CLIMATE CHANGE MASTER PLAN

LEAD INFLUENCE TRANSFORM

2020 – 2030

Region of Peel
working with you

The Region of Peel Climate Change Master Plan is an output of a larger technical report prepared by Sustainability Solutions Group.

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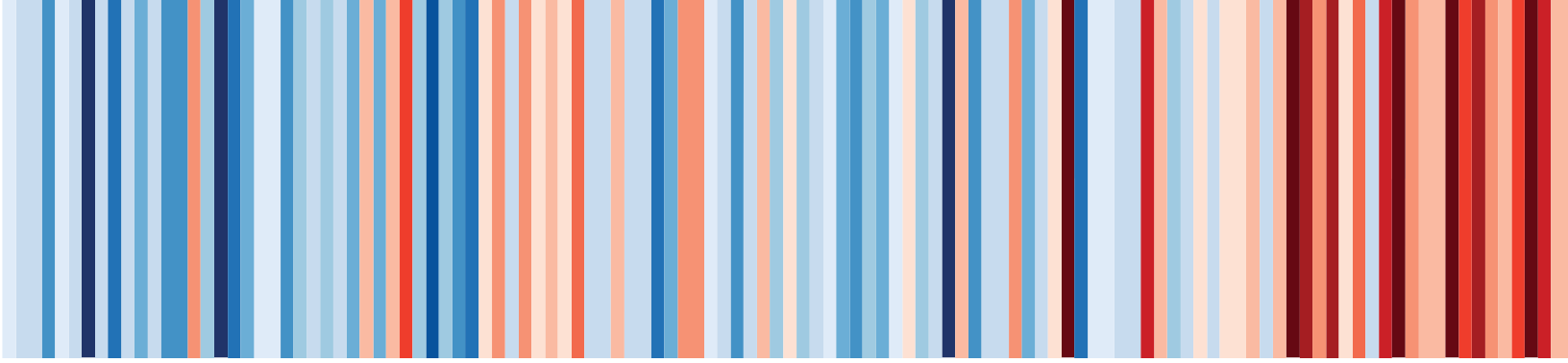

Warming Stripes for Canada from 1901–2018. Annual average temperatures for Canada from 1901–2018 using data from Berkeley Earth.*

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CHAPTER ONE

Introduction

Purpose of the Chapter

This chapter describes the policy context for the Climate Change Master Plan, assesses relevant trends, and inventories the Region's current assets and services.

The Climate Emergency

In 2018, the Intergovernmental Panel on Climate Change (IPCC), the world's leading scientific body on climate change, released a report titled Global Warming of 1.5°C. The report indicated that the risks of climate change can be substantially reduced by limiting warming to 1.5 degrees Celsius. The IPPC has developed a science-based target to reduce emissions by 45% below 2010 levels by 2030 to limit the temperature rise and avoid catastrophic and irreversible damage.

Climate Change at the Region of Peel

In 2017, Regional Council endorsed a Climate Change Statement of Commitment to ensure concrete action is taken to mitigate and adapt to the effects of climate change, provide tangible benefits for residents today, and ensure future generations will have access to resources that support a healthy, safe, and connected community.

The Statement of Commitment establishes guiding principles and desired outcomes for Council to support transitioning to a low-carbon and resilient future. The statement acknowledges that the Region of Peel (the Region) has a long-term organizational target to reduce greenhouse gas (GHG) emissions and the imperative to build a more resilient community. To achieve these outcomes, the Statement committed the Region to develop a climate change master plan.

The Region has invested in addressing climate change since the mid-2000s, including providing annual climate change funds to the Toronto and Region Conservation Authority and Credit Valley Conservation from 2007 to present. Further, climate change action has been a priority for the Region for the last two terms of Council. The focus of this priority has evolved during this time, from the 2010–2014 Term of Council Priority (ToCP) "Reducing Greenhouse Gas Emissions" to the 2014–2018 priority of "Adapt to and Mitigate the Effects of Climate Change." The current 2018–2022 ToCP is to "Build Environmental Resilience" and aims to ensure "Peel is a community that is resource efficient, emits less greenhouse gases, is healthier and better prepared for the impacts of climate change."

These ToCPs have spurred the development of climate change related plans and strategies, such as:

- *The Inflow and Infiltration (I/I) Strategy* - focused on reducing the risk of basement flooding from the sanitary sewer system during severe weather events.
- *The Changing Landscape of Health in Peel* - a Comprehensive Health Status Report released in 2019 identifying climate change as a key health threat to Peel residents.
- *The Stormwater Design Criteria and Procedural Manual* - intended to limit stormwater quantity and quality concerns.

The Climate Change Master Plan

The Climate Change Master Plan (the CCMP) is comprised of 20 actions and 66 activities which will set forth the direction for how the Region will **Lead** by example through the management of Regional assets, infrastructure, and services in a changing climate over the next decade; and substantiate the **Influence** necessary to support the community as it **Transforms** in response to climate change. In doing so, the CCMP will compliment and support efforts of partners in the broader community.

As a master plan, the CCMP provides details for decision-makers on what solutions should be acted upon to achieve the Region's climate change outcomes, while still providing subject-matter experts the flexibility on how these actions will be implemented.

The primary outcomes of the CCMP are to "Reduce 'Emissions" and "Be Prepared," which reflect the imperative to mitigate and adapt to the effects of climate change. The remaining three are supportive to the primary outcomes and will enable success by providing direction to "Build Capacity," "Invest," and "Monitor and Report" (see Table 2.1). The pursuit of these outcomes is guided by four principles: balance, transparency, collaboration, and innovation.

Table 1.1
CCMP Outcomes

Outcomes	Description
Primary	
Reduce Emissions	Corporate greenhouse gas emissions are reduced by 45% by 2030, relative to 2010 levels.
Be Prepared	A safe, secure, and connected community is provided by ensuring Regional services and assets are more resilient to extreme weather events and future climate conditions.
Supporting	
Build Capacity	Climate change is considered in all decision-making through organization-wide climate literacy, planning, and accountability.
Invest	Innovative and sustainable approaches are used to finance action on climate change.
Monitor and Report	Progress on addressing Regionally funded climate change work is consistently reported, available, and widely understood.

Recommended actions are based on in-depth analysis, modelled calculations, review of the available literature and extensive consultation. Additional details have been provided throughout the CCMP technical report. Contact zzgoccem@peelregion.ca for a copy of the technical report.

The Challenge

Figure 1.1
Peel Regional Boundary

Regional Growth

Peel covers 1,246 km^2, reaching from Lake Ontario to the Oak Ridges Moraine and the Niagara Escarpment. With a 2016 population of 1.4 million people, Peel is the second largest municipality in Ontario. The Region of Peel consists of three area municipalities: the City of Mississauga, the City of Brampton, and the Town of Caledon and two conservation authorities: Credit Valley Conservation and Toronto Region Conservation Authority.

The Region is projected to be one of the fastest growing municipalities in Ontario. The health, well-being and safety of Peel's residents, now and in the future, are paramount. Climate change will affect how the Region provides critical services to its growing population. Responding to the effects of climate change may result in the Region needing to expand its services while it supports its infrastructure over a vast geographical area. This will include maintaining and protecting over $27 billion in current assets as well as a projected $9 billion in additional assets by 2041.

In this dynamic environment, the Region will be looked to **Lead** in the community through significant reductions in GHG emissions, while simultaneously increasing resilience to future climate change. This is enabled through the Municipal Act empowerment of local government as leaders in the community. The Region is tasked with accountability and transparent decision making that has the well-being of the municipality at its core, including respecting and responding to threat of climate change.

Climate

Peel's climate is characterized by winters that are cold and damp, with a mix of rain and snowfall, while summers are frequently hot and humid. With the onset of climate change, average annual temperatures could increase by 2°C, with multiple weeks above 30°C and several days above 35°C. Extreme precipitation is also expected to further increase. This is expected to negatively impact the following areas:

- Increased health impacts and reduced productivity;
- Growing demands on public health, paramedic, and emergency services;
- Increased energy use and vulnerability of the electricity supply;
- Rising financial costs and liabilities;
- Increased pressure on operations and maintenance;
- Increased impacts to natural systems.

Opportunities

The CCMP is intended to provide a map that will guide the delivery of critical Regional services through this challenge while being mindful of opportunities to be a positive **Influence** in the community. The impact of the Region's services is felt greatest by vulnerable populations, notably the services described in the Living section of Table 1.2. Vulnerable populations are more strongly affected by climate events and take longer to recover from extreme weather events. The actions of the CCMP will help address these exposures and apply a lens of climate equity.

