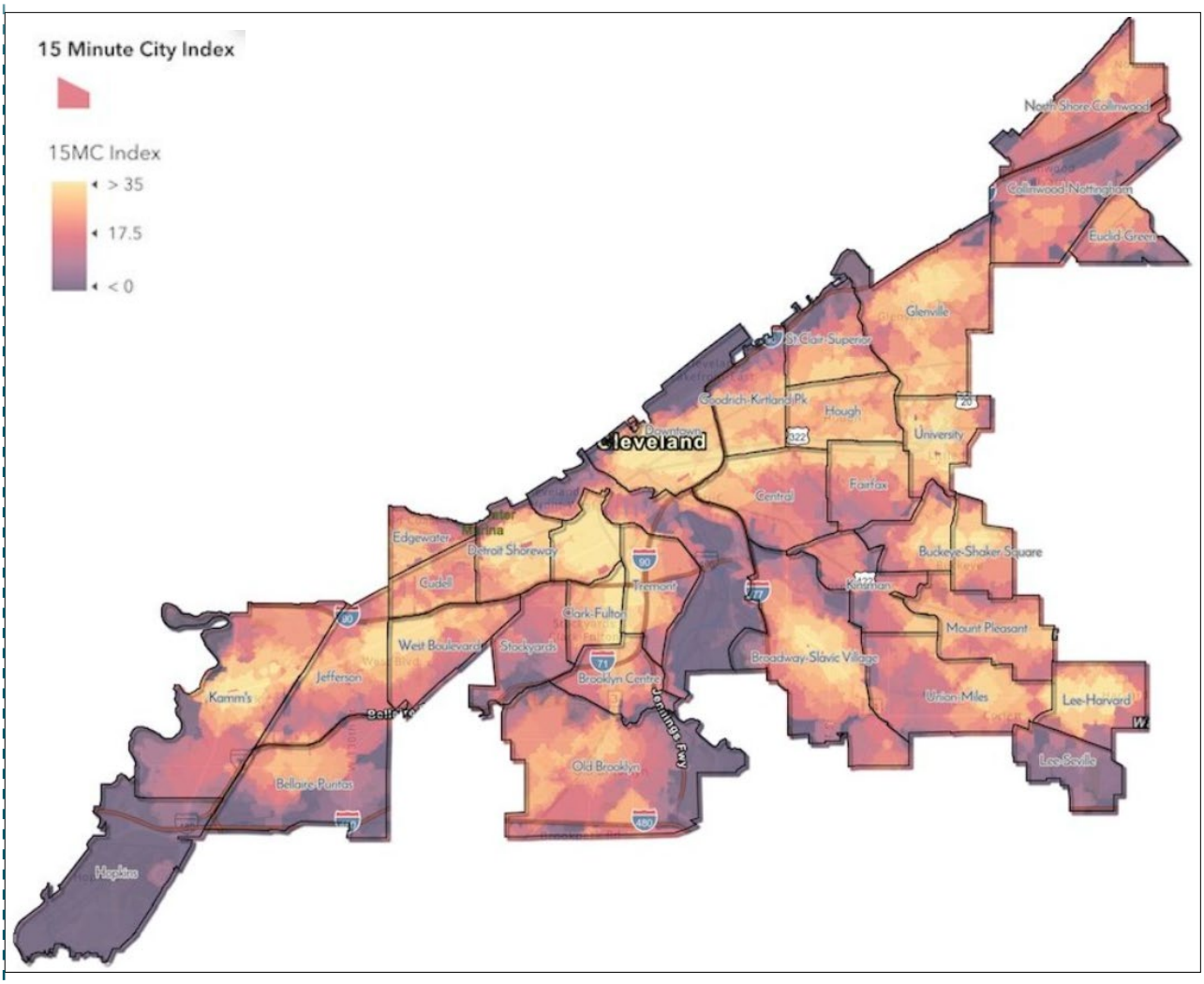
ACTION 57

Complete a sidewalk inventory to identify locations that are not present or not accessible to all.

ACTION 58

Create pedestrian zones or car-free zones in city centers or busy commercial areas to prioritize walking and enhance the pedestrian experience.

Figure 16: Cleveland's 15-Minute City Index



Circular Economy in Clean Transportation

Climate actions that recommend a transition from single occupancy, single owner, fossil fuel-powered vehicles to more diverse types of transportation, such as walking, taking public transit, electric vehicles, and bicycles, represent a reduction in waste and pollution, a principle of the circular economy.

I take medicine that makes me extremely sensitive to heat. I want to go out and explore more in the summer since it's so beautiful out but there's a major lack of shade in certain places. Even the bus stops are built to not provide any sort of cooling shade. ***I really enjoy walking around but sometimes it's so debilitatingly hot that I break down in tears.***

— *Tremont Resident*

ACTION 59

Create a policy on where the city and partners should prioritize benches, bike racks, public art, lighting, waste container, and public restrooms to make walking more enjoyable and convenient. Prioritize location near schools, transit stops/stations, and other high pedestrian areas. Remove barriers, such as permit fees, from the installation process for benches and bike racks provided by city partners.

ACTION 60

Develop and implement a traffic signal policy that includes leading pedestrian intervals, half cycles, and other pedestrian safety improvements (including restricting right turn on red).

ACTION 61

Decouple the cost of parking from residential and commercial rents citywide.

ACTION 62

Implement policies to improve parking pricing and reduce the amount of land devoted to surface parking in Cleveland. This could include implementing a property tax on commercial surface parking.

OBJECTIVE 18

Make Cleveland a gold or platinum level bicycle friendly community recognized by the League of American Bicyclists.

ACTION 63

COMMUNITY PRIORITY

Complete the 2024 Citywide Mobility Plan, identifying a network of high-comfort bike connections, and develop a 3-year implementation plan to identify priority investments to make walking and rolling safer and more comfortable for everyone.

ACTION 64

Lobby the State of Ohio to allow automated enforcement of traffic and parking violations in bikes lanes, bus lanes, and bus stops.

ACTION 65

Establish regular maintenance programs for bike lanes, paths, and facilities to ensure they are well-maintained, accessible, and safe for cyclists.

ACTION 66

Update and implement a bike parking policy and install racks citywide, especially near new bike projects.

ACTION 67

Install shared mobility hubs across the city to ensure consistent access to shared mobility devices, including e-bikes and shared EVs.

OBJECTIVE 19

Prioritize and improve roadway safety to achieve Vision Zero and transportation decarbonization.

ACTION 68 Focus roadway projects on quick-build bikeway construction and safety improvements for all road users, rather than replacing pavement.

ACTION 69 Work with Ohio Department of Transportation (ODOT) to use alternatives to vehicle level of service (LOS) for city-led projects, as permitted under its Vulnerable Road User (VRU) Assessment.

ACTION 70 Expand the city's traffic calming program, focusing on high injury/crash areas, in order to make active transportation safer and easier for all.

ACTION 71 Work with the Cleveland Department of Public Safety to prioritize enforcement of traffic violations on Cleveland's high crash corridors.

ACTION 72 Ensure that there will be a net reduction in vehicular lane miles in Cleveland by shifting road space to other modes (e.g. bus lanes, protected bike lanes, sidewalks/pedestrian areas).

GOAL 8

Decarbonize Cleveland's transportation fleet by 2050.

OBJECTIVE 20

At least 50% of light-duty vehicle sales are zero emissions vehicles by 2030, reaching 100% by 2040.

Impact: 66,000 $MtCO_2e$ reduced by 2030; 359,000 $MtCO_2e$ reduced by 2050.

ACTION 73

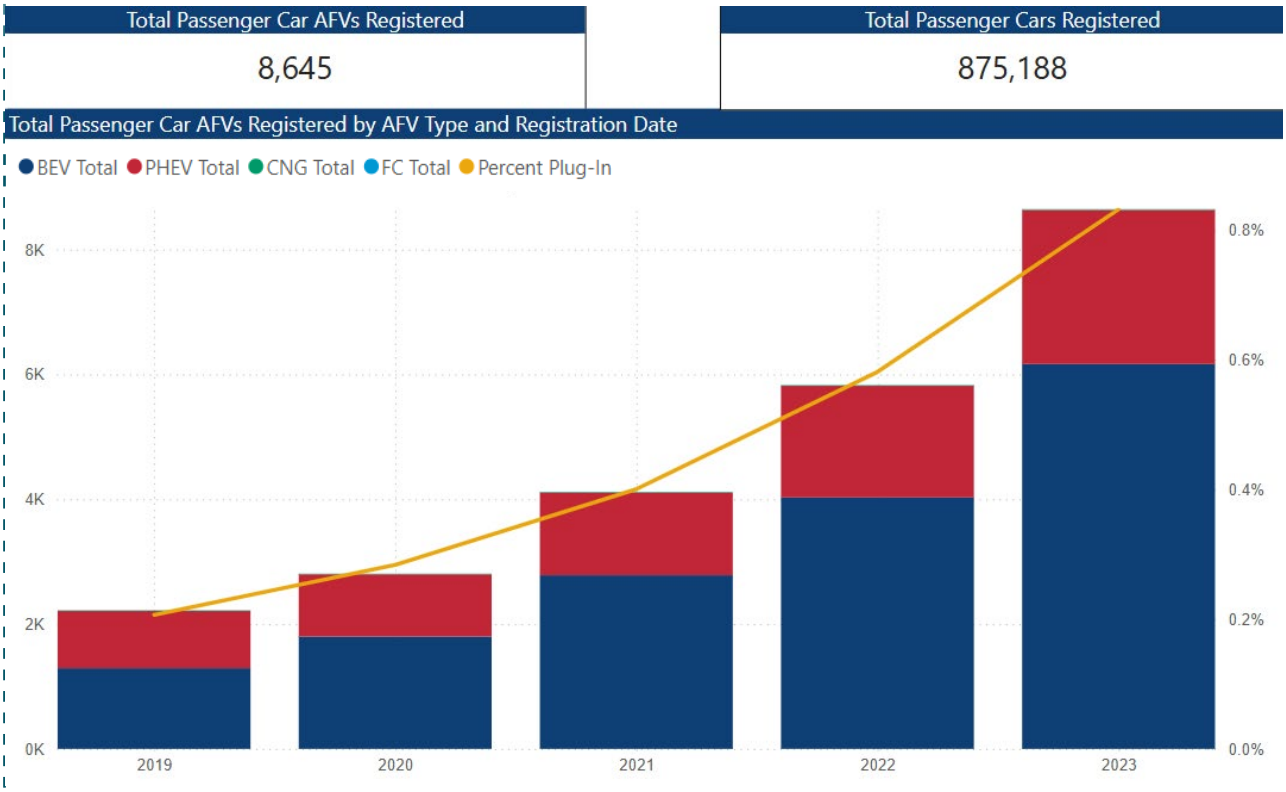
Lobby State of Ohio to remove barriers to zero emissions vehicle adoption and adopt policies that accelerate the transition.

