NOACA
Northeast Ohio Areawide Coordinating Agency

CITY OF CLEVELAND
Mayor Justin M. Bibb
MAYOR'S OFFICE OF SUSTAINABILITY



CLEVELAND-ELYRIA METROPOLITAN STATISTICAL AREA COMPREHENSIVE CLIMATE ACTION SNAPSHOT

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PREPARED FOR:
Climate Pollution Reduction Grant Program
U.S. Environmental Protection Agency

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HOW TO USE THIS SNAPSHOT

WHAT IS THE CCAP SNAPSHOT?

The CCAP Snapshot is a summary of the Comprehensive Climate Action Plan (CCAP). This Snapshot is easy to read and useful for many audiences including: residents, local governments, and businesses and institutions. While the full 238-page CCAP plan and Implementation Playbook includes detailed research, technical information and sector by sector strategies, this 26-page Snapshot pulls together the most important goals and actions in a simple, clear format so people can quickly understand what the plan means for them and how they can take part.

WHAT IS THE CCAP?

The City of Cleveland, NOACA, and Cuyahoga County worked with regional partners and local universities to create a **Comprehensive Climate Action Plan** (CCAP). This plan covers the five-county Cleveland Metropolitan Statistical (MSA) region, which includes Cuyahoga, Geauga, Lake, Lorain, and Medina counties. By the federal government, this region is known as the Cleveland-Elyria Metropolitan Statistical Area (MSA) region. The CCAP updates emissions data, sets goals to cut pollution, and outlines practical actions to reduce climate impacts while supporting jobs and community benefits.

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Residents
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Local governments
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Businesses & institutions
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CCAP Materials can be found here:

https://www.eneo2050.com/capmaterials

CLIMATE CHANGE IN NORTHEAST OHIO
Risks, Impacts & Benefits

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, mainly caused by human activities like burning fossil fuels for energy and travel. Excessive fossil fuel use and pollution release a surplus of heat trapping "greenhouse gases" in the air, such as carbon dioxide. While the "greenhouse gas effect" is naturally occurring and keeps our planet warm to support an abundance of life, a surplus of these gases increases warming of the atmosphere, destabilizing major planetary processes and systems. Think disruption of stable ocean current circulation patterns, thawing of Arctic permafrost, and erratic global trade winds and jet streams that determine major weather patterns

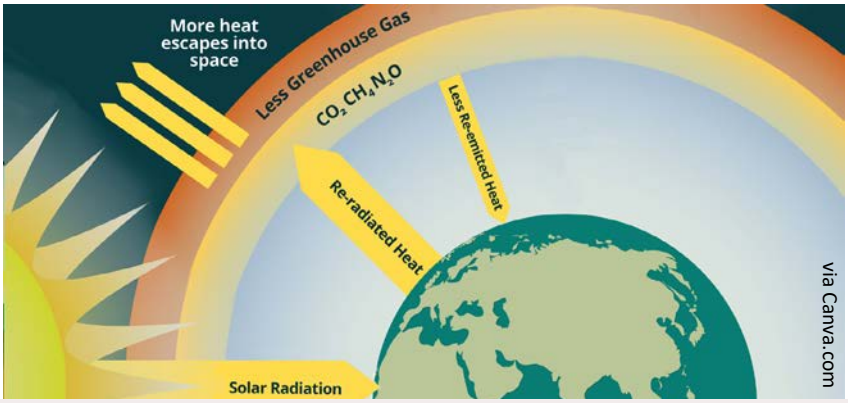
WHY DOES CLIMATE CHANGE MATTER IN OHIO?

Climate change affects our air, water, health, economy, and quality of life. In Northeast Ohio, our most pressing climate hazards are extreme heat, heavy rainfall and flooding, severe storms and poor air quality.

IS OUR REGION MAKING PROGRESS TO REDUCE GREENHOUSE GASES LIKE CARBON DIOXIDE (CO_2)?

Yes, but most of the progress so far comes from cleaner electricity across our grid, not from changes in how we travel, build, or produce goods. We will need to continue to decarbonize, or reduce the emissions of climate pollution from our economy.

GREENHOUSE EFFECT



HOW WOULD OUR REGION BENEFIT FROM REDUCING EMISSIONS?

BENEFITS OF REDUCING GREENHOUSE GAS EMISSIONS

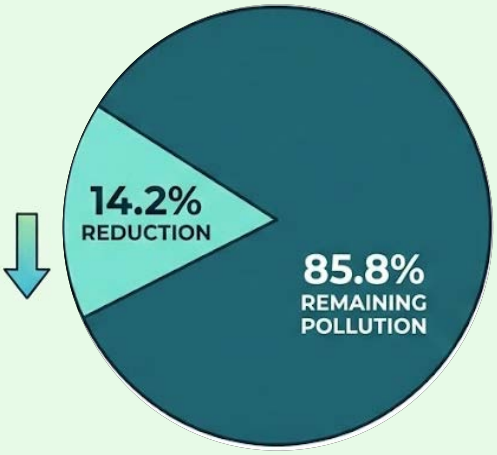
HEALTH
- Improvements to Physical and Mental Heath and Well-being

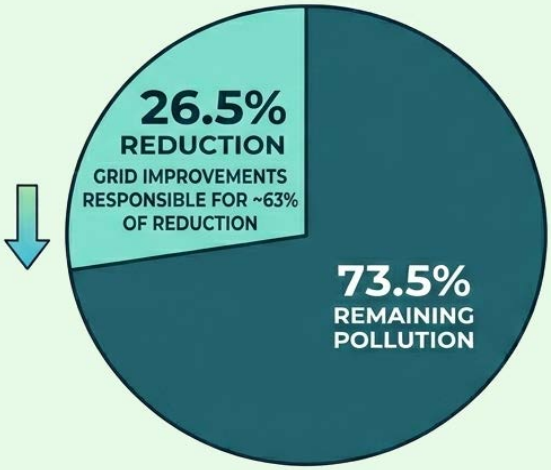
ENVIRONMENTAL
- Improvements to Air Quality
- Biodiversity
- Improvements to Water Quality
- Reduced Urban Heat Island Affect
- Reduced Risk of Flooding

SOCIAL
- Public Education & Awareness
- Quality of Life Improvements
- Increased Multi-modal Transportation
- Improved Resilience

ECONOMIC
- Local Job Creation and Workforce Development
- Increased property values
- Cost-savings and Improved Affordability

Key Takeaways and Findings from CCAP





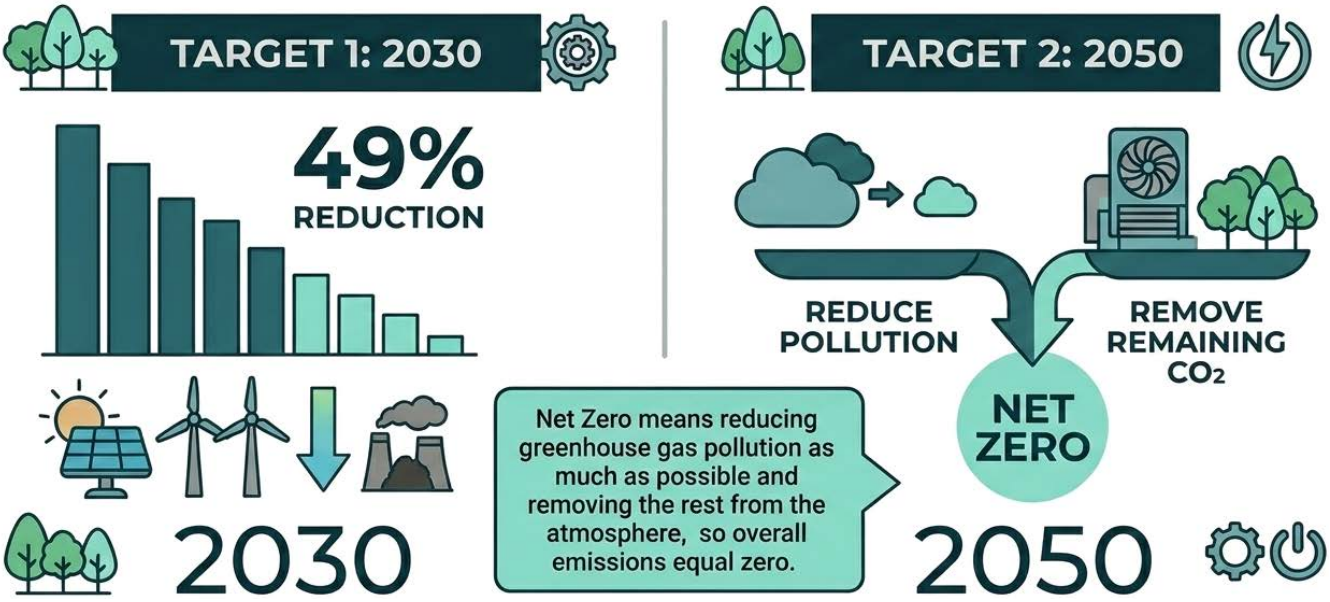
EQUIVALENT TO
42 MILLION GALLONS
OF GASOLINE BURNED



The region is reducing climate pollution:
Between 2018 and 2022, the Cleveland–Elyria MSA cut greenhouse gas emissions significantly, showing that coordinated action and cleaner energy can deliver real results

Clean electricity is driving most of the progress:
Improvements to the electric grid and a shift toward cleaner energy sources have produced the largest emissions reductions across the economy, benefiting homes, businesses, and industry.

Current progress is not enough to meet climate goals: If the region continues on its current path, emissions reductions will stall and level off, falling far short of what is needed to cut pollution nearly in half by 2030 and reach net-zero by 2050. Climate inaction could cost the region ~$170 billion by 2050, driven by extreme heat, flooding, storm damage, lost productivity, and health impacts.



Key Takeaways and Findings from CCAP

SECTOR	EMISSIONS IMPACT	WHAT THIS MEANS
Electricity	Very High 5/5	Clean power enables reductions across all sectors; switching to renewable electricity reduces emissions from homes, buildings, vehicles, and industry.
Transportation	High 4/5	EVs, expanded transit, biking/walking, and smarter regional planning reduce cars on the road and traffic emissions and air pollution.
Industry	High 4/5	Decarbonizing steel, cement, chemicals, and other industrial processes cuts large, persistent sources of pollution and improves air quality near factories.
Buildings	Moderate 2/5	Energy efficiency, insulation, heat pumps, and building electrification reduce heating/cooling emissions, lower energy bills, and improve indoor comfort.
Waste	Moderate 2/5	Capturing methane from landfills, improving recycling and composting, and reducing food waste avoids potent GHG emissions and creates local energy opportunities.
Carbon Removal	Moderate 1/5	Reforestation, soil carbon management, and emerging technologies remove emissions that cannot be eliminated otherwise, helping the region reach net zero.

Most remaining emissions now come from harder sectors: As electricity gets cleaner, buildings, transportation, and industry account for most remaining emissions and these systems require intentional policies, infrastructure, and investment to transform.

"Go Big" Strategies

Northeast Ohio is ready for climate action!