***Climate equity** is a principle promoting solutions that give equal opportunity for everyone to benefit from investments in climate change, while ensuring vulnerable populations do not bare an unequal burden from impacts.*

Table 1.2
Services provided by the Region of Peel.

Living	Thriving	Leading
Housing Support	Early Growth and Development	Public Accountability
Homelessness Support	Chronic Disease Prevention	Financial Management
Income Support	Infectious Disease Prevention	Asset Management
Employment Support	Water Supply	Workforce
Community Investment	Wastewater	Corporate Governance
Adult Day Support	Waste	Information and Technology
Long Term Care	Roads and Transportation	
Paramedics	Land Use Planning	
Accessible Transportation	Heritage, Arts, and Culture	

Co-Benefits

In many cases, reducing emissions and being prepared will also contribute to a vibrant urban environment, improve public health outcomes, reduce municipal operating and capital costs, and support innovation. These additional benefits, known as co-benefits, are summarized in table 1.3, and explored below.

Table 1.3

Financial Benefits

GHG Reduction Benefits	Be Prepared Benefits
Operational cost savings and avoidance from energy efficiency	Avoided costs from physical damage to infrastructure causing increased demand on service
Reduced operating and maintenance costs	Prolonged asset life
Avoided fuel costs from shift to more sustainable transportation and green fleet	Increased staff productivity and retention
Increased property and asset value	
Local economic growth and investment	

Health Benefits

GHG Reduction Benefits	Be Prepared Benefits
Improved outdoor air quality from cleaner sources of energy	Improved air quality from increased green infrastructure
Improved indoor air quality	Avoided illness, disability and death from reduced exposure to climate related hazards
Improved traffic safety	Improved heath from more active living
	Enhanced mental health

Social and Quality of Life Benefits

GHG Reduction Benefits	Be Prepared Benefits
Increased employment opportunities from community benefits	Improved neighborhood design, aesthetics and civic pride
Complete communities	Greater social cohesion, increased social capital and equity
Increased energy security	Increased food security
Enhanced reputation and branding	
Increased public trust from more transparent responsive governance	

Environmental Benefits

GHG Reduction Benefits	Be Prepared Benefits
Improved air quality	Improved water quality
Helps keep global increase in temperatures below 1.5 degrees C	Improved biodiversity
	Improved soil quality

The CCMP will help the Region make the right investment decisions to create a healthy, safe, and connected community. It outlines a pathway for bold leadership and demonstrates the Region is a government that is future-oriented and accountable.

i Region of Peel, 2019. Term of Council Priorities. https://www.peelregion.ca/strategicplan/term-of-council-priorities/. Accessed June 2019

ii Statistics Canada. 2017. Peel, RM [Census division] Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed October 24, 2018).

CHAPTER TWO

Build Capacity

Outcome: Climate change is considered in all decision making through climate literacy, planning, and accountability.

Purpose of the Chapter

The ability to **Lead, Influence and Transform** how the Region prepares for climate change and reduces GHG emissions requires leadership, evidence informed and transparent planning, innovation, and clear communication. The actions in this chapter address the Region's capacity gaps in preparation for an effective climate change response.

Why this Matters

Municipalities are at the forefront of change, continually responding to the evolving needs of the community. The Region recognizes the need to enhance climate literacy, planning processes, and the depth of accountability to proactively adapt to rapidly changing conditions.

Climate Readiness: Capacity, Culture, and Communication

Organizational capacity is an organization's ability to perform work, to marshal, develop, and direct financial, human, physical, and information resources. The Region of Peel will build on existing skills and organizational strengths, and develop new capacities in order to address climate change. The central drivers which enable this process are cultivating a supportive culture and maintaining clear and simple communication.

1 Ingraham, P., Joyce, P., Donahue, A. (2003). Government performance: Why management matters. Taylor & Francis.

2 Cox, K., Jolly, S., Staaij, S. V. D., & Stolk, C. V. (2018). Understanding the Drivers of Organisational Capacity (p. 51). Rand Corporation.

ACTIONS

1. Update Service Level Operational Plans

Why this Matters

Collective action on a rapidly emerging and time-bound problem like climate change requires a response with a clear direction and clarity of role. A response that is informed by the current environment and embodies the agility and innovation needed to evolve and be opportunistic. It is important that all involved have an appreciation for and shared understanding of their contributions to collective success.

Description

Service level operational plans will be updated to support implementation of the CCMP actions. Updated operational plans will clarify roles and responsibilities, timelines, and resources needed to achieve climate change outcomes. They will be informed by GHG reduction targets and opportunities and exposure to climate risks. Where necessary, initial operational plan actions will be informed by Pacesetter projects.

Pacesetter

Taking the lead or setting standards of achievement for others

Activities

1.1	Develop and assign GHG emissions reduction targets at the service level
1.2	Assess, and where feasible quantify, climate risks to services, establish resiliency objectives, and update operational plans
1.3	Update operational plans with actions from the CCMP, including roles and responsibilities, timelines, and resource required to achieve outcomes

ACTIONS

2. Provide Tools that Enable Integration of Climate Change Priorities into Decision Making

Why this Matters

The complexity and uncertainty of climate change impacts can be overwhelming. Conventional decision-making frameworks, such as cost benefit analysis, do not fully account for the consequences and co-benefits associated with climate change mitigation and adaptation initiatives.

Description

To enable the intent to lead by example, the Region will produce a series of decision support tools that further embed climate change into organizational process and practice. This will include the development of climate change impact scenarios designed to inform business planning, and updates to Regional standards and specifications.

Activities

2.1	Develop a set of climate change impact scenarios to support decision making
2.2	Develop a guide to support the integration of climate change into business plans
2.3	Incorporate climate change into relevant specifications and performance requirements and update every five years

ACTIONS

3. Communicate the Need for and Benefits of Climate Action

Why this Matters

The communication of evidence-based information will empower leaders and the community with the knowledge needed to inform decision-making and set expectations. It will strengthen broader engagement by providing a platform for dialogue and ideas sharing.

Description

An Engagement Strategy will increase awareness surrounding the need to act on climate change, inspiring collective action required to achieve the CCMP outcomes. It will use an array of communication techniques and platforms to elevate climate literacy, while promoting the opportunity for dialogue. This would include social media campaigns, integration with online mapping platforms, and leveraging educational surveys to spur action throughout the organization and in the community.

Activities

3.1	Develop the Climate Change Engagement Strategy
3.2	Leverage existing surveys to incorporate climate change questions and education into organizational and community surveys
3.3	Create platforms for information sharing and dialogue

ACTIONS

4. Stimulate Innovative Approaches to Address Climate Change

Why this Matters

The ability to **Lead** on climate change requires continued willingness to innovate, take risks and bounce back after failure. By creating the right conditions to nurture innovation in a responsible way, new ideas can emerge that facilitate transformational change.

Description

An innovation incentive program will support pilot projects that reduce GHG emissions or climate change risks. Projects will be selected based on their impact and ability to **Influence** similar actions within the community. Case studies and lessons learned from these projects and the implementation of the CCMP will be shared with the community via knowledge transfer events.

Activities

4.1	Establish innovation incentive program, including selection criteria and monitoring and reporting protocols
4.2	Prepare feasibility studies and research papers in anticipation of innovation
4.3	Coordinate knowledge transfer events to share learnings from innovative CCMP projects

Stimulating Innovation – Ozone Laundry at Regional Long Term Care Facilities

Between 2016 and 2017, the Region conducted an Ozone Laundry pilot project to evaluate this technology's ability to reduce natural gas use, chemical needs, and operational costs at Malton Village Long Term Care Centre. Results showed a 31% decrease in laundry process GHG emissions, with a great return on investment. In 2019, the Region scaled up this innovation and rolled out this technology to three additional Long Term Care sites. This project is a clear demonstration of financial and environmental co-benefits as a result of climate change action.

Ozone is a molecule consisting of three oxygen atoms (O_3). It is injected during the washing cycle to clean stains and sanitize materials. It can do this in colder water, resulting in less GHG emissions associated with using less natural gas to heat water.

CHAPTER THREE

Reduce GHG Emissions

> **Outcome:** Corporate greenhouse gas emissions are reduced by 45% by 2030, relative to 2010 levels.

Purpose of the Chapter

Tackling climate change requires new approaches and bold solutions to reduce GHG emissions. This chapter explores the Region's current emissions profile, analyzes the future trajectory of emissions under a Business as Planned scenario, and puts forward a low carbon pathway to meet the Region's GHG emissions reduction targets.

