



Clean Air Partnership

The State of Climate Action Implementation in Ontario Municipalities

2022 Report



About The Clean Air Partnership

Clean Air Partnership (CAP) is a registered charity that works in partnership to promote and coordinate actions to reduce greenhouse gases for healthy communities. Our applied research on municipal policies strives to broaden and improve access to public policy debate on air pollution and climate change issues. Clean Air Partnership's mission is to transform cities into more sustainable, resilient, and vibrant communities where resources are used efficiently, the air is clean to breathe, and greenhouse gas emissions are minimized.

About The Clean Air Council

The Clean Air Council is a network of 41 municipalities and health units from across Ontario. Since 2000, Clean Air Council members have been working collaboratively on the development and implementation of clean air, climate change, sustainability and resilience actions.

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Executive Summary

Canadian municipalities play a pivotal role in achieving local and national greenhouse gas (GHG) reduction targets. Municipal actions have significant potential to lower emissions, bolster community resilience, and contribute to creating a low-carbon future.

The [Clean Air Council \(CAC\)](#), a project of [Clean Air Partnership \(CAP\)](#), is a network of 41 municipalities and Public Health Units across Ontario that are committed to advancing bold climate action. These CAC municipalities collectively represent an impressive 87% of Ontario's population. The CAC actively empowers municipalities by providing cutting-edge research on climate action, fostering local capacity building.

This 2022 report details the latest GHG reduction actions underway in Ontario featured in our online [Climate Action Atlas](#). By featuring these actions, we aim to inspire and facilitate other municipalities in advancing similar progress. As of January 2023, the Atlas showcases a total of 132 actions implemented by CAC municipalities. Throughout this report, each featured action is linked to its corresponding entry in the Atlas for further exploration.

This initiative is an ongoing effort to positively showcase current municipal GHG reduction efforts while simultaneously stressing the critical urgency to accelerate and scale-up ambitious climate actions. This annually released report showcases regional advancements in climate action and identifies areas where further actions are required. While it currently profiles actions within the CAC jurisdiction, we encourage all Ontario municipalities to contribute actions for inclusion in future versions. Actions may be added through the Atlas portal at www.cleanairpartnership.org/atlas.

Introduction



Major Emission Sources

Total emissions have been broken down and classified into seven sectors or emission sources, as used in standard GHG accounting protocols.



Land Use - Land use planning shapes the patterns of energy use and development within communities. Land use emissions are attributed to activities and changes in land use, such as deforestation, urbanization, and alterations in land management practices.



Transportation - Emissions from the transportation sector primarily come from burning fossil fuels for our vehicles. Transportation emissions are heavily influenced by municipal land use planning.



Energy - The processes of energy generation, transmission, and distribution generate GHGs. Depending on the combination of sources used in energy generation, each province emits a different quantity of GHGs per unit of energy generated. The greenhouse gas intensity of Ontario's electricity grid was 25 grams of CO₂e per kilowatt-hour for electricity generated in 2020.



Buildings - GHG emissions from residential and commercial buildings arise primarily from using fossil fuels for space and water heating and electricity for cooling, lighting and appliances.



Industry - GHGs from industry arise from burning fossil fuels for energy and emissions from certain chemical reactions necessary to produce goods from raw materials.



Waste - GHGs such as methane are released from landfills through the decomposition of organic waste. In addition, anaerobic decomposition of wastewater and incineration of waste also produces emissions.



Agriculture, Forestry and Other Land Use (AFOLU) - AFOLU category is unique as it includes both carbon sources and sinks. AFOLU encompasses a range of activities, including agricultural practices, forestry management, and other land use changes such as urbanization and land degradation. Restoration and preservation of natural ecosystems enhances its carbon sequestration potential, bolstering GHG mitigation.

Ontario's Emissions



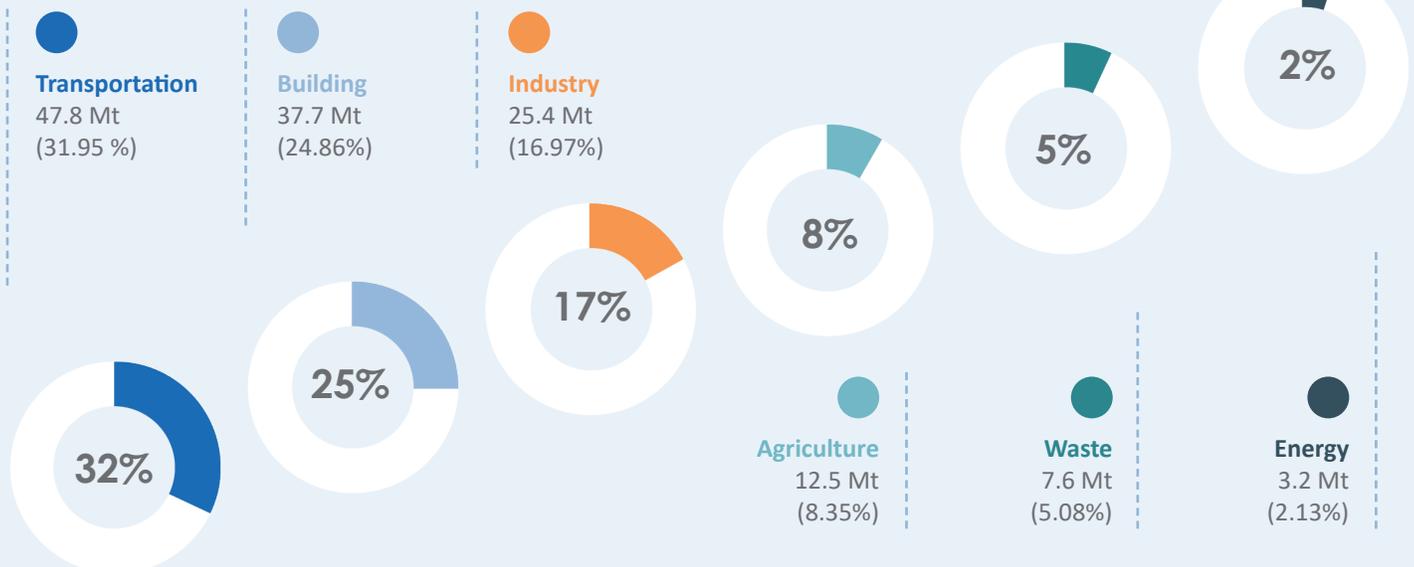
Ontario is Canada's second-largest province, covering more than a million square kilometers with a population of about 14.2 million. In 2020, Ontario accounted for 149.6 Mt of carbon dioxide equivalent emissions. The densely populated Greater Toronto and Hamilton Area, home to about half of Ontario's population is the second-largest financial centre in North America and represents 42% of Ontario's total emissions.

