ATTACHMENT 1

PEEL ZERO EMISSION VEHICLE STRATEGY

The road to a healthier low carbon community

Region of Peel working with you

Toronto and Region Conservation Authority

Credit Valley Conservation inspired by nature

MISSISSAUGA

TOWN OF CALEDON

BRAMPTON

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MESSAGE FROM THE CHAIR

I am proud to be introducing the Peel Climate Change Partnership's Zero Emission Vehicle Strategy. This policy framework and strategic action plan is an important part of our work to keep Peel moving while mitigating our carbon impact. We know that we have a role to play and the vision for this strategy is to create opportunities to accelerate zero-emission vehicle adoption across the Region.

As the Region continues to grow, the way we move is expected to change but there will continue to be a role for the light-duty vehicle. Our goal is to ensure that the residents and businesses within Peel Region have the necessary resources and information to rapidly transition to zero-emission vehicles to continue on the road to a low carbon healthier community.

This Strategy comes at a critical time when we all must act on climate change. This is why all municipalities in the Region of Peel have declared climate emergencies, developed climate change plans and strategies, and have taken action to reduce GHG emissions.

On behalf of the Peel Climate Change Partnership, I'd like to thank all the organizations and community members that have contributed their time and effort to the development of this strategy.

We look forward to continued collaboration as we work in partnership to implement these actions.

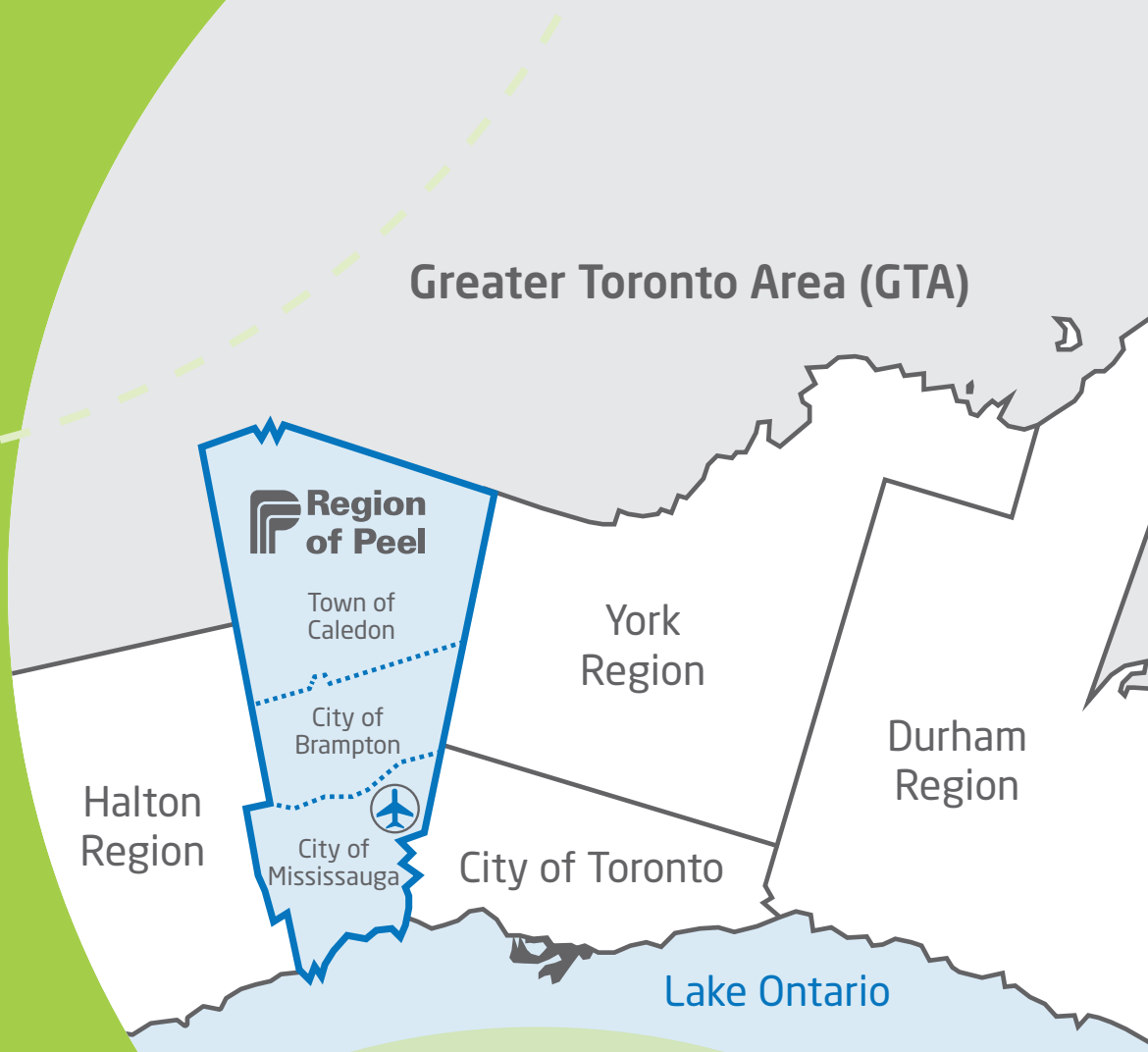
Jodi Robillos

Peel Climate Change Partnership Chair
Commissioner, Community Services
City of Mississauga

WHO WE ARE

The Regional Municipality of Peel is located in the Greater Toronto Area, just west of Toronto and hosts three lower tier municipalities: the City of Mississauga, the City of Brampton, and the Town of Caledon.

The Region serves over 1.5 million residents and approximately 175,000 businesses. Governing the area's watersheds are Credit Valley Conservation, and Toronto and Region Conservation Authority.



THE PEEL CLIMATE CHANGE PARTNERSHIP

Working together to address climate change

For more than 10 years, the Peel Climate Change Partnership (PCCP) has been building and accelerating innovative climate solutions in the geographic region of Peel. The PCCP leverages resources and expertise from six member organizations or PCCP Members: the Region of Peel, Town of Caledon, City of Brampton, City of Mississauga, Toronto and Region Conservation Authority and Credit Valley Conservation.

The PCCP embraces the opportunity to accelerate the outcomes of PCCP Members' climate change plans and pursues strategic actions that transcend political boundaries to collectively produce greater results.

The PCCP aims to:

- Reduce greenhouse gas (GHG) emissions in buildings and vehicles;
- be better prepared for extreme weather and climate change impacts; and
- measure, report and communicate progress towards achieving GHG emissions reduction targets and increasing resiliency.

The Peel Zero Emission Vehicle (ZEV) Strategy provides strategic actions for PCCP Members to support increasing the use of light-duty ZEVs across our community. By working together to implement a region-wide strategy, we are aiming to efficiently support residents and businesses to reduce GHG emissions and air pollution.

EXECUTIVE SUMMARY

Driving a Zero Emission Vehicle is one of the most impactful ways to help fight climate change and reduce air pollution, and municipalities have a key role to play in supporting their adoption.

Currently, transportation accounts for 35% of the Region's community GHG emissions.[1]

Developing this Strategy signals a commitment from the PCCP to work with all levels of government utilities, and community stakeholders to support Peel's transition to ZEVs.

COLLECTIVE GOALS

Reduce GHG emissions and air pollution

Improve business and resident knowledge on the costs and benefits of ZEVs

Increase ZEV driving experiences, availability, and ownership

Enhance planning processes and access to charging infrastructure

Promote local job creation and economic development

The Peel ZEV Strategy actions include five areas of focus that reflect the PCCP Members' role in increasing and supporting ZEV adoption throughout the region:

1. Expanding Access to Public EV Charging Stations
   - How to deploy ZEV charging stations equitably across the Region of Peel and ensure awareness of their locations.
2. Enhancing ZEV Education and Awareness
   - How to increase ZEV knowledge amongst Peel residents, businesses and PCCP staff.
3. Enhancing Private Investments into ZEVs and Charging Infrastructure
   - How municipal programs can support businesses and residents to purchase ZEVs and charging infrastructure.
4. Embedding ZEV Infrastructure Considerations in the Planning Process
   - How to enhance municipal policies and development standards for charging infrastructure and coordinating with local electric utilities on planning, programming and innovation.
5. Advocating, Implementing and Reporting Collectively
   - How to establish governance and partnerships to implement the Peel ZEV Strategy monitor progress, and best support the community.