With strong regional assets including: climate action planning, a skilled workforce, industrial capacity, transit corridors, and abundant freshwater and coastline, Northeast Ohio is well-positioned to scale climate solutions quickly and cost-effectively. In this Snapshot, residents, businesses, and local governments can see concrete ways to support climate action, in addition to the Six "Go Big" Strategies outlined below:

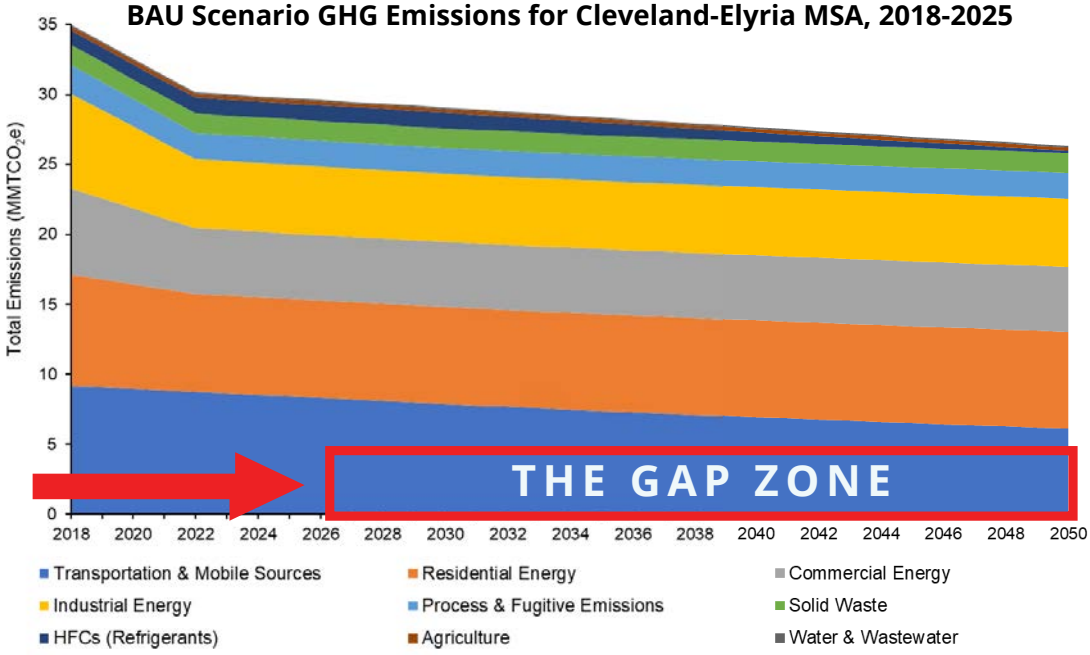
- Expanding Perry Nuclear Power Plant
- Expanding Passenger Rail Service
- Developing Offshore Wind on Lake Erie
- Developing a Regional Direct Air Capture Facility
- Net Zero Steelmaking at Cleveland Cliffs
- Implementing a Reforestation "Headwaters Forests Initiative"

What happens if we continue business as usual?



Our current progress is not enough. If the region keeps going as it is now, without new policies or investments, pollution emissions will stop decreasing and level off. Most of the remaining pollution comes from how **buildings** are heated, how people **travel and move** around, and with how **industry** produces goods, and these systems do not change quickly on their own.

BAU Scenario GHG Emissions for Cleveland-Elyria MSA, 2018-2025



This graph shows that, under a business as usual scenario, we will fall short of net zero emissions, leaving a "gap zone"

COSTS OF CLIMATE INACTION FOR CLEVELAND-ELYRIA MSA

COUNTY	2030 ESTIMATED ANNUAL COST ($ BIILLION)	2040 ESTIMATED ANNUAL COST ($ BIILLION)	2050 ESTIMATED ANNUAL COST ($ BIILLION)	2023-2050 ESTIMATED ANNUAL COST ($ BIILLION)
CUYAHOGA	$4.1	$3.7	$3.3	$108.1
GEAUGA	$0.3	$0.3	$0.3	$7.5
LAKE	$0.7	$0.7	$0.7	$19.1
LORAIN	$0.8	$0.7	$0.7	$20.9
MEDINA	$0.5	$0.5	$0.5	$14.4
TOTAL MSA	$6.5	$5.9	$5.3	$170

Climate inaction could cost the region about $170 billion by 2050, due to impacts like extreme weather, lost productivity, and damage to infrastructure.



Extreme Heat: More very hot days and nights, (up to 52 days above 95°F and 52 warm nights by 2100), and longer and more frequent heatwaves.

Heavy Rain & Flooding: The region is getting more heavy rain and severe storms, with the biggest storms dropping much more water at once and increasing flash flood risks.

Severe Summer Storms: Thunderstorms, windstorms, hail, and tornadoes are becoming more damaging in Northeast Ohio. From 2014–2023, at least 255 storms caused $12.9 million in property damage.

Poor Air Quality: The Cleveland-Elyria MSA struggles with ozone and fine particle pollution, and climate change could make it worse.







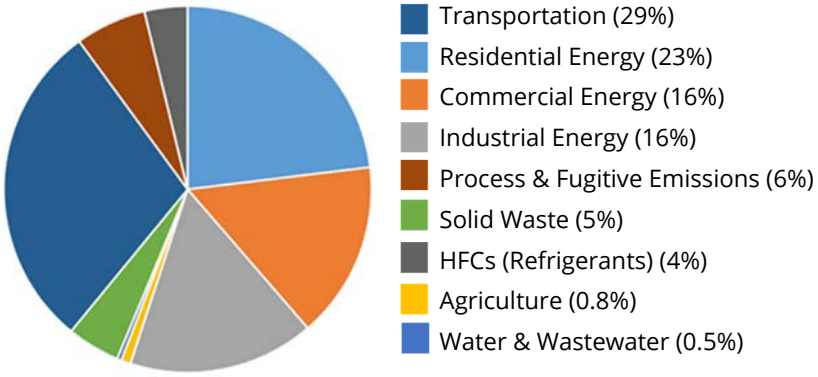
Making Progress: 2018-2022 Emissions Reductions

Emissions Reduction Sectors

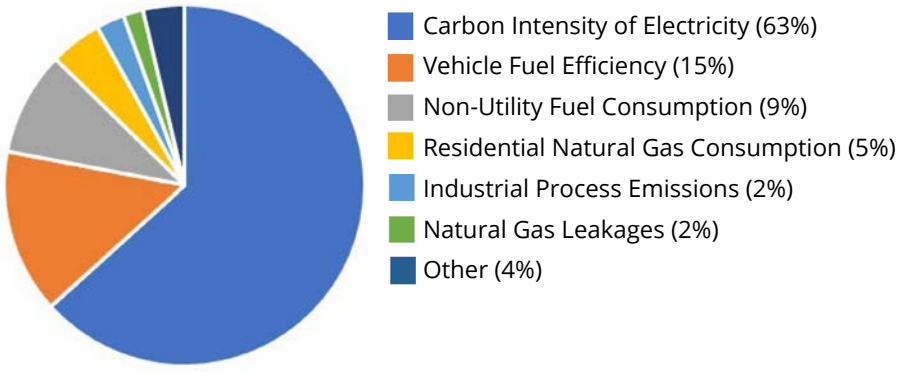
- **Electricity:** How power is generated (coal, gas, renewables, etc.) and the emissions from producing electricity.
- **Residential & Commercial Energy:** Energy used in homes, offices, stores, schools, hospitals, and other non-residential buildings as well as construction for non-electricity energy needs.
  Most buildings still rely on natural gas for heat in Ohio! (See linked state of Ohio's Priority Resilience Plan for more info!)
- **Industry:** Emissions from manufacturing and production: factories, refineries, cement, steel, and other processes.
- **Transportation:** Emissions from moving people and goods: cars, trucks, buses, planes, trains, and shipping.
- **Waste:** Emissions from landfills, wastewater, and waste treatment *(especially methane from decomposing trash)*.
- **Agriculture / Forestry / Land Use (AFLOU):** Emissions and carbon storage related to farming, forests, soil, and how land is managed or developed.
- **Process & Fugitive Emissions**: Leaks from pipelines and oil/gas wells, industrial processes, and HFC refrigerants

How Have Emissions Changed Between 2018-2022?

2022 Total Regional GHG Emissions by Sector



Sources of GHG Emissions Reductions in Cleveland Elyria MSA, 2018 to 2022



Improvements to the electric grid and switching to cleaner energy has reduced emissions in the residential, commercial and industrial energy sectors.



Cuyahoga County: Regional Snapshot

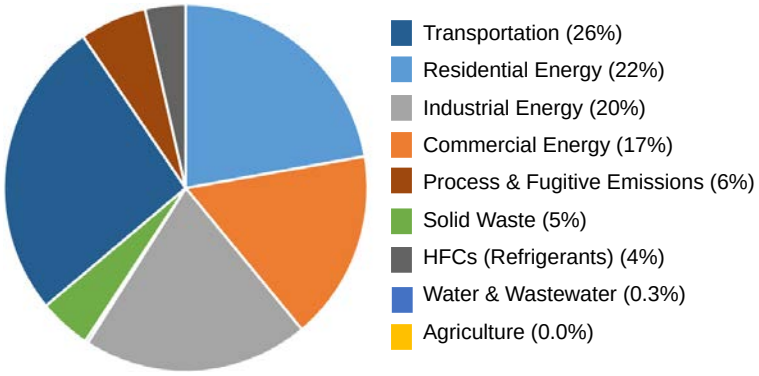
Profile: Cuyahoga County is the region's urban core, with a mix of dense cities like Cleveland, inner-ring suburbs, and established neighborhoods.

Population & Density: 1.24 million residents, with around 2,766 people per square mile, the highest density in the region (2020 Census data)

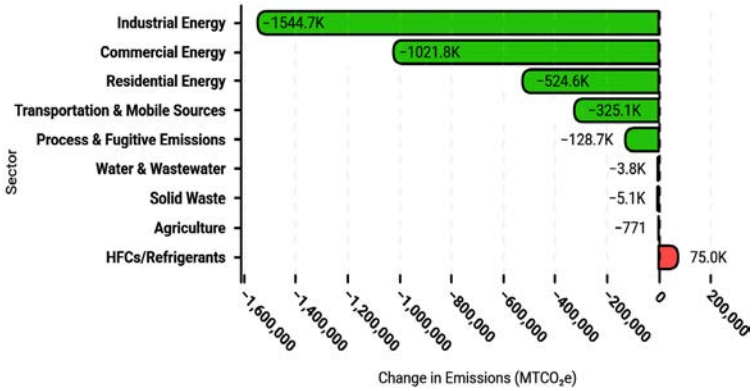
GHG Reduction from 2018-2022: 15.5% (includes carbon storage from forests & trees)

Recent Climate Action Plan: Cuyahoga County recently updated their Climate Action Plan for 2025-2030, check it out here!