Why this Matters

Reducing GHG emissions is necessary to limit the impacts of climate change. The Paris Agreement sets out a global action plan in order to avoid dangerous climate change. Achieving the objectives of the Paris Agreement requires that every person, organization, and government accelerate their efforts. Technologies and practices, which reduce GHG emissions.

1) Build on actions and strategies already being undertaken
2) "Future proof" the Region against technological change
3) Demonstrate leadership, and,
4) In many cases, save money.

The Low-Carbon Pathway

Two scenarios were developed to explore possible futures for the Region of Peel: a Business-as-Planned (BAP) scenario, and a Low-Carbon Pathway (LCP) scenario. The BAP represents a possible future where no additional initiatives are put in place, beyond panned work, to reduce corporate GHG emissions while accounting for the Region's projected growth. The LCP represents a future where the Region takes on additional and ambitious action to reduce emissions, with the goal of achieving the Reduce GHG Emissions outcome of 45% below 2010 levels by 2030. Figure 3.1 displays how the Region's emissions are projected to trend if we continue as we are today under the BAP scenario compared to implementing actions under the LCP scenario to meet the 2030 target.

Figure 3.1
Scenario Results Relative to GHG Targets

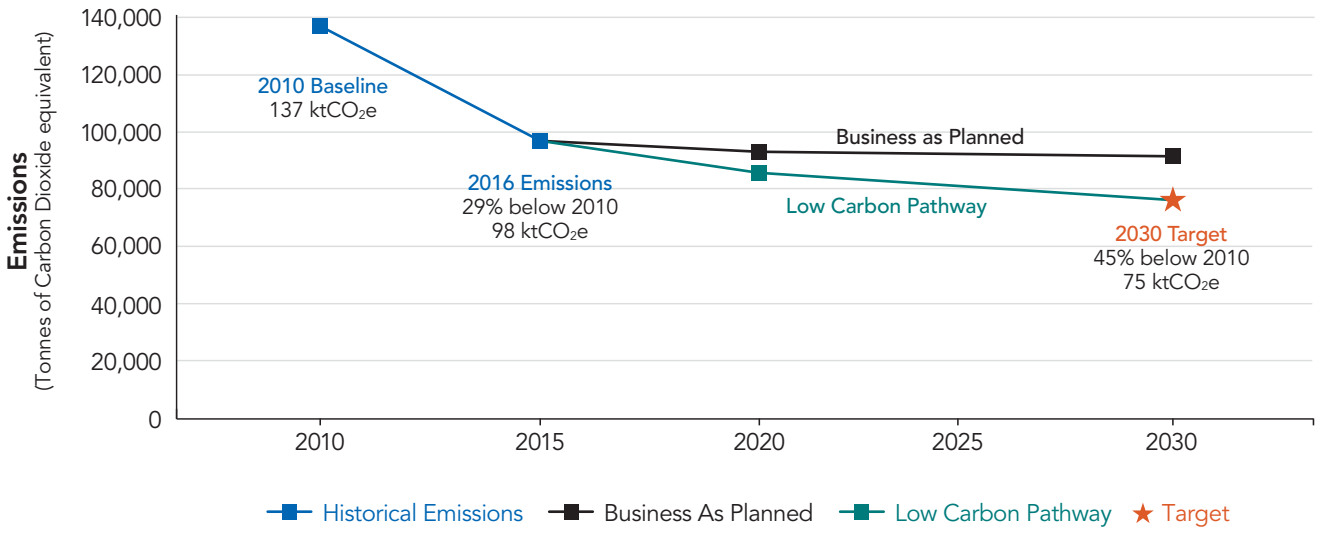
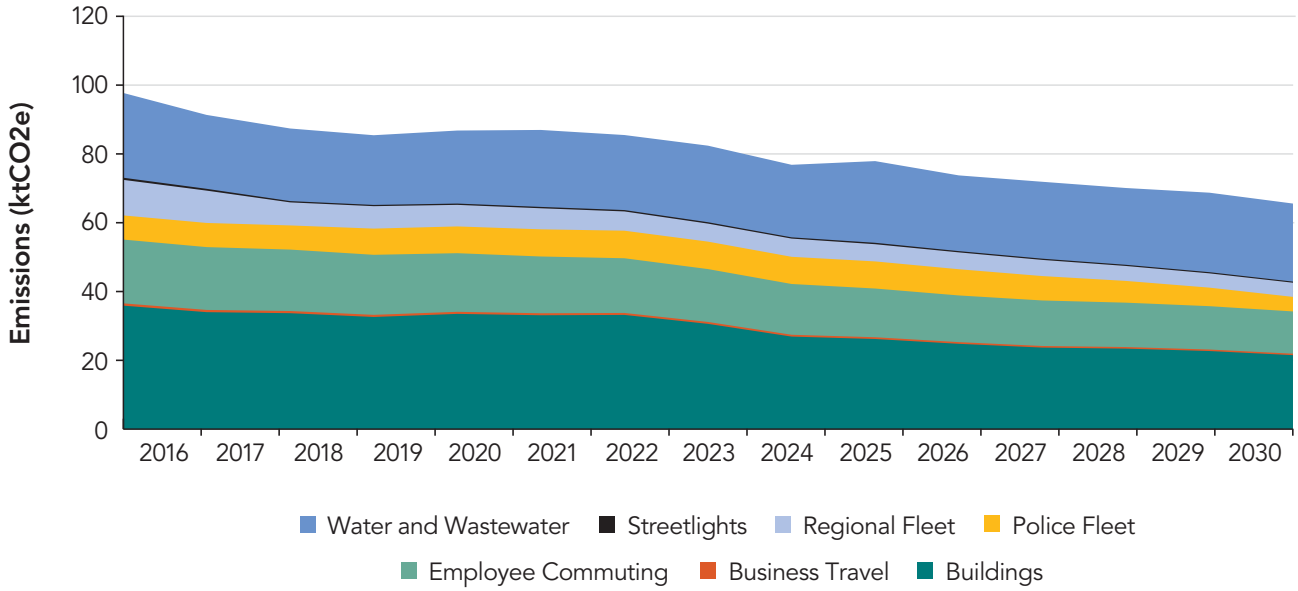


Figure 3.2 shows the Region's current emissions and the LCS pathway to reduce these emissions by sector based on actions identified in this Plan.

Figure 3.2
Low Carbon Pathway Emissions by Sector



What about waste?

Although waste is outside the scope of this plan, waste management has a significant role to play in reducing GHG emissions in several ways, including landfill gas capture, recycling and organic waste diversion. Waste Management's Roadmap to a Circular Economy in the Region of Peel identified an organics recovery program for Peel's long term care facilities and a textile recovery program as key components in achieving the Region's 75% waste diversion goal by 2034.

Long Term Care Organics Collection Pilot

In July 2018, the Region of Peel piloted organics collection at two Peel long term care facilities. By November 2018, all five Region owned long term care facilities were receiving organics collection. The organics pilot expands acceptable items including incontinence products and allows long term care facilities to use regular plastic bags for disposal. To date, there has been 370 tonnes of organic material collected from these long term care facilities. On average, waste diversion at the long term care facilities has increased from 11% to 64%.

Textile Collection Pilot

Curbside

The Region of Peel partnered with three charitable organizations to pilot curbside third-party textile recovery from October 2017 to June 2019. Two types of collections were piloted: scheduled collection dates and a call-in service to schedule pick-up. There was a total of 10 collection events in Brampton and Mississauga recovering over 22 tonnes of textiles from curbside.

Multi-Residential

The Region of Peel, in partnership with Diabetes Canada, expanded the textile collection to include multi-residential buildings in August 2018. Taking a phased approach, the pilot was implemented at 55 Peel Living buildings and 4 private multi-residential condominiums. Each multi-residential building has a Region branded textile donation bin placed indoors or outdoors. To date, over 91 tonnes of textiles have been recovered from multi-residential buildings.