ACTION 74

Equitably expand the public electric vehicle (EV) charging network to ensure all Clevelanders have access to affordable, reliable charging.

> *Electric vehicle charging stations need to be as common in the city as gas stations.*
>
> — *Detroit-Shoreway Resident*

Figure 17: Number of Alternative Fuel Vehicles in Cuyahoga County (2019-2023)



Source: Ohio Alternative Fuel Vehicle Registration Dashboard

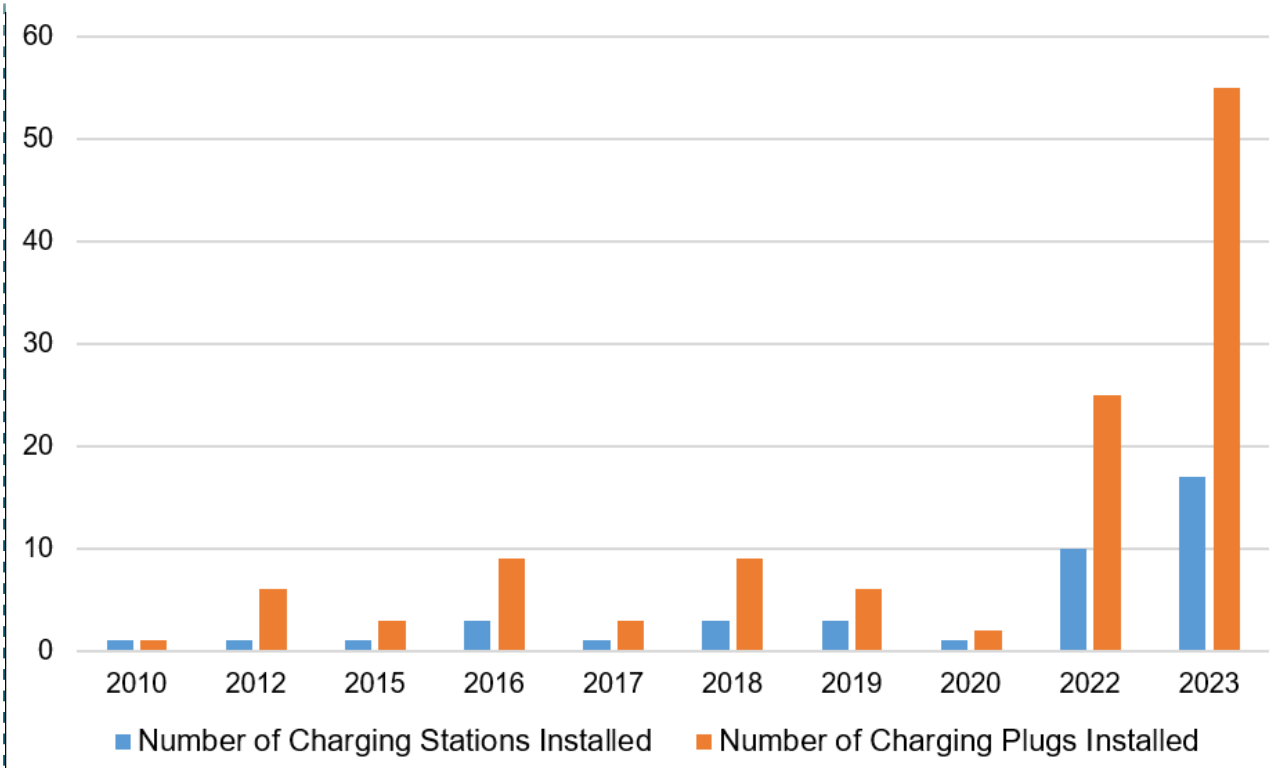
ACTION 75

Develop training programs for local contractors to support electric charging installation and service.

ACTION 76

Develop outreach programs to educate residents, businesses, nonprofits, and public sector agencies on incentives for vehicle electrification.

Figure 18: Electric Vehicle Charging Stations Installed in Cleveland (2010-2023)



OBJECTIVE 21

At least 15% of fleet vehicles across the City are zero emissions vehicles by 2030, reaching 100% by 2045.

Impact: 37,000 $MtCO_2e$ reduced by 2030; 347,000 $MtCO_2e$ reduced by 2050.

ACTION 77

Increase the adoption of zero emission vehicles among transit and school vehicle fleets.

ACTION 78 **Develop and implement zero emissions vehicle plans for public medium- and heavy-duty vehicle fleets (e.g. garbage trucks, plow trucks).**

ACTION 79 **Explore adoption of a Clean Miles Standard to rapidly electrify ridehailing vehicles.**

> ***Gas-powered lawncare equipment affects air quality, stormwater function, water quality, and public health. Homeowners and landscaping businesses should be encouraged to transition to electric equipment.***
>
> *— Buckeye-Shaker Square Resident*

OBJECTIVE 22

Transition non-road vehicles (air, marine, rail) to zero emission alternatives by 2050.

Impact: 412,000 $MtCO_2e$ reduced by 2050.

ACTION 80

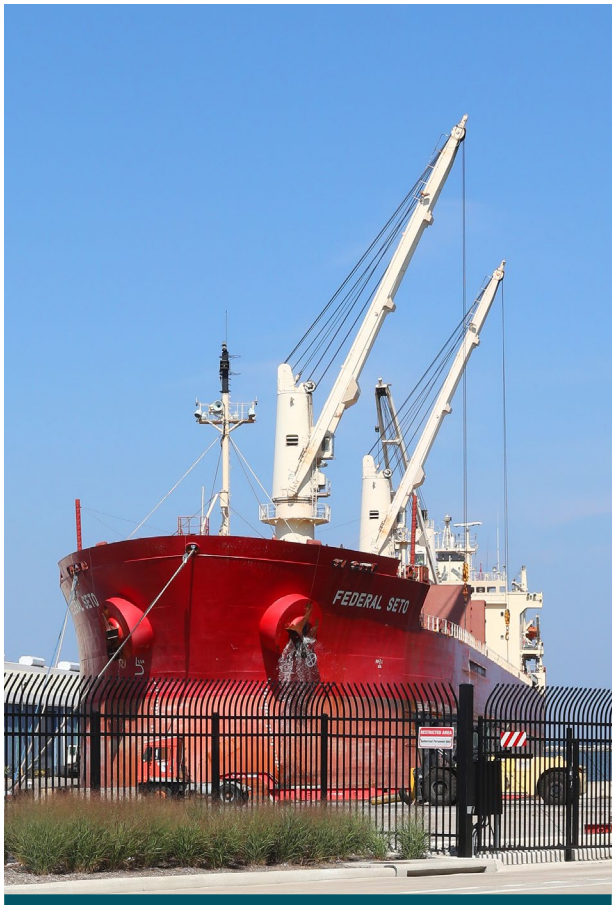
Provide financial incentives for residents and commercial landscapers to electrify their nonroad equipment (e.g. lawnmowers, leaf blowers).

ACTION 81

Invest in alternative fuel infrastructure, including electrification, at the Port of Cleveland.

ACTION 82

Research the use of sustainable aviation fuels at Cleveland's airports and implement best practices based on research findings and Federal Aviation Administration targets.



ACTION 83

Prioritize nonaviation modes in passenger and freight transportation planning for City of Cleveland.

ACTION 84

Electrify marine and aviation land support vehicles and equipment, including installing charging infrastructure.

GOAL 9

Increase transportation choice for all Clevelanders, regardless of age, ability, or resources.

OBJECTIVE 23

Create programs that make sustainable transportation modes affordable and accessible for all Clevelanders.

ACTION 85

COMMUNITY PRIORITY

Develop and implement an electric bike rebate/ subsidy program for Cleveland residents.

> ***Build bike lanes and then subsidize e-bike purchases (which are car replacers).***
>
> *— Euclid-Green Resident*

ACTION 86

Implement a fare equity/subsidized transit fare programs, in partnership with GCRTA.

ACTION 87

Pursue a Universal Basic Mobility pilot program to enhance mobility and access to key services for low-income and disadvantaged communities.

ACTION 88

Attract a private electric car share program or create a public program.

ACTION 89

Establish a comprehensive program to support mode shift through transportation demand management initiatives (including user incentives), curb management, and transit priority programs.

OBJECTIVE 24

Minimize the environmental health costs of the transportation system, particularly for overburdened communities.

ACTION 90

Expand monitoring of air quality in high-traffic areas to identify communities with disproportionate exposure to transportation-related air pollution.

> *I live close to I-90 and had surgery for cancer last year. I am greatly concerned about the highway pollution combined with warmer temperatures from climate change.*
>
> — Kamms Corners Resident

ACTION 91

Enforce Cleveland's existing idle reduction policy and expand outreach and education to fleet managers.

ACTION 92

Pilot School Street programs to eliminate vehicle traffic and emissions from around CMSD schools.

NATURE-BASED SOLUTIONS

Development patterns and other human activities have altered the natural environment of Cleveland, and climate change threatens to make these trends worse. However, while the environment will suffer from climate change, it also provides us a number of lessons and examples on how to tackle this crisis.