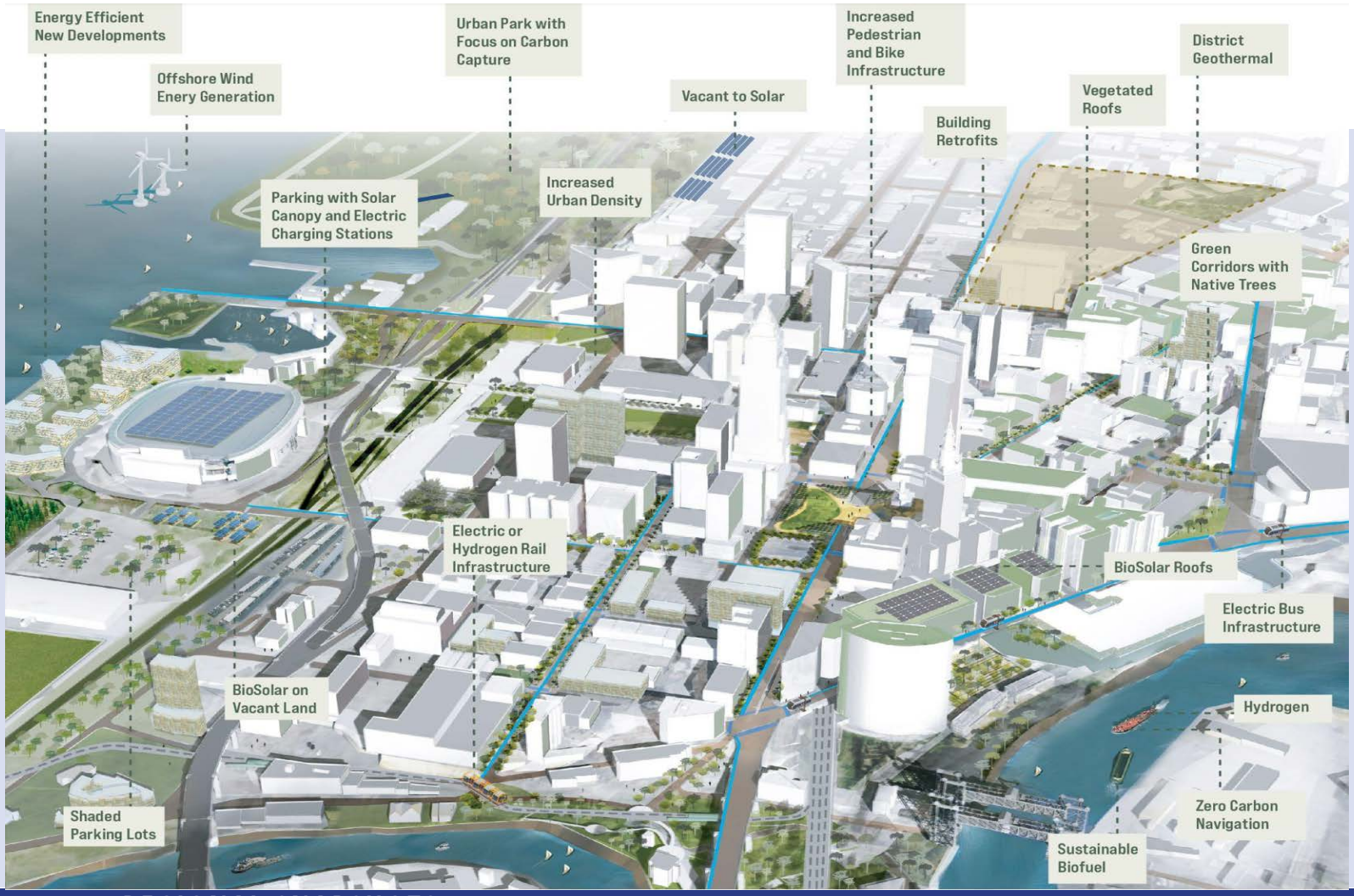
CCAP: 2022 Cuyahoga County GHG Emissions by Sector



Cuyahoga County Change in Emissions: 2018-2022



A Vision for Cleveland: Pollution-Reducing Measures



Lake County: Regional Snapshot

Profile: Located along Lake Erie, Lake County is known for shoreline communities, parks, and suburban and semi-urban living. Mentor and Painesville are some of the larger urban centers.

Population & Density: 232,360 residents with about 1,015 people per square mile (2020 Census data).

GHG Reduction from 2018-2022: 9.4% (including carbon storage from forests and trees)

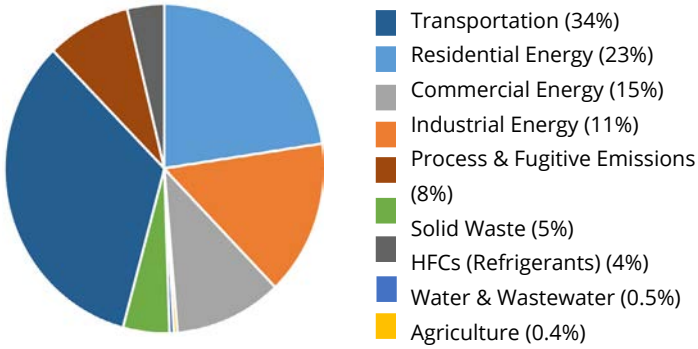
Coastal Resilience Plan: Did you know that Lake Soil and Water Conservation District, Lake County Planning Commission, Lake Development Authority, SmithGroup, and Chagrin River Watershed Partners (CRWP) are developing a Lake County Coastal Resilience Plan?

Lake County has 40.25 miles of Lake Erie coastal shoreline. Changing weather patterns, higher intensity storms, dramatic water level changes, and rapid urbanization have increased the rates of erosion and sedimentation entering Lake Erie. Addressing the erosion has been done by hard-armoring coastal properties in a piece-meal fashion, however, a whole coastline approach to address current conditions and provide resilience for the future is necessary. Planning for coastal issues was last conducted over twenty years ago.

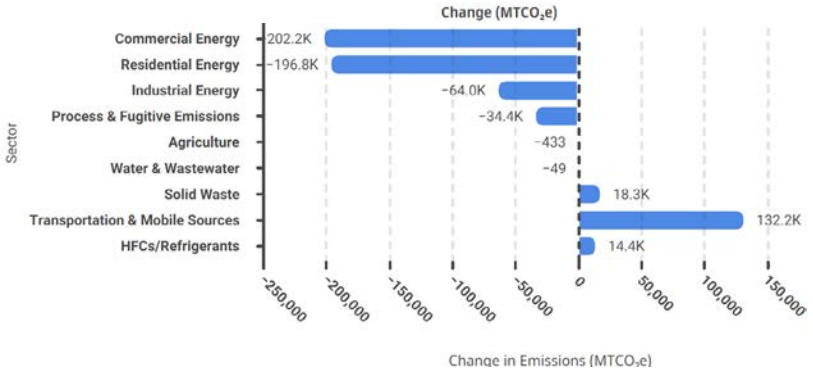
Coastal Resiliance Plan



2022 Lake County GHG Emissions by Sector



Lake County Change in Emissions: 2018-2022



Geauga County: Regional Snapshot

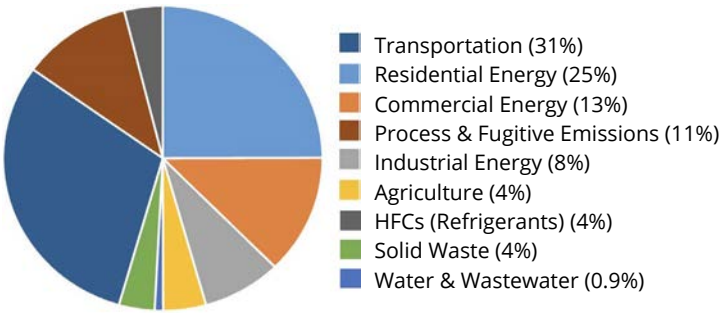
Profile: Geauga County features larger tracts of farmland, open space, and smaller towns. Geauga includes communities like Chardon, Chesterland, and Middlefield.

Population & Density: 95,362 residents with about 238 residents per square mile. (2020 Census data)

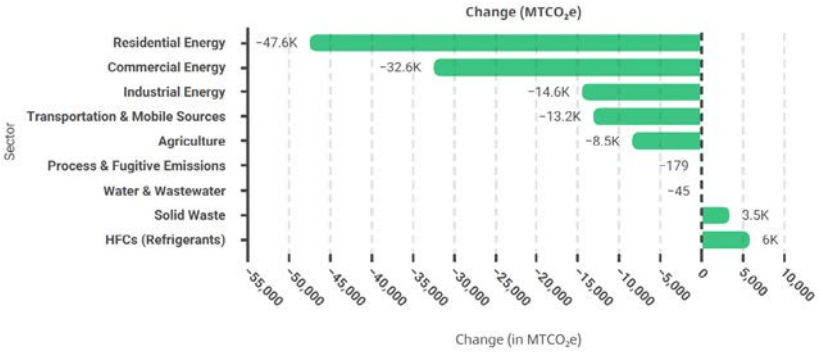
GHG Reduction from 2018-2022:
9.9% (including carbon storage from forests & trees)

Updated Hazard Mitigation Plan: Geauga County's Hazard Mitigation Plan was created to protect the health, safety, and economic interests of Geauga County residents and businesses by reducing the impacts of natural hazards through mitigation planning, awareness, and implementation. Some hazards noted in the interactive Hazard Explorer are tornadoes and strong winds, storms, power outages, floods, wildfire, and extreme heat.

2022 Geauga County GHG Emissions by Sector



Geauga County Change in Emissions: 2018-2022



Lorain County: Regional Snapshot

Profile: West of Cuyahoga County, Lorain includes urban, suburban, and rural communities, as well as open forested and agricultural land. The city of Lorain is the county center, with Grafton, Oberlin, Elyria, and Amherst other known urban centers in this county.

Population & Density: 322,030 residents, with roughly 638 people per square mile (2020 Census data).

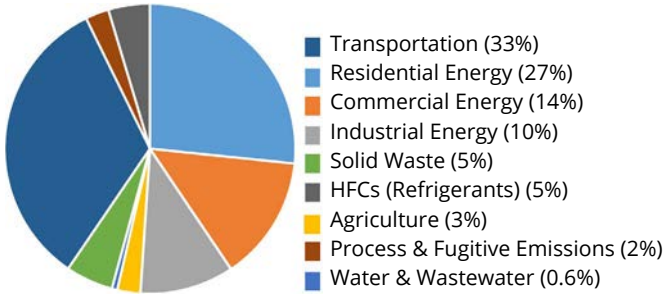
GHG Reduction from 2018-2022: 13% (includes carbon storage from forests & trees)

Strategic Action Plan: Powered by FutureIQ, Lorain County has a dynamic website for their strategic action plans, including details on workshops, interactive survey results illustrating how stakeholders describe their preferred future for Lorain County, task force action reports, the current strategic action plan, and translations in Spanish. The most recent Strategic Action Plan (March 2024) highlights pillars on facilitating creative solutions to transportation, housing, and infrastructure needs, as well as maintaining and enhancing the County's natural resources.

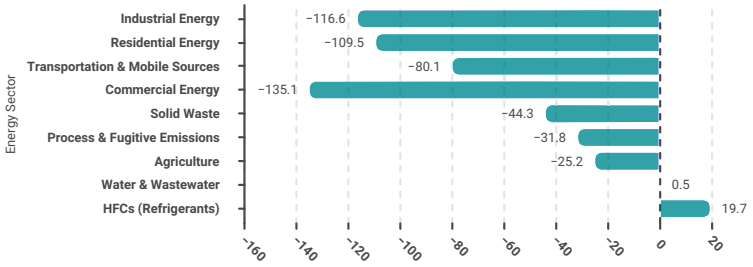
Strategic Action Plan Project
Hazard Mitigation Plan
Community Health Assessment



2022 Lorain County GHG Emissions by Sector



Lorain County Change in Emissions: 2018-2022



Medina County: Regional Snapshot

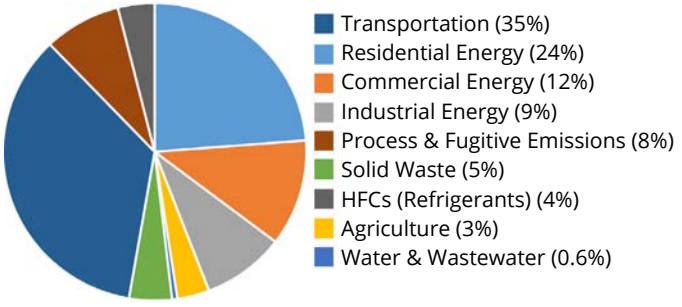
Profile: A mix of suburban and rural areas, Medina County has experienced steady growth. The city of Medina is the county center, and other familiar communities are Hinckley, Brunswick, Lodi, and Wadsworth.