Role of Municipalities in Climate Action

Ontario municipalities have an important role to play in reducing emissions. Through municipal operations, public works, facilities and fleet management practices, transportation plans and community planning decisions, municipal governments can directly and indirectly influence about 50% of Canadian emissions.

In recent years, municipal governments have shown increasing climate leadership by setting ambitious net zero targets, developing and implementing climate action plans and driving down GHGs in their communities. These plans include actions such as walking and cycling infrastructure improvements, municipal, residential and commercial building retrofits, constructing net zero buildings and communities, GHG capture in wastewater treatment plants and landfills, restoration and reforestation of green space, and the expansion of public electric vehicle (EV) infrastructure and fleets.

Figure 1: Ontario's GHG emissions in 2020



This report provides a summary of actions that municipalities of the [Clean Air Council](#) have implemented in 2022 to reduce emissions and is a resource for other municipal governments that are exploring ways to reduce emissions in their own communities.

Scope of this Report

Inclusion Criteria

This report showcases large-scale, municipal community-level GHG reduction actions. We have included only climate mitigation actions advanced by our 39 CAC member municipalities. As the CAC network expands, ambitious actions from new member municipalities are being added to the database. In future years, as we observe more innovation in the climate mitigation realm, new categories and actions will be added to the Climate Action Atlas to expand its scope.

Our database includes both fully implemented actions, and actions at advanced stages of implementation as of 2022. For projects at an advanced stage of implementation, we have

included projects with an assigned budget and work-in-progress. Our database reflects the actions undertaken by municipalities independently, or in partnership with other municipalities, the public or private sectors. For information on actions from 2021 or before, please check out our [2021 Report](#).

Exclusion Criteria

Because we are focusing on those actions that directly reduce emissions, we are excluding plans, policies, feasibility studies or projects at early stages without committed budgets. Also excluded are municipal corporate energy efficiency actions that have become standard practice, such as mechanical system replacements and lighting retrofits. Through this report, we are highlighting only those actions implemented or underway in 2022 that showcase bold, innovative and accelerated climate action leading to significant emissions reduction. As such, adaptation actions are also not included.

Because of the limited role of municipalities in regulating industrial emissions, industrial emission reduction actions are excluded, however, it will be populated should these actions be undertaken by municipalities in the future.

“

Municipal planning decisions made today will have environmental impacts far into the future.”

Highlights



Overview

The [Climate Action Atlas](#) consists of 132 ambitious climate mitigation actions taken by the CAC member municipalities from 2015 to present. Of these, 22 actions commenced in 2022.

Of these, five actions belong to the Transportation category. These actions are further divided into two subcategories:

- Electric vehicles (EV fleet and charging infrastructure adoption) (4)
- Enhanced walking and cycling infrastructure (1)

The Energy category includes five actions divided into three subcategories:

- Renewable energy systems (2)
- Net zero carbon district energy systems (2)
- Energy generation from waste (1)

The Buildings category includes five actions divided into two subcategories:

- Net-zero municipal facilities and buildings (1)
- Commercial and residential building retrofits (4)

The Land Use category highlights three (3) actions all around the adoption of Green Development Standards in various CAC member municipalities.

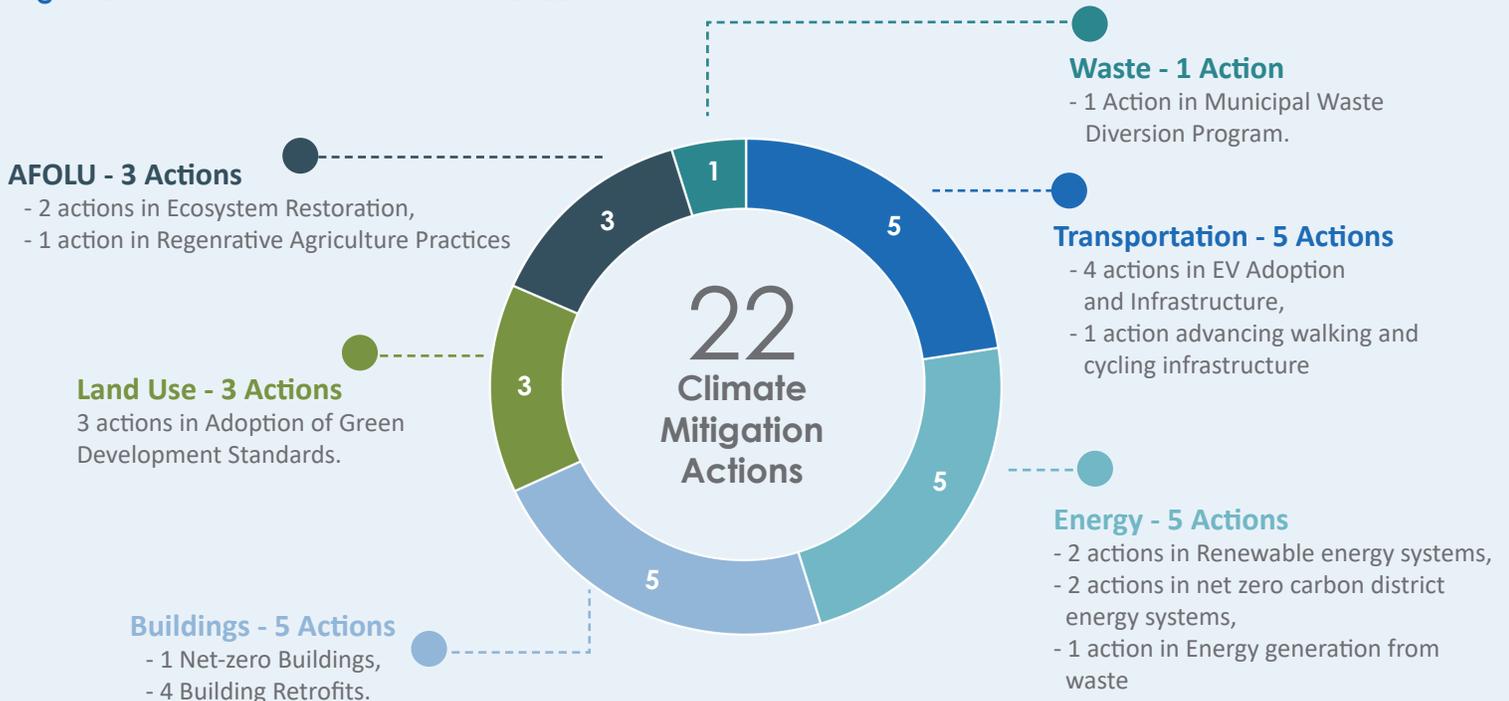
The Agriculture, Forestry and Other Land Use (AFOLU) category includes three actions divided into two subcategories:

- Natural ecosystem restoration actions (2)
- Regenerative agriculture practices (1)

The waste category consists of one action belonging to waste diversion subcategory.