Electric vehicles powered by low emissions electricity offer the largest decarbonization potential for land-based transport, on a life cycle basis.[2]

- Intergovernmental Panel on Climate Change (2022)

INTRODUCTION

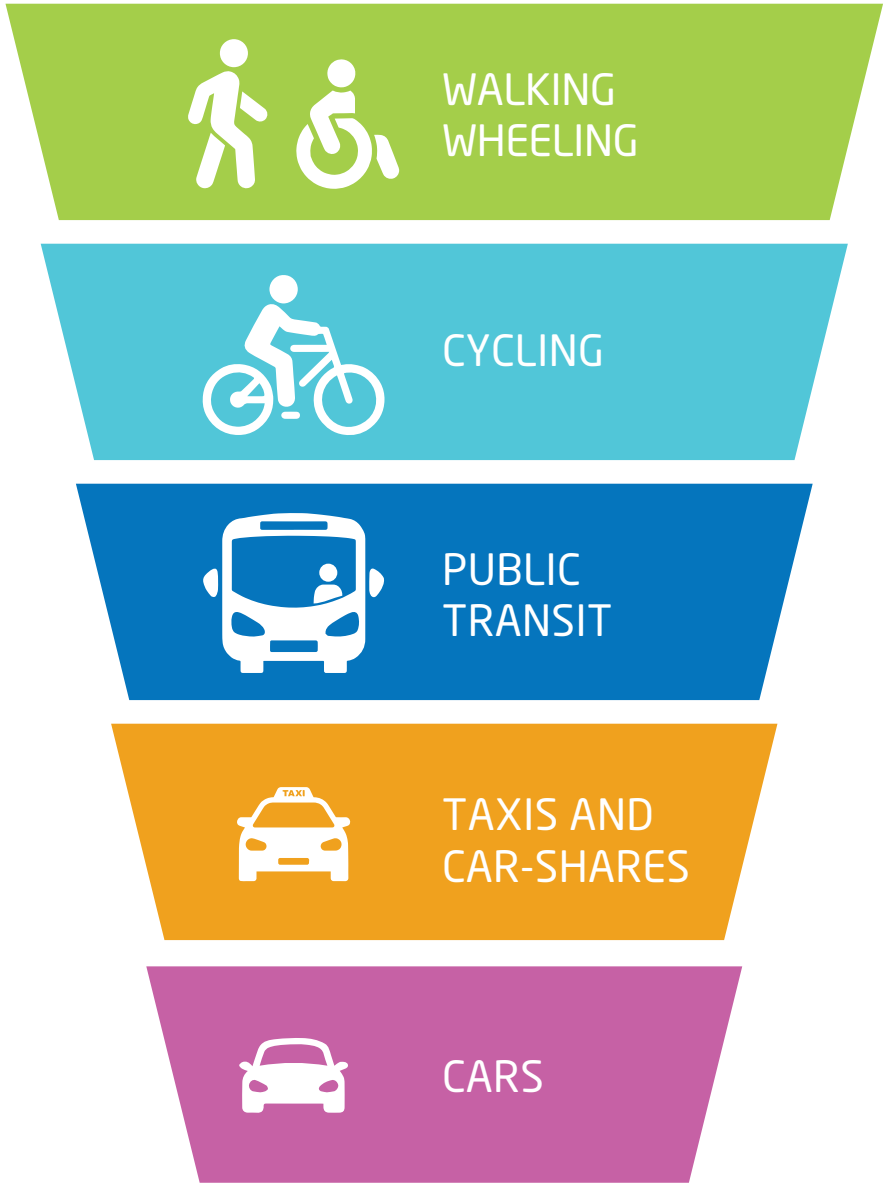
The Peel ZEV Strategy is a five year plan that identifies actions to accelerate ZEV uptake across the Region of Peel. With the population in the region expected to grow by 40% between now and 2050, transportation emissions can significantly increase.

Moving to ZEVs can help reduce GHG emissions, improve public health, advance equity, promote job growth and enhance energy security.

Municipalities are uniquely positioned as the closest level of government to the public and can be effective leaders in the transition to ZEVs.

RELATED PLANS AND STRATEGIES

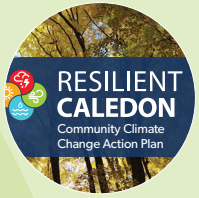
The ZEV Strategy aligns with existing municipal plans, policies and strategies that enable climate action and clean transportation in the community. ZEVs are only one component of the sustainable transportation hierarchy. Municipalities also have plans that focus on public transit, micro-mobility (e-bikes, e-scooters, e-skateboards) and active transportation (walking, wheeling and cycling). These plans support residents in transitioning to healthier and safer modes of travel, while connecting our communities. Passenger vehicles will continue to be an integral component of the region's diversifying transportation system and the ZEV Strategy will focus on converting these kilometres into low carbon kilometres.



RELATED MUNICIPAL PLANS AND STRATEGIES

Region of Peel working with you

TOWN OF CALEDON



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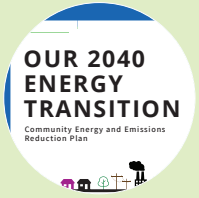

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SCOPE

This Strategy focuses on light-duty vehicles – cars, trucks and vans – owned by the general public and businesses, and the charging infrastructure to support these vehicles. Municipal fleet and transit vehicles have been excluded from the scope of this Strategy, as each partner has addressed corporately-managed vehicles through existing plans and commitments.

SUMMARY OF STRATEGY SCOPE
IN SCOPE
Light-duty class: cars, trucks and vans
Vehicles owned by general public and businesses
Charging infrastructure
NOT IN SCOPE
Freight and heavy-duty
Municipal fleet
Transit
Two-wheelers (e.g. motorcycles, scooters, etc.)
Hydrogen fuel cell vehicles

WHAT IS A ZEV?

Zero Emission Vehicles can produce no tailpipe emissions. They can have a conventional internal combustion engine, but can operate without using it. ZEVs include battery-electric (BEV), plug-in hybrid electric (PHEV), and hydrogen fuel cell (hydrogen is converted to electricity using a fuel cell).

- Transport Canada

WHERE WE ARE TODAY

Climate change is among the most pressing emergencies of our time. This is why all Peel municipalities have declared climate emergencies, developed climate change plans and strategies, and are taking action to reduce GHG emissions and build resilience.

While each municipality is unique, there is a clear need for a unified effort to reduce emissions from the transportation sector. The electrification of light-duty vehicles presents a significant opportunity and will be imperative to meet near-term targets from our local climate action plans and long-term net-zero goals.[3]

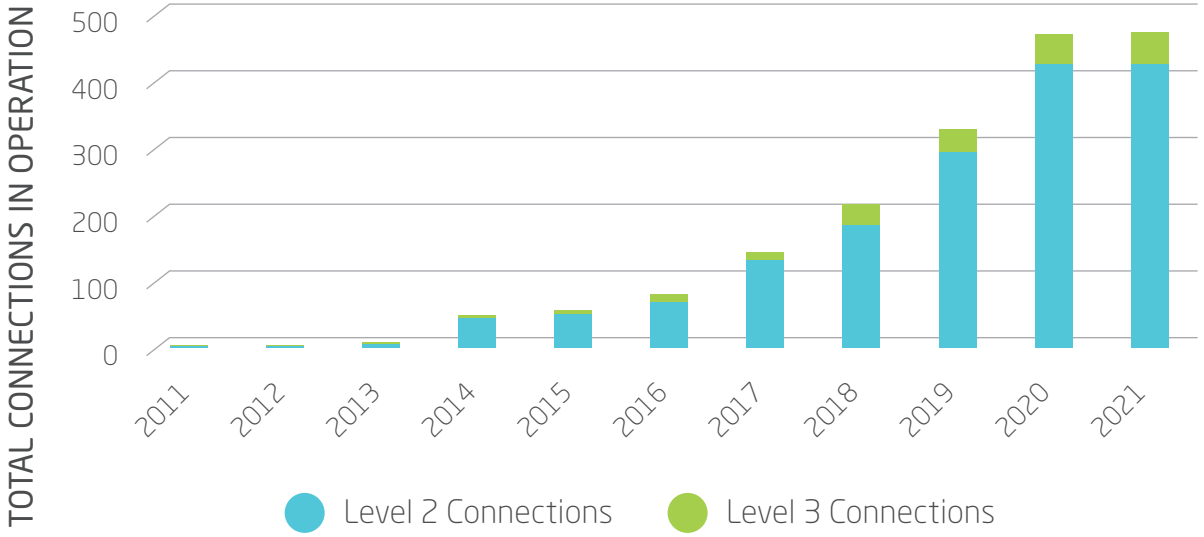
Access to public charging infrastructure is critical for ZEV market growth across the region.