Population & Density: 184,625 residents, about 433 people per square mile (2020 Census data)

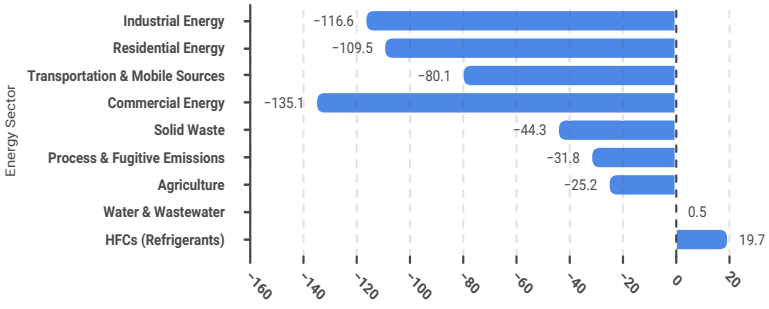
GHG Reduction from 2018-2022: 13.7% (includes carbon storage from forests and trees)

Updated Hazard Mitigation Plan: The Medina County Health Department has a variety of publicly available data briefs, reports, and community profiles. Their most recent Community Health Assessment (May 2024) linked to their 2024-2028 Community Health Improvement Plan illustrates how access to transportation & healthcare, food security, housing quality, socioeconomic status, and environmental conditions are linked to health outcomes. This is another way to approach climate change adaptation & resilience work, through the lens of public health!

2022 Medina County GHG Emissions by Sector



Medina County Change in Emissions: 2018-2022



Climate Goals: Cutting Emissions by 49% by 2030 & Net Zero by 2050

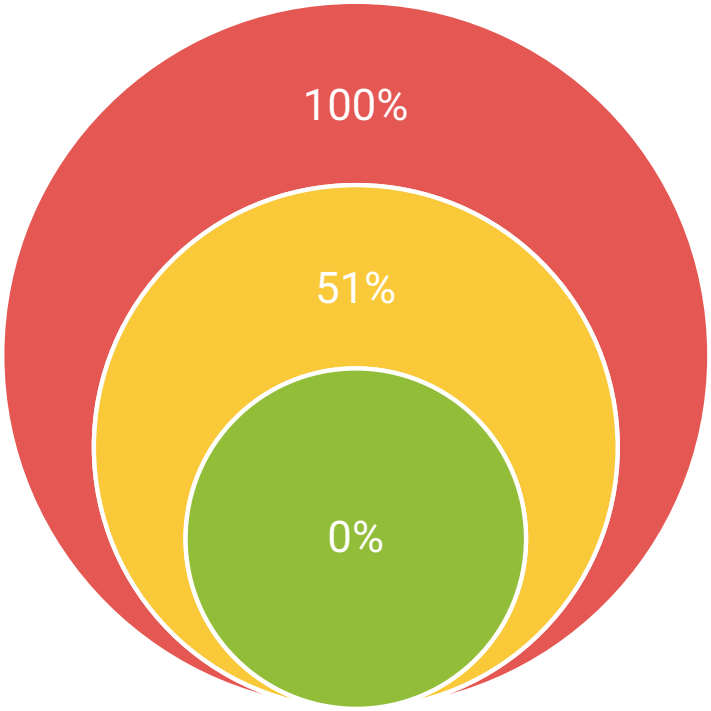
The region is working to to nearly halve climate pollution by 2030 and reach net-zero by 2050 to protect people and the environment.

What "49% by 2030" actually means

- In 2018, the Cleveland–Elyria region emitted approximately 35 million metric tons of CO_2-equivalent greenhouse gases.
- A 49% reduction means lowering emissions to approximately 18 million metric tons of CO_2-equivalent ($MMTCO_2e$) by 2030.
- This requires eliminating nearly one out of every two tons of pollution produced in 2018, within just over a decade.
- The easiest reductions tend to happen first; deeper reductions require larger system changes.
- **Net zero** means reducing greenhouse gas pollution as much as possible and removing the rest from the atmosphere, so overall emissions equal zero.

REDUCING EMISSIONS BY 49% IS *NOT* EVEN HALFWAY TO NET ZERO

Greenhouse Gas Reduction Targets



Current

Current emissions level

2030

Emissions after 49% reduction

2050

Emissions after 100% reduction

Reducing Emissions Across Sectors

Reducing emissions requires a stacked, cross-sector approach, with coordinated actions in electricity, transportation, buildings, industry, waste, and carbon removal all contributing to the overall 2030 goal.

Across the region, cleaner electricity and upgrades to the power grid have helped lower pollution from homes, businesses, and industry. At the same time, there is still an opportunity to reduce emissions in tougher areas like transportation, buildings, and waste.

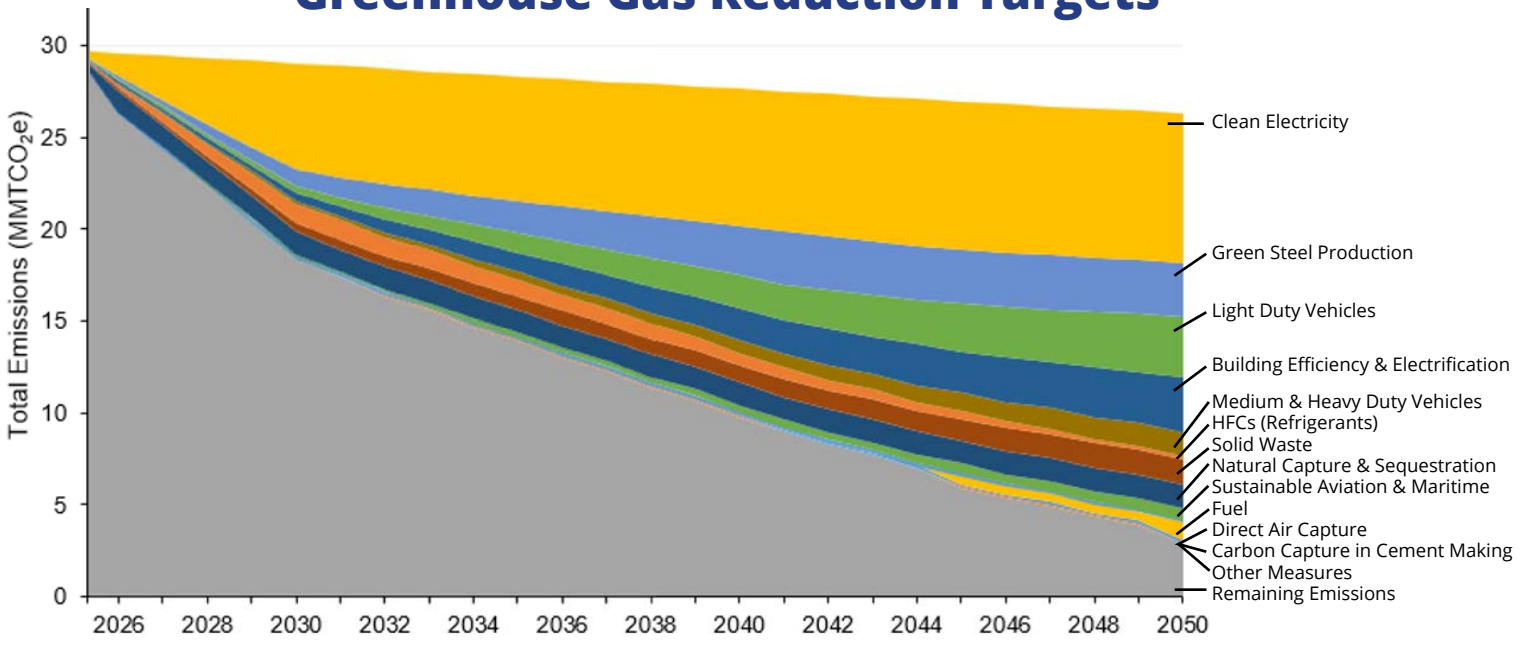
CHECK OUT THE CCAP IMPLEMENTATION PLAYBOOK FOR DETAILED, COMMON SENSE *"NO-REGRET MEASURES,"* ACTIONS TO TAKE NOW, TO REDUCE EMISSIONS!







Greenhouse Gas Reduction Targets



Reducing Emissions in the Electricity Sector

The electricity sector has the greatest potential to reduce emissions, through cleaner power, electrifying buildings and industrial processes, improving efficiency, and cutting waste.

ELECTRICITY EMISSIONS HAVE FALLEN FASTER THAN ANY OTHER SECTOR AND FORM THE BACKBONE OF EMISSIONS REDUCTIONS ACROSS THE ECONOMY

Reducing Electricity Emissions

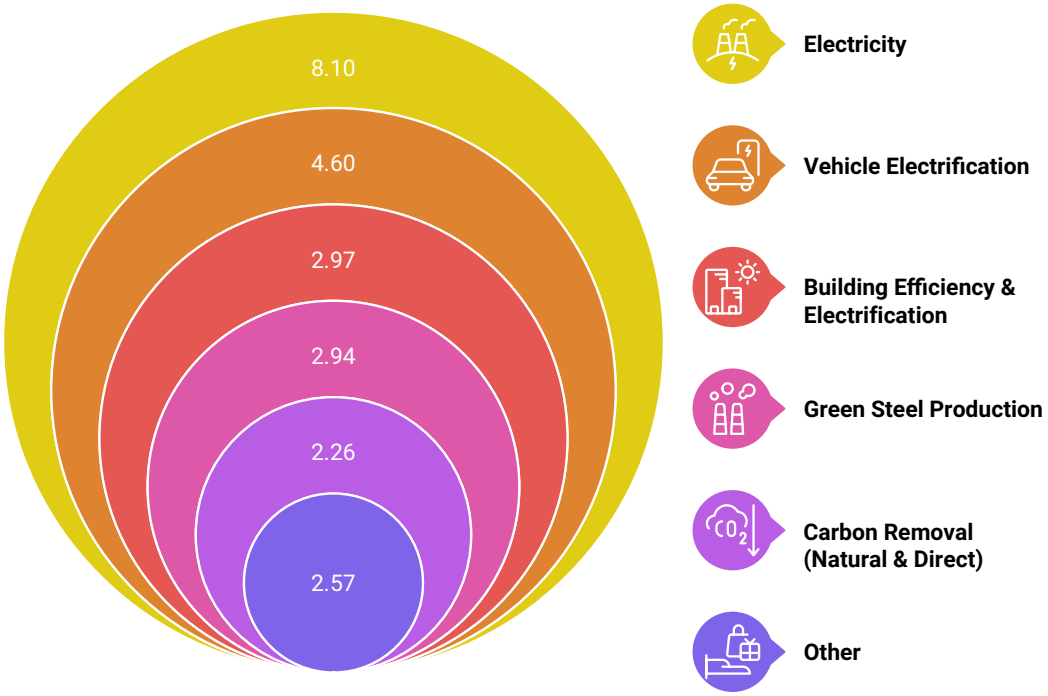
Modernize the Electrical Grid: Improving the grid with smarter management and modernization, like intelligent systems, virtual power plants, and efficient transmission allows communities to have more reliable electricity, upgrade appliances and systems to more modern electrical options, and reduce emissions.

Improve Energy Efficiency: Communities can boost energy efficiency through weatherization and proper insulation of homes and buildings, replacing aging appliances, and completing the switch to LED lighting.

Generating Renewable Electricity: Communities can switch to cleaner forms of energy by putting solar panels on rooftops, parking lots, empty lands, and farms; adding batteries to store power; and using smart electricity programs. Offshore wind in Lake Erie offers strong potential for clean energy and job creation, but faces federal regulatory hurdles and lost tax credits. Nuclear and geothermal energy offer Northeast Ohio the potential for reliable, low-carbon power and heating to meet energy needs while reducing greenhouse gas emissions.

Action Now Pays Off Later: Making upgrades now, like improving the grid, increasing energy efficiency, or installing renewable energy, is crucial to enable future electrification of homes, businesses, and transportation.