Nature-based solutions are actions to address societal challenges like climate change and environmental health challenges by protecting, sustainably managing, and restoring ecosystems.[86]

These approaches provide an array of benefits beyond absorbing and storing carbon. Nature-based solutions also improve air, water, and soil quality; moderate urban heat; absorb stormwater runoff; enhance mental health and well-being; improve property values; lower energy costs; offer areas for recreation; and provide habitat for plants and animals.

Cleveland is committed to utilizing nature-based solutions to address climate change, and residents and stakeholders have consistently identified these approaches as a top priority for the CAP. Clevelanders want to expand the City's tree canopy, protect natural areas, and expand access to parks and green space.

Nevertheless, the need to expand the City's built infrastructure sometimes comes into conflict with these priorities. For example, the need to increase or retain parking spaces conflicts with the opportunity to expand tree lawns or green infrastructure. There is also less funding for green infrastructure projects like rain gardens and bioswales within the public right of way, compared to the amount available for streets.

Despite these challenges, the City of Cleveland recognizes that nature-based solutions can help the City both to reduce GHG emissions and increase climate resilience.

The City is committed to increasing its use of nature-based solutions through policy and design practices to ensure they are a part of development, through making it easier to plant and care for trees, and to reuse or reduce organic materials in the landfill.

KEY FACTS

- Tree cover in the City of Cleveland has declined to 17.9%, and this lack of tree cover is particularly serious in low-income neighborhoods and communities of color.
- Cleveland received a 2024 park score of 57.9 from the Trust for Public Land, ranking it 31st of the top 100 U.S. cities.[87]
- Cleveland is home to a large and vibrant urban agriculture community, with several active farms, including Chateau Hough, Ohio City Farm, and Rid-All Green Partnership, and a robust community gardening history.
- Human activities, such as habitat destruction and the introduction of invasive species, have placed an array of Cleveland's biodiversity at risk, and climate change is making this problem worse.

CHALLENGES

- Despite efforts to expand the City's tree canopy, total tree cover has decreased in Cleveland, falling by 5% from 2011 to 2017.
- The Cuyahoga River remains affected by the legacy of pollution. The River remains a U.S. EPA designed Area of Concern (AOC), and it has four Beneficial Use Impairments.
- Lake Erie faces ongoing threats from agricultural runoff and climate change. The Lake experiences significant harmful algal blooms (HABs) on an annual basis, with the HAB severity exceeding the target of 3.0 out of 10 on 13 occasions since 2010.[88]
- Due to the smoke from Canadian wildfires during the summer of 2023, PM2.5 levels increased in Cleveland from 2018 to 2023. The three-year average level rose by 13% across this span.
- Invasive species pose an increasing threat to environmental health in Cleveland. The spotted lanternfly, a highly invasive insect native to Asia, moved into Cleveland during 2023, threatening the health of fruiting trees and vines.

SUCCESS STORIES *(since 2018)*

The City of Cleveland and its partners **planted 1,371 trees in 2023.** Since 2015, the Cleveland Tree Coalition has planted or distributed over 41,000 trees across Cleveland.

The City of Cleveland strengthened its Complete and Green Streets (CGS) ordinance in 2022, furthering the City's commitment to invest in green infrastructure and reduce the amount of pavement in Cleveland. The City hired a CGS and Trails Manager in 2023, and it has **provided funding to replace approximately 8,200 square feet of pavement with tree lawns and green space.**

Cleveland completed a comprehensive Parks and Recreation Needs Assessment during 2024 to inform the development of its new 15-year Parks and Recreation Master Plan. The City also reestablished a standalone Department of Parks and Recreation to oversee the design and implementation of this parks master plan.

Cleveland partnered with the Student Conservation Association (SCA) and the Center for Regenerative Solutions (CRS) to launch the Community Forestry Corps, a **program to provide urban forestry workforce development opportunities for youth.** Youth employees also collected data on heat to create an urban heat StoryMap for the Buckeye Neighborhood.

Cleveland improved both its overall ParkScore and its ranking from 2018 to 2022. **The share of residents living within a 10-minute walk from a park increased to 81%.**

The Cleveland Metroparks expanded its tree canopy by 7% from 2010 to 2021. This tree canopy sequesters GHGs emissions equivalent to more than 8.4 million gallons of gasoline and energy use of over 9,000 homes annually.[89]

> ***Biodiversity is all the different kinds of life you'll find in one area—the variety of animals, plants, fungi, and even microorganisms like bacteria that make up our natural world. Each of these species and organisms work together in ecosystems, like an intricate web, to maintain balance and support life. Biodiversity supports everything in nature that we need to survive: food, clean water, medicine, and shelter.***[90]
>
> — *World Wildlife Fund*

BIG WINS *(since 2018)*

- The City of Cleveland received a **$3.4 million Urban and Community Forestry grant** from the U.S. Department of Agriculture (USDA) to develop an updated public right-of-way tree inventory and tree care strategy and expand tree maintenance and planting with partner organizations.
- The Cleveland Tree Coalition **distributed more than $660,000 in grants** to community organizations to plant trees across the City during 2024.
- Cuyahoga County established its Healthy Urban Tree Canopy (HUTC) Grant program in 2019. Each year, the program has **provided $1 million in grants to expand the tree canopy** across the County, including in Cleveland.
- USDA awarded **more than $340,000** to the City of Cleveland to establish a **residential food waste capture and composting program** with Rust Belt Riders.

GOALS

10. **Enhance nature-based infrastructure to create a more resilient watershed.**
11. **All residents live within a 10-minute walk of a safe, accessible, robust green space that support an increasing tree canopy by 2045.**
12. **Enhance reuse and repurposing of organic materials to improve economic and environmental health.**

GOAL 10

Enhance nature-based infrastructure to create a more climate resilient watershed.

OBJECTIVE 25

Optimize funding opportunities and development patterns to increase Cleveland's capacity to absorb stormwater by 25%.

ACTION 93

Partner with NEORSD to expand funding for its green infrastructure grant program.

ACTION 94

COMMUNITY PRIORITY

Cleveland will create stormwater design guidelines for development, using the Sustainable SITES initiative as a reference for City-led and large-scale development projects.

ACTION 95

COMMUNITY PRIORITY

Utilize Complete and Green Streets policy to prioritize implementing nature-based approaches to transportation infrastructure projects, including removing excess pavement, expanding vegetative buffers, and installing pervious surfaces.

ACTION 96

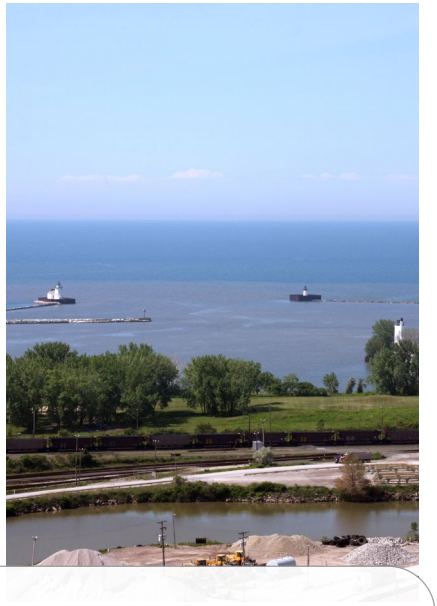
Identify hydrologically sensitive sites for nature-based interventions, such as daylighting, rain gardens, and pocket parks.

ACTION 97

Update City building codes to enable sustainable alternatives to lawns and encourage the planting of native vegetation.

OBJECTIVE 26

Support a resilient and accessible Lake Erie.



ACTION 98

Expand Cleveland's existing Riparian Setback Ordinance to require and enforce a minimum of 25-foot buffers along waterways and implement nature-based shorelines and stormwater retrofits in flood-prone areas of the coast.

ACTION 99

Support funding for management measures to remove Beneficial Use Impairments in the Cuyahoga River.

> *I've lived my whole life in the Lake Erie watershed, and it's past time the lake started to be treated as the incredible natural wonder/resource that it is.*
>
> — Tremont Resident

GOAL 11

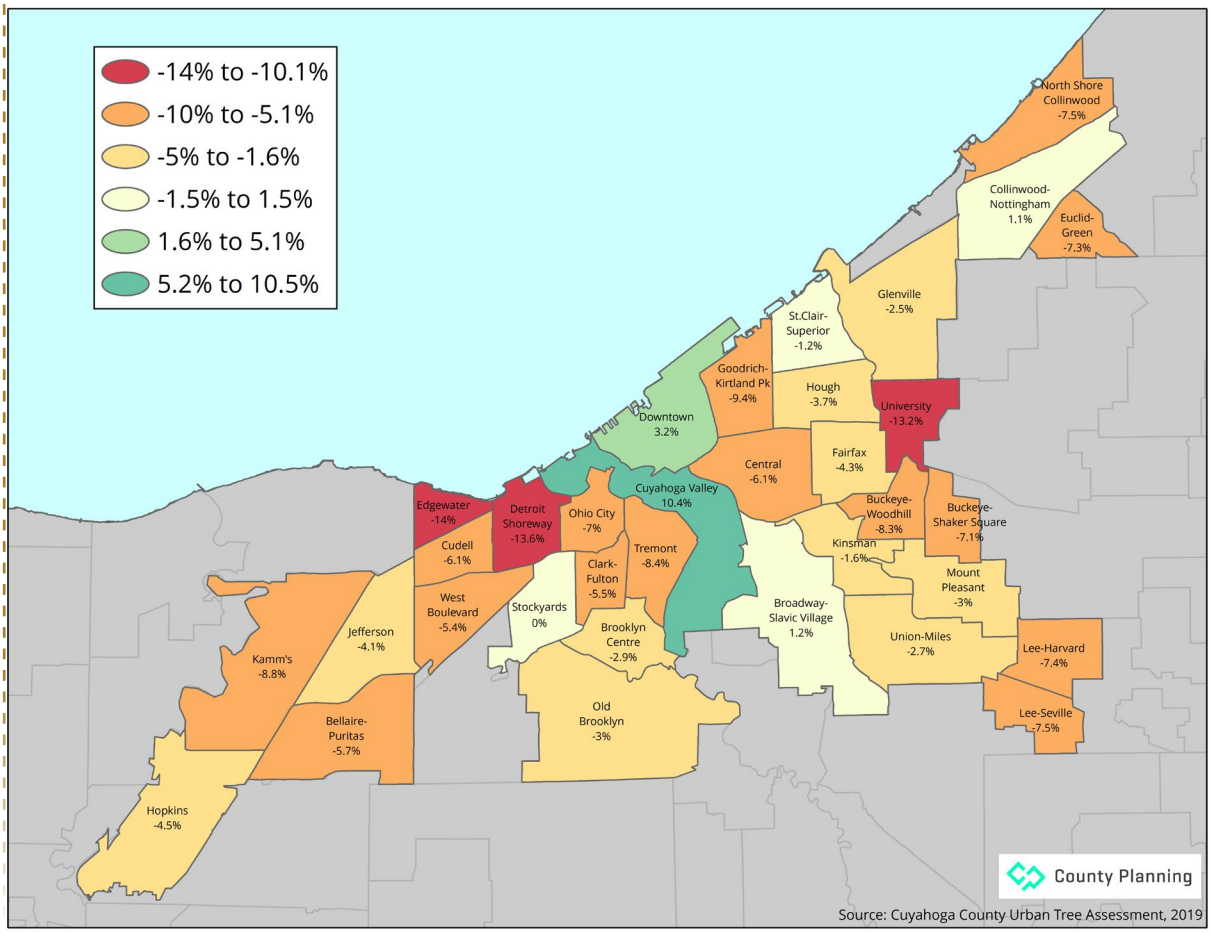
All residents live within a 10-minute walk of a safe, accessible, robust green space that support an increasing tree canopy by 2045.