ACTIONS

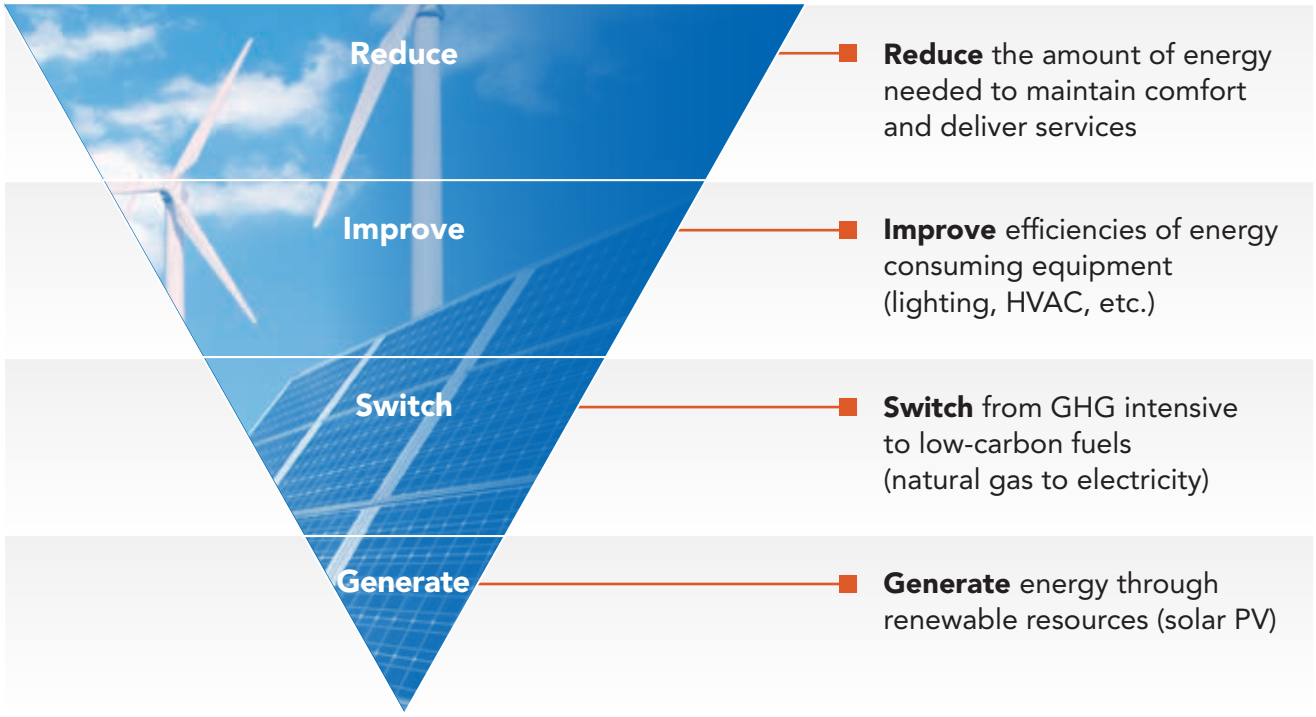
5. Undertake Deep Retrofits for Existing Buildings

Why this Matters

Buildings are significant greenhouse gas emitters primarily due to the use of natural gas for heating. Inefficient buildings have more heat transfer through the walls, roof, and windows, which increases heating and cooling needs and therefore energy costs. Deep retrofits minimize energy loss, reducing total energy use, while enhancing the comfort of the indoor environment. Undertaking a deep retrofit program will enable existing buildings to be highly energy efficient and low GHG emitters.

Description

Deep retrofits will be completed by taking a holistic planning approach to reducing a building's energy needs while leveraging the Reduce, Improve, Switch, and Generate framework, which prioritizes emissions reduction measures based on cost-effectiveness.



Even the best constructed building can have its energy performance undermined by the behaviour of occupants. Energy efficiency information campaign will help ensure that the people working and living in the Region's buildings understand how they can contribute to lowering GHG emissions.

Finally, the Region will continually recommission its buildings to ensure energy consuming equipment is performing as designed.

Enabling Technology

The Region uses drones with thermo-graphic cameras to gauge the level of heat loss at a building.

Activities

5.1	Undertake deep retrofits of existing buildings to target near net-zero emissions, leveraging planned investments for state of good repair work and prioritizing energy intensive buildings
5.2	Implement energy efficiency information campaigns for buildings
5.3	Recommission buildings on an ongoing basis

ACTIONS

6. Ensure New Buildings have High Energy Performance

Why this Matters

The Region is a growing municipality and as new facilities come online, GHG emissions increase. These buildings will be standing for decades to come, and if they are not constructed to high levels of energy performance, they will need to be retrofitted in the future at likely higher capital costs.

What is net-zero emissions?

A net-zero emissions facility produces onsite, or procures, emissions-free renewable energy in an amount to offset the annual emissions associated with operations.

Buildings can be designed to minimize the necessity of on-site emissions based on how the building is used and constructed. To reach zero emissions balance, renewable energy can be generated on site through technologies such as solar or geothermal to avoid emissions, or low carbon energy can be obtained off site through connection to district energy systems or the purchase of renewable energy credits (RECs).

Net-zero emissions buildings can also increase the resiliency of the buildings though reliable on-site back up power and better envelope construction for improved thermal stability.

DESCRIPTION

All new buildings are constructed to reach or exceed energy use intensity (EUI) targets and align with rigorous industry standards and local best practices, with the end goal achieving near-zero GHG emissions.

Reaching high performance EUI targets and near-zero GHG emissions targets in a building generally requires:

- Tight building envelope (walls, roofing, and windows) that eliminates leakages, thermal bridging, and heat loss to achieve lower thermal energy demand intensity (TEDI);
- Highly insulated walls and roofs;
- Strategic building orientation and window placement for passive heating and cooling;
- Energy recovery ventilation and automated ventilation controls;
- Highly efficient and low GHG emission heating system (ex. ground source heat pumps).

Energy use intensity (EUI) *is a measure of all energy used in a building per unit of floor area per year. It is a good way to measure how well a building is performing from an overall energy perspective.*

Thermal energy demand intensity (TEDI) *is the annual heat loss from the building envelope and ventilation per unit of floor area per year. Achieving TEDI targets will lower the energy required for the building to be heated or cooled.*

Activities

6.1	New buildings will be constructed to a high performance and are constructed to net-zero emissions ready

ACTIONS

7. Generate Low Carbon Energy

Why this Matters

The generation of low carbon energy is essential for the Region to provide the continuous delivery of critical services to the community while achieving its climate change outcomes. The success of many CCMP Reduce Emission Actions are linked to generation of low carbon energy.

Description

There are a range of solutions that can allow the Region to **Transform** its energy supply though the use of low carbon energy generation sources, making a stronger business case for switching from fossil fuels. These solutions can harness the energy available in the environment or optimize the use of fossil fuel energy sources by capturing wasted energy

Electrification as a strategy to reduce GHG emissions

Fuel switching from fuels with a high carbon intensity such as gasoline and natural gas – which are used for transportation and heating – to low-carbon electricity is a major opportunity to reduce GHG emissions when balanced with operating costs.

Activities

7.1	Install solar PV panels and geoexchange systems at existing assets at the time of retrofit
7.2	Install solar PV panels and geoexchange systems on new assets at the time of construction
7.3	Prepare a strategy for the optimal use of the Region's renewable natural gas production

What is renewable natural gas?

Renewable natural gas (RNG) is chemically identical to conventional natural gas, but is produced from biogenic sources, such as wastewater sludge, municipal solid waste, and farm wastes, and therefore has minimal GHG emissions.

RNG can be used as a way to transition from conventional natural gas. In the future, the Region can produce and/or purchase RNG to offset all remaining gas use in its buildings and vehicles.

ACTIONS

8. Enable Alignment of Regional Actions with Transition toward Diversified and Decentralized Energy Systems

Why this Matters

The source of energy powering buildings has a significant impact on total GHG emissions. By planning for clean, local electrical and thermal energy the Region can help transform the energy system to one that is low carbon and resilient. Consistent with the Ontario Growth Plan for the Greater Golden Horseshoes (2019) which directs municipalities to "Integrate climate change considerations into planning and managing growth such as moving towards environmentally sustainable communities by incorporating approaches to reduce greenhouse gas emissions."

Description

A diversified and decentralized energy system can take many forms and should be customizable to best service the community that it is within. By doing this, a system can have a local energy supply that optimizes available sources (e.g. waste heat), lessens the dependency on importing energy and stimulates the local economy. The additional benefit of clean, local generation is fewer power losses and increased resiliency in the system due to limited energy transmission infrastructure exposure to extreme weather events.

There are many features that should be considered in the planning of a diversified decentralized energy system. Some of these features include;

District Energy Systems

District energy systems are a mature technology that use centralized heating plants, ideally from renewable sources, to heat or cool multiple buildings connected to a distribution network. .

Electrical Energy Storage

Electrical energy storage balances supply and demand by storing excess electricity supply from clear sources for periods when there is insufficient supply, avoiding more costly and higher emitting emissions.

Smart Grids

Smart grids are energy systems that are efficient, low-carbon, and respond automatically to energy system data to allow multiple components of the grid, including generation, storage, consumers, and appliances to communicate in real time, to optimize electricity supply and demand.