GHG Emissions Reductions



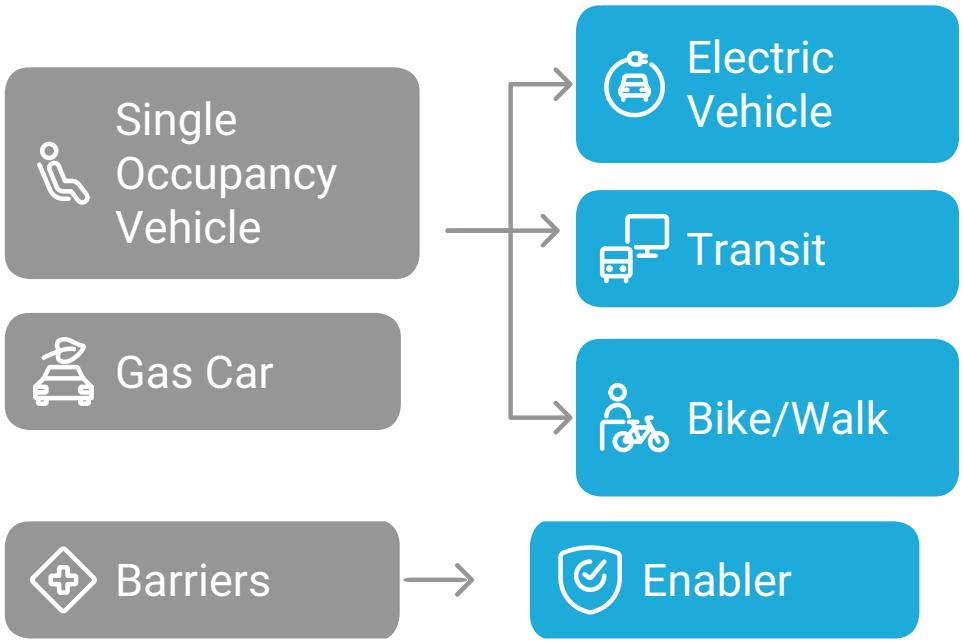


Switching to renewable sources of electricity and improving efficiency could be responsible for 35% of all emissions reductions by 2050.

The Transportation Sectors: Reducing Emissions

Transportation caused 29% of regional emissions in 2022, and cutting them will require more efficient, accessible, and sustainable mobility. The two main ways to cut transportation emissions are **driving less and switching to electric or other zero-emissions vehicles.**

The region can cut transportation emissions by improving transit options, using smart technologies, and shifting all vehicles and fuels to zero-emission options while ensuring electric vehicle(EV) charging and fuel infrastructure is widely available.



THE MAIN BARRIERS TO DECARBONIZING TRANSPORTATION AND BUILDINGS ARE HIGH UPFRONT COSTS, LIMITED INFRASTRUCTURE, LACK OF AWARENESS OR MOTIVATION, TECHNOLOGY GAPS, AND POLICY OR REGULATORY HURDLES.





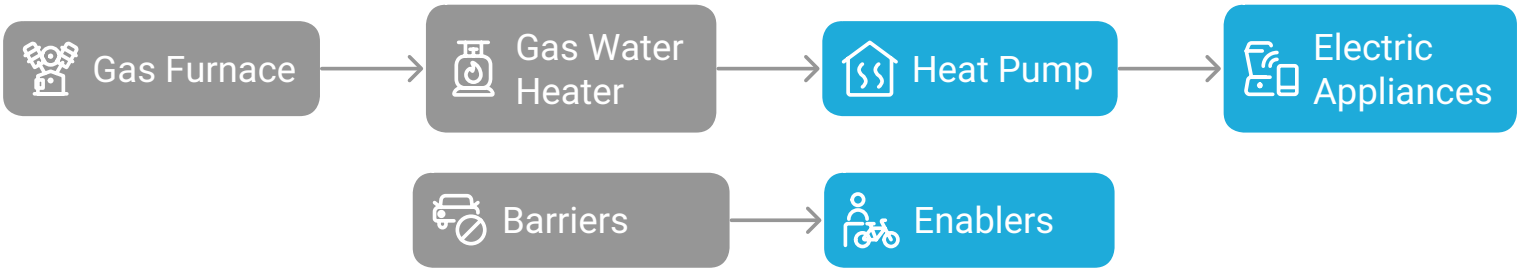


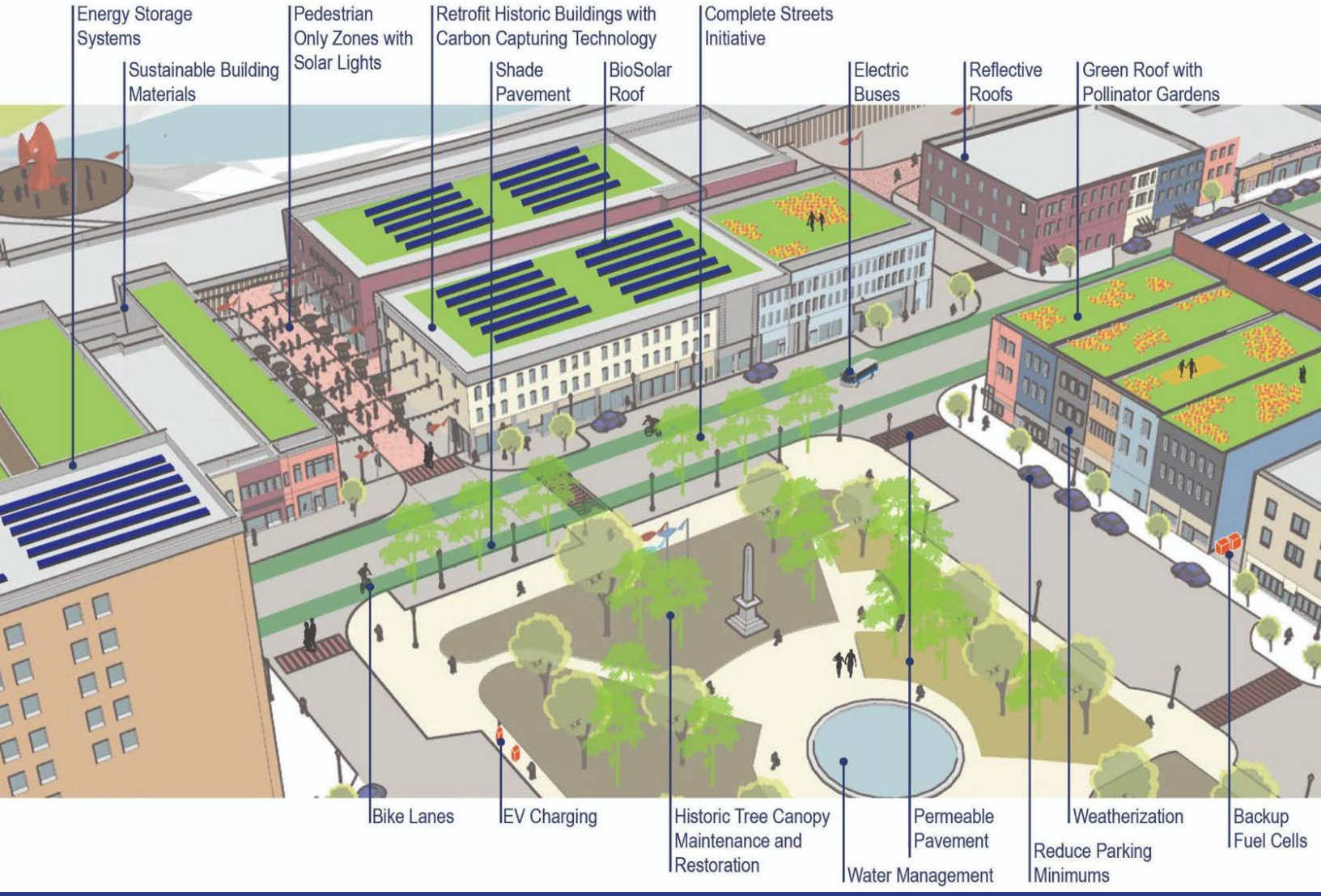
The Building Sectors: Reducing Emissions

Improving buildings can cut emissions by making them more energy-efficient through upgrades like insulation, smart systems, efficient heating, ventilation, and air conditioning(HVAC), LED lighting, and heat pumps, which can reduce energy use by 10–61%.

Additional strategies like electrifying heating, using cool or green roofs, installing rooftop solar, enforcing energy codes, and tracking energy use, further lower emissions while saving money and improving building performance.

TRANSPORTATION AND BUILDING ARE SEPARATE SECTORS WITH SIMILAR CHALLENGES THAT MOVE TOGETHER BECAUSE OF CLEAN ELECTRICITY.

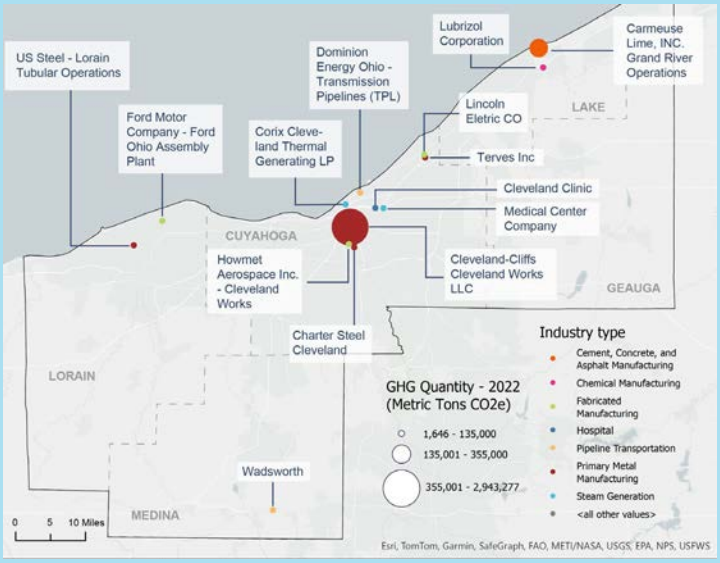




INDUSTRY, WASTE & RESIDUAL EMISSIONS
Reducing Emissions

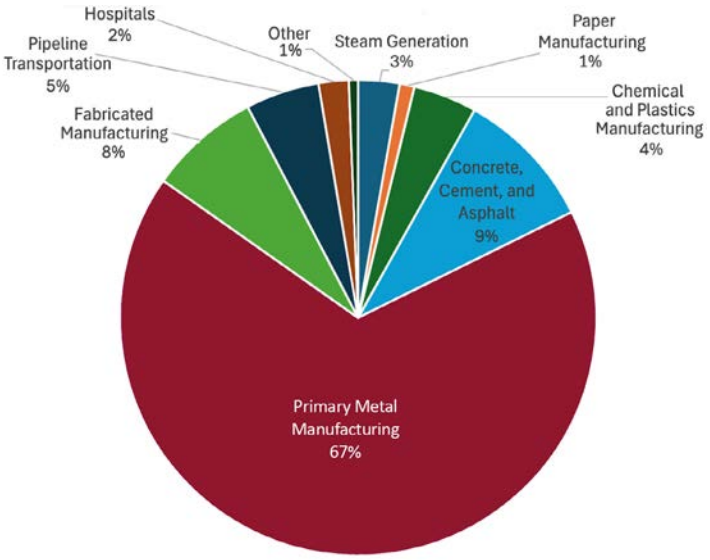
Industry is a major source of pollution, making up 22% of emissions. There are practical strategies to cut emissions from key sectors, including steel and metal production, cement and concrete, plastics and chemicals, pipelines, steam generation, hospitals, and paper manufacturing, but these strategies may require significant investment and advances in technology.