To date, the PCCP Members have installed 129 publicly accessible chargers, including eight Level 3 Fast Chargers.

While the region is home to over 450 public charging connections, significant investments in additional infrastructure are needed to serve over 1.5 million residents in a meaningful shift to ZEVs.

Identifying equity gaps in the location of EV charging infrastructure and other strategic locations will support a more equitable transition to ZEVs.

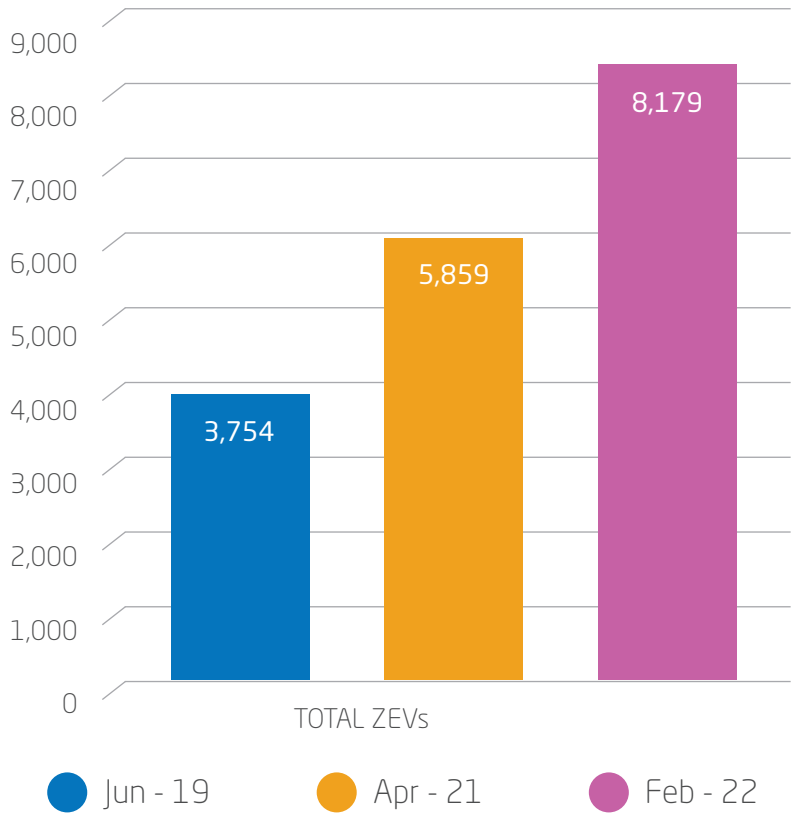
FIGURE 1:
Peel Region Public Electric Vehicle Charging Connections

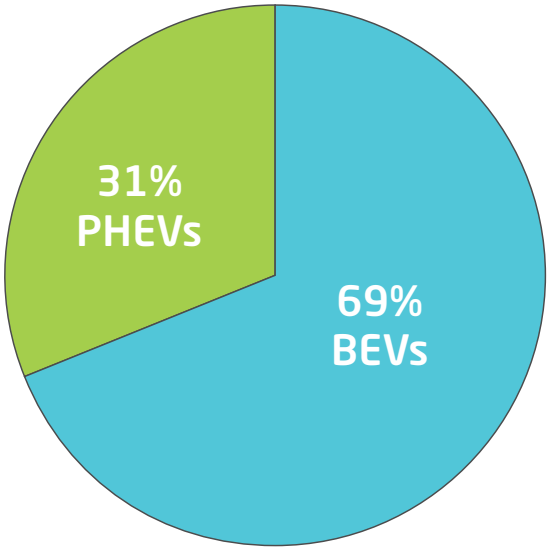


Plug-in hybrid and battery electric vehicle ownership in the Region of Peel is growing rapidly. The Region has seen a 40% increase in ZEV registrations in just 10 months.

TOTAL ZEV VEHICLE GROWTH

June 2019, April 2021, and February 2022





BATTERY ELECTRIC VEHICLES (BEVS):

Powered exclusively by electricity and must be plugged in to charge.

PLUG-IN HYBRID VEHICLES (PHEVS):

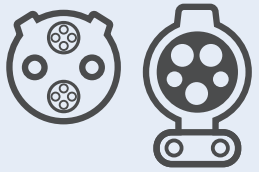
Can be fuelled with both gasoline and electricity and can be plugged into charge.

Over 8,000 ZEVs registered in Peel Region as of February 2022.

TYPES OF CHARGERS

ZEVs recharge their batteries using electricity provided by charging stations. There are three 'Levels' of charging stations reflecting power output and the speed at which a battery can be charged.

LEVELS OF CHARGING

	LEVEL 1 TRICKLE CHARGING	LEVEL 2 MEDIUM CHARGING	LEVEL 3 FAST CHARGING
Where charging happens	Overnight at home	Home, workplaces, public and commercial destinations	Public and commercial destinations, fueling stations, traffic corridors
Power Delivery	1 - 1.4 kilowatts (kW)	3.9 - 19.2 kilowatts (kW)	24 - 350 kilowatts (kW)
Driving range added	5 - 8 km per hour	20 - 130 km per hour	2 - 28 km per minute
Time to Charge 60 kWh EV *(from 10% to 80% battery charge)*	30 - 40 hours	2 - 10 hours	8 minutes - 2 hours
Charging Connectors Used	 J1772 connector plugged into standard 120V outlet	 J1772 connector	 CHAdeMO SAE Combo CCS

GOALS AND OBJECTIVES

The Peel ZEV Strategy supports the Federal sales mandate to ensure at least 20% of new light-duty vehicle sales will be ZEVs by 2026, at least 60% by 2030, and 100% by 2035[4].

The Peel ZEV Strategy aims to:

- Reduce GHG emissions and air pollution from the transportation sector;
- Improve business and resident knowledge on the benefits and costs of ZEVs;
- Increase ZEV driving experiences, availability, and ownership;
- Enhance planning processes and access to charging infrastructure;
- Promote local job creation and economic development.

DEVELOPING THE STRATEGY

The Peel ZEV Strategy was developed through community surveys, technical research and extensive consultations.

COMMUNITY SURVEYS

An online and telephone survey was conducted to better understand Peel Region residents and business' attitudes towards ZEVs, their appetite for using ZEVs, and to determine potential steps by municipalities to accelerate the transition to ZEVs. A total of 541 Region of Peel residents and 33 companies with facilities located in Peel were surveyed.

BEST PRACTICE ACTION RESEARCH

An extensive list of potential ZEV Strategy actions was developed through a best practice research scan of similar municipal plans in Ontario, and more broadly throughout Canada and internationally.

STAKEHOLDER FEEDBACK

Meetings were held across the departments of PCCP Members that have a role in the ZEV Strategy. Stakeholders were provided with an opportunity to comment on the ZEV Strategy actions, including representatives from the Government of Canada, Province of Ontario, Plug'n Drive, local electric utilities, the Peel Climate Change Partnership, the Clean Air Partnership, the Atmospheric Fund, and the EV Society.

RESEARCH STUDIES*

ZEV UPTAKE SCENARIOS

This research study investigated the region and neighbourhood-specific ZEV uptake scenarios for the Region of Peel for 2021, 2026 and 2035. The results of this analysis provided insight into the scale of uptake of ZEVs in the Region of Peel and the factors that have the biggest impact to grow/advance ZEV uptake.

GRID IMPACT MODEL

The results of the ZEV uptake scenarios were used to estimate electricity demand throughout the Region of Peel due to ZEVs; assess the capacity on the local electricity grid; and to determine where areas of high demand may occur. The results of this analysis are helpful to ensure the electrical grid has sufficient capacity to support charging infrastructure, and were provided and discussed with local electric utilities.