Smart grids can also contribute to climate resilience by detecting line faults or allowing for small portions of the grid to function using their own generation resources during an outage.

Activities

8.1	Engage relevant stakeholders across multiple sectors to discuss the future of energy use, movement and production at a regional-scale
8.2	Complete region-wide energy mapping exercise
8.3	Identify and address drivers, conditions, requirements, and current barriers for successful implementation of a future diversified and decentralized energy system
8.4	Advocate for supportive policies and programs for future diversified and decentralized energy system

ACTIONS

9. Support Sustainable Transportation for Commuting

Why this Matters

Most trips made by Peel residents are done in vehicles. If travel habits remain unchanged and the population continues to grow, the Region would face untenable increases in traffic congestion, demands for road infrastructure, negative health impacts, and rising GHG emissions. By providing internal sustainable transportation leadership, the Region has the opportunity to influence the behaviours of the community.

Description

The Sustainable Transportation Strategy envisions that 50% of peak trips will be made by sustainable transportation by 2040. This vision can be supported by the Region through the internal promotion and implementation of programs and initiatives promoting active transportation, ride sharing, electric vehicles, and remote working.

This is complimented by the Region's continued support for urban densification in its Official Plan.

Experience and best practices gained through this action can help inform the broader roll out of community actions.

Activities

9.1	Apply the Sustainable Transportation Strategy to mode shifting
9.2	Implementation of remote working initiatives
9.3	Expand infrastructure to support low and zero-emission vehicle (ZEV) adoption

ACTIONS

10. Green the Fleet

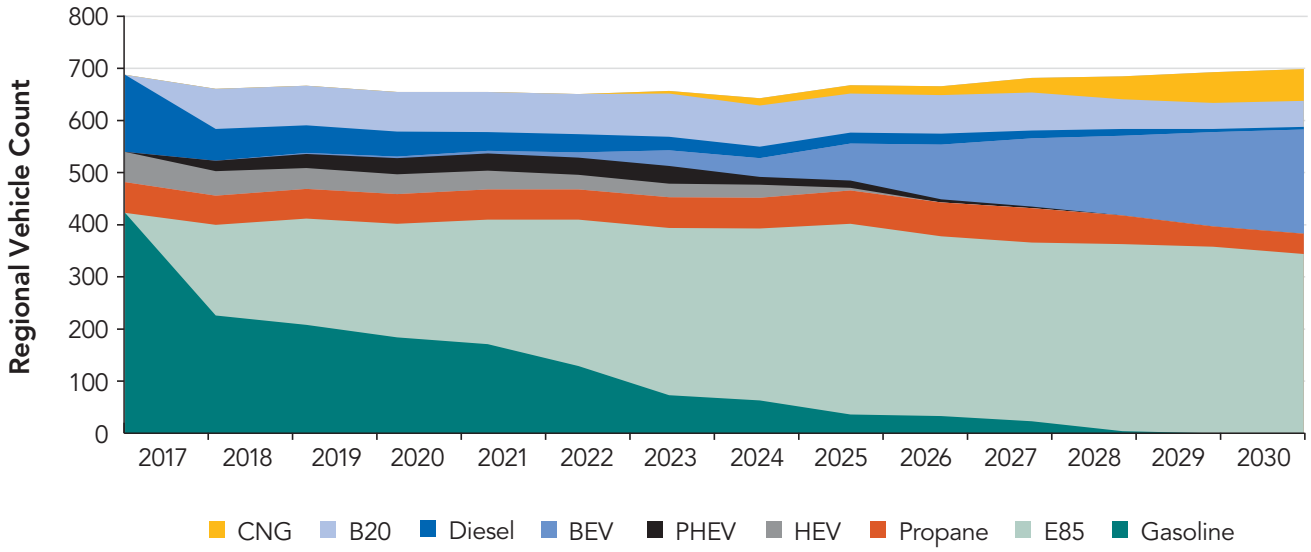
Why this Matters

The transportation sector is responsible for more than a third of Peel's community GHG emissions. With nearly 1,500 Regional and Police fleet vehicles operating within the community, there is a highly visible opportunity to showcase climate change leadership via more sustainable vehicle choices.

Description

Through the continued implementation of the Green Fleet Strategy (GFS), Regional fleet vehicles will continue to reduce their GHG Emissions by increasing the use of ethanol and bio-diesel and transitioning to electric vehicles as technologies become available. The projected low-carbon transition of the Regional vehicle stock through the implementation of the GFS is displayed in Figure 3.3

Figure 3.3
Corporate Fleet Vehicle Counts by Fuel Type



Peel Regional Police have begun piloting hybrid vehicles, and are keen to explore technology transitions that can meet operational needs in the coming years.

Activities

10.1	Implement the Green Fleet Strategy
10.2	Pursue hybrids and electric vehicles, where feasible, within the Peel Region Police Fleet


EV CHARGING


RP-17-17414
RP-13-10225
Region of Peel
Working for you
This is a low emissions hybrid vehicle


CLEANER, GREENER WASTE MANAGEMENT.
Region of Peel
peelregion.ca/waste
EM 135
CLEANER, GREENER WASTE MANAGEMENT.
Powered by Compressed Natural Gas

ACTIONS

11. Maximize Energy Efficiency and Energy Recovery in Water and Wastewater Systems

Why this Matters

The treatment and transmission of water and wastewater consumes and produces significant amounts of energy. By maximizing the use of this energy within water and wastewater processes the Region can be well positioned to achieved substantial GHG reductions. This may also lead to possible financial savings for the Region and the broader community.

Description

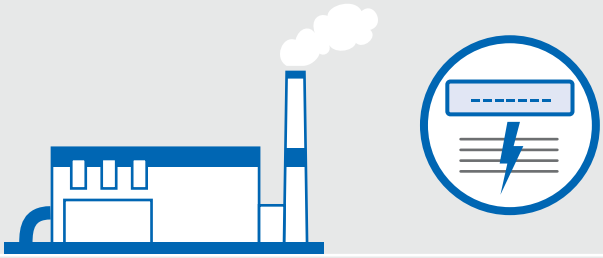
To support the achievement of the Reduce Emissions outcome, the Region will be assessing and implementing energy efficiencies within the water and wastewater system. The Region will also be implementing, where feasible, the recommendations of the Water Efficiency Strategy and the Wastewater Energy Security Strategy to optimize the supply and demand of energy within the system.

How is energy recovered from wastewater processes?

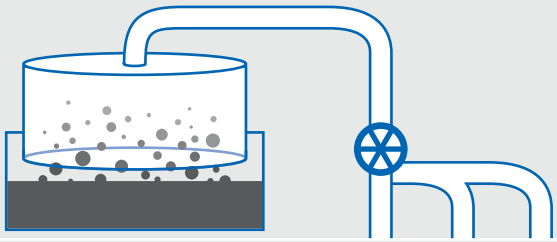
As water is removed from wastewater, it is transformed into a bio-rich sludge. At this stage, the sludge can be prepared and disposed of at landfills or used as nutrient-rich compost for fertilizing plants, incinerated and released into the atmosphere, or it can be used in energy recovery.

Sludge energy recovery methods

Wastewater sludge is **incinerated** to run a steam turbine in a **Combined Heat and Power (CHP) plant.**



Wastewater sludge is **put in a digester, creating biogas**, which can be combusted to create electricity and heat in a CHP plant.[i]



Biogas created from sludge in the digester can be **upgraded to renewable natural gas** and used in vehicle fleets or injected into natural gas grids for use in heating.

i This process already occurs at Clarkson WWTP. Further analysis would be required to see if this process is feasible at GE Booth WWTP.

Activities

11.1	Implement actions of the Wastewater Energy Security Strategy
11.2	Implement actions of the Water Efficiency Strategy
11.3	Further implementation of pumping optimization

i Hast, A., Syri, S., Lekavicius, V., Galinis, A. (2018). District heating in cities as a part of low-carbon energy system. Energy, 152, 627–639, https://doi.org/10.1016/j.energy.2018.03.156.

ii Hirsch, A., Parag, Y., Guerror, J. (2018). Microgrids: A review of technologies, key drivers and outstanding issues. Renewable and Sustainable Energy Reviews, 90, 402–411.

CHAPTER FOUR

Be Prepared

> **Outcome:** A safe, secure, and connected community is provided by ensuring Regional services and assets are more resilient to extreme weather events and future climate conditions.