Large Industrial Emitters in the Cleveland-Elyria MSA



The color represents different types of industries, and the size of the circle shows the relative quantity of emissions.

Key sectors: metal & plastic manufacturing, cement, chemicals, pipeline leaks, hospitals, and steam generation.



Waste & Wastewater

While emissions exist in all five counties, the burden is greatest in Cuyahoga County, which accounts for 61% of the region's waste-related emissions. Unlike a power plant that can be turned off, landfills and water-treatment waste produce emissions through biological decay. These "process emissions" can only be mitigated by physical capture or total waste reduction or offset by carbon capture technology.

RESIDUAL EMISSIONS MUST BE BALANCED BY *CARBON REMOVAL*, SUCH AS REFORESTATION OR DIRECT AIR CAPTURE, SO THAT TOTAL EMISSIONS DO NOT EXCEED CLIMATE TARGETS.

Reducing Industry, Waste & Wastewater Emissions

- **Upgrade Factories:** Switch big industries, like steel and cement plants, from fossil fuels to clean electricity or hydrogen and use newer machines that use less energy.
- **Reduce Transportation Emissions:** Switch diesel trucks and equipment to electric or hydrogen power.
- **Less Trash:** Expand recycling and reuse programs so less waste gets to the landfill in the first place.
- **Waste to Energy:** Use technology to turn waste and methane gas from landfills into clean electricity and heat for the community.
- **Facility Efficiency:** Upgrade wastewater and manufacturing plants with high-efficiency pumps and motors to lower energy needs and use carbon capture technology.
- **Residual Emissions:** Leftover climate pollution that is difficult or expensive to eliminate completely, even after using the best available technology and reduction strategies. They come from certain industrial processes like steelmaking, long-distance freight, agricultural equipment and aviation fuels.

USING THE CCAP'S RECOMMENDED MEASURES, DECARBONIZING INDUSTRIAL PROCESSES IN THE CLEVELAND-ELYRIA MSA COULD SAVE $250 MILLION IN AVOIDED HEALTHCARE COSTS BY 2050. REDUCING WASTE AND WASTEWATER POLLUTION COULD SAVE ANOTHER $20 MILLION.

GO BIG STRATEGIES
Regional Energy & Industry

The CCAP has over 60 ways to cut emissions, but six main "Go Big Strategies" are the most powerful, offering big environmental benefits and the potential to boost local economic growth.

PERRY NUCLEAR EXPANSION

(EXPANDING ZERO-CARBON ELECTRICITY)



The Perry Nuclear Power Plant in Lake County is a key asset that can expand to help the region decarbonize its electricity supply.

Emissions impact: Produces large amounts of electricity without adding carbon pollution
Why it matters: Provides reliable power, especially as more solar and wind come online
Who's involved: Local utilities, government regulators, and trained workers
Community Benefit: Energy reliability, long-term skilled jobs, stable electricity prices

OFFSHORE WIND (LAKE ERIE)

(NEW CLEAN ENERGY + REGIONAL INDUSTRY)



Offshore wind in Lake Erie can provide large-scale clean electricity, create local jobs, and establish the region as a leader in a growing renewable energy industry, though it faces federal regulatory and permitting challenges.

Emissions impact: Large-scale clean electricity that complements nuclear and solar
Why it matters: Port redevelopment; manufacturing, fabrication, and logistics jobs; supply chain opportunities for Northeast Ohio firms
Who's involved: Federal, state & regional agencies, port authorities, manufacturers, labor & workforce programs
Community Benefits: Waterfront communities, industrial corridors, and port workers/trades

NET-ZERO STEELMAKING

(HARD-TO-ABATE INDUSTRIAL TRANSFORMATION)



The Cleveland Works steel facility produces a third of regional industrial emissions, mainly from converting iron ore into steel and using fossil fuels.

Emissions impact: Cuts one of the region's largest single sources of industrial pollution.
Why it matters: Keeps heavy industry viable while reducing greenhouse gases and improving air quality.
Who's involved: Manufacturers, labor, energy providers
Community benefits: Supports worker health, cleaner air, and the long-term competitiveness of regional industry

GO BIG STRATEGIES: Transportation

PASSENGER RAIL EXPANSION

Passenger rail makes it easier and cheaper to get around, cuts traffic and pollution, and brings new jobs and opportunities to our communities

Emissions impact:

Reduces transportation emissions by shifting people from cars to shared rail, addressing travel at the system level rather than just cleaner vehicles.

Why it matters:

Provides a long-term solution to traffic, pollution, and high emissions tied to daily commuting and regional travel patterns, while making travel faster, easier, and more affordable.

Who's involved:

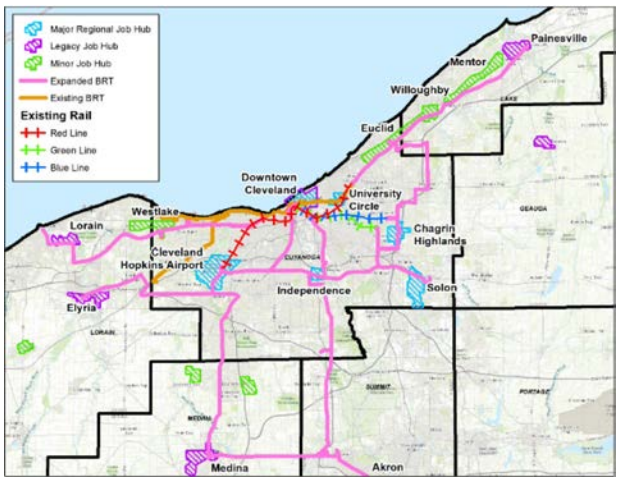
Transit agencies, regional planners, state and local governments, transportation authorities, and community partners.

Community Benefits of Increased Rail & Public Transportation:

Better access to jobs, schools, and training, Lower household transportation costs, cleaner air and improved public health, reduced traffic congestion and safer streets, stronger local economies and transit-oriented development, more equitable access for non-drivers (seniors, students, people with disabilities), lower greenhouse gas emissions, Improved quality of life and mobility for residents

TRANSPORTATION PRODUCES THE MOST EMISSIONS IN THE REGION *(29% OF THE TOTAL)* BECAUSE HOW AND WHERE WE TRAVEL, OUR ROADS, CITIES, AND DAILY ROUTINES, MATTER JUST AS MUCH AS THE TYPE OF VEHICLES WE DRIVE.

Existing & Proposed Commuter Transit Expansion

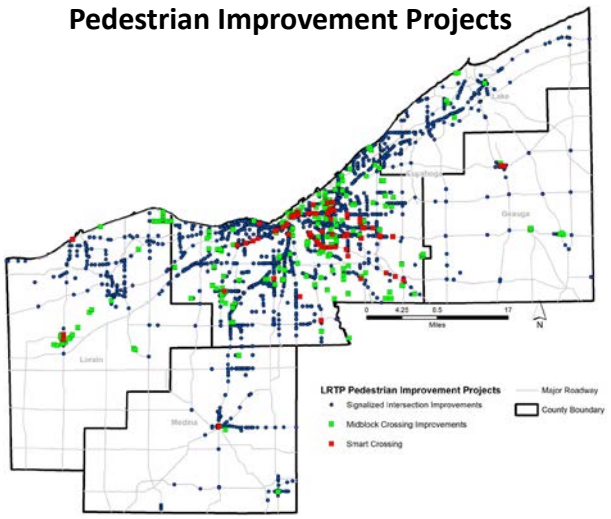


The current rail and Bus Rapid Transit (BRT) system only serves a small part of the region, connecting just 4 of 18 job hubs and mostly staying within Cuyahoga County. Implementing the proposed, expanded BRT network would reach 13 job hubs and better connect growing suburban communities.

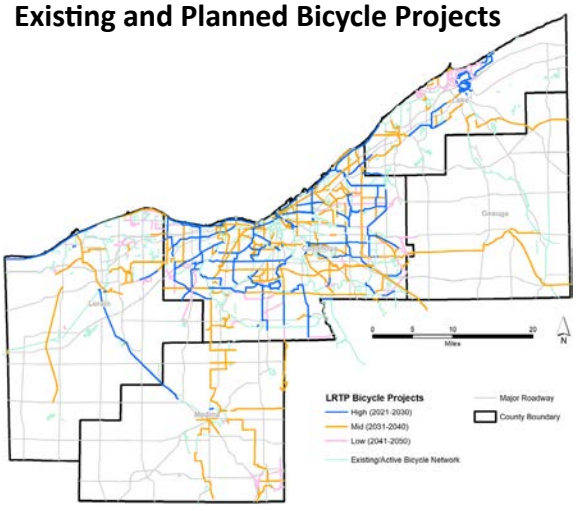
An expanded BRT network would significantly boost transit ridership and connect more residents to major job centers across Northeast Ohio.

Other Planned Transit Improvements

Pedestrian Improvement Projects



Existing and Planned Bicycle Projects



GO BIG STRATEGIES: Carbon Capture

ENGINEERED CARBON CAPTURE: DIRECT AIR CAPTURE (DAC)

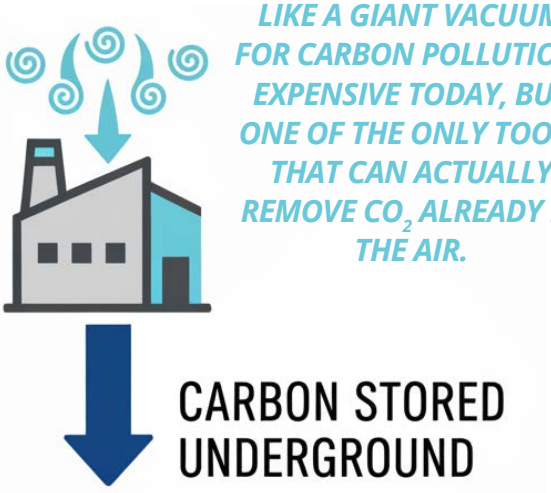
DAC removes CO_2 directly from the air and stores it permanently or reuses it in products. While it can be built almost anywhere and run continuously, carbon removal should be used mainly for emissions that cannot be eliminated, cutting emissions at the source remains the top priority.

Emissions impact: Removes up to 500,000 metric tons of CO_2 per year per facility today, with much higher potential by 2050. Can capture CO_2 100x faster than reforestation on the same land area.
Why it matters: Essential for reaching net-zero by addressing emissions that cannot be eliminated (aviation, heavy industry, chemicals). DAC provides a backstop for climate targets when other solutions fall short and creates a pathway for negative emissions, not just emissions reductions.
Who's involved: Clean energy companies, industrial manufacturers, utilities and energy providers, federal and state governments, research institutions and climate tech firms.
Community Benefits of Increased Rail & Public Transportation: New clean-tech industry and jobs in engineering, construction, and operation. Improved air quality over time. Positions the region as a climate innovation hub

NATURE-BASED CARBON CAPTURE: HEADWATERS FOREST INITIATIVE

Reforestation and land stewardship increase the region's natural ability to store carbon while also improving air and water quality, reducing flood risk, and restoring wildlife habitat. This is a long-term, place-based climate solution especially well-suited to rural and outer suburban communities.

Emissions impact: Reforesting just 10 square miles along regional river headwaters could store about 345,000 metric tons of CO_2 by 2050, with over 26,500 tons added each year after that. While slower than technological solutions, this provides steady and durable carbon removal.
Why it matters: This is a low-cost, natural climate solution that works alongside emissions reductions. It is especially effective in communities with available land and less carbon-intensive industries, making it a practical way to offset remaining emissions.
Who's involved: Local governments, landowners, conservation groups, watershed organizations, farmers, and state agencies.
Community Benefits of Increased Rail & Public Transportation: Improved air and water quality, flood protection and erosion control, healthier rivers and ecosystems, wildlife habitat and biodiversity, rural economic opportunities through conservation and land management



DIRECT AIR CAPTURE IS LIKE A GIANT VACUUM FOR CARBON POLLUTION, EXPENSIVE TODAY, BUT ONE OF THE ONLY TOOLS THAT CAN ACTUALLY REMOVE CO_2 ALREADY IN THE AIR.