SOCIOECONOMIC IMPACT ANALYSIS

The third research study assessed potential job creation in the Region of Peel as a result of increased ZEV uptake. The study considered the large cluster of automotive suppliers in the region and jobs that can be created for battery/vehicle design and manufacturing; sales, maintenance and after-sales service; as well as research and development.

HEALTH IMPACTS, CLIMATE CHANGE AND TOTAL COST OF OWNERSHIP

This study evaluated existing research on the impact ZEVs have in improving human health, reducing GHG emissions, and increasing financial benefits to ZEV owners.

*Research studies available on request.

WHY THE TRANSITION TO ZEVS IS MORE IMPORTANT NOW THAN EVER

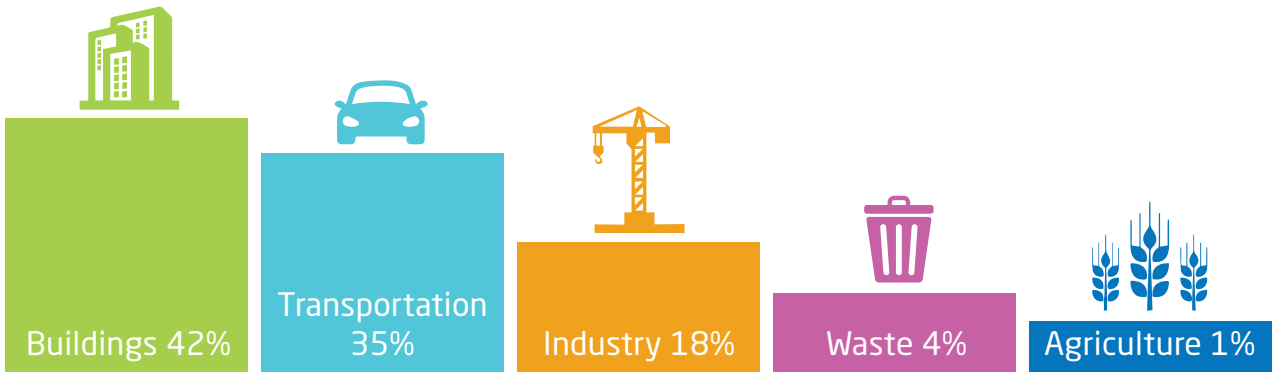
THE IMPACTS OF A CHANGING CLIMATE

Over the next 100 years, it is expected that the average temperature in Ontario will rise by 3 to 8°C due to human-caused climate change without significant intervention.[5] The frequency of extreme weather will also increase. Along with these consequences comes new health implications for residents, as well as impacts on our local ecosystems and economy. Without mitigation measures to minimize the effects of climate change, we expect significant economic impacts to the region, municipal assets and direct impacts to residents and local businesses.

We are already seeing the impacts of climate change. The latest research indicates that human influence has warmed the planet, resulting in widespread changes such as extreme heat, rising sea levels and more severe storms. In fact, the speed of warming has increased, with changes irreversible from centuries to millennia. However, we can limit climate change by increasing efforts to reduce GHG emissions. There is still a path forward, but that pathway is narrowing. Large-scale action is required now to slow climate change, and reduce the human health, environmental, social and economic impacts.

A switch to ZEVs will significantly decrease transportation related GHG emissions and support broader global efforts to mitigate the impacts of climate change.

PEEL REGION 2020 GHG INVENTORY[6]



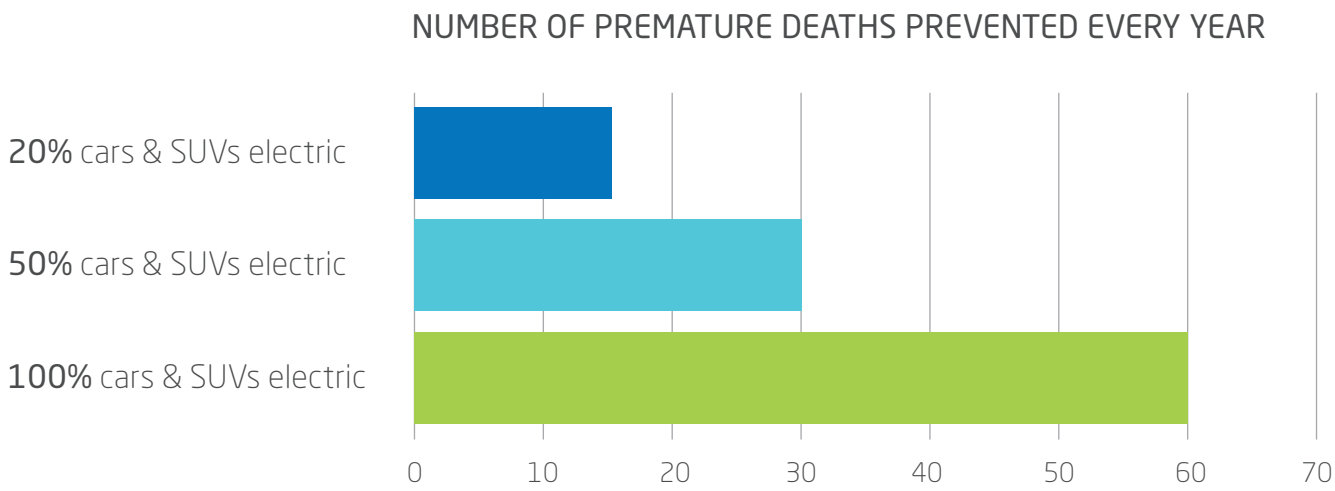
ZEVs emit significantly lower lifetime GHG emissions than gas and diesel vehilces. This is especially true in Ontario where the vast majority of electricity is generated from low carbon sources. Maintaining access to clean electricity is crucial for ZEVs to address the climate emergency. Reductions in carbon emissions between an internal combustion and battery electric vehicles are drastic; lifetime emissions of ZEVs are less than 30% compared to internal combustion vehicles.

IMPROVEMENTS TO HUMAN HEALTH

Exhaust pollution negatively impacts human health contributing to heart and lung conditions, chronic health conditions, hospitalization and premature death.

ZEVs address both direct and indirect health impacts because they can operate without exhaust and produce significantly lower GHG emissions. Adopting ZEVs widely is expected to prevent 60 premature deaths each year in Peel Region and reduce hospitalizations related to poor air quality.[6]

FIGURE 2:
Preventable Deaths in Peel Region[6]



STIMULATING THE LOCAL ECONOMY

Peel Region and surrounding area is home to large automotive suppliers and a talented workforce with local training programs, making it well positioned to support ZEV manufacturing, and boost the local economy. As a logistics hub, Peel is the ideal location to support the automotive sector by making it easy for companies to interact and establish supply chains.

At a global level, the employment implications of electrification are expected to be minimal with some sector-specific gains and losses. Jobs in Canada's EV industry are expected to increase twenty-six fold by the end of this decade if measures outlined in Canada's A Healthy Environment and a Healthy Economy plan are implemented.[7] Ontario's Government has set a goal to build at least 400,000 electric and hybrid vehicles in Ontario by 2030. A move towards the electrification of light-duty vehicles has the potential to significantly stimulate the local economy.

THE APPETITE AND KNOWLEDGE FOR ZEVs IN OUR LOCAL COMMUNITY

A survey was conducted to understand residents' attitudes toward ZEVs, their appetite for uptake, and potential motivations and barriers to making the transition to ZEVs. Results show most residents recognize the environmental and climate change benefits from making the switch. There is an interest from some residents in purchasing a ZEV in the next five years (22%), however, further uptake was hindered by cost, a lack of charging stations, and limited knowledge of the technology.

The vast majority of surveyed residents would like to see Peel municipalities help accelerate the adoption of ZEVs.

THE BARRIERS

Ontario's current ZEV registrations lag below the national average. In 2021, ZEVs made up only 3.3% of the province's new vehicle registrations[8]. There are some common challenges to increasing the adoption of ZEVs. While ZEV ownership is on the rise across Canada, the barriers described in this section have slowed the rate of growth required to wide-scale ZEV adoption.