Purpose of the Chapter

This chapter describes key climate change risks and impacts to regional services and assets. It provides ways the Region can **Lead** in response to increased natural disasters, understand and manage risks, and set forth a plan to **Transform** to a well-prepared resilient community.

Why this Matters

The Region of Peel has experienced several significant weather-related events over the last decade. Events have included a record breaking rainfall in July 2013 that resulted in widespread flooding; an ice storm in December 2013 that resulted in power outages and $190 million in damages in the GTA - $85 million in Peel Region alone; and a windstorm in May 2018 that caused $380 million in damage across the Greater Toronto Area.

These events significantly affected people, infrastructure, natural systems, and the economy, resulting in health impacts, damage to property, disruption in critical infrastructure systems, business and service interruptions, and limited mobility and access to services.

Climate-related shocks and trends are projected to increase in Peel, including higher average temperatures, increased heat waves, and more intense precipitation events. In other words, in the future, these events will be more disruptive, more destructive and longer lasting.

At the same time Peel is growing. Peel is one of the fastest growing municipalities in Ontario and is expected to grow to 1,770,000 by 2031 ; an increase of 24% between 2016 and 2031.

This growth may increase pressure on Regional services and further stress infrastructure and natural systems, while driving demand for new assets, services, and resources. Planned urbanization will exacerbate the urban heat island effect and the risk of flooding as vegetated areas are converted to impervious surfaces. In recognition of risks posed by climate change to growing municipalities, the provincial government updated the Growth Plan for the Greater Golden Horseshoe (2019) directing that "Communities and infrastructure must be adapted to be more resilient."

1 Region of Peel. Populations Growth. Accessed at https://www.peelregion.ca/strategicplan/20-year-outcomes/population-growth.asp.

Climate Risks *– the probability of climate change related events occurring multiplied by the consequence should they happen. Risks are determined by the degree to which people, property or places are vulnerable and exposed to climate related hazards.*

Climate Impacts *– the direct and indirect effects of climate change on lives, livelihoods, health and well-being, ecosystems and species, economic, social and cultural assets, services (including ecosystem services), and infrastructure.*

Figure 4.1
Warmer, Wilder, Wetter Weather


Mississauga flood (2013)


GTA windstorm (2018)


Brampton ice storm (2013)

A More Resilient Region is a more Resilient Community for Life

The ability of the community to thrive is inextricably linked to the ability of the Region to provide its services. The Region will ensure its infrastructure assets, and the services they provide, are resilient to extreme weather events and future climate conditions. In so doing, the Region will be a backbone of resilience for the community in the face of climate change.

While the entire community of Peel will be impacted by climate change, not everyone will be impacted equally; vulnerable populations will be disproportionately affected. Socially isolated seniors, the very young, persons with pre-existing illnesses/poor health or disabilities, those with low income, homeless and under-housed and persons living in poor quality housing/living conditions all face increased risks from climate change due to their sensitivity and/or exposure to climate related hazards, and have greatest difficulty recovering.

Addressing underlying conditions that make people more vulnerable like increasing access to affordable housing, reducing poverty, increasing access to good jobs will be a critical to ensure everyone benefits from the resiliency building efforts.

ACTIONS

12. Better Prepare to Respond to, and Raise Awareness of, Increased Climate Change-Related Emergencies and Health Impacts

Why this Matters

The health and safety of the public in Peel is expected to be impacted by a range of climate hazards, including:

- increased temperature-related morbidity and mortality; particularly from extreme heat exacerbated by the urban heat island effect;
- poor air quality, and worsening respiratory and cardiovascular conditions;
- increased risk of injuries and mortality resulting from extreme weather;
- increased food and water contamination, leading to more illnesses;
- rising incidence rates of vector-borne illnesses as climates become more favourable to their survival;
- reduced psychological health, including mental health and stress-related illnesses;
- displacement of populations and crowding in emergency shelters;
- disruption to global food supply chains, increasing costs and exacerbating local food insecurity.

Description

To minimize climate change impacts to a growing vulnerable population, emergency and health responses in the Region will strengthen community partnerships with social service agencies and volunteer groups. For example: Partnerships to expand access to facilities with cooling capacity (during heat waves) to areas in need.

The Region of Peel will continue to develop and refine response plans for climate change events to ensure that emergency management and health services have the capacity and resources to respond to the human health impacts of future climate change. This process includes identifying gaps and/or changes that may be needed for resourcing, training, inter-agency and public communication, infrastructure, tools, and financing.

Enhanced investment in supportive services that help to reduce the underlying drivers of social vulnerability is also an important consideration.

The Human Side of Climate Change

Around the world increasing natural disasters, extreme weather events and failure of adequate climate change adaptation and mitigation is leading to mass displacement of populations[1]. The Region of Peel is a favourable destination for those seeking temporary shelter or asylum due to the proximity of Pearson International Airport.

Case in point:

In July 2019, several significant forest fires in Northwestern Ontario impacted many First Nations communities with both heavy smoke and their proximity to individual communities. At the height of the event, fires that were four times the size of Brampton resulted in the evacuation of over 7,500 individuals from several communities.

The Region of Peel was requested to provide temporary shelter to approximately 150 families evacuated from Pikangikum First Nation since the capacity of host communities across Northern Ontario were nearing capacity.

Though the planned evacuation did not occur because the situation in the north improved, the Regional Emergency Operations Centre was activated with significant resources from regional, municipal and other stakeholder services being mobilized. Planning continued in the event that the weather changed and assistance was required.

[1] Global Risk Report (2019) http://www3.weforum.org/docs/WEF_Global_Risks_Report_2019.pdf

Activities

12.1	Convene a coalition of emergency social service and health agencies to identify gaps and needs to deliver services in the context of climate change, specifically during extreme events
12.2	Investigate and increase monitoring, through tools like local radar systems to support enhanced notification on climate-related hazards
12.3	Install or improve cooling solutions (passive and active) for buildings which are currently or are projected to be vulnerable to overheating
12.4	Ensure policies and procedures to protect outdoor workers consider climate change impacts

ACTIONS

13. Identify and Manage Risks to Infrastructure

Why this Matters

The Region depends upon a complex network of urban infrastructure systems that are owned and operated by the Region and function to deliver continuous services. Climate change poses a potential risk to the long-term financial sustainability of the Region as it relates to its infrastructure. As climate events become more extreme and occur more frequently, damage and disruption to the Region's infrastructure and services will likely increase, driving up costs to maintain a state of good repair (SoGR), and affect the delivery of services. Accordingly, new Ontario Regulation 588/17 (O. Reg 588/17) requires that climate change considerations be integrated into municipal asset management policy and practice.

Description

Each infrastructure category, and the service it delivers, will face varying levels of risk depending on their current condition, inherent sensitivities, location, operational needs, and service delivered. In compliance with O. Reg 588/17, the Region will improve its knowledge of climate change risks to infrastructure and apply evidence-based solution through updated standards and specifications.

While these actions seek to reduce climate risk for the Region, for many practical reasons, all risks cannot be eliminated; successful adaptation does not mean that negative impacts will not occur, only that they would be less severe than would be experienced had no adaptation occurred.

Activities

13.1	Assess infrastructure for risks associated with extreme weather events and future climate conditions, and integrate knowledge into asset management
13.2	Develop and enhance inspection procedures and protocols for high-risk infrastructure to minimize disruption to service
13.3	Develop a Climate Change Adaptation Management Tool for Transportation and Infrastructure Planning
13.4	Develop and implement climate resilience technical design and performance criteria for infrastructure
13.5	Ensure Region's insurance policy provides coverage for increasing climate related risks

What does integrating climate into asset management look like?

Integrating climate into asset management means taking stock of the physical and financial impacts climate will have on the condition, performance, and longevity of assets and service delivery, and using this information to identify and prioritize needs for investment, both in the near and long term.

The Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure, which applies to the Region, requires the Region to consider climate change in the development of its asset management plan, and will be supported by this approach.

ACTIONS

14. Protect And Increase Green Infrastructure Throughout Peel

Why this Matters

Urban areas are prone to experience heat island effect where surface and air temperatures increase due to urban development. Urban development also increases impervious surfaces and decreases vegetation which contributes to flooding risk in cities, since less rainwater is able to go into the ground. As the Region continues to urbanize, and as the climate continues to change, specifically with increases in average temperatures, heat waves, precipitation and extreme rainfall events, these effects will continue to intensify.