OBJECTIVE 27

By 2030, promote the implementation of sustainable management of our urban forest and reduce deforestation of our tree canopy.

Impact: 10,000 $MtCO_2e$ reduction through 2030; 45,000 $MtCO_2e$ reduction through 2050.

Figure 19: Change in Tree Canopy Cover by Neighborhood (2011-2017)



Source: Cuyahoga County Planning, "Urban Tree Assessment 2019"

ACTION 100

COMMUNITY PRIORITY

Assist residents with tree planting and maintenance and care for mature trees, including developing a cost-share fund to assist landowners.

ACTION 101

Strengthen guidelines for protecting trees during electric and gas utility work and work with public and private utilities to adhere to guidelines within the City.

ACTION 102

Coordinate with partners to establish processes to identify and mitigate the threat to forests from invasive species.

ACTION 103

Develop framework to guide engagement among residents, community development corporations (CDCs), and the Urban Forestry Division to promote cooperative decision-making around tree planting, maintenance, and removal. This may include establishing task forces of trained tree stewards in every ward who lead the empowerment of resident data collection to report and generate work orders for tree maintenance and planting.

OBJECTIVE 28

Increase access to and ownership of high-quality green space.

ACTION 104

Implement the recommendations of the Cleveland Parks Master Plan to ensure residents can access greenspace, regardless of identity, income, or physical ability, particularly residents of neighborhoods most vulnerable to the impacts of climate change.

ACTION 105

Coordinate with local Landbanks to establish processes to evaluate and identify parcels for nature-based solutions, prioritizing decarbonization, climate resilience, and supporting biodiversity. Work with identified stakeholders to implement a nature-based solutions framework for vacant land parcels.

> ***Investing in safe and accessible green space should be a priority,*** *taking into consideration how these spaces will be maintained and utilized for maximum public benefit and economic growth.*
>
> *— North Shore Collinwood Resident*

Circular Economy in Nature-Based Solutions

The best example of a circular economy may be found in nature, where there is no waste. Nature-based solutions contribute to a circular economy by renewing and restoring nature. Examples of the circular economy in the Climate Action Plan include the planting and maintenance of trees and composting of food waste.

GOAL 12

Enhance reuse and repurposing of organic materials to improve economic and environmental health.

OBJECTIVE 29

Utilize discarded materials from City and business operations to reduce emissions, regenerate urban land, and create economic opportunity.

ACTION 106

Establish policies to reclaim and upcycle wood from urban forestry activities.

ACTION 107

Build on green workforce demand study (Holden Forests and Gardens) to establish urban forestry and urban forestry material reuse industries.

ACTION 108

Establish necessary facilities and systems to enable diversion of 25% of organic waste from institutions, businesses, and residents to composting by 2035. Secure purchasing commitments from the City of Cleveland and other park owners for locally generated compost and biochar.

Source: Rust Belt Riders

ACTION 109

Use fungi, plants, and dredge material from Cuyahoga River for demolition fills and vacant land remediation to increase the carbon sequestration potential of soils.

The Food Scrap Drop-Off Composting Program

During January 2024, the City of Cleveland **received more than $340,000 from USDA to launch a residential composting program.** Through a partnership with Rust Belt Riders, Cleveland has launched The Food Scrap Drop-Off Composting Program, which will enhance food waste landfill diversion efforts and support the City's broader climate and sustainability goals by increasing access to food waste composting for residents.

The program is establishing drop-off locations for residential compost across the City and subsidizing monthly composting subscriptions for 250 low-income households. This program will also fund neighborhood-level community Compost Ambassadors to support education around composting services and Compost Trainees in a composting workforce development program. Limited free finished compost will be available to urban growers in Cleveland.

"Using food scraps to create healthy soil, engage residents and reduce landfill trash is a major step toward a more circular economy and a more sustainable city," said Sarah O'Keeffe, the Director of Sustainability and Climate Justice.

OBJECTIVE 30

Improve understanding of climate challenges and solutions within the nature-based solutions sector.

ACTION 110

Expand nature-based solutions training opportunities (e.g. streambank stabilization, green stormwater infrastructure, etc.) and require such training for contractors who work in the City.

ACTION 111

Engage CMSD and higher education institutions to enhance education and workforce development opportunities in nature-based solutions.

> ***We need neighborhood based training and employment opportunities for maintenance of trees planted and green spaces.***
>
> *— Roundtable Participant*

OBJECTIVE 31

Support regenerative urban agriculture and local food systems.

ACTION 112

Establish goals for food purchased and sold from local providers and expand existing programs to purchasing local foods, including Produce Perks.

Produce Perks

Offered through the Ohio Nutrition Incentive Network, the Produce Perks program provides a $1-for-$1 match (up to $25) to recipients of supplemental food assistance programs to purchase fruits and vegetables at farmers markets throughout Ohio.

ACTION 113

Have every available acre of the current Urban Agriculture Innovation Zone under production and increase access to land and water for urban agriculture.

> ***Parks can be centers of agriculture within our cities.*** *The idea of using parks and recreation spaces to take away land from agricultural use is a practice that needs to be amended. Parks should provide food and spaces for people to cultivate land to produce food for themselves.*
>
> *— North Shore Collinwood Resident*

RESILIENT PEOPLE

As Chapter 5 shows, Cleveland is already experiencing the effects of a changing climate. While the infrastructure investments and nature-based solutions outlined in the other focus areas will reduce the City's vulnerability to these impacts, ensuring that the Cleveland community is prepared for a changing climate will require determined focus on enhancing the resilience of its people. As the COVID-19 pandemic demonstrated, the City remains vulnerable to outside shocks, and Cleveland is only as strong as its most vulnerable residents and institutions.

Cleveland is charting a bold path toward climate resilience, prioritizing inclusive community engagement and robust programs to address the city's most pressing environmental challenges.

With significant funding and a collaborative spirit, the city is actively involving youth, residents, and community-based organizations to shape a sustainable and equitable future.

Cleveland's resilience efforts are guided by three primary goals: strengthening city infrastructure and public health against climate risks, empowering youth and residents to lead climate action, and ensuring equity for frontline communities. Programs such as the Mayor's Children and Youth Cabinet, the Northeast Ohio Youth Climate Summit, and Clean in CLE underscore Cleveland's commitment to engaging all residents, particularly young people, in creating lasting change.

85%

Share of Cleveland residents who say climate hazards have prevented them from completing daily tasks

KEY FACTS

- **Cleveland faces significant risks from extreme heat, flooding, and declining air quality, disproportionately impacting underserved neighborhoods.**
- **More than 85% of Clevelanders stated that climate hazards have prevented them from completing essential daily tasks.**
- **Nearly nine in ten Cleveland residents (87%) live in low-income and disadvantaged areas (LIDAC), according to data from the Climate and Economic Justice Screening Tool (CEJST). Despite making up less than 20% of the region's population, Cleveland accounts for nearly 60% of total LIDAC areas in Northeast Ohio.**

CHALLENGES

- Many of Cleveland's neighborhoods are highly susceptible to the impacts of climate change. More than 37% of the City's Census tracts rank among the most vulnerable in the U.S., meaning they rank at or above the 95th percentile for baseline vulnerability on the Climate Vulnerability Index.[91]
- Many of Cleveland's residents are particularly vulnerable to climate impacts, including disabled residents, the elderly, low-income families, and unhoused residents. Nearly one-third of Clevelanders live below the poverty line, leaving them at risk of shocks like severe storms and power outages such as those occurring on August 6, 2024.
- Cleveland's aging housing and infrastructure exposes residents to the harms of climate change. Almost 40% of Clevelanders are housing cost burdened, meaning they spend at least 30% of their income on housing costs, and 20% of parcels in the City are vacant.[92]
- Six in ten Clevelanders live in food deserts, meaning they live more than 0.5 miles from the nearest grocery store, and more than one in five (21.5%) are food insecure, meaning they don't have enough to eat and don't know where their next meal will come from.[93]
- Northeast Ohio failed to meet federal air quality standards by 2021. The region does not meet federal air quality standards for ground-level ozone or PM2.5.