LACK OF ZEV AVAILABILITY AT DEALERSHIPS

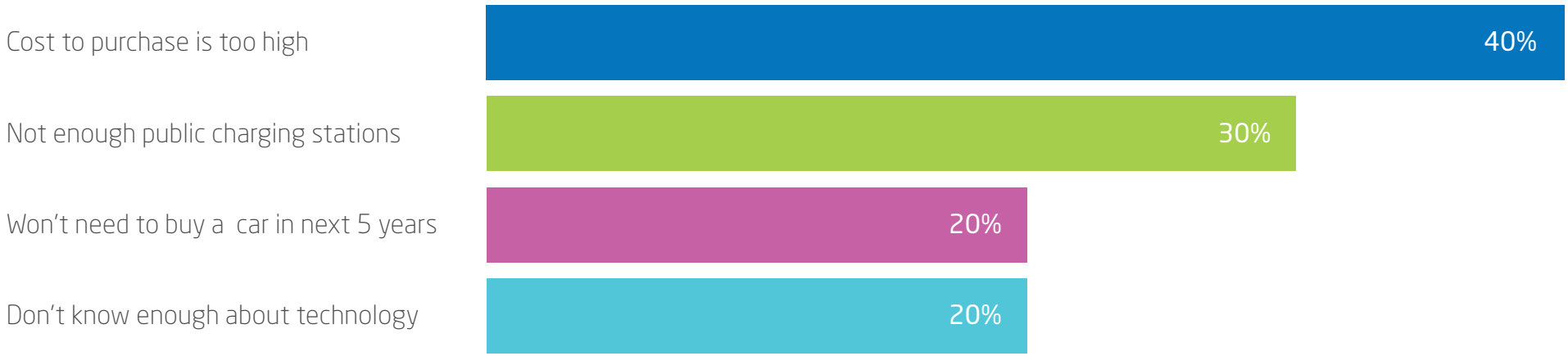
The majority of dealerships in Canada have limited or no availability of ZEVs in stock. While inventory levels are slowly increasing, many shoppers are not able to find an in-stock ZEV. Ontario has at least one ZEV in 41% of dealerships, but only 6% have five or more[10].

Long wait times for vehicle delivery are an additional barrier. A third of Ontarian's wait three to six months for their ZEV, and only 6% receive theirs within less than one month[11]. Although COVID-19 may have impacted ZEV availability, the majority of the dealerships do not see the pandemic as the main factor for wait times.

PERCEIVED COSTS OF ZEVS

While ZEVs may have a higher upfront price, the operating costs of the vehicle (e.g. fuel and maintenance) are much lower than internal combustion engine vehicles. Overall, battery electric vehicles are estimated to save consumers about 60% on fuel costs compared to the average vehicle in their class, according to a 2020 study conducted by Consumer Reports. With increasing fuel prices, the operational savings only increase.[12] **Retail costs for ZEVs are anticipated to reach price parity with gas and diesel vehicles by the middle of this decade.** It is paramount for residents to understand the financial benefits of driving a ZEV.

FIGURE 3:
Top Reasons Peel Survey Respondents are Unlikely to Purchase a ZEV



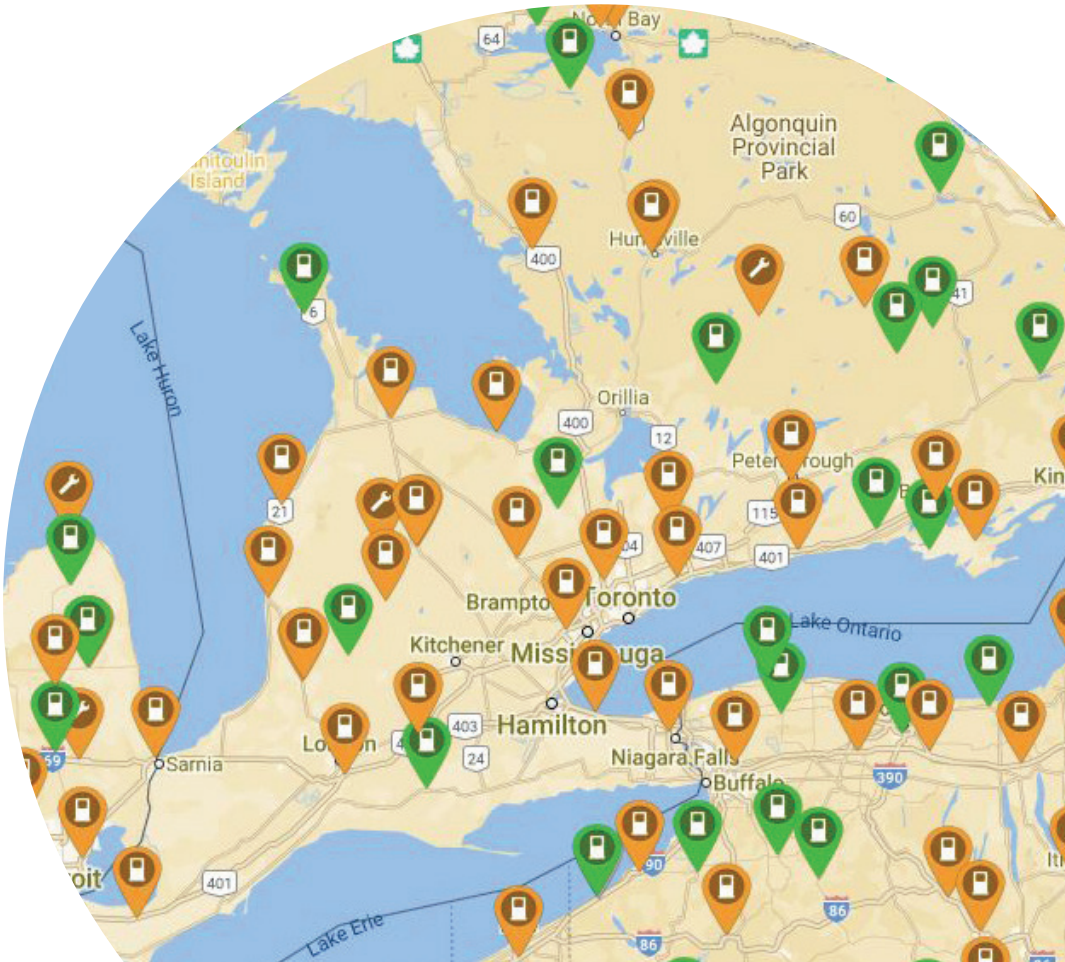
RANGE ANXIETY AND CHARGING INFRASTRUCTURE AVAILABILITY

Many non-ZEV owners are concerned about accessing public charging. ZEV drivers tend to recharge daily or once every two days, typically overnight at home, and overall, about 70-80% of charging occurs at home or at a workplace parking lot[13]. Charging at home is a notable challenge for residents who live in apartments or condos without charging stations.

ZEV range is also a concern on long distance trips because it may be difficult to find an en route place to charge, especially when leaving an urban area. One of the most commonly cited barriers to EV adoption is a perceived drawback due to range or the fear of running out of electricity, also called "range anxiety."[14] According to the International Energy Agency, the average range of EVs are increasing, from 211km on average for 2015 models to 338km on average for 2020 models[15]. However, EVs have a reduced range or performance in colder climates, meaning that charging infrastructure must be even more visible and accessible.

ONTARIO BUILDING CODE CHANGES

In 2018, the Ontario Building Code removed ZEV charging infrastructure requirements, making it challenging for municipalities to require ZEV charging in new developments. Peel municipalities are in the process of amending their parking bylaws and have passed Green Development Standards to advance ZEV-ready requirements in new developments.



Fast charging infrastructure in the GTHA

THE OPPORTUNITIES

The ZEV market is evolving quickly and is moving beyond the early adopters. Support from the Federal and Provincial government, increasing access to charging infrastructure and ZEV model availability, low overnight electricity rates and dedicated education and outreach organizations all contribute to increasing ZEV adoption.

PCCP Members Unveil ZEVIP Funded EV Chargers (Caledon, 2020)

Since 2019, the Peel Climate Change Partnership has secured $1.177 million through the Natural Resources Canada's Zero Emission Vehicle Infrastructure Program to support the installation of 192 public and fleet EV chargers, including five Level 3 public DC Fast Chargers.