- Municipal waste diversion program (1)

Figure 2: Climate Actions Per Sector in 2022



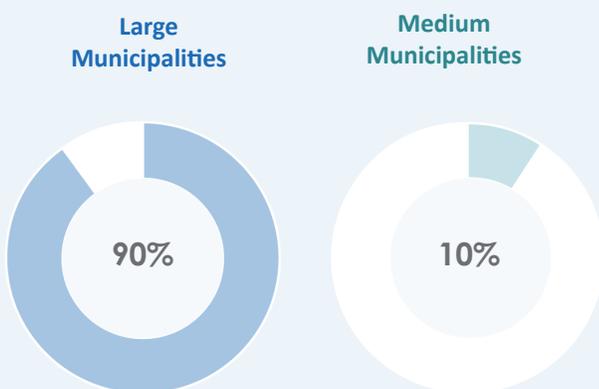
Municipal Size

The CAC network includes municipalities of various sizes. We have categorized them into three sizes based on population: small <10k; mid-sized 10k -100k; large >100k. Larger municipalities have more dedicated staff to undertake larger-scale climate actions. They also often have access to more funding and access to local partners to research and test out new initiatives for GHG reduction. Additionally, they have larger populations and therefore larger revenue bases.

The distribution of climate actions in the Atlas reflects this disparity, where two were implemented by mid-sized municipalities, and 20 (or 90%) were undertaken by large municipalities.

With Ontario's tiered government structure, larger upper-tier municipalities can support and collaborate with lower-tier municipalities on collective climate actions to reduce regional emissions. Smaller municipalities can benefit from collaborative networks such as the CAC to learn about climate actions taken by their peers, the challenges, best practices and project outcomes. This can assist in determining the type and scale of projects best suited for implementation in their own municipalities.

Figure 3: Percentage of Climate Actions in this report from Large and Medium Municipalities



Updates on Actions Ongoing in 2022

For larger-scale multi-year actions, the atlas provides annual updates on the progress of the project to ensure transparency to the public. In 2022, we have updated 13 actions that are currently underway.

Eight (61%) of these actions belong to the [transportation sector](#) and include fleet electrification and EV charger installations by municipalities including Mississauga, Oshawa, Clarington, Guelph, St. Catharines, Kingston, and the York Region. A driving force behind municipal fleet electrification is the availability of federal funding through the Zero Emission Vehicle Infrastructure Program available until 2027. Municipalities throughout the CAC network are expanding EV fleets and charging infrastructure and we will see many more actions in this sector in the coming years.

In the [AFOLU sector](#), two updates are reported in the ecosystem protection and restoration category at Kerrison Wetland Project in Ajax and the Jim Tovey Lakeview Conservation Area in Mississauga. The municipalities are restoring shorelines, planting native trees, creating habitats for wildlife and enhancing ecosystem functioning.

In the [Land Use sector](#), one action was updated. The Town of Whitby began working with partners to complete a demonstration project that measures the costs and benefits of integrating advanced sustainability criteria outlined in the Whitby Green Standard. This project includes monitoring the design, construction, and occupancy stages for low-rise residential homes.

In the [Buildings sector](#), we have reported one update on the successful uptake of interest-free loans of up to \$75,000 offered through the Retrofit Halton Hills program to 9 homeowners. The total

annual energy reduction of these homes is 807GJ/year and GHG reduction is expected to be 44 tonnes/year.

One action was updated in the [Energy sector](#). In 2022, Burlington expanded its renewable energy projects and unveiled its City View Park Pavilion. The Pavilion is a carbon-neutral and fossil fuel free facility which uses roof-top solar panels produce all the electricity that the building uses.

Some Common Trends Observed in 2022

This year, we observed 12 actions (4 new and 8 updates) in the transportation sector expanding municipal corporate and community fleet electrification and installation of charging infrastructure. The increased adoption of EVs and the corresponding development of charging infrastructure can be largely attributed to the availability of federal funding.

Municipalities are scaling up their residential GHG reduction efforts by launching community retrofit programs. In 2022, we observed 5 actions (4 new and 1 update) in the buildings sector to advance building retrofits and reduce emissions from the residential and commercial buildings.

With the rising costs of fossil-fuels, municipalities are making their communities more resilient and affordable by investing in renewable energy systems and installing net-zero district energy systems. In the Energy sector, 3 actions (2 new and 1 update) feature renewable energy installations and net-zero district energy systems that are powered by renewable energy.

Growing numbers of municipalities are redefining infrastructure to include natural assets and making a financial case to invest in, protect and restore these

ecosystems while also benefitting from the services they provide. Municipalities are undertaking multi-year environmental restoration projects in the AFOLU sector to advance the Federal Government's two billion trees program, improve ecosystem functioning and preserve native biodiversity. The AFOLU sector reported 3 actions (2 new and 1 update) on ecosystem restoration to boost local carbon sequestration efforts.

“Municipalities are electrifying fleets and installing charging infrastructure. Building retrofits are reducing emissions, while renewable energy systems and net zero district energy are becoming more affordable. Municipalities are investing in environmental restoration projects to boost carbon sequestration.”

Sectoral Focus - Land Use



Land use decisions can significantly impact municipal emissions through various mechanisms including transportation and zoning. Poor land use planning, such as creating sprawling, car-dependent communities with inadequate public transportation options, result in increased vehicle kilometres traveled and greater reliance on fossil fuel-powered vehicles, leading to higher transportation emissions.