HOW IT WORKS: TREES REMOVE CO_2 FROM THE AIR THROUGH PHOTOSYNTHESIS AND STORE IT IN THEIR TRUNKS, BRANCHES, ROOTS, AND SURROUNDING SOIL. AS FORESTS GROW, THEY ACT LIKE LONG-TERM "CARBON SINKS," LOCKING CARBON AWAY FOR DECADES OR EVEN CENTURIES.

RESIDENTS: A Guide for Action

***Take Action in Your Community*: Learn how you can reduce energy use, support clean transportation, and shape local climate policy in Northeast Ohio!**

Actions for Residents



1. Use your voice as a voter and ratepayer

- Support climate-friendly policies like community solar and expanded public transit by contacting your Ohio state legislators.

Did you know? Ohio hasn't been a member of the *Midwest Interstate Passenger Rail Commission* since 2013. This commission helps plan regional passenger rail routes (like Amtrak) across the region. Iowa, Nebraska, and South Dakota also aren't member states.

- Attend regional climate planning meetings and public input sessions.
- Advocate for policies and support leaders who prioritize clean energy and transportation solutions.



2. Participate in energy and clean power programs

- Join a solar co-op like the *Cuyahoga County Residential Solar Co-op* to save on rooftop solar installations and learn from peers. *Solar United Neighbors*, a national nonprofit that advocates for more homeowners to adopt solar, has a robust Northeast Ohio office and is a great resource to talk to if you are curious!
- Check if your utility offers time-of-use pricing or demand response options (programs that reward you for using electricity when the grid isn't stressed during off-peak hours).
- Explore energy efficiency resources and assistance programs through your city, county, or local electric and natural gas utilities.



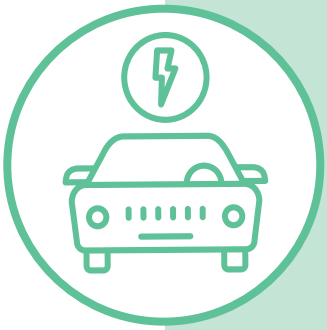
3. Reduce energy use and electrify at home

- Upgrade to smart thermostats, efficient appliances, heat pumps, or induction stoves when replacing old systems.
- Consider rooftop solar or community solar where possible — these can lower both emissions and bills in the long run.

RESIDENTS: A Guide for Action

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Actions for Residents



4. Support clean transportation

- Take transit, bike, or walk when possible to reduce driving.
- When replacing a vehicle, choose a hybrid or electric vehicle if feasible.
- Advocate locally for more EV chargers and stronger regional transit options like expanded rail and bus services.



5. Connect with local climate efforts

- Review and get involved with your local climate action plan.
- Join local environmental and community groups to multiply your impact.
- Support community nature-based efforts like tree planting, green space restoration, and watershed protection.

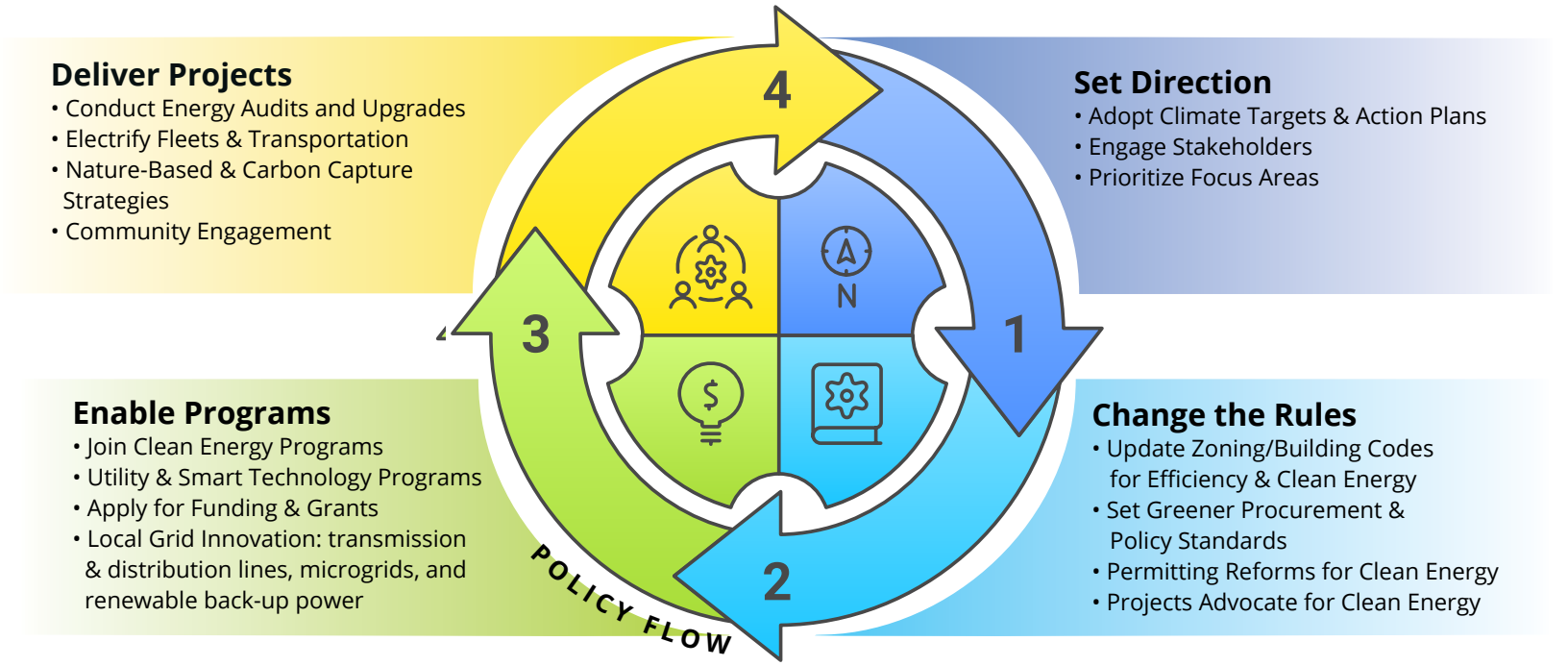


CHECK OUT THE RESOURCE PAGE AT THE END OF THIS DOCUMENT FOR LINKS TO LOCAL CLIMATE ACTION PLANS AND EVIDENCE-BASED RESOURCES FOR FUTURE ACTION!

LOCAL GOVERNMENTS: A Guide for Action

Take action locally to reduce emissions, save taxpayer dollars, and unlock state and federal funding; your city or county can lead Northeast Ohio's clean energy future.

Driving Climate Action: A Guide for Northeast Ohio Local Governments



Track & Report Emissions/Usage • Use Dashboards & Analyze Metrics • Update Policy & Projects

Local Climate Action Plans

Cities and communities in the region have their own climate action plans, and you can find all of them online through the resources listed in this document.

ENTITY	YEAR PUBLISHED	EMISSIONS TARGETS	SECTORS COVERED	EQUITY	LAST UPDATED
City of Cleveland	**2025**	Cut citywide GHG emissions by 63.3% through 2030 and achieve net zero emissions by 2050	Transportation, Buildings, Electricity Supply, Natural Climate Solutions	Yes	2025
City of Cleveland Heights	**2024**	Reduce GHG emissions by 30% by 2030 and achieve carbon neutrality by 2050.	Transportation, Buildings, Electricity Supply, Natural Climate Solutions	Yes	2024
Cuyahoga County	**2019**	45% overall reduction in GHG emissions from 2010 baseline by 2030, and net zero emissions by 2050	Transportation, Electricity, Natural Climate Solutions	NA	2025
City of Lakewood	**2023**	50-52% reduction in GHG emissions from 2005 levels by 2030; Net zero by 2050	Transportation, Buildings, Electricity Supply, Natural Climate Solutions	Yes	2023
City of Oberlin	**2011**	Reduce GHG emissions by 50% in 2015, 75% by 2030, and below 100% by 2050	Buildings, Electricity Supply, Natural Climate Solutions	Yes	2019
GCRTA	**2022**	Reduce GHG emissions from 2018 by 10% by 2030, 30% by 2040, and 60% by 2050.	Transportation	NA	2022

BUSINESSES: A Guide for Action

Businesses play a central role in emissions reductions because they own and operate large buildings, vehicle fleets, industrial processes, and supply chains. Unlike individual actions, decisions made by these entities can deliver large, durable reductions when aligned with supportive policies and financing.

Four Action Lanes

Facilities & Operations

- Energy audits, LED & smart meter upgrades
- Process energy upgrades & phase out fossil fuel appliances/heating
- Smart energy management & time-of-use pricing
- Rooftop, parking lot, or on-site solar & wind, tied with batteries, as back-up power or mini/micro-grid for your site

Procurement & Investment

- Clean electricity procurement
- Invest in efficiency upgrades
- Support Industrial innovation & source low-carbon materials
- Advocate to suppliers for sustainable supply chains

Advocacy & Workforce Development

- Advocate for stronger energy efficiency standards & policy reforms
- Partner with local universities/colleges
- Create internships and workforce programs



Fleets & Logistics

- Fleet electrification
- Install EV charging infrastructure
- Encourage employee public transit and carpooling

	Decision	Enablers	Outcomes
Facilities & operations	**Upgrade Buildings** Electrify systems Optimize energy use Install smart tech	**Utility Programs** Financing & credits Technical assistance for retrofits & Electrification	**Reduced Emissions** Lower energy use Reduced Emissions Operational savings Building resilience
Fleets & logistics	**Electrify Fleets** Add EV charging Sustainable commuting & freight modes	**State Incentives** NEVI program Public charging networks & guidance	**Lower Emissions** Reduced fuel costs Fleet efficiency Cleaner air

Climate action isn't just good for the planet, it's smart business

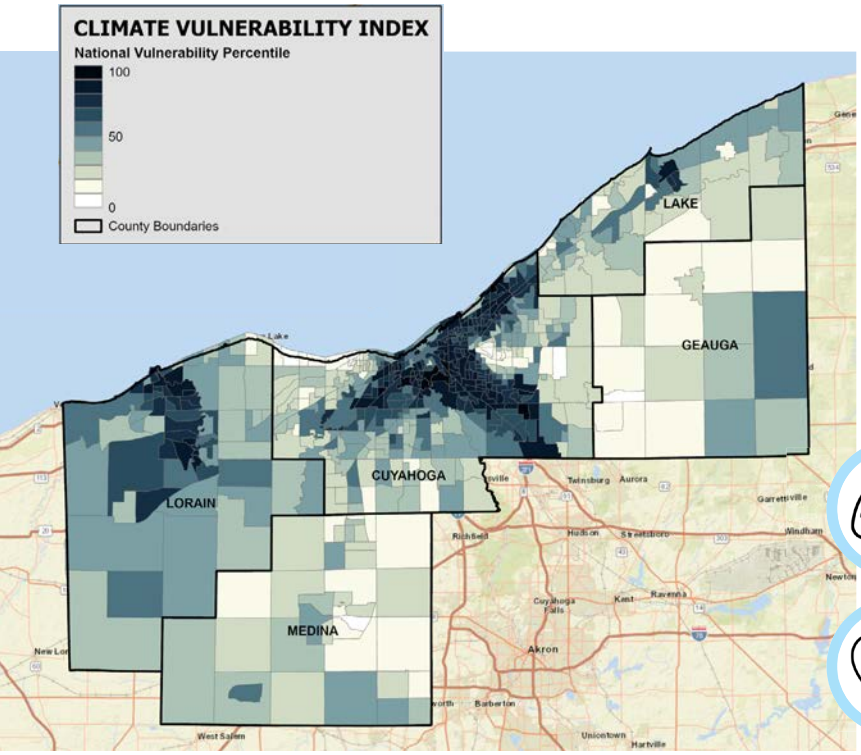
Schools can implement energy efficiency and clean energy projects to save money, improve student health, and give students hands-on lessons in sustainability.