FEDERAL SUPPORT

The Government of Canada has set a mandatory target for all new light-duty cars and passenger trucks to be zero-emission by 2035. Two funding programs have been established by the Federal Government to support this mandate. The Zero Emission Vehicle Infrastructure Program (ZEVIP) offers funding to address the lack of charging and refuelling stations in Canada. The Federal Government also provides incentives for the purchase of ZEVs through its incentives for Zero Emission Vehicles Program (iZEV) by offering point-of-sale incentives for consumers who buy or lease a ZEV vehicle of up to $5,000.

PROVINCIAL SUPPORT

The Province has established several programs to support the transition to ZEVs. The Province provides green licence plates for eligible low-carbon vehicles in high occupancy vehicle (HOV) lanes with any number of occupants and high occupancy toll (HOT) lanes on 400-series highways and the QEW at no cost. The Province amended The Highway Traffic Act by adding the Reserved Parking for Electric Vehicle Charging Act. This Act allows tickets to be issued for two reasons: parking a non-electric vehicle in a designated EV charging space, and for parking an EV that is not plugged in. The Province also invested $56.4 million to create the Ontario Vehicle Innovation Network (OVIN) to accelerate the development of next generation electric, connected and autonomous vehicle and mobility technologies, as well as supporting Ontario's role as a manufacturing hub.

DEDICATED EV ORGANIZATIONS

Non-profit organizations such as Plug'n Drive and the EV Society enhance consumer education and awareness about ZEVs, providing educational events such as pop-up test drives. Plug'n Drive also offers a Used Electric Vehicle Incentive of $1,000 toward the purchase of a used fully electric vehicle and has a Discovery Centre with EV models available to test drive.

ONTARIO'S ELECTRICITY GRID

Local distribution companies in Ontario have time of use pricing, where the price depends on when you use electricity. Off-peak pricing offers the lowest cost electricity and occurs when demand for electricity is lowest, providing incentives for ZEV owners to charge their vehicles in the evening and overnight. Off-peak demand consumption in Ontario is also when the electricity grid emits the lowest GHG emissions. The province has announced plans for an ultra-low overnight electricity rate. The new rate, if adopted, can result in energy savings for residents while also creating a potential capacity cost savings for the electricity system. At the same time the new rate will support electric vehicle (EV) adoption by decreasing overnight charging costs when province-wide electricity demand is lower.[17] Transitioning to ZEVs also increases energy security in Ontario, as internal combustion engines are powered by oil that comes from outside of the Province and is subject to higher levels of volatility globally. The transmission and distribution of electricity is maintained in Ontario and can have economic advantages to using a locally distributed resource.

ZEV MODEL AVAILABILITY

The variety of ZEVs has been steadily increasing. 370 electric car models were available worldwide in 2020, a 40% increase from 2019[16]. As of 2021, there are 66 models of ZEV models available in Canada. While supply chain challenges have created a global shortage of vehicles in the short term, the range of ZEV models is expected to continue to increase.

INCREASED ACCESS TO ZEV CHARGING

EV charging infrastructure is continuously being installed throughout Ontario, including the recent deployment of charging infrastructure along ONRoute locations such as highways 401 and 400. The PCCP pursues opportunities to collaborate on Federal ZEVIP grant applications to install more EV charging stations throughout the region.

MAKING ACCESS TO ZEVs EQUITABLE

Everyone should have access to ZEVs

We need to make decisions that are inclusive; to ensure fair and equitable implementation of a program or policy. The Region of Peel's 20-year Vision for Peel is "Community for Life," where everyone enjoys a sense of belonging and has access to all the services and opportunities they need to thrive throughout their life.

The PCCP plays an important role in promoting equitable access and affordability for electric mobility. We recognize there are equity issues associated with ZEVs and the policies and programs designed to support ZEV adoption.

Residents in the region may face challenges that include:

- The inability to afford home EV charging infrastructure;
- The inability to install EV charging infrastructure at an apartment or rental property;
- Less access to public EV charging infrastructure because stations are not equitably dispersed throughout the community;
- Having a smaller budget for a vehicle purchase;
- EV incentives are often after the point of sale, rather than at the time of purchase, making it difficult for people who do not have the funds at the time of sale to take advantage of these savings; and
- Educational information on ZEVs and their benefits may not be available in a resident's primary language.

These factors make ZEV ownership more challenging for some residents and policies are needed to address these inequities. The PCCP will examine these challenges in its ZEV Strategy actions and throughout implementation, for example by designing programs that are inclusive and allow the economic benefits of vehicle electrification to be shared across a wider cross-section of people and pursuing equitable access to EV charging.[18]

Low-income households can benefit from ZEVs because lower maintenance and fuel costs reduce the strain on household budgets.

HOW WE WILL ACCELERATE THE TRANSITION TO ZEVS

TAKING ACTION

The ZEV Strategy focuses on five areas that reflect PCCP Members' role in enhancing ZEV adoption throughout the region by:

- Expanding Access to Public EV Charging Stations
- Enhancing ZEV Education and Awareness
- Enhancing Private Investments into ZEVs and Charging Infrastructure
- Embedding ZEV Infrastructure Considerations in the Planning Process
- Advocating, Implementing and Reporting Collectively

PCCP Members include staff from the Region of Peel, Cities of Mississauga and Brampton, Town of Caledon, Toronto and Region Conservation Authority and Credit Valley Conservation. Where PCCP Members are listed as an implementation lead, it means the action is within scope of each member and there is an opportunity to implement an action collectively. The scale of implementation of all actions will be self-determined by each member.

Each action includes the implementation timeframe within the five-year scope of the Strategy and estimated costs:

ACTION TIMEFRAME DESCRIPTION	
TIMEFRAME	DESCRIPTION
Ongoing	Action will continue to be implemented
Immediate	Action is currently being completed
Short-term	1-2 years (2022 – 2024)
Medium-term	3-4 years (2025 – 2026)
Long-term	5 years (2027)

ESTIMATED ACTION COST DESCRIPTION	
SYMBOL	ESTIMATED COST*
$	$100,000 or less
$$	$100,000 - $1,000,000
$$$	$1,000,000 - $10,000,000+

*Costs do not include the offset of potential grant funding opportunities.

EXPANDING ACCESS TO PUBLIC ZEV CHARGING STATIONS

Actions in this section focus on supporting sufficient and equitable access to charging stations, and enhancing awareness of their locations.

Why is this important?

A perceived lack of public charging stations is one of the highest ranked barriers for residents to consider when purchasing a ZEV in the region.[19] About two thirds of residents support installing publicly-accessible charging infrastructure at municipal facilities.[20] Enhancing awareness on charging locations and promoting consistent availability across the community is essential for a fair transition to electric vehicles.

Progress will be evaluated by mapping the distribution and tracking the number of ZEVs and charging stations across the region.

EXPANDING ACCESS TO PUBLIC EV CHARGING STATION ACTIONS					
#	SUB-ACTION	TIMEFRAME	IMPLEMENTATION LEAD AND POTENTIAL KEY STAKEHOLDERS	ESTIMATED COST	POTENTIAL IMPLEMENTATION TOOLS
1.0 EXPAND ACCESS TO PUBLIC EV CHARGING STATIONS					
1.1	Enable the installation of public charging stations at municipal-owned facilities and conservation authority lands *(e.g. libraries, community centres, arenas, parking lots, destination parks conservation areas)*	Immediate and Ongoing	• PCCP Members	$$ - $$$	• Grant programs for charging infrastructure (e.g. NRCan, The Atmospheric Fund (TAF), Alectra) • Green Building Standards • Public private partnerships
1.2	Develop a methodology to guide charging infrastructure distribution throughout the community using an equity lens	Short-term	• PCCP Members • Equity diversity and inclusion community groups • Clean Air Partnership • Utilities	$	• Green Vehicle registration mapping • A mechanism for the public to provide input into EV charging station locations
1.3	Install and explore standardizing wayfinding signage for ZEV charging stations	Short-term and Ongoing	• PCCP Members • Ministry of Transportation	$	• Provincial Tourism Oriented Directional Signage (TODS) platform • Destination/tourism and other maps such as trails and cycling routes

ENHANCING ZEV EDUCATION AND AWARENESS

Actions in this section aim to increase ZEV knowledge amongst Peel residents, businesses, and PCCP members.

Why is this important?