SUCCESS STORIES *(since 2018)*

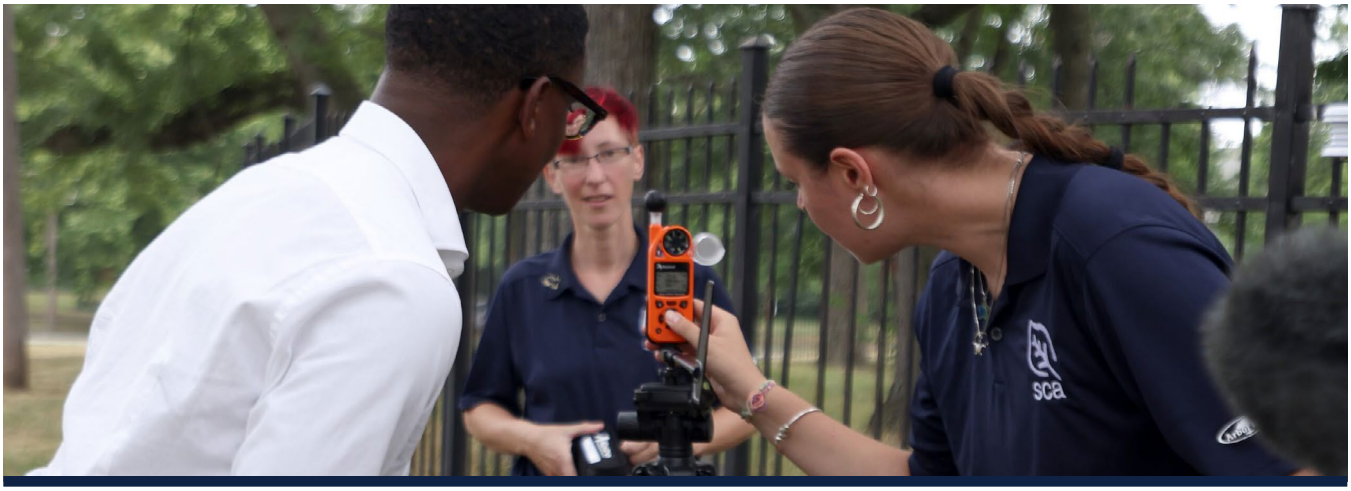
Smog has slightly decreased since 2018, falling to 73 parts per billion (ppb) in 2023 from 75 ppb in 2018. The **number of days on which the region exceeded the federal ozone standards fell by more than half**, to six in 2023 from 13 in 2018.[94]

The City of Cleveland updated and enhanced its Climate Risk and Vulnerability Assessment (CRVA) during 2023-2024. The City engaged nearly 450 people who live and work in Cleveland throughout this process.

Youth participants in the Community Forestry Corps installed sensors to map the urban heat island in the Buckeye neighborhood.

In February 2024, Mayor Bibb launched the "A Home for Every Neighbor" program, which **provides stable housing for chronically homeless Clevelanders.**

The City has launched a number of youth-focused initiatives, like the Northeast Ohio Youth Climate Summit, to **amplify the voices of young leaders and build intergenerational engagement.**



BIG WINS *(since 2018)*

- The Cleveland Division of Air Quality (CDAQ) received a **$500,000 grant from the U.S. EPA to launch its CleaninCLE program in 2023.** The program is expanding the City's air quality monitoring network by installing 30 sensors in different neighborhoods.
- The City of Cleveland, KeyBank, and the Local Initiatives Support Coalition (LISC) have partnered to launch the Cleveland Housing Investment Fund (CHIF), a **$100 million public-private partnership to invest in affordable housing.**
- The Cleveland Metroparks, City of Cleveland, and other partners secured a grant from the National Fish and Wildlife Foundation to complete the Cleveland Harbor Eastern Embayment Resilience Strategy (CHEERS), a plan to **enhance the resilience of the City's eastern lakefront** by restoring habitats and creating recreational space.
- The Northeast Ohio Black Health Coalition (NEOBHC) received a **$1.3 million grant from the National Oceanic and Atmospheric Administration (NOAA) for its Building Resilience to Extreme Weather in Northeast Ohio program.** This effort will establish a resilience hub of 30 community-based organizations to address barriers to climate resilience, invest in climate literacy and public engagement, and secure funding to implement resilience-focused projects.

GOALS

13. **Make Cleveland resilient to priority climate hazards.**
14. **Strengthen capacity of Clevelanders to adapt to & address the climate crisis.**
15. **Strengthen social equity and inclusion for frontline communities.**

GOAL 13

Make Cleveland resilient to priority climate hazards.

OBJECTIVE 32

Limit the impacts of poor air quality on the health and well-being of Clevelanders.

COMMUNITY PRIORITY

ACTION 114

Expand network of air quality monitoring stations, including installing local scale and mobile monitors to supplement regulatory network.

> *I worry the more air quality warnings we have, the less people will go outside when they are growing up. I wasn't able to take my newborn daughter outside for two months out of the summer in 2023.*
>
> — *Old Brooklyn Resident*

Source: Gus Chan, Eye on Ohio.

ACTION 115

Update Cleveland's Air Pollution Control Code to reflect best practices and account for the potential impacts of climate change on air quality.

ACTION 116

Improve existing communication to the public for quality action days, including providing messaging in multiple languages and communication styles.

ACTION 117

Identify air pollution hotspots to guide interventions that improve air quality and enhance public health.

ACTION 118

Invest in indoor air quality upgrades at community gathering places (e.g. neighborhood resource and community centers) to provide residents with access to clean air on poor air quality days.

OBJECTIVE 33

Develop and implement comprehensive strategies to mitigate the risk of extreme heat.

ACTION 119

COMMUNITY PRIORITY

Coordinate with residents and stakeholder organizations to develop comprehensive Heat Mitigation Plan for City of Cleveland.

ACTION 120

Expand hours at city-owned pools and splash pads on extreme heat days.

ACTION 121

Identify urban heat island hotspots throughout the City and target these areas for heat mitigation interventions.

ACTION 122

Pilot infrastructure interventions to reduce the impacts of extreme heat (e.g. reflective pavement, green roofs).

OBJECTIVE 34

Reduce Cleveland's vulnerability to extreme precipitation and flooding.

ACTION 123

Collaborate with partners to identify infrastructure assets most vulnerable to flooding.

ACTION 124

Assess flood risks in neighborhoods and identify areas to limit development of critical infrastructure.

ACTION 125

Explore the creation of rebates and incentives to help residents flood-proof their properties.

ACTION 126

Examine opportunities to help residents relocate from hazard-prone areas, where appropriate, such as the creation of voluntary home buyout programs.

GOAL 14

Strengthen the capacity of Cleveland's residents to adapt to and address the climate crisis.

OBJECTIVE 35

Empower residents to take climate action in their communities.

ACTION 127 Create climate change educational resources for local schools, community organizations, and neighborhood-level champions, including reestablishing the Climate Ambassadors program.

ACTION 128 Provide climate change trainings and listening sessions with elected & public officials.

ACTION 129 Reinvigorate and expand the Cleveland Climate Action Fund (ClevelandClimateAction.org).

ACTION 130 Coordinate with community-based organizations to develop neighborhood-level climate action implementation plans.

OBJECTIVE 36

Engage and empower residents to increase climate resilience within their communities.

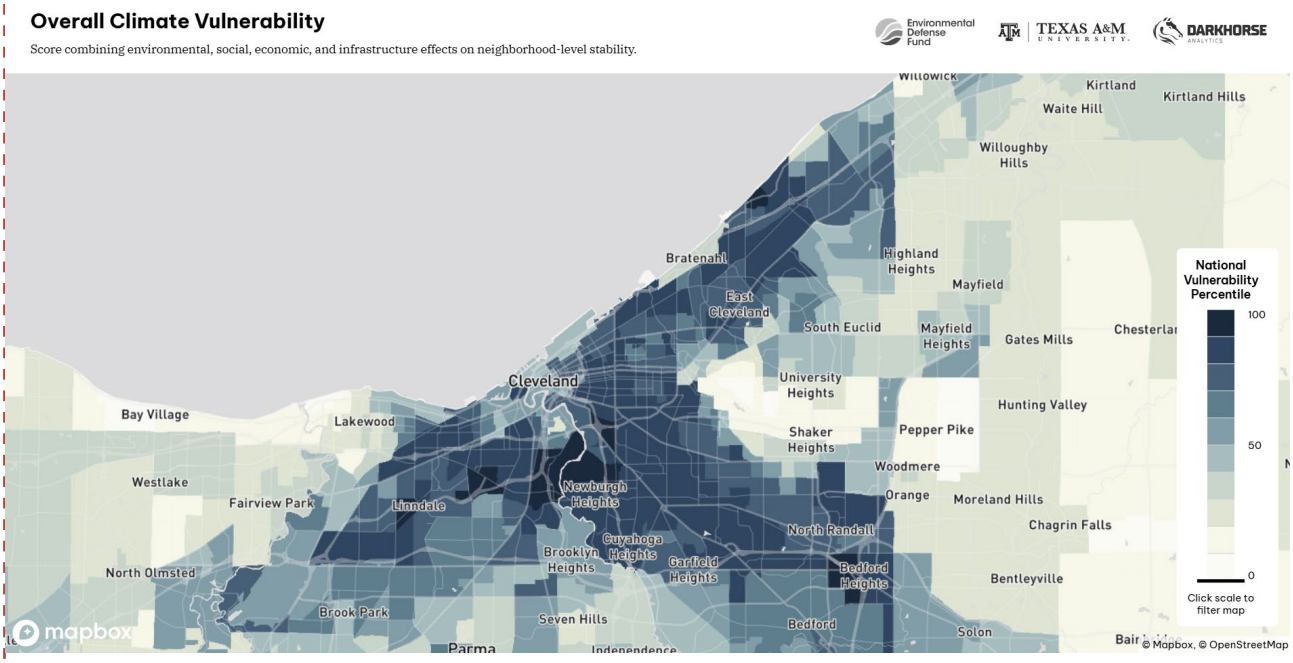
ACTION 131

Complete community asset and vulnerability mapping exercises at the neighborhood level.

ACTION 132

Collaborate with emergency management partners and community-based organizations to develop multilingual emergency response plans and communication strategies.

Figure 20: Climate Vulnerability Index Rankings for City of Cleveland Census Tracts



Source: Climate Vulnerability Index, map.climatevulnerabilityindex.org.