Businesses and schools can explore additional strategies and detailed guidance by consulting the CCAP Implementation Playbook and access local Climate Action Plans on the Resource Page at the end of this report.

Community Impact & Inclusive Implementation

A Cleaner, Healthier Environment for Every Neighborhood

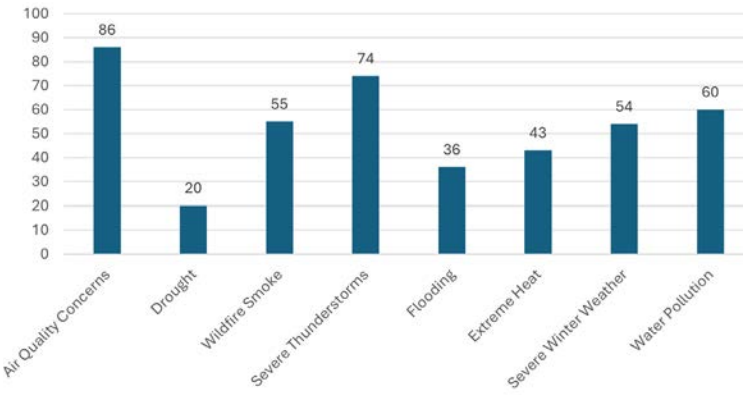
To ensure our region reduces emissions and modernizes fairly, this plan prioritizes communities that face the highest risks. Because of past policies that left some neighborhoods behind, efforts must focus resources where they are needed most.



Climate Vulnerability Index Score by Census Tract

Climate vulnerability is the measure of how likely a person or neighborhood is to be harmed by environmental hazards based on their exposure to risks and their access to the resources needed to recover. A higher climate vulnerability index score means a neighborhood is more likely to suffer serious harm from environmental changes like extreme heat or flooding.

Top Concerns From Residents



The Benefits of Taking Action

Cleaner Air: Between 82% and 99% of the benefits from cleaner air will happen in climate-vulnerable communities.

Healthier Families: Reducing air pollution means fewer cases of asthma, heart disease, and lung problems for the people who have suffered the most in the past.

Lower Energy Costs: Incentive programs help residents upgrade their homes with better insulation and modern appliances, lowering energy costs.

Cooling & Green Space: Planting trees and expanding parks provides natural shade and cooler air. This protects residents from extreme summer heat and provides the health benefits of spending time outdoors.

These 4 benefits were also identified by residents as priorities from feedback that was gathered at the city level and by NOACA and is detailed in the CCAP.

Community Impact & Inclusive Implementation

Equity Requires Different Solutions for Different Places

NEIGHBORHOOD TYPE	THE CHALLENGE	THE EQUITABLE SOLUTION
Legacy Cities	High pollution, aging housing, lack of green space	Industrial cleanup, home weatherization/ upgrades, expanding green space
First-Ring Suburbs	Aging infrastructure & transit gaps.	Expanded bike lanes, rail and bus lines & home weatherization/upgrades
Rural Townships	Isolation & storm risks.	Resilient power grids & farm-based energy.

*The CCAP and Implementation Playbook have outlined detailed issues and solutions for legacy cities, first/second/outer-ring suburbs, established cities and rural townships







FOR RESIDENTS & BUSINESSES

JOIN LOCAL MEETINGS, SHARE YOUR IDEAS, AND PARTICIPATE IN PLANNING DISCUSSIONS TO ENSURE YOUR COMMUNITY'S NEEDS AND PRIORITIES **ARE REPRESENTED IN CLIMATE AND SUSTAINABILITY DECISIONS THAT AFFECT YOUR NEIGHBORHOOD.**

FOR LOCAL GOVERNMENTS

THE CCAP AND IMPLEMENTATION PLAYBOOK PROVIDE DETAILED STRATEGIES FOR MEANINGFULLY ENGAGING STAKEHOLDERS, PRIORITIZING LOW-INCOME AND DISADVANTAGED COMMUNITIES (LIDAC) COMMUNITIES, AND MEASURING EQUITY.

Conclusion & Next Steps

Our region faces an urgent need to reduce pollution to protect communities and the environment, but this challenge is also a tremendous opportunity. By taking bold, coordinated action across energy, transportation, waste, and industry, while centering equity and community engagement, we can build a cleaner, healthier, and more resilient future for all residents.

Explore the full Cleveland Climate Action Plan (CCAP) and its Implementation Playbook to access current data, navigate challenges and solutions, learn how to lead your community toward a cleaner and more equitable future. (See last page of this document)

Putting the CCAP to Work

Residents/Community Groups

- Learn about your neighborhood's plan, or start one!
- Advocate for local projects
- Join green job training
- Take advantage of incentive programs

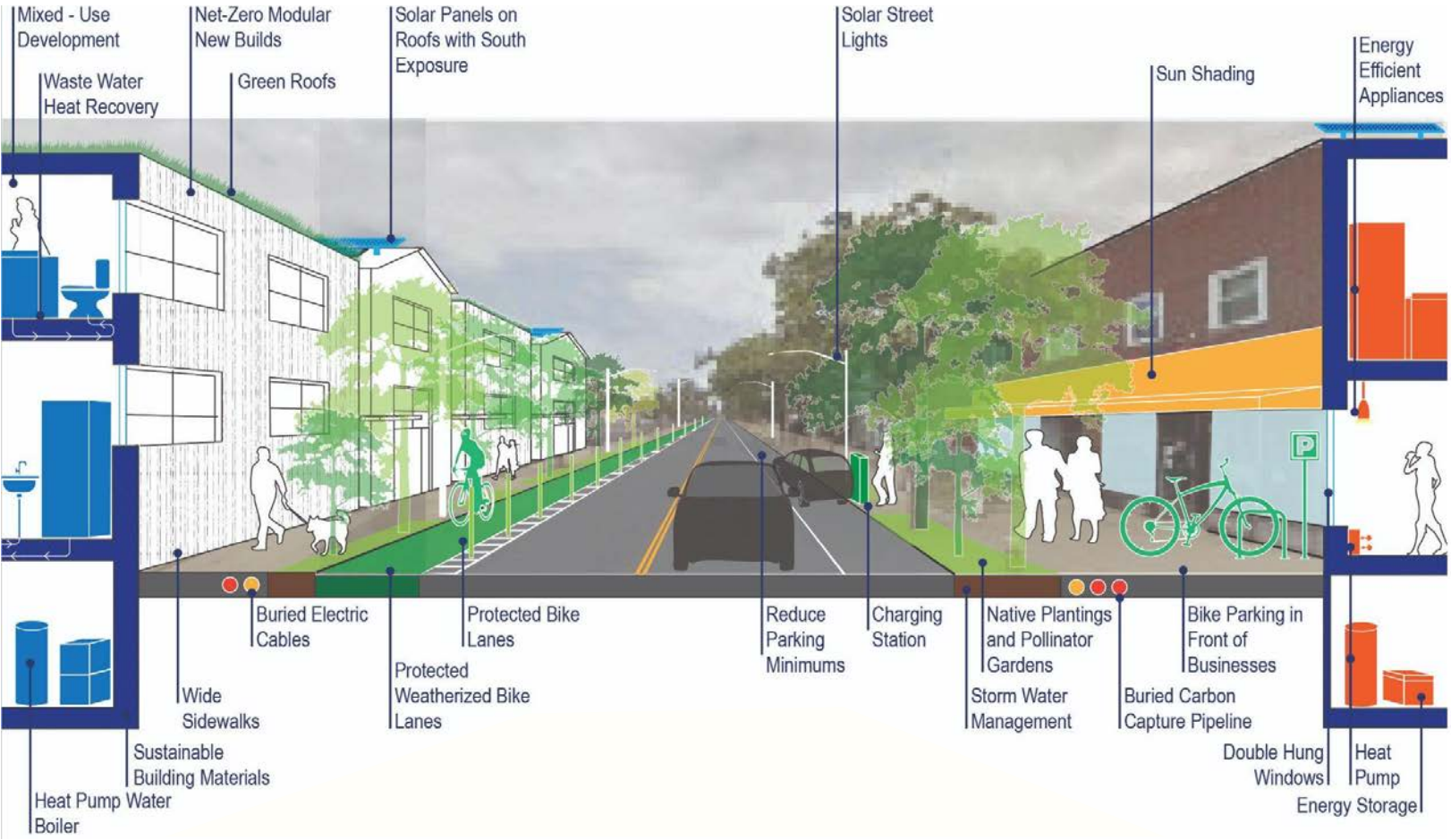
Businesses and Industry

- Learn about your city's plan, or advocate to start one!
- Find funding for upgrades
- Switch to clean energy
- Create green jobs

Local Governments

- Access planning tools
- Fund community projects
- Measure equity and progress

Modernizing Neighborhoods Reduces Emissions and Improves Lives



List of Resources







Climate Action Plans:

- NOACA CCAP Landing Page
- Priority Climate Action Plan (PCAP)
- NOACA's long-range transportation plan, weNEO2050+
- Ohio EPA, Priority Resilience Plan

Local Climate Action Plans

- Cleveland Climate Action Plan
- Cleveland Heights Action and Resilience Plan
- Cuyahoga County Climate Action Plan
- Lakewood Climate Action Plan
- Oberlin Climate Action Plan (Draft Update 2025)
- GCRTA Climate Action Plan

Tracking tools and groups

- Climate Action Tracker
- Project Drawdown
- Midwest Climate Resource Network
- Powering a Clean Future (PCFO)
- Green Energy Ohio
- Dashboard for Rapid Vehicle Electrification (DRVE)

Cuyahoga County

- Cleveland Community Climate Action Toolkit
- Circular Cleveland Roadmap
- Cleveland's Clean and Equitable Energy Future
- Cleveland Comprehensive Environmental Policy Platform
- Greenhouse Gas (GHG) Inventory & related emissions projections

Other Relevant Local Resources

- Lake County Coastal Resilience Plan
- Lake County General Health District Community Health Improvement Plan
- Geauga Park District Reforestation Initiative
- Lorain County Strategic Action Plan
- Medina County Soil & Water Conservation District Strategic Vision & Plan

Additional Archived Tools

- EPA EJScreen and CEJST
- Rewiring America's Personal Electrification Planner
- Future Risk Index
- Climate Mapping for Resilience and Adaptation (CMRA) Tool
- NOAA Climate Explorer
- Climate Central: Climate Risk Viewer
- Heat.gov Heat & Health Tracker
- Climate Impact Lab's Climate Impact Map
- CDC Social Vulnerability Index
- CDC Environmental Justice Index

NOACA
Northeast Ohio Areawide Coordinating Agency

CITY OF CLEVELAND
Mayor Justin M. Bibb
MAYOR'S OFFICE OF SUSTAINABILITY

CCAP Materials can be found here:

https://www.eneo2050.com/capmaterials

Climate Pollution Reduction Grant Program
U.S. Environmental Protection Agency

City of Cleveland
Office of Sustainability and Climate Justice
75 Erieview Plaza, Suite 115
Cleveland OH 44114
Tel: (216) 664-2455

Northeast Ohio Areawide Coordinating Agency
1299 Superior Avenue
Cleveland OH 44114
Tel: (216) 241-2414