Furthermore, land use decisions can affect energy consumption and efficiency. Zoning regulations and development policies that promote low-density, inefficient building designs can result in increased energy demands for heating, cooling, and lighting. This, in turn, leads to higher building emissions.

Additionally, land use decisions can impact natural resources and ecosystems. The conversion of green spaces, forests, or agricultural lands into urban or industrial areas can lead to the loss of carbon sinks, such as trees and vegetation, which absorb and store carbon dioxide. This loss of carbon sinks contributes to higher GHG concentrations in the atmosphere.

To reduce municipal GHGs resulting from land use decisions, it is crucial for local governments to prioritize sustainable urban planning. This can include promoting compact, mixed-use development with easy access to public transportation, and preserving green spaces and natural areas.

Maximizing the efficient use of municipal infrastructure and achieving higher density developments around existing or planned transit corridors can also promote public transit and active transportation. This reduces transportation emissions and increases access to amenities like schools, shops and parks.

Green Development Standards

Green Development Standards (GDS) are a collection of mandatory and voluntary performance and design standards created by municipalities to encourage developments that are environmentally, socially, and economically sustainable. These standards are integrated into the planning approvals process, where development applications are asked to meet certain criteria in the GDS. Some of these criteria include mandatory and voluntary energy efficiency and GHG performance standards, which can greatly reduce emissions from new developments.

“*Local governments must prioritize sustainable urban planning, promote compact, mixed-use development, accessible public transportation, and preserve green spaces to reduce land use emissions.*”



Planning and designing a new development in accordance with the local Green Development Standards.

CASE STUDY

Ajax Green Standard

The Ajax Green Standard (AGS) is a municipal green development standard that establishes sustainable design guidelines and performance measures for new development and redevelopment within the Town of Ajax.

The AGS provides developers with a guidebook and checklists which outline 21 sustainable design and performance metrics across 6 categories, including air, energy, natural assets and habitat, waste and materials, water, and other.

All new Site Plan and Draft Plan of Subdivision applications for low-density residential and mid to high-density residential and non-residential developments are required to complete the AGS checklist. The AGS is comprised of 2 tiers of achievement for most metrics. Tier 1 is the minimum required level of achievement. Tier 2 is a voluntary higher level of achievement. Some metrics only have one mandatory tier of achievement, such as the requirement for heat island reduction measures on 100% of the available roof area.

“
Ajax Green Standards will advance building practices that reduce greenhouse gas emissions, build infrastructure that is resilient to future climate change and create a healthier environment for residents
”

Sectoral Focus - Transportation



Emission reductions from the [transportation sector](#) can be achieved through many municipal actions. Replacing internal-combustion engine fleet vehicles with hybrid or EVs reduces corporate transportation emissions. For community emissions reductions, municipalities can install public EV charging stations, improve public transit services, and invest in walking and cycling infrastructure, encouraging residents to replace trips in private vehicles with low or zero-emissions modes of transportation.

Public Transit Upgrades

Upgrading public transit services can reduce emissions by encouraging more people to replace car travel with transit and reducing overall traffic on roads. Transit upgrade measures can include creating or expanding local transit networks within a municipality or between municipalities, as well as increasing the frequency, convenience, or affordability of transit service. Improving public transit benefits the economy, the environment and helps people reduce their transportation costs and improves transportation equity.

[Public transit infrastructure upgrades](#) enhance and modernize various aspects of public transportation

systems to improve their efficiency, accessibility, and sustainability. This may include expanding and improving transit networks by adding new routes, increasing service frequency, and extending coverage. Upgrades may also involve the integration of advanced technologies such as real-time passenger information systems, contactless payment systems, and intelligent transportation systems. Additionally, infrastructure upgrades may encompass the construction or renovation of transit stations, terminals, and depots to provide better facilities for passengers and accommodate increasing ridership.

Enhanced Walking and Cycling Infrastructure

Investing in walking and cycling infrastructure provides low-carbon transportation options to the community and encourages healthy and active lifestyles. [Active transportation infrastructure upgrades](#) include building enhanced walking and cycling infrastructure such as sidewalks, multi-purpose trails, dedicated/separated bike lanes, and paved road shoulders. Municipalities are also adopting bylaws requiring bike parking facilities and lowering their minimum car parking requirements for new developments.

“

Municipalities can undertake many actions to decarbonize transportation, such as switching to low carbon electric fleet vehicles, improving public transportation options and providing active transportation infrastructure. ”

In addition, providing or supporting educational programs to promote active transportation in the community is critical to raising awareness among residents and increasing uptake of active transportation modes.

EV Fleet and Infrastructure Investments

Actions like [fleet electrification](#) and investments that encourage community EV adoption are key to achieving transportation emission reductions. By installing a widespread [public EV charging network](#), municipalities can encourage residents to switch to EVs that operate on low or zero emission electricity. Given that transportation emissions make up a major portion of GHGs, municipalities have a significant opportunity to promote low-carbon transportation alternatives through regional planning and collaboration with other orders of government.

Automatic Vehicle Location Systems

[Automatic vehicle location \(AVL\) systems](#) are powerful tools used by municipalities to manage vehicle fleets including service vehicles, emergency vehicles, and transit vehicles such as buses and trains. AVL systems allow for improved productivity and resource allocation by optimizing routes, reducing idle time, and minimizing fuel consumption. Municipalities can benefit from improved monitoring of vehicle use and understanding of the amount and type of fuel consumed and associated emissions. AVLs can enhance municipal ability to conduct analyses of year-over-year fuel consumption and trends, can help reduce vehicle kilometres travelled and reduce fuel consumed through idling. year-over-year fuel consumption and trends, can help reduce vehicle kilometres travelled and reduce fuel consumed through idling.

CASE STUDY

Kingston's Electric Ice Resurfacers

Kingston added [three new electric ice-resurfacers](#) to its fleet in 2022, at Springer Market Square, Leon's Centre and the Memorial Centre. With these three new vehicles, Kingston is now nearly halfway to reaching their goal of replacing all 12 propane-powered ice-resurfacers with quiet, zero-emission electric ice-resurfacers. This aligns with the City's Climate Leadership Plan and the goal to achieve GHG reduction targets.



Kingston's Electric Ice Resurfacer



Windsor's Public EV Charging Station.