The majority of Peel residents believe driving a ZEV will lead to environmental benefits and help address climate change; however most have moderate-to-low levels of knowledge about many aspects of ZEVs. Less than 20% are highly knowledgeable on how to charge a ZEV, the ZEV benefits vs. combustion engines, and the costs to purchase a ZEV. Only 1 in 10 have a good understanding of routine maintenance costs and available rebates, which can be linked to high vehicle costs being the primary barrier to purchasing a ZEV. 45% of surveyed residents support the municipal role in providing education on ZEV benefits and availability.

Peel region's business community expressed a lack of knowledge on the types of ZEVs available. They also have minimal understanding on the charging infrastructure, including project experience, costs and managing station use. About 40% of businesses are in favour of municipal support to make education and guidance resources available.

The majority of residents who have driven a ZEV are highly satisfied with their experience. 85% of survey respondents indicate they will be in the market for a new vehicle in the next five years, facilitating a ZEV driving experience will be an effective approach to encourage uptake.

Progress will be measured by re-conducting community and staff surveys to measure changes in their understanding of ZEV technologies, programs and policies.

ENHANCING ZEV EDUCATION AND AWARENESS ACTIONS					
#	SUB-ACTION	TIMEFRAME	IMPLEMENTATION LEAD AND POTENTIAL KEY STAKEHOLDERS	ESTIMATED COST	POTENTIAL IMPLEMENTATION TOOLS
2.0 EDUCATE AND RAISE AWARENESS ON THE BENEFITS OF ZEVS					
2.1	Brand ZEV fleet vehicles owned by PCCP members	Immediate and Ongoing	• PCCP Members	$	• Regional/municipal fleet vehicles
2.2	Work with auto industry, not-for-profits, and utilities to provide ZEV test drives, raise awareness and ensure ZEV availability across the community	Short-term and Ongoing	• PCCP Members • Plug'n Drive • EV Society • Auto industry and car dealerships • Utilities	$-$$	• Existing municipal-led and other local events • Grant programs for ZEV Education (e.g. NRCan - Zero Emission Vehicle Awareness Initiative)
2.3	Educate municipal staff, residents and businesses about federal mandates and targets, incentive programs, ZEV charging and parking locations and the benefits of ZEVs *(health, cost, environment, etc.)*	Short-term and Ongoing	• PCCP Members • Plug'n Drive • Toronto and Region Conservation Authority (SNAP, PPG) • EV Society • Utilities	$	• Return on Investment tools • EV charging retrofit guides • Existing programs such as SNAPs, Vision Zero, EcoSchools, and GreenBiz • Regional and municipal social media platforms • PCCP website and webinars • Resident and business surveys • Real Estate listings

ENHANCING PRIVATE INVESTMENT IN ZEVs AND CHARGING INFRASTRUCTURE

Actions in this section focus on municipal programs to support businesses and residents in purchasing ZEVs and charging infrastructure.

Why is this important?

For property owners, developers and managers in the Region of Peel, the greatest motivation to invest in ZEV chargers is to stay ahead of the curve as requests from tenants, employees, and customers continue to rise. Fleet operators are motivated to transition to ZEVs to reduce air pollution, GHG emissions and fuel costs. Concerns about ZEV driving range remains a top-of-mind barrier for light-duty fleet electrification. Overall, the greatest barrier for businesses in the region to accelerate ZEV uptake is high costs for chargers and vehicles.

Approximately 40% of surveyed residents are unsure if a ZEV is the right option for their next vehicle[21] due to high costs and a lack of charging stations. Nearly half of surveyed residents support municipalities working with electric utilities to make it easier to install charging stations in homes.

Progress will be measured by the uptake in the programs described in this section.

ENHANCING PRIVATE INVESTMENT IN ZEVS AND CHARGING INFRASTRUCTURE ACTIONS					
#	SUB-ACTION	TIMEFRAME	IMPLEMENTATION LEAD AND POTENTIAL KEY STAKEHOLDERS	ESTIMATED COST	POTENTIAL IMPLEMENTATION TOOLS
3.0 ENCOURAGE BUSINESSES TO ELECTRIFY FLEETS AND INSTALL CHARGING INFRASTRUCTURE					
3.1	Explore financial and non-financial incentives for ZEV charging stations and fleet for the commercial/industrial sector	Ongoing (Caledon) / Medium-term	• Town of Caledon • City of Mississauga • City of Brampton	$$ - $$$	• Community Improvement Plans • Development charge discounts • Business and vehicle license fees or rebates
4.0 ENCOURAGE RESIDENTS TO PURCHASE ZEVS					
4.1	Evaluate ZEV charging infrastructure as an eligible measure in home energy retrofit programs	Short-term	• City of Brampton • City of Mississauga • Town of Caledon	$$ - $$$	• Local improvement charges (LIC) or property assessed clean energy programs (PACE)

EMBEDDING ZEV INFRASTRUCTURE CONSIDERATIONS IN THE PLANNING PROCESS

Actions in this section focus on enhancing municipal policies and development standards for charging infrastructure, as well as coordinating with local electric utilities on planning, programming, and innovation.

Why is this important?

Increasing public and active transportation are priorities in the Region of Peel, but cars will continue to have a significant presence on our roadways. Currently, municipal plans call for electric vehicle charging infrastructure in new community areas and in parking and zoning by-law updates.[22]

Installing charging stations in existing residential buildings is more costly and complicated than implementing ZEV ready parking in new construction.[23] 45% of Peel residents support requiring new buildings to be ZEV charging ready. Access to a home charger is a critical factor in determining household ZEV adoption[24] as the large majority of charging currently occurs at drivers' homes.[25]

As ZEV uptake is set to accelerate, electricity demand and use in the community is sure to follow. With today's typical vehicle charging rates and trends, the majority of connected residential customers can adopt ZEVs without exceeding local transformer capacities.[26] However, as vehicles with longer driving ranges and bigger batteries become available, customers seeking faster and higher-powered home chargers can cause significant electricity grid constraints.

Monitoring ZEV uptake and working closely with the local electric utilities is crucial to ensure a smooth transition. Key planning exercises to collaborate on include locating infrastructure and demand management on a neighbourhood scale.

Progress will be demonstrated by ZEV uptake being a consistently communicated municipal goal, the application of new by-laws and development standards, and ongoing collaboration with electric utilities.

EMBEDDING ZEV INFRASTRUCTURE CONSIDERATIONS IN PLANNING PROCESSES ACTIONS					
#	SUB-ACTION	TIMEFRAME	IMPLEMENTATION LEAD AND POTENTIAL KEY STAKEHOLDERS	ESTIMATED COST	POTENTIAL IMPLEMENTATION TOOLS
5.0 REQUIRE EV READY PARKING					
5.1	Include ZEV ready parking requirements for new developments	Short-term	• City of Brampton • City of Mississauga • Town of Caledon • Clean Air Partnership	$	• Green Development Standards • Official Plans • Parking and Zoning Bylaws • Site Plan and Pre-Development Meetings
5.2	Amend municipal by-laws to enforce violations for improper parking in designated EV charging station spaces on municipal properties	Short-term	• City of Brampton • City of Mississauga • Town of Caledon	$	• Reserved Parking for Electric Vehicle Charging Act, 2019, S.O. 2019, c. 18 – Bill 123 • Administrative Penalty By-Law
5.3	Explore municipal on-street ZEV charging infrastructure requirements in high density areas *(e.g. at select mixed-use developments, business improvement areas and tourist locations)*	Long-term	• City of Brampton • City of Mississauga • Town of Caledon • Utilities	$$-$$$	• Capital Planning (e.g. major roadway projects) • Grant programs for charging infrastructure (NRCan, TAF, Alectra)

EMBEDDING ZEV INFRASTRUCTURE CONSIDERATIONS IN PLANNING PROCESSES ACTIONS					
#	SUB-ACTION	TIMEFRAME	IMPLEMENTATION LEAD AND POTENTIAL KEY STAKEHOLDERS	ESTIMATED COST	POTENTIAL IMPLEMENTATION TOOLS
6.0 ENSURE ZEVS ARE FACTORED IN LONG-TERM PLANNING					
6.1	Include language to encourage ZEV uptake and charging infrastructure deployment in municipal plans and policies	Immediate and Ongoing	• City of Brampton • City of Mississauga • Town of Caledon • Region of Peel	$	• Official Plans • Transportation Master Plans • Climate Change Plans • Zoning by-Laws and parking standards • Urban Design Guidelines • Long Range Transportation Plan • Goods Movement Strategy • Asset Management Plans
6.2	Provide ZEV mapping and charging infrastructure guidance documents to municipal planners to encourage ZEV ready development	Short-term	• PCCP Members • Plug'n Drive • Clean Air Partnership	$	• Green Development Standards • Pre-consultation meetings with Developers • Green Vehicle registration mapping
6.3	Work with electric utilities to inform planning for ZEV charging infrastructure readiness across the community, and explore opportunities for pilot projects focused on electricity demand management and vehicle-to-grid technologies	Short-term and Ongoing	• PCCP Members • Utilities • IESO	$-$$	• Alectra Value Framework • Community ZEV Adoption Modeling • Regional Infrastructure Planning Meetings

ADVOCATING, IMPLEMENTING AND REPORTING COLLECTIVELY

Actions in this section focus on continued partnerships to implement the ZEV Strategy, and advocating on the PCCP Members' needs to achieve Federal ZEV sales targets.