GOAL 15

Strengthen social equity and inclusion for frontline communities.

OBJECTIVE 37

Expand programs to address underlying causes of climate vulnerability for frontline communities.

ACTION 133

Advocate for local and state level policies to prevent utility disconnections during the summer months.

> *When the tornado came through [on August 6, 2024], we did not have electricity for 5 days and I could not sleep with the oxygen machine for sleep apnea.*
>
> — *Roundtable Participant*

COMMUNITY PRIORITY

ACTION 134

Assess neighborhood resource and community centers and identify priority locations for resilience hubs.

ACTION 135

Establish fan/air conditioning delivery/rental program for vulnerable populations during periods of extreme heat.

ACTION 136

Provide free/subsidized air purifiers for residents to improve indoor air quality in their homes.

ACTION 137

Conduct accessibility audits and retrofit public spaces for wheelchair access and other accommodations.

> ***As a person who has multiple disabilities that place me at a higher risk for complications from climate change-related health issues, I want to remind you that people with disabilities will be hit harder by everything—economic, social, and climate. But prioritizing vulnerable populations will also improve life for everyone.***
>
> *— Union-Miles Resident*

ACTION 138

Proactively engage with vulnerable populations (e.g. people living with disabilities) to review and update hazard preparedness plans.

A Home for Every Neighbor

The City of Cleveland launched its "A Home for Every Neighbor" program in early 2024. Through this program, the City and its partners have worked to identify geographic areas for targeted housing-focused outreach; document unique needs specific to each neighbor in these areas; recruit landlords with signing bonuses and twelve months of guaranteed rental payments; collaborate with partners to provide comprehensive wraparound services; and deliver ongoing case management and support following move-in.

Through October 2024, **the program has provided housing to 68 unsheltered neighbors, with 72% of them experiencing chronic homelessness.**

"Financial, social, emotional, and physical health cannot be fully-realized if people are living on the streets," Mayor Bibb said. "Everyone deserves a place they can call home and – thanks to this initiative – we have been able to provide that to almost 70 neighbors so far and we'll continue to work to make sure every neighbor is given that opportunity."

ACTION 139

Coordinate with partner organizations to enhance and expand transportation to shelters and cooling/warming centers during hazard events.

OBJECTIVE 38

Enhance the resilience of Clevelanders experiencing homelessness by providing essential resources and supports.

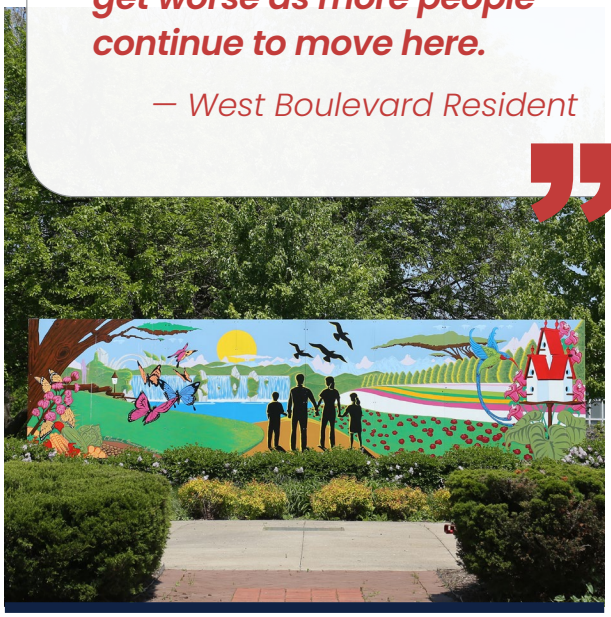
ACTION 140

Establish and expand emergency shelter and transitional housing programs for the unhoused population, considering climate-resilient design and location.

ACTION 141

Co-develop hazard preparedness plans targeted for the unhoused population with community partners and community members.

> *Houseless and housing unstable folks do not have enough options or support to live during climate change events in Cleveland. This issue is only going to get worse as more people continue to move here.*
>
> — West Boulevard Resident



ACTION 142

Provide climate-resilient services such as access to clean drinking water, food, hygiene facilities, and medical care.

ACTION 143

Expand and enhance outreach programs to unhoused residents, particularly in advance of climate hazard events.

OBJECTIVE 39

Foster a just, inclusive transition towards a sustainable economic system in Cleveland.

ACTION 144

Coordinate with partners to conduct an assessment of the workforce development needs to facilitate Cleveland's transition to a green economy and the barriers to achieving it.

ACTION 145

Establish workforce training, apprenticeship, and mentorship programs to help residents benefit from the clean energy economy.

ACTION 146

Advocate for and implement local and state-level labor protections for workers exposed to climate hazards (e.g. mandatory water/cooling breaks).

ACTION 147

Establish retraining programs for workers in occupations displaced by the green transition.

ACTION 148

Advocate for worker protections in clean energy projects and firms (e.g. prevailing wages, labor peace agreements, employee ownership).

> ***Some of my job necessitates being outside. It is dangerous to be outside during heat waves and when there's poor air quality. Planting trees, tree maintenance, invasive removal, etc. all become impossible during extreme weather events.***
>
> *— Ohio City Resident*

13,732
Total number of green jobs in Cuyahoga County.

#42
Cuyahoga County's raking nationally for total number of green jobs.

5x
Green jobs grew five times faster than the overall economy in Ohio.

66%
Two-thirds of Ohio's clean energy companies are small businesses with 20 or fewer employees.

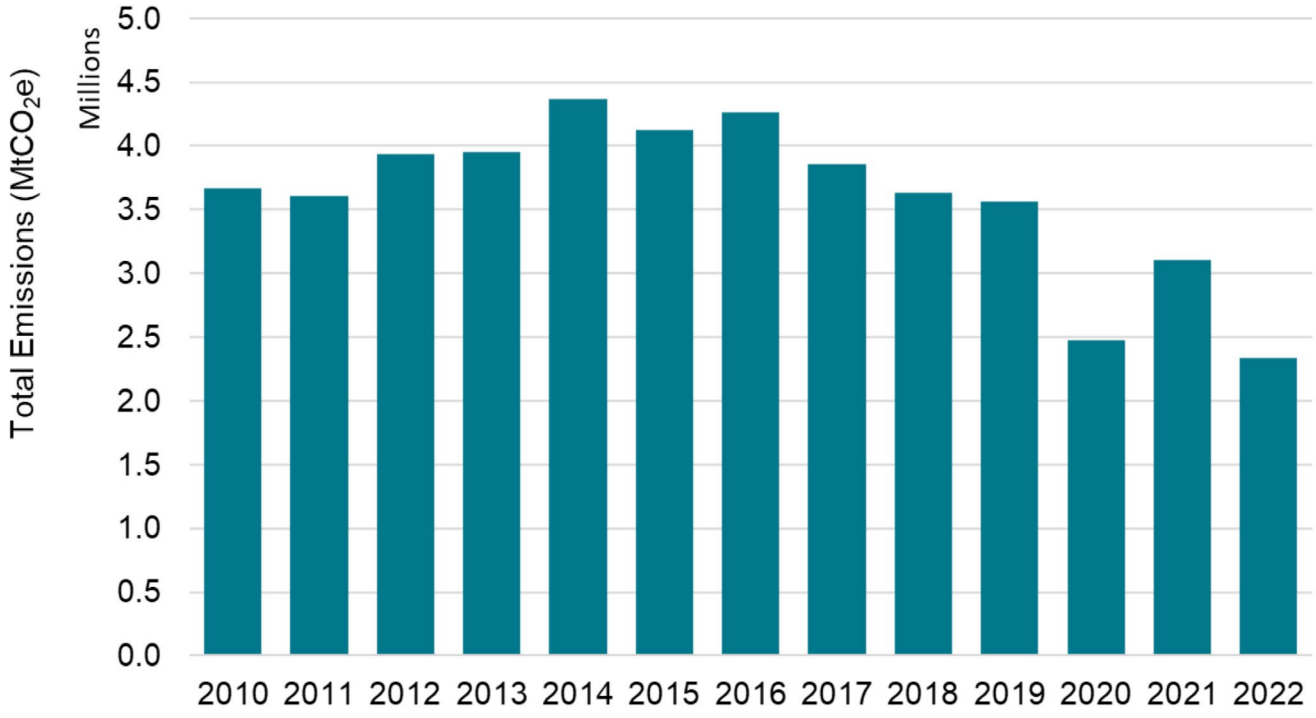
$8.8 billion
Total amount of clean energy investments in Ohio since the passage of the Inflation Reduction Act in August 2022.

CIRCULAR INDUSTRY

Given the City of Cleveland's historic reliance on heavy industry and manufacturing, it is not surprising that industry is an essential part of the City's strategy to achieve net zero emissions. **Industry is a primary source of resource consumption, waste production, and GHG emissions.**

During 2022, industrial processes and product use (IPPU) in Cleveland was responsible for approximately 25% of the total GHGs. When accounting for industrial electricity and natural gas use, the industry sector produced 50% of total emissions. This is consistent with previous years – from 2010 to 2022, industry made up 55% of total GHGs in Cleveland.

Figure 21: Industrial Process & Product Use Emissions in Cleveland (2010-2022)



A key component of moving towards more circular industries in Cleveland is shifting towards clean energy sources. Industrial partners currently rely on fossil fuels for production, as many of these companies depend on high heat for industrial process and must operate continuously to meet demand and maintain their equipment. Shutting down industrial equipment is often a costly, time-consuming process; one cannot turn a blast furnace on and off like a light switch.

Providing abundant, affordable clean energy is necessary for decarbonizing Cleveland's industrial sector, but it is not enough on its own. In addition to using fossil fuels for production, industrial processes – such as converting iron ore to steel – directly releases GHGs.

Achieving net zero emissions will require more fundamental changes to industrial operations. While solutions are quickly becoming both technologically and economically feasible, climate action in this area will take place over decades, rather than over a few years.