CASE STUDY

Windsor's EV Charging Stations

Windsor has invested \$525,000 to install 11 new electric vehicle charging stations capable of charging up to 22 electric vehicles. These new charging stations were installed throughout Windsor to make it easier for EV and hybrid drivers to charge up. Each station features a dual connector which can charge two vehicles at once. All 11 station stations were installed by March 2022.

For an initial period, charging services are available for free to allow the City to collect data to determine the future needs of Windsor's electric vehicle infrastructure.

“
Expanding the EV charging network will help the city stay on track to meet climate and energy efficiency goals.
”

Sectoral Focus - Buildings



Buildings accounted for about a quarter of Ontario’s total GHG emissions in 2020. The largest source of GHG emissions from buildings is the use of fossil fuels for heating, cooling, lighting, and powering various appliances and systems. Municipalities can directly oversee and regulate GHG emissions originating from their own buildings, while also influencing emissions stemming from privately owned buildings through a diverse range of initiatives. Municipal governments are actively formulating programs aimed at retrofitting residential and commercial buildings, as well as facilitating the establishment of innovative net-zero energy constructions, thus spearheading the transition towards more sustainable building practices.

Net-Zero Neighborhoods

Municipalities are collaborating with developers and energy companies to research and design new neighbourhoods powered by their own renewable energy and serviced by community-scale distributed geothermal energy systems for heating, cooling, and domestic hot water. These low-carbon communities will benefit the residents in multiple ways, including greater energy efficiency through optimization, reduced energy costs for consumers, reduced maintenance costs, and reduced emissions, resulting in better air quality and health.

Net-zero Municipal Buildings

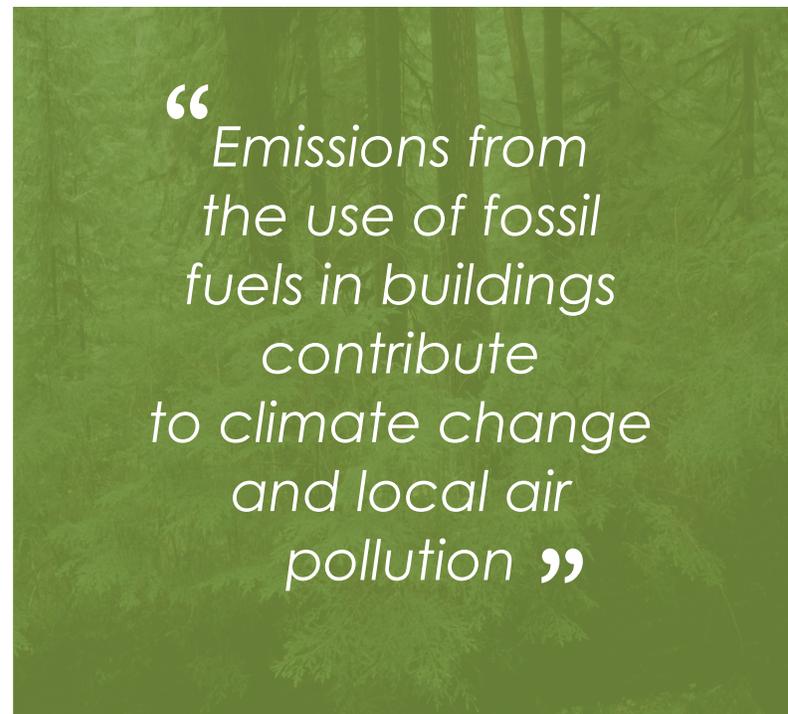
Net-zero energy buildings are key to climate action as they are designed to produce as much energy as they consume annually, using on-site renewable energy sources such as solar, wind and geothermal. Municipalities in the CAC network are partnering on net-zero energy building projects that construct or renovate buildings such as daycares, parking lots, senior residences, and affordable homes. Net-zero residential buildings are resilient, comfortable, and

healthy. Moreover, due to their limited operating costs, they have the potential to reduce energy poverty. due to their limited operating costs, they have the potential to provide a secure home for low-income occupants facing energy poverty.

Retrofit Programs

The existing ageing residential and commercial building stock needs to be retrofitted to minimize energy consumption. There is growing market interest in energy-efficient buildings, and many provincial and federal programs seek to improve energy efficiency at the municipal level.

In order to reduce emissions from this sector, municipalities in the CAC network are offering residential and commercial building owners upfront loans with convenient repayment schemes, and facilitating access to rebates and incentives offered by the Federal Government and Utilities.





A heat pump is a highly efficient and climate-friendly alternative to a gas, oil or electric furnace or baseboard heating system

CASE STUDY

Durham Greener Homes

In 2022, the Regional Municipality of Durham launched its [Durham Greener Homes program](#), which helps homeowners overcome the challenges of completing energy retrofits by providing support throughout the home retrofit journey.

Program participants gain access to a home energy coach who will provide impartial expert advice throughout the renovation process, including:

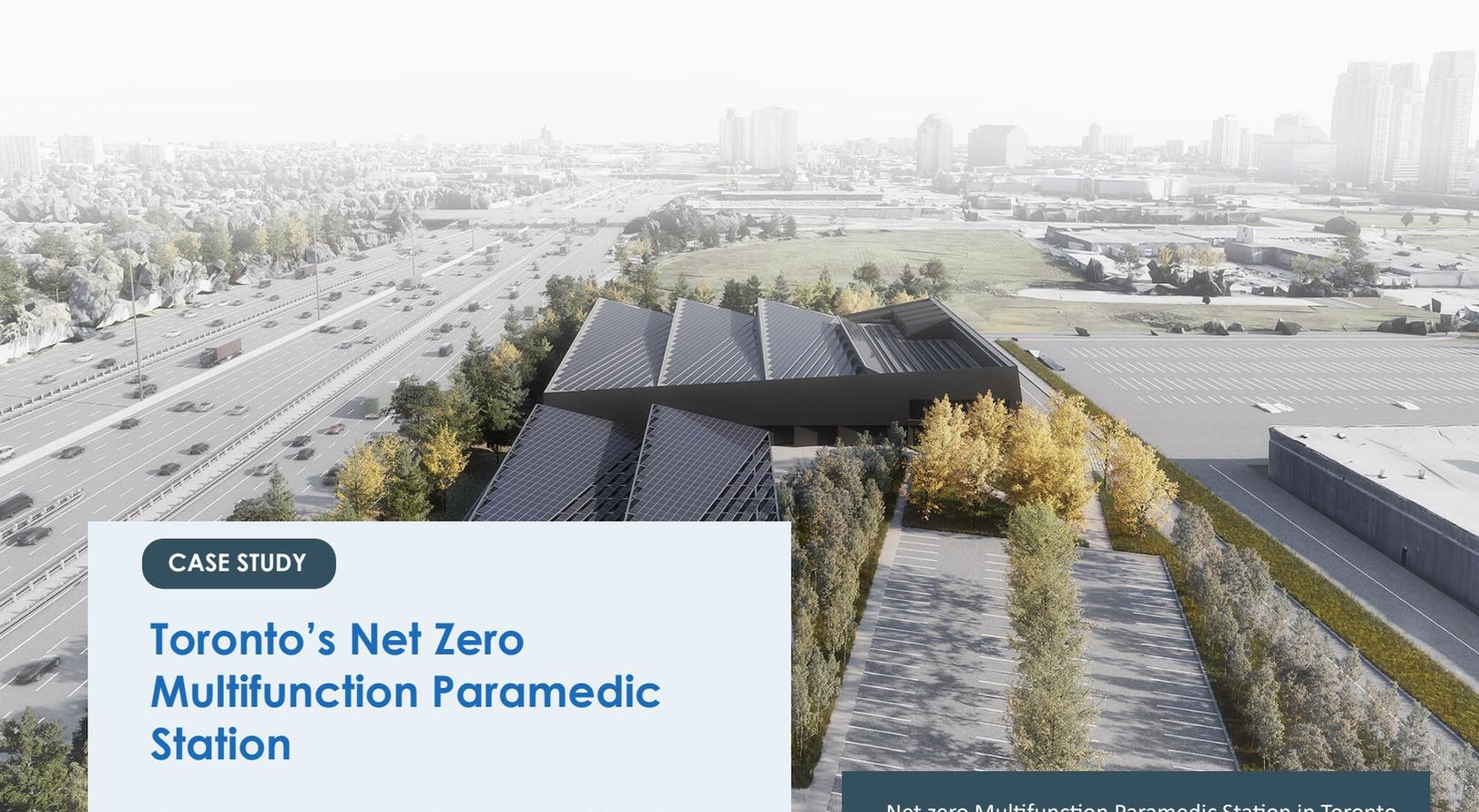
- Completing an in-home energy assessment
- Identifying eligible retrofits, including insulation, heating and cooling equipment, rooftop solar, and in-home electric vehicle charging stations
- Selecting qualified contractors
- Accessing utility and government cash-back rebates

In December 2022, the Region of Durham introduced the Deep Retrofit Rebate, which provides participating residents with up to \$10,000 in incentives for reducing their home's greenhouse gas emissions. The Region is also partnering with the Canadian Home Builders' Association (CHBA) to launch the Towards Net Zero Renovations Project to further develop the Durham Greener Homes Program. The project is seeking participants in Durham who want to upgrade their home to Net Zero Energy or Net Zero Energy Ready.

“

Durham Greener Homes Program makes it easier and affordable for residents to make energy improvements to their homes.

”



CASE STUDY

Toronto's Net Zero Multifunction Paramedic Station

The Toronto Paramedic Services [Multifunction Paramedic Station](#) houses vehicles for essential services, and offsets vehicle emissions with its net zero carbon and net zero energy features. The building has a photovoltaic roof that unifies the individual sheds of the building, providing optimal angles for solar energy capture and clerestories to the occupied interior spaces. A mass timber structure is used to reduce embodied carbon, helping the project target net zero carbon certification.

A tilted south-facing solar wall conserves a further 15 percent of the entire building's energy. Fresh air is warmed by the south sun on the dark metal cladding, rising into energy recovery ventilators (ERVs) on the roof. The ERVs deliver the heated air to the vehicle bays through low-level displacement ventilation cabinets. High-level return air ducts draw air back to the rooftop ERVs, using latent heat to further preheat incoming air.

Net zero Multifunction Paramedic Station in Toronto

“
The boldly angular Multifunction Paramedic Station will exceed Toronto's zero emissions mandate, aiming to achieve both zero emissions and net zero energy.
”

Sectoral Focus - Energy



Municipalities in the CAC network are implementing small and large scale [zero-emission energy projects](#) across their communities to reduce emissions. These projects include renewable energy systems such as solar, wind and geothermal energy, and low carbon district energy system networks that heat and cool buildings. Whether it is to power buildings or heat and cool entire neighbourhoods, locally generated energy from low or zero-emission sources can contribute significantly to lowering municipal emissions.

Net-zero Carbon District Energy Systems

Municipalities are adopting [low carbon/net-zero district energy systems](#) that run on renewable energy sources such as solar thermal, sewer heat, biogas, cold lake water, biomass and ground heat

to distribute thermal energy to multiple buildings in an area or neighbourhood. Hot water and/or chilled water are produced at central plants and distributed to surrounding buildings using closed-loop underground distribution systems known as a thermal grids. The thermal energy delivered to the buildings is used for space heating, domestic hot water heating and air conditioning.

Renewable Energy Systems

[Small and large-scale projects](#) implemented by municipalities to generate renewable energy are becoming more common. Municipalities across the CAC network have installed solar panels, solar thermal, wind turbines, geothermal loops and other sources to generate low-carbon electricity and heat on municipal buildings, community centres, etc.



Wasterwater Energy Transfer System is being installed at Toronto Western Hospital

CASE STUDY

Toronto's Wastewater Energy Transfer (WET) System

Construction is underway at Toronto Western Hospital and Krembil Discovery Tower to build world's largest raw [wastewater energy transfer \(WET\) system](#). The WET System will use thermal energy from wastewater flowing through a nearby municipal sewer to supply up to 90% of the hospital's heating and cooling needs, significantly reducing use of existing electric and natural gas systems. As a result, the site's direct emissions will be reduced by about 10,000 tonnes each year – more than 60% of UHN's overall direct emissions and the equivalent of removing 1,811 cars from the road.



Zibi Community District Energy System

CASE STUDY

Ottawa's Zibi Community Utility District Energy System

The [Zibi Community Utility District Energy System](#) – an equal partnership between Hydro Ottawa and Zibi – currently provides net-zero carbon heating and cooling for all Zibi tenants, residents and visitors in the 34-acre riverfront city.