***Green infrastructure** – can be natural or human-made, can include parks, trees, shrubs, urban forests, green roofs and walls, gardens, bioswales, natural channels and watercourses, and constructed wetlands.*

Green infrastructure reduces the risk of heat stress and flooding primarily by increasing infiltration and reducing runoff, increasing evaporative cooling, and providing shading and areas for reprieve. Reducing heat and flood risk through the expansion of green infrastructure can benefit a range of services. While intended to primarily address heat stress and flooding in the context of climate change, green infrastructure provides an array of social, environmental, and economic benefits.

Description

Protecting and increasing green infrastructure calls on the Region to **Lead** by example, expanding green infrastructure across Regional assets and properties with the intent to **Influence** similar action within the Peel community. This will require the Region to protect and significantly expand green infrastructure by;

- Inventorying and maintaining green infrastructure assets;
- Expand green infrastructure across Regional Road networks; and
- Implementing green infrastructure on Regional properties focusing on flood and heat vulnerable areas

This work will be completed in alignment with area municipalities and conservation authorities to accelerate efforts and avoid duplication of efforts for the greatest **Influence** within the community.

Activities

14.1	Develop a region-wide green infrastructure services in collaboration with the local municipalities and conservation authorities with focus at facility level implementation
14.2	Develop and implement a Green Infrastructure Asset Management Plan to support the preservation and expansion of green infrastructure
14.3	Implement tree planting and management program for new and existing trees
14.4	Implement green infrastructure elements of future Storm Servicing Master Plan for Regional Road Infrastructure
14.5	Create Green Infrastructure Guidance document to achieve improved water storage and retention for all regional sites
14.6	Require buildings undergoing applicable state of good repair work to consider green infrastructure opportunities

ACTIONS

15. Enhance Standards, Guidelines, and Planning Activities that Pursue Resilient Urban Design and Development

Why this Matters

When communities are planned and built for climate conditions that no longer exist, it increases vulnerability and risk to both current and future residents and businesses and may lead to investments that are financially unsustainable.

Description

As the Region grows, it will be necessary to understand and continue to account for official plans, change risk information and infrastructure related decision-making processes to reduce the community's vulnerability to climate related hazards.

Planning tools (such as standards, guidelines, development permits, planning data, and risk mapping are among the most effective processes to facilitate local climate resilience, in collaboration with local municipalities and conservation authorities, and can be used to reduce climate risks through:

- limiting or increasing planning standards for development in hazard-prone or high-risk areas;
- ensuring that new infrastructure is planned and built to withstand a range of climate hazards,
- educating stakeholders and decision-makers about risks and opportunities; and,
- fostering dialogue about climate resilience.

Activities

15.1	Have climate change related Official Plan Policy adopted and monitor implementation for continuous improvement
15.2	Develop and/or enhance tools and guidelines that support the integration of climate risks into infrastructure planning such as Climate Change Adaptation Management Tool for Infrastructure Planning
15.3	Map and maintain up-to-date data on hazards, vulnerabilities, and risks
15.4	Monitor and track relevant new or amended policies, plans, standards and guidelines for opportunities to incorporate climate change resiliency considerations
15.5	In partnership with local conservation authorities and municipalities, align guidelines, standards and tools to further support community flood and heat resiliency planning
15.6	Require buildings undergoing applicable state of good repair work to consider green infrastructure opportunities

i Region of Peel. Report on Health Vulnerability to Climate Change: Assessing Exposure, Sensitivity, and Adaptive Capacity in the Region of Peel.
ii Region of Peel – Public Health. (2019) The Changing Landscape of Health in Peel. A Comprehensive Health Status Report.

CHAPTER FIVE

Invest

> **Outcome:** Innovative and sustainable approaches are used to finance action on climate change.

Purpose of the Chapter

The estimated cost of the CCMP is in the range of $300–400 million with an estimated $85 million in cumulative saving during the life of the CCMP, with additional savings to be incurred in the following decade and beyond. These are primarily incremental costs for the implementation of actions that reduce greenhouse gas emissions, in addition to work that will allow for improved planning in preparation of the effects of climate change. This chapter explores the investments for implementing these actions and their alignment with the Region's financial principles.

Why this Matters

Climate science indicates that action is required to mitigate and adapt to climate change now. These actions require significant investments, and many will generate returns as assessed with a strict financial analysis. Irrespective of their financial merit, these investments are critical to the future well-being of the Region and community.

Investment Approach

The Region's track record of prudent, forward-looking fiscal and budgetary policies has resulted in an enviable fiscal position, but climate change is a threat to this stability. Climate change represents a risk to the services provided by the Region and will drive up costs, likely impacting tax and utility rates.

Consideration of climate change in investments is increasingly viewed as an aspect of fiduciary responsibility. By decreasing GHG emissions and preparing for climate change impacts, the Region is reducing risks of fluctuations in tax and utility rates due to disruptive impacts. The CCMP will help the Region plan for, manage, and/or reduce impacts and future costs in order to appropriately maintain programs and services, ensuring that the Region is a desirable place to live and work.

The Long-Term Financial Planning Strategy describes nine principles and a consistent lens which will help guide the Region's investments in climate change.

2 Note that this analysis excludes program delivery costs and staff time, which have been evaluated separately.

Table 5.1

Climate Change Lens applied to Region of Peel's financial principles

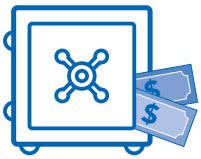
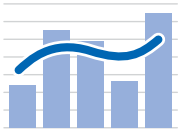
	Financial Principles	Climate Change Lens
1 	Respect the tax and utility rate payer – the Region of Peel will strive to achieve reasonable and responsible tax and utility rates and ensure Regional Council's highest-priority programs (both capital and operating) are maintained.	Climate change represents a risk to the services provided by the Region and will drive up costs, impacting tax and utility rates. The CCMP will manage and/or reduces impacts and future costs in order to maintain programs and services.
2 	Ensure the Capital Plan is sustainable – where reserves and reserve funds should be funded to the levels required for their purposes, capital expenditures are reviewed in the context of affordability, and the operating impact of capital is sustainable and affordable.	Actions in the CCMP will contribute to identifying what levels of funding are required to ensure reserves and reserve funds are adequate to reduce GHG emissions and prepare for climate change impacts.
3 	Maintain assets - when it can be demonstrated that the replacement cost and subsequent maintenance costs are less expensive than maintaining the existing asset in a state of good repair over the same period of time.	Low-carbon actions are tied to end-of-life replacements resulting in incremental costs as opposed to new costs. Lifecycle costing is used to evaluate the overall cost or benefit to the Region.
4 	Deliver value for money - seek efficiency and quality improvements in the way it manages and delivers services, and pursue innovative approaches to financing services, like the use of public–private partnerships (P3s) and shared services.	The majority of reduced GHG emissions actions show positive returns over the project's life with even greater value when considering co-benefits. Funding challenges are significant and both existing and innovative approaches will be required.

Table 5.1 continued

	Financial Principles	Climate Change Lens
5 	Users pay where appropriate – This principle is focused on how and when user fees are utilized and the principle of "growth pays for growth."	The CCMP is based on the principle that "savings fund savings" which can be enabled through a climate change financing strategy.
6 	Work with local municipalities to support economic viability of the community – ensure the Region of Peel continues to be a desirable area to live, work, and play.	The provision of resilient services and infrastructure is critical to ensuring that the Region is a desirable place to live and work.
7 	Make prudent investments – do not compromise the safety of principal and maintenance of liquidity in order to maximize investment returns.	Consideration of climate change in investments is increasingly viewed as prudent, and even as an aspect of fiduciary responsibility.
8 	Mitigate significant fluctuations in tax and utility rates – use working funds to implement techniques to smooth and maintain the tax and utility rates.	By preparing for climate impacts the Region is reducing risks of fluctuations in tax and utility rates due to disruptive impacts.
9 	Borrow only for substantial long-term assets at affordable levels – ensuring actions do not negatively affect the credit rating.	Adequately addressing climate risk in the Region will help maintain a strong credit rating.

The CCMP Investment

The total capital investment, largely to complete the GHG emissions reductions actions and activities of the CCMP, is estimated to be in the range of $300–400 million. These are incremental in costs, in addition to budgeted 'business as planned' initiatives.

The return on impact of the CCMP is anticipated to be great with opportunities for $85 million in cumulative savings. While the focus of this plan is 2020–2030, it's anticipated that the most significant benefits will be realized post-2030. As actions in the CCMP are completed, additional costs are expected to be identified, for example, the cost of increasing infrastructure resilience to extreme weather.

ACTIONS

16. Complete a Climate Change Financing Strategy

Why this Matters

The capital investment necessary for the meaningful and sustained actions called for within the CCMP is a critical component of its success. It is important that the funding of the work takes a balanced approach that aligns with the Region's Long-Term Financial Plan and is progressive in its fiscal evaluation of climate change action. This is an approach that is mindful of both the taxpayer today and the taxpayer of the future.