Cleveland's industrial sector is also a primary driver of resource use and waste. In 2022, companies generated 253,469 tons of industrial waste. While much of this waste was recovered and reused, 37% of it still ended up in landfills. Industrial producers will need to make more concerted efforts to reduce waste through their operations and share resources with partners throughout their supply chains in the coming years.

KEY FACTS

- Industry accounted for half of total GHGs in Cleveland during 2022.
- Industrial emissions declined by 28% from 2018 to 2022. The largest reduction occurred for industrial processes and product use (-36%).
- In 2020, Cleveland-Cliffs, headquartered in Cleveland, committed to reducing GHG emissions by 25% through 2030.
- Steel is the most widely recycled material in the world, with approximately 60% of produced steel recycled in the U.S. During 2023, Cleveland-Cliffs recycled over 6.6 million tons of steel and iron materials.[95]

CHALLENGES

- Cleveland-Cliffs' Cleveland Works facility is the single largest source of GHG emissions in Cleveland, producing more than 2.9 million tons of GHGs during 2022. Cleveland Works is a blast furnace-basic oxygen furnace (BF-BOF) facility, making it more carbon intensive than other forms of steel production.
- Cleveland's historic reliance on heavy industry has taken a significant toll on air quality in the City. According to one recent study, the 17 remaining coal-based steel and coke facilities in the U.S., including Cleveland Works, are responsible for 460-892 premature deaths and more than 250,000 asthma attacks each year.[96]
- Low-carbon steel currently costs 40% more than traditional production, making it difficult for steelmakers to justify the investment in clean production.[97]
- The share of industrial waste that was recycled in Cleveland decreased to in 2023 from 50% in 2018.[98]
- There were 71 total facilities in Cleveland that reported releases of toxic chemicals to U.S. EPA in 2023. Combined, they released nearly 8.1 million pounds of toxic chemicals, up 12% from 2018.[99]
- Total GHG emissions from the Cleveland Clinic increased slightly from 2018 to 2022.

SUCCESS STORIES
(since 2018)

Emissions from the Cleveland Works facility fell by 30% from 2018 to 2022, accounting for the majority of the reduction in citywide emissions during that period.

During 2023, the emissions intensity of BF-BOF steel produced by Cleveland Cliffs declined to 1.54 $MtCO_2e$ per ton, a 15% reduction from 2020. This is 28% lower than the industry-wide average.[100]

Due to upgrades at the Cleveland Works facility, Cleveland-Cliffs will reduce water consumption by nearly 23 million gallons per year.

Corix converted its Cleveland Thermal facility to natural gas in 2017. In 2022, the facility's emissions were 47% lower than they were in 2016, prior to the conversion.

BIG WINS *(since 2018)*

- Cleveland-Cliffs received a **$575 million grant from DOE to invest in two steel decarbonization projects** at plants in Middletown, Ohio and Butler, Pennsylvania.

- Cliffs also received a **$19 million grant from DOE's Office of Clean Energy Demonstrations' Industrial Demonstrations Program** to invest in electric steel production at facilities in Zainesville, Ohio and Lyndora, Pennsylvania.

- Ohio is part of the Appalachian Hydrogen Hub that received **$925 million from DOE** to produce and distribute low-carbon hydrogen for various commercial and industrial uses.

GOAL 16

Achieve net zero emissions within the industrial sector by 2050.

OBJECTIVE 40

Improve energy productivity and decarbonize industrial operations in Cleveland by 30% by 2030.

Impact: 1.73 MMtCO_2e reduced by 2030, 1.74 MMtCO2e reduced by 2050

ACTION 149

COMMUNITY PRIORITY

Coordinate with key industry partners to identify priority pathways to decarbonization, including hydrogen and carbon capture, building upon the Cleveland Regional Decarbonization Pathways Analysis.

> *The plan should encourage and support Cleveland-Cliffs' efforts to **shift to green steel production.***
>
> — *Buckeye-Shaker Square Resident*

COMMUNITY PRIORITY

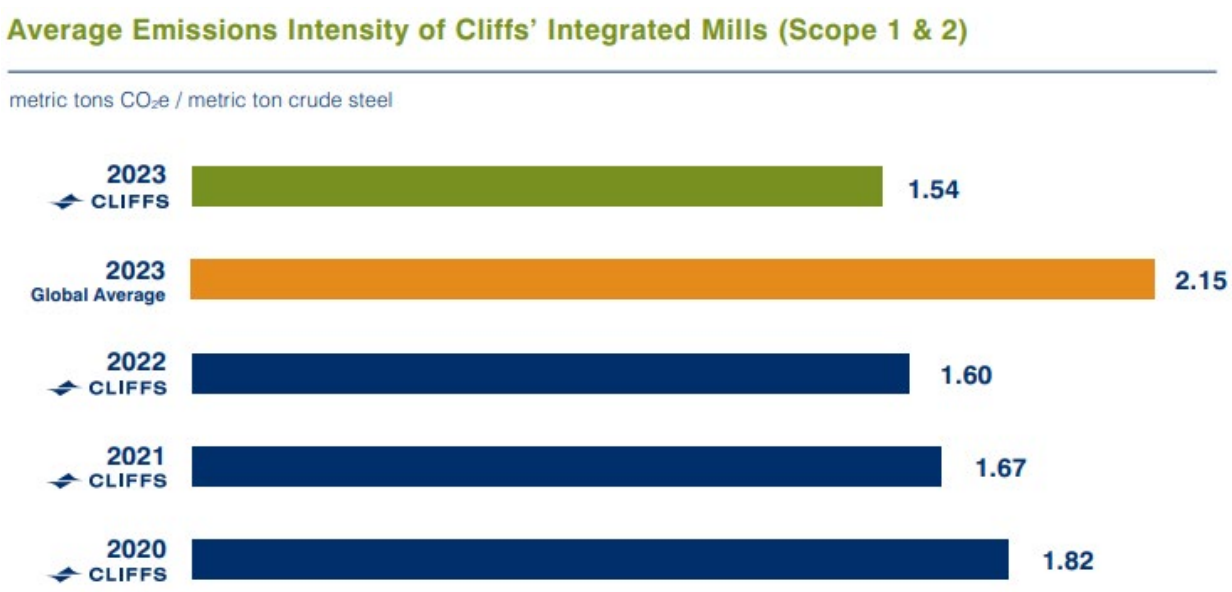
ACTION 150

Connect industrial sector partners to technical assistance and resources to promote the reduction of greenhouse gas emissions, e.g. through DOE's Industrial Training and Assessment Centers.

ACTION 151

Implement solutions for energy efficiency and savings in manufacturing processes based on the results of energy audits.

Figure 22: GHG Emissions Intensity of Cleveland-Cliffs Integrated Steel Mills (2020-2023)



Source: Cleveland-Cliffs

OBJECTIVE 41

Identify funding and investments for the transition to a circular economy.

ACTION 152

Support the application, subsequent funding and implementation of the NSF Engines Development Award Phase II.

Circular Economy in Cleveland's Industrial Sector

There are a number of small businesses in Cleveland that are currently applying the principles of the circular economy. Examples include Rust Belt Riders, Rebuilders Xchange, and the Upcycle Parts Shop. Strategies critical to the transition to the circular economy for industrial businesses include decreasing the impact of material use, expanding clean energy production and stimulating resource sharing among industry.

Additionally important is a shared understanding of the principles of a circular economy. A regional example of circular economic principles being leveraged as an innovation driver is the Sustainable Polymers Tech Hub in Akron, Ohio.[101]

ACTION 153

Increase research and development (R&D) funding for industrial circular solutions and pilot programs that contribute to reducing carbon emissions, particularly for small and medium enterprises (SMEs).

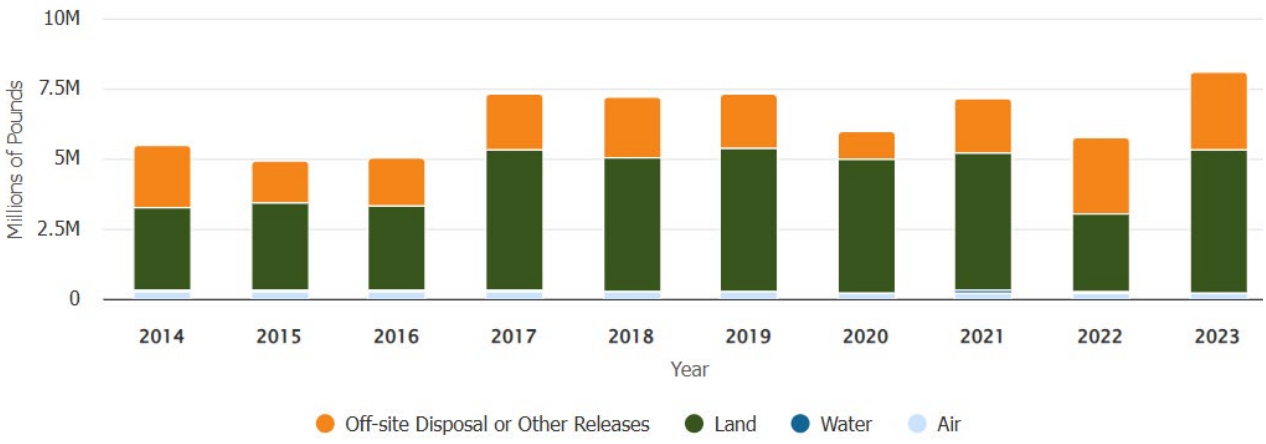
ACTION 154

Form public-partnerships to secure federal funding to advance industrial decarbonization and support the transition to a circular economy.

ACTION 155

Support the NSF-funded Great Lakes Water Innovation Engine and its partners in R&D investments, workforce development and water tech start ups.[102]

Figure 23: Total Releases of Chemicals from Industrial Facilities in Cleveland (2014-2023)



Source: U.S. EPA, Toxics Release Inventory

> *It's our responsibility to keep the lakes clean, regulate waste practices, educate the public on our individual responsibility and hold people accounmtable to helping with this issue.*
>
> — Brooklyn Centre Resident

OBJECTIVE 42

Reduce waste in industrial settings by 30% by 2030.