Low-grade waste industrial heat is recovered from the neighbouring Kruger tissue mill and injected into the system. In summer, heat is rejected directly or via chillers into the Ottawa River to efficiently produce chilled water to cool the buildings. The plant, which came online in December 2021, currently services three residential buildings and three office buildings totalling 615,00 square feet.

CASE STUDY

London's My Heat Solar Platform

London launched online map to support residents to make their homes more resilient to climate change and using renewable energy. The map is called [MyHEAT Solar](#), and it helps residents identify the financial and environmental benefits solar panels would have on their roof. It was developed by MyHEAT and Google, and it uses Google Maps and Google's Project Sunroof technology to quickly calculate a roof's estimated solar potential and recommended panel size. The tool also accounts for factors that affect solar energy production, like average annual weather patterns and nearby objects casting shade.

With this data, residents can evaluate the potential financial and environmental benefits of solar panels for their homes, along with information about incentives to install panels. The platform estimates potential savings over a 25-year life span of the panels and shares the estimated number of years until upfront costs are recovered. MyHEAT Solar also calculates the amount of GHGs that can be avoided if solar panels are installed on a home.



MyHEAT Solar Platform supports London's residents to calculate their roof's solar potential

Sectoral Focus - Waste



Ontario’s municipal governments manage the collection, recycling, composting, and disposal of household waste. Decomposition of organic waste releases large quantities of methane and other GHGs. Diverting waste by recycling and composting reduces the impact of solid waste on the environment. Ontario municipalities have made significant progress in [reducing waste](#) going into landfills through circular economy strategies, reuse and repair initiatives, waste diversion programs, and energy-from-waste projects. CAC municipalities are also adopting innovative technologies to collect fugitive emissions from sewer waste, landfills or agricultural waste and converting it into energy.

Waste Diversion

[Municipal waste diversion programs](#) direct waste away from landfills or incinerators through reuse, recycling, composting or anaerobic digestion. Waste diversion is a key component of effective and sustainable waste management. CAC municipalities are currently advancing waste diversion programs

for organic waste, textiles, hazardous waste and recyclable waste.

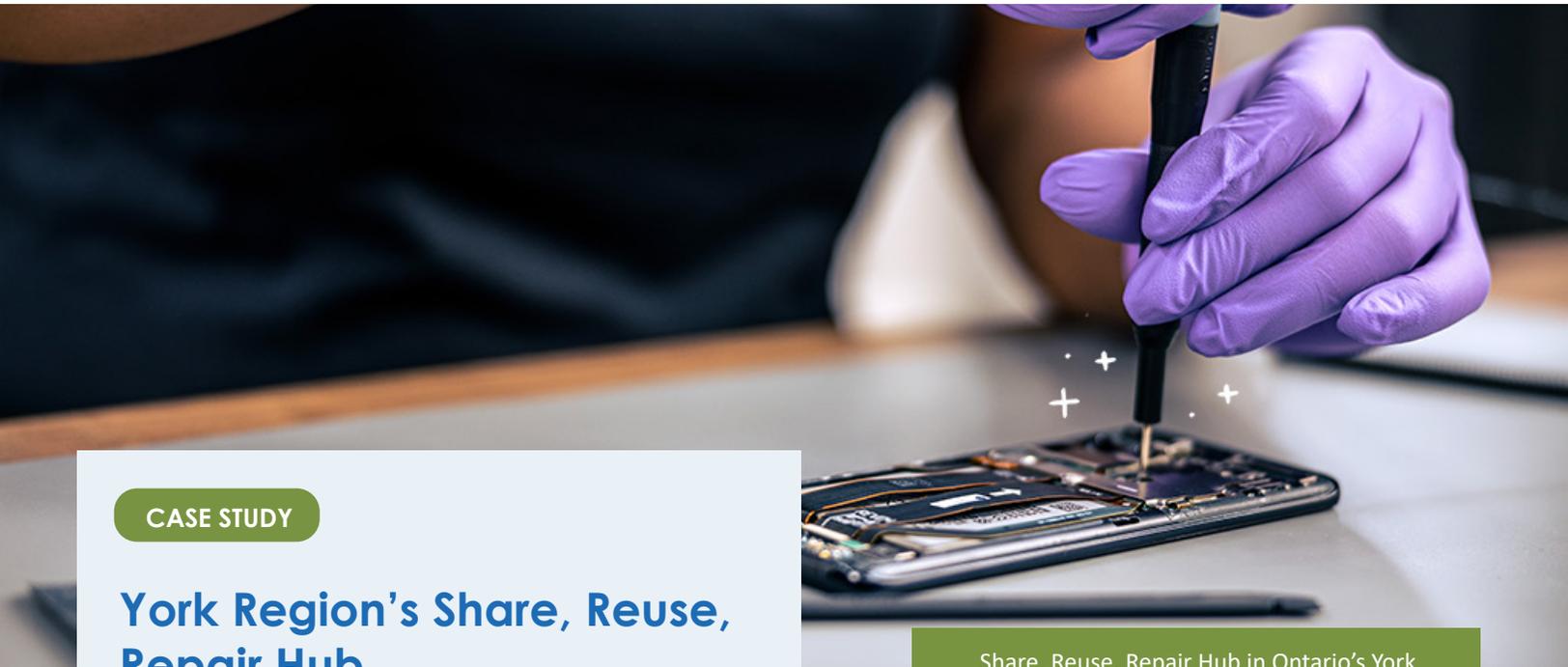
Energy Generation from Waste

Municipalities across the CAC network are adopting innovative ways to [convert waste into energy](#) through renewable natural gas (RNG) generation and by capturing waste heat. RNG can be produced as an environmentally responsible alternative to natural gas from organic materials. RNG production generates lower emissions when compared to conventional natural gas.

RNG can be produced from various local community sources, including agricultural waste, municipal landfill gas, forestry waste, and other biomasses. RNG can be used instead of natural gas for heating, electricity generation, and as an alternative fuel for vehicles. Municipalities are also incinerating sewage and other organic waste to generate electricity and reduce emissions.

“

Municipal governments in Canada manage household waste. Decomposition of organic waste releases large quantities of methane and other GHGs. Diverting waste by recycling and composting can help reduce the impact of solid waste on the environment. ”



CASE STUDY

York Region's Share, Reuse, Repair Hub

In 2022, the Regional Municipality of York and the Circular Innovation Council launched the [York Region Share, Reuse, Repair Hub](#). Funded by York Region's Circular Economy Initiatives Fund, the hub aims to empower individuals, businesses, and organizations to participate in the circular economy. Through an online platform, the hub provides a range of tools and resources to support the sharing, reusing, and repairing of everyday items, including textiles, electronics, household appliances, recreational equipment, and furniture. The hub has a directory of shops and organizations, and provides a live map of events such as swap events, second-hand stores, or donation drop-off centres.