Description

The Climate Change Financing Strategy will provide the framework for how the actions of the CCMP will be funded. The strategy will position the CCMP funding needs into a ten-year capital plan that will look to mitigate impacts to the tax base and utility rate through pursuit and advocacy for external funding. The Strategy will also account for climate change by further integrating its full cost into asset management and growth planning exercises.

Activities

16.1	Convene internal stakeholders and industry experts to explore the range and potential for innovative climate change funding/financing tools
16.2	Incorporate the results of the risk and vulnerability analysis (Activity 13.1) for asset management to fully inform long term capital planning
16.3	Identify and assess public and private sources of capital to fund CCMP actions

2 Note that this analysis excludes program delivery costs and staff time, which have been evaluated separately.

CHAPTER SIX

Monitor and Report

> **Outcome:** Progress on addressing Regionally funded climate change work is consistently reported, available, and widely understood.

Purpose of the Chapter

The actions of the Monitor and Report chapter are in alignment with the Region's existing reporting streams. Through transparency and learning, monitoring and reporting will help enable success of the CCMP.

Why this Matters

Monitoring and reporting plays an important role in promoting society's rapidly evolving understanding and engagement on climate change. By reporting on climate change actions and outcomes, transparency is promoted internally and externally. This builds accountability, trust, and civic engagement, which are important to **Influence** climate action within the community. Reporting and monitoring also enables the Region to **Lead** by building knowledge on the initiatives with the greatest impact and awareness of those initiatives where the Region should pivot and adapt.

ACTIONS

17. Report Annually on Climate Change Master Plan Implementation

Why this Matters

There is a finite amount of time to implement the actions necessary to respond to the impact of climate change. Annual progress reporting is one way to ensure that actions are being pursued efficiently and effectively.

Description

Provide status to senior leadership on the progress of the implementation of the Climate Change Master Plan. The information shared through this exercise can be used to inform service delivery, inform budget priorities and long-term capital planning.

Activities

17.1	Develop key performance indicators that will measure the outputs of the CCMP implementation progress
17.2	Prepare annual report to share progress of the CCMP implementation

ACTIONS

18. Develop a Corporate Climate Change Resiliency Performance Report

Why this Matters

Resiliency is a critical factor for how prepared a municipality is to respond to climate change. Clear, measurable criteria are necessary to ensure that appropriate actions are being pursued and that they are achieving the desired GHG reduction targets and resiliency results.

Description

The Region has developed a Climate Change Resiliency Scorecard to guide the Corporate Climate Change Resiliency Performance Report. The scorecard has been informed by global practices of leading resilient communities. It is a metric for corporate level service, reported annually and will be included in the Community for Life Dashboard.

Through the Corporate Climate Change Resiliency Performance Report the actions of the CCMP will be measured against the following climate resiliency criteria;

Commitment, capacity and partnerships expanded	Public support and disaster preparedness increased
Human health protected	Climate risks and GHGs understood and plan in place to address them
Climate related risks and GHGs reduced	Land use policy adopted to reduce GHGs and community vulnerability
Natural and green infrastructure protected and enhanced	Investments made and financial risks and opportunities disclosed

Activities

18.1	Create key performance indicators to measure performance against climate resiliency scorecard
18.2	Apply a standard approach to measuring and verifying the performance of initiatives to inform decision making
18.3	Track the Region's greenhouse gas emissions inventory against targeted reductions
18.4	Prepare an annual Council report to accompany the Community for Life reporting

ACTIONS

19. Develop An Annual Climate-Related Financial Disclosure Report

Why this Matters

The Task-force for Climate-related Financial Disclosure (TCFD) framework constitutes a comprehensive approach for reporting on all the dimensions of the CCMP and enhancing climate change disclosure. Robust disclosure plays a critical role in helping governments understand the risk and opportunities that climate change poses and enables them to incorporate climate considerations into decision making and future investments.

Description

The TCFD divides the reporting structure into risks and opportunities and is an appropriate framework for the primary reporting mechanism on the implementation of the CCMP (see figure 6.1).

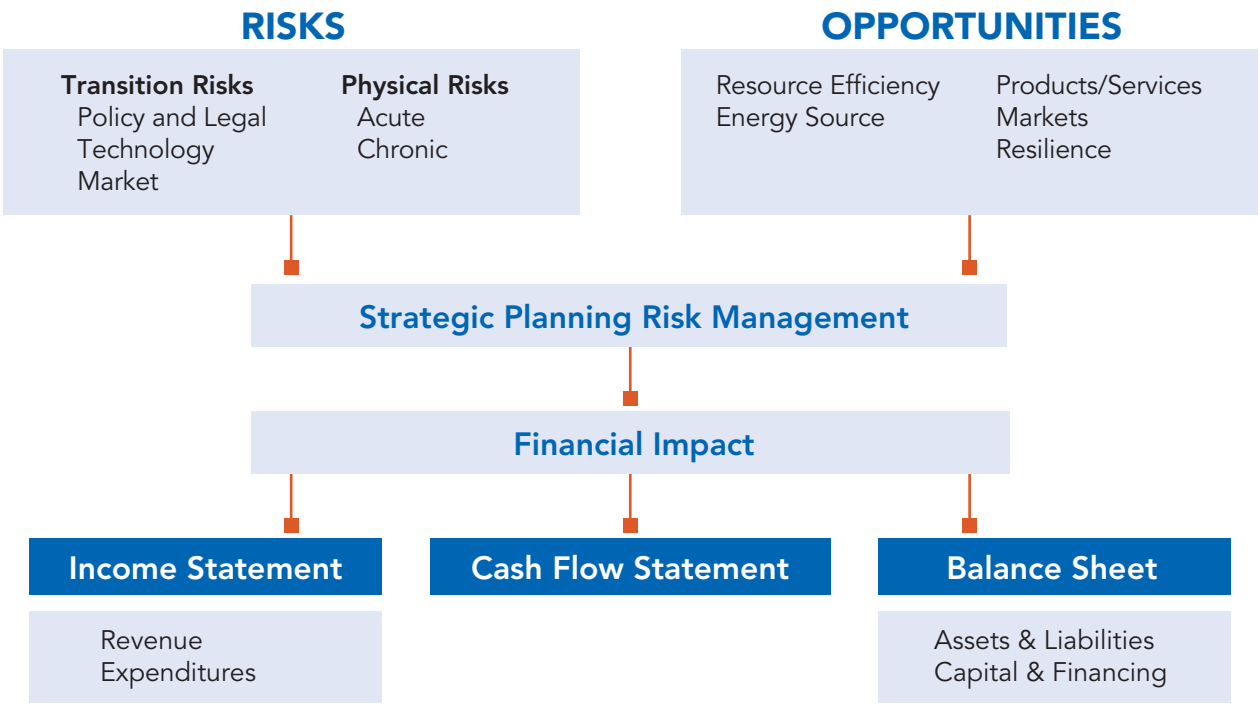
As a public-facing document, this report will also provide an opportunity to share best practices, highlight initiatives or projects, and describe co-benefits of the Region's activities. This will include investment made through the conservation authorities that are in alignment with the Region's climate change outcomes.

Activities

19.1	Compile all relevant data for the completion of the Climate-Related Financial Disclosure Framework
19.2	Complete the Climate-Related Financial Disclosure Framework
19.3	Prepare annual Council report on the outcomes of Climate-Related Financial Disclosure Framework

Figure 6.1

Task Force for Climate-disclosure Reporting Framework



ACTIONS

20. Complete Periodic Science Reviews

Why this Matters

Climate change science and best practices will be reviewed on an ongoing basis and the findings will be incorporated into the annual work plan and priorities as required. Every five years, working with a university or research organization, a formal science review will be conducted to collate the above and to establish new findings and information on global, regional, and city-specific climate change and/or new adaptation techniques.

Description

The science review will incorporate the following:

- Identify the latest studies on the impacts of climate change on the broader region;
- Assess the findings of those studies;
- Identify any new projections for climate change in the region from the climate models;
- Identify any new impacts of climate change on the region; and,
- Identify any new guidance or insights on strategies or actions to respond to the impacts of climate change.

The CCMP will be systematically reviewed every five years, in order to evaluate the objectives, actions, and activities, and how they are responding to emerging science and the impacts of climate change.

Activities

20.1	Complete a review of climate science and its implications for the Region of Peel
20.2	Findings of the periodic science review will be communicated and disseminated widely

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