ACTION 156

Advance the principles of the circular economy principles in industrial settings, including reuse, repair, and recycle, and encourage businesses to explore the use of digital passports for their products focusing on high value, high impact materials.

ACTION 157

Promote the Ohio Materials Marketplace and Ohio Byproduct Synergy Network as channels for material reuse.[103]

ACTION 158

Encourage and facilitate solid waste and water audits, tracking, and reporting.

ACTION 159

Encourage businesses to join the U.S. Plastics Pact.

OBJECTIVE 43

Educate businesses and industrials on the business value, principles and, practices of the Circular Economy.

ACTION 160

Develop common definitions, language, and goals that can drive alignment, shared understanding, and progress towards the transition to a circular economy with a focus on financial success.

ACTION 161

Assist manufacturers in sustainable and circular practices and expand engagement to support businesses to become leaders in DOE's Better Buildings Program, Better Climate Challenge, and Better Plants Program and other nationally-recognized certifications.

ACTION 162

Public and private partners will identify and develop green job hubs in Cleveland with a strong focus on attracting the workforce of the future.

ACTION 163

Promote industrial clusters in polymers, metals and chemicals/coatings and drive industrial circularity at the plant and regional level in these clusters.

CHAPTER 8

Implementation: Accountability & Transparency

During its engagement for this CAP, the City of Cleveland asked residents and stakeholders to share information on how they will help implement the actions outlined in this CAP. As noted earlier, the City directly controls a small fraction of Cleveland's total GHG emissions, and the actions outlined in this plan alone are not sufficient to achieving the Cleveland community's climate goals.

Accordingly, Cleveland needs to demonstrate that it is "all in" on climate action at all levels, from City government to nonprofit partners to private businesses to individual residents. The CAP Implementation Plan, outlined in Appendix D (bit.ly/CAP_AppendixD), lays out essential details for implementing the actions in this plan, including implementing partners, funding sources, and implementation timelines. Because these details are likely to change based upon circumstances at the local, state, and federal levels, Clevelanders should see this CAP Implementation Plan as a living document that will evolve from now until 2030, when this CAP will again be updated.

The City encourages residents, businesses, and other stakeholders to share how they plan to integrate climate action in their lives and operations. Individuals and organizations can visit SustainableCleveland.org/Climate_Action to sign the Cleveland Climate Action Pledge and share what actions they are taking to help implement this CAP in their daily lives.

Tracking CAP Progress

The City has joined several local, national, and international partnerships to advance and report on climate action over the past decade. These have included:

CLIMATE MAYORS

The City of Cleveland joined Climate Mayors in 2017 in order to show climate leadership and action. Representing nearly 750 mayors in 46 states, the Climate Mayors coalition reflects Cleveland's commitment to climate progress. **In 2024, Mayor Bibb served as the coalition's Chairman and will continue to serve as Chair Emeritus in 2025..**

GLOBAL COVENANT OF MAYORS FOR CLIMATE AND ENERGY (GHoM)

Cleveland joined the Covenant of Mayors for Climate and Energy, an international alliance of cities and local governments with a shared long-term vision of promoting and supporting voluntary action to combat climate change and move to a low emission, resilient society. Participation in the Covenant requires using a common reporting framework and making action plans publicly available. **Cleveland became compliant with the Covenant in 2017, becoming one of the first 10 U.S. cities to accomplish this.**

CDP

The City of Cleveland also reports annually to CDP, a global nonprofit organization that runs a climate disclosure system for investors, companies, cities, states and regions to manage their environmental impacts. **In 2018, Cleveland was recognized by CDP as one of the cities globally leading on climate disclosure.** The City has received an A or A- score from CDP every year since 2018.

THE CLIMATE REGISTRY (TCR)

Cleveland joined TCR in 2024 to help advance its climate work at a local level and connect with other local governments. TCR is a nonprofit organization formed in 2007 that empowers organizations to do more in the fight against climate change. It supports local climate policy and ambition on the global stage, and works to advance action on climate solutions by showcasing the innovative power of public-private partnerships at the local level. Cleveland played host to TCR's annual Climate Leadership Conference in May 2024.

AMERICA IS ALL IN (AIAI)

The City of Cleveland joined AIAI in 2025, with Mayor Bibb elected as Co-Chair. **This is the most expansive coalition of leaders ever assembled in support of climate action in the United States.** Mobilizing thousands of U.S. cities, states, tribal nations, businesses, schools, and faith, health, and cultural institutions, the coalition is focused on pushing and partnering with the federal government to develop an ambitious, all-in national climate strategy that meets the urgency of the climate crisis.

LOCAL GOVERNMENTS FOR SUSTAINABILITY (ICLEI USA)

As part of its CDP reporting, Cleveland also reports to ICLEI, which is the first and largest network of local governments working to address sustainability challenges. **In 2023, Cleveland became a member of ICLEI USA, the local chapter of the global organization, and joined its Cities Race to Zero initiative.** Cleveland also worked with ICLEI USA to launch the Northeast Ohio Resilient Cities Cohort, a peer-to-peer network of local governments from across the region working to advance climate action.

AMERICAN ALLIANCE FOR AN ENERGY EFFICIENT ECONOMY (ACEEE)

Cleveland reports data on its climate action work to ACEEE for its biannual City Clean Energy Scorecard. ACEEE, a nonprofit research organization focused on advancing energy efficiency and tackling climate change, ranks cities based upon their success implementing actions across the built environment, transportation, and government operations. In 2024, Cleveland ranked 46th out of 75 cities with a total score 61 points.

BETTER BUILDINGS CHALLENGE AND BETTER CLIMATE CHALLENGE

The U.S. Department of Energy hosts these nationwide challenges to help communities ramp up efforts to reduce building energy use and cut GHG emissions. **Cleveland reports data on energy use and GHGs from its own operations on an annual basis, with a commitment to reduce GHGs from operations by 50% by 2030.** The City was featured on the 2024 Better Climate Road Show to showcase how it's innovating municipal operations to reduce GHGs.

CLEVELAND 2030 DISTRICT

The City of Cleveland is a founding member of the Cleveland 2030 District, the local chapter of a national effort to improve energy and water use efficiency in buildings in commercial buildings. Cleveland and a number of other large building owners report data on its energy and water use and employee commuting to the District on an annual basis, helping to track progress towards the District's goals of cutting energy consumption, water use, and transportation emissions by 50% through 2030.

The City reports its progress on climate actions to these organizations on a regular basis, demonstrating its commitment to accountability and transparency, both of which are essential elements for tackling climate change. **Sustainability is built on trust, and Cleveland recognizes that we cannot expect residents, stakeholders, and partners to commit to climate action**

if the City does not share clear and accurate data to track progress; give regular updates on implementation progress; and provide honest information on the City's own actions to address the climate crisis.

As part of the engagement process for this CAP, the City of Cleveland asked residents and stakeholders how they want the City to stay informed on CAP implementation. Respondents indicated they wanted the City to share updates via a public-facing tracking dashboard, regular public presentations to stakeholders and the public, and annual reports on progress.

The Mayor's Office of Sustainability is committed to reporting CAP progress via:

1. **Public reporting dashboards**, including, but not limited to, the City's Open Data Portal;
2. **Annual reports** to the public and public-facing platforms, including those listed above; and
3. Periodic **presentations to the public** and stakeholders, including, but not limited to, meetings of the Cleveland Environmental Advocacy Coalition (CEAC) and the City of Cleveland-Cuyahoga County Sustainability stakeholder group.

The City will also share relevant updates on a more regular basis via various channels, including the City website, newsletters, social media, and press releases. To sign up to receive information directly from the Office of Sustainability, email sustainability@clevelandohio.gov.

CHAPTER 9

Conclusion

This CAP is neither Cleveland's first step into climate action, nor is it the last. Addressing the climate crisis will require dedicated, consistent action across all sectors and by everyone in the City of Cleveland community for years to come.

Decarbonizing Cleveland means we must rethink and reshape all of the ways that we produce and consume energy, from the way that we heat our homes to the way that we cook our food to the way we get to work or school or community gatherings.

Climate change will require "reinventing fire," as scientist Amory Lovins put it.[104]

While climate change presents the greatest threat Cleveland has yet faced, it also represents an unprecedented opportunity to envision a new future – a future in which Cleveland is a growing, thriving green city on a blue lake.

A future in which Cleveland runs on locally generated clean energy, in which Clevelanders no longer suffer the health impacts of air pollution; in which Lake Erie and the Cuyahoga River are healthy for people and animals; in which residents' homes are affordable, comfortable, and healthy; in which Clevelanders from all backgrounds can benefit from sustainable economic growth regardless of background, identity, or ability.

The City of Cleveland will play many roles in executing of this plan, including convener, facilitator, thought leader, policymaker, regulator, financer, and cheerleader. The City cannot implement many of the actions in this plan directly. It must be prepared to wear these different hats where appropriate, and other actors must understand and play their roles as well.

Achieving this vision will not be easy by any means, and actors at all levels may delay action. But this CAP provides Cleveland with a roadmap on how to reach goals that benefit our community at a fundamental level. Throughout the development of this plan, the City of Cleveland has learned more about the threats climate change poses our city, the solutions available to us, and the aspirations of our residents.

This process has identified a number of priorities, which we have laid out in this plan, including:

- **Providing support for residents** to invest in energy efficiency, electrify their homes, and reduce waste;
- **Invest in clean energy** at our homes and across our neighborhoods;
- **Increase transportation choice** by investing in public transit and active transportation infrastructure, particularly quick-build, low-cost projects;
- **Restore the natural environment** by expanding our tree canopy and prioritizing green infrastructure;
- **Connecting vulnerable residents with the tools to protect themselves** from climate hazards, such as better information on air quality and access to resilience hubs; and
- **Better coordination, training, and information sharing to reduce pollution** in the industrial sector.

Climate action is a journey of a thousand miles, and that begins with one step. This CAP does not represent Cleveland's first or last step on this journey, but it is our next step.

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Thank you for being part of this important journey.

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