By extending the lifespan of products, the hub helps to reduce emissions and keeps items out of landfills. Additionally, it supports local businesses in York Region and beyond, promoting a more sustainable and circular economy.

Share, Reuse, Repair Hub in Ontario's York Region.

“
The Hub encourages circular economies by providing resources for sharing, reusing and repairing everyday items such as textiles, electronics, household appliances, recreational equipment, and furniture.
”

Sectoral Focus - Agriculture, Forestry and other Land Use



The [AFOLU sector](#) includes GHG sinks, as well as sources. Municipalities can reduce GHG emissions associated with the AFOLU sector by:

- Promoting sustainable agricultural practices that prioritize soil health, water conservation, and biodiversity protection, encouraging the adoption of climate-smart agriculture techniques, and supporting local farmers to reduce emissions and enhance carbon sequestration.
- Investing in urban forestry and tree planting programs to expand green spaces and enhance carbon sinks.
- Implementing land-use planning policies that prioritize preserving natural areas, undertaking ecosystem restoration, promoting sustainable land management, and minimizing urban sprawl.

Rural municipalities are working with farmers and landowners to encourage sustainable agricultural practices to preserve natural assets – which can act as important carbon sinks.

While many CAC municipalities are primarily urban with relatively low emissions from the agricultural sector, some have undertaken projects to enhance carbon sequestration from agriculture and natural ecosystems.

Regenerative Agriculture

[Regenerative agriculture](#) includes practices to maintain continuous vegetation cover, promote soil stabilization, increase the diversity of organic materials, and sequester water, nutrients and carbon. These practices include reduced tillage/ no-till and cover crops, diverse crop rotations with higher frequency of perennial crops, grass cover for waterways and crop buffers, agroforestry, integrated livestock management with improved grazing management, and utilization of compost and organic

waste to build soil health.

Ecosystem Protection and Restoration

Boosting the carbon sequestration potential of ecosystems through the protection and restoration of existing ecosystems and creating new human-made ecosystems is an effective approach to reducing and removing carbon emissions. The carbon sequestration potential of ecosystems can be enhanced through practices such as conservation, restoration, reduced deforestation and degradation, as well as sustainable management and afforestation/reforestation. Several CAC municipalities are partnering on [ecosystem protection and restoration projects](#) with conservation authorities and local environmental organizations.

“Municipalities are reducing AFOLU emissions by promoting sustainable agriculture, investing in urban forestry, and implementing land-use planning policies to preserve natural assets and enhance carbon sequestration.”



Experimental Acres supports farmers in adopting experimental agricultural practices

CASE STUDY

Guelph and Wellington's Experimental Acres Project

Experimental Acres is a regenerative agriculture project that was launched in May 2022 by Our Food Future, a project of the City of Guelph and County of Wellington. The project works with farms to implement climate friendly farming techniques that emphasize conservation and rehabilitation to strengthen the health of farm soil. In its first year, the program supported 15 farms, covering 150 acres, with expertise, financial support, soil testing, and community building. Through the program, participating farms implemented regenerative practices including tree planting, no-till planting, cover cropping, and silvopasture. In 2023, the Experimental Acres program accepted 22 new participating farms, including 11 in Wellington County and 11 in Dufferin and Grey Counties.

CASE STUDY

Barrie's Retrofit and Upgrade of Sunnidale Stormwater Management Facility

The City of Barrie retrofitted and upgraded the Sunnidale Stormwater Management Facility, which is located on the south side of Sunnidale Road between Livingstone Street and Anne Street. The specific improvements at the pond included:

- Installation of a storage and infiltration system beneath the existing pond, which means less flooding, less erosion, a reduction in phosphorus, and a better environment for fish in Kidd's Creek.
- Planting of new trees and shrubs, as well as seeding with locally native seed mixes.
- Regrading of the pond's banks back to its original shape.
- Naturalizing the pond to help attract pollinators.



Retrofit and upgrade of the Sunnidale Stormwater Management Facility

Conclusion



Municipalities are often overlooked in the context of climate change, with provincial and federal politics taking center stage. However, it is crucial to recognize that municipalities influence over nearly half of Canada’s GHG emissions. If Canada is to meet its national and international GHG reduction targets and avoid warming above 1.5° C, local governments will need to ramp up their efforts and implement transformative GHG reduction actions across all sectors. Municipalities are also at the frontlines of experiencing the tangible impacts of climate change. Municipal elected officials are community members who reside among their constituents, personally encountering the consequences of their decision-making.

Municipalities of all sizes across Ontario are advancing climate action, as demonstrated in this Report. Our Report focuses on what is currently underway in Ontario. It is important to mention that there are many actions underway in other

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In 2015, Canada committed to reducing its annual GHG emissions by 30 percent below 2005 levels by 2030. Urgent action is needed to curb GHG emissions, meet Canada’s GHG reduction target, and achieve net-zero emissions by 2050.”

jurisdictions that can result in significant emission reductions that are not yet happening here. For example, in transportation, some jurisdictions have already [achieved 100 per cent electrification](#) of its public transit fleets. Cities are rapidly scaling up their building decarbonization efforts to bring building emissions down drastically. [Global heat pump sales](#) rose by nearly 15 percent in 2021, double the average of the past decade, led by the European Union where they rose by around 35 percent. In 2022, some cities in the US implemented [programs to ban the use of fossil fuels in new construction](#). In the waste sector, more and more municipalities are advancing their commitment to become [zero waste cities](#).

With all this push to decarbonize our cities and make our communities healthier, we look forward with hope. In 2023 and beyond, we’re imagining a greater momentum to drastically change how we manage energy supply, natural and agricultural ecosystems, and how we inhabit and move in the urban spaces where most of the world’s products, energy and materials are consumed. We envision innovation in the construction industry to build future-proofed buildings and to retrofit our millions of existing buildings, more walkable and bikeable neighbourhoods easing traffic congestion and air pollution, better waste management and healthier natural ecosystems. With climate action, health and equity as our north stars, we can continue to make our cities more sustainable, comfortable, and healthy into the future.



Clean Air Partnership