Why is this important?

ZEVs, the charging ecosystem and driver behaviours are rapidly evolving. Over the next five years, it will be important to monitor community uptake and challenges, adjust workplans and tactics, and support Peel Region's residents by advocating to higher levels of government for needed policies and programs.

Climate change cannot be addressed by one body or level of government. It requires coordinated and collective action to have a significant and sustainable impact. Implementing the ZEV Strategy actions will require strategic oversight, resource allocation and partnerships. PCCP Members are committed to coordinate ZEV adoption efforts within the community, but achieving ambitious Federal ZEV sales targets will require collaboration with a variety of stakeholders – school boards, utilities, public transit authorities, EV societies, environmental advocacy groups, innovation centres, auto manufacturers and dealerships, and large fleet operators – to name a few. Going forward, the PCCP Members will continue to build long-term relationships with community stakeholders to take actions that establish Peel Region as national leader in ZEV adoption.

Progress will be measured by collective advocacy positions and reporting ongoing achievements from implementing the ZEV Strategy.

ADVOCATING, IMPLEMENTING AND REPORTING COLLECTIVELY ACTIONS					
#	SUB-ACTION	TIMEFRAME	IMPLEMENTATION LEAD AND POTENTIAL KEY STAKEHOLDERS	ESTIMATED COST	POTENTIAL IMPLEMENTATION TOOLS
7.0 FORM A PCCP MEMBER WORKING GROUP TO IMPLEMENT AND REPORT ON ZEV STRATEGY ACTIONS					
7.1	Work together to implement ZEV Strategy actions and monitor and report progress on implementation	Short-term	• PCCP Members • Utilities • Auto Industry and Dealerships	$	• Resident and business surveys • EV charging infrastructure usage data • Green vehicle license plate registration data • Electric charging and alternative fueling stations locator • Annual reports on municipal climate change action plans
8.0 ADVOCATE TO ENABLE ZEV ADVANCEMENT					
8.1	Advocate for: • building code updates; • municipal authority to require EV charging readiness; *(e.g. fast-charging infrastructure requirements, MURB charging infrastructure requirements)* • appropriate policies and regulations; • vehicle availability; and, • utility rates and incentives, and a low emissions electricity grid to support ZEV uptake; *(e.g. incentives for low-income earners)*	Immediate and Ongoing	• PCCP Members • Clean Air Partnership • Utilities • Plug'n Drive	$	• PCCP • Provincial and Federal Conferences • Clean Air Council • Regional/Council approved advocacy positions

LET'S GET TO WORK

Much work lies ahead to achieve wide-scale adoption of ZEVs in the Region of Peel. In the near term, PCCP Members will focus on initiating the following five priority actions:

Work together to implement ZEV Strategy actions and monitor and report progress on implementation

Include language to encourage ZEV uptake and charging infrastructure deployment in municipal plans and policies

Continue to enable the installation of public charging stations at municipal-owned facilities and conservation authority lands

Enhance ZEV education and support events such as pop-up ZEV test drives

Evaluate ZEV charging infrastructure as an eligible measure in home energy retrofit programs

GLOSSARY

Battery Electric Vehicle (BEV): Powered exclusively by electricity and must be plugged in to charge.

Bidirectional Charging: Allows electric vehicle drivers to charge their battery OR take the energy stored in their battery and push it back to a home, building, or power grid. It also enables smarter EV charging during off-peak hours, when electricity generation from clean sources is highest.

Clean Air Partnership (CAP): Charitable environmental organization that aims at enabling communities to improve air quality, advance active transportation and take bold climate action.[28]

Electric Vehicle (EV): A vehicle that requires electric charging.

Electric vehicle charging station: The equipment that connects an electric vehicle to a source of electricity to recharge electric cars, neighbourhood electric vehicles and plug-in hybrids.[29]

Fuel Cell Electric Vehicle (FCEV): Vehicle that converts hydrogen into electricity using a fuel cell.

GHG emissions: The main greenhouse gases are carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O). These are released through activities including burning fossil fuels, solid waste, and agricultural and industrial activities. Greenhouse gas emissions trap heat in the atmosphere, which contributes to the greenhouse effect and global warming.

Internal Combustion Engine (ICE): Vehicle with gasoline or diesel-powered engine.

Key performance indicators (KPIs): KPI stands for key performance indicator, a quantifiable measure of performance over time for a specific objective.[30]

Level 1 Charging Station: Charging stations using a standard outlet (110 Volts/15 Amps), providing a range of ~8km/hour of charging. These are the slowest charging stations.

Level 2 Charging Stations: Charging stations using a stove or dryer type outlet (240 Volts/30 Amps), providing a range of ~35 km/hour of charging. These are the second fastest charging stations.

Level 3 (DC Current) Charging Stations: Charging stations using a 400 Volt/100 Amp outlet, providing a range of ~250 km/hour of charging. These are the fastest charging stations, bringing an EV from empty to an 80% charge in 30 to 45 minutes.

Low carbon community: A community where infrastructure, residents, and businesses produce low amounts of greenhouse gas emissions (GHG) by carrying out sustainable actions, resulting in a community with a low carbon footprint.

Low emission electricity: Electricity produced with substantially lower greenhouse gas emissions than conventional fossil fuel power generation. This includes electricity produced from wind turbines, photovoltaic cells, hydro, etc.

Mitigation Measures: The provision of a system to avoid, offset, and/or reduce the adverse environmental impacts of climate change from human GHG emissions.

Multi-Unit Residential Building (MURB): One third of Canadian residents currently reside in MURBs, which are residential buildings with a common entrance and individual units. They can be low-rise, mid-rise, or high-rise.

Partners in Project Green (PPG): PPG is a fast-growing community of businesses, government bodies, institutions and utilities working together to build the world's largest eco-business zone.[31]

Peel Climate Change Partnership (PCCP): PCCP is a partnership designed to build and accelerate innovative climate solutions in the geographic region of Peel. By leveraging resources and expertise from the six member organizations, the Region of Peel, Town of Caledon, City of Brampton, City of Mississauga, Toronto and Region Conservation Authority and Credit Valley Conservation.[32]

Plug-in Hybrid Electric Vehicle (PHEV): Can be fueled with both gasoline and electricity and can be plugged in to charge.

Plug 'n Drive: Plug 'n Drive is a non-profit organization that promotes the use of electric vehicles to maximize environmental and economic benefits through education and awareness.[33]

The Atmospheric Fund (TAF): A regional climate agency working towards helping the Greater Toronto and Hamilton Area become carbon neutral by 2050 by investing in low-carbon solutions, including the EV Station Fund.[34]

Zero Emission Vehicle (ZEV): A vehicle that has the potential to produce no tailpipe emissions (e.g. battery-electric, pub-in hybrid electric, hydrogen fuel cell).[35]

Zero Emission Vehicle Infrastructure Program (ZEVIP): A federally funded program that aims to address the lack of charging and refueling stations in Canada.[36]

ENDNOTES

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Region of Peel
working with you

Toronto and Region
Conservation
Authority

Credit Valley
Conservation
inspired by nature

MISSISSAUGA

TOWN OF CALEDON

BRAMPTON