
For Information

REPORT TITLE: Climate Change Master Plan Progress Report 2022

FROM: Gary Kent, CPA, CGA, ICD.D, Chief Financial Officer and Commissioner of Corporate Services

OBJECTIVE

To provide the annual Region of Peel Climate Change Master Plan progress update.

REPORT HIGHLIGHTS

- Peel is experiencing the impacts of climate change and the science community continues to assert these impacts will worsen without deep and rapid cuts to global greenhouse gas (GHG) emissions.
 - The Region's Climate Change Master Plan (CCMP) sets forth a path that, if fully implemented, can allow the Region to meet its Reduce Emissions and Be Prepared outcomes by 2030.
 - In the latest corporate GHG emissions inventory (2021), Peel offset emissions from growth, but overall, the inventory remained static at 33% below 2010 levels. There are a number of funded climate actions planned over the next few years, but unless significantly greater investments are made, the Region will still fall short of meeting its 2030 GHG emissions reduction target.
 - In 2022, the Region implemented a series of climate actions that promoted knowledge (e.g. *Thermal Stability Study for District Energy*), innovation (e.g. *New Construction Zero Emissions Building Policy and Standard*) and transparency (e.g. *Climate Change lens for budget process*) in response to the climate emergency.
 - To date, Peel is making incremental progress but continues to face challenges with enabling the greater expediency and scale required to fully implement the CCMP and achieve outcomes.
 - The challenges of meeting the Region's CCMP outcomes can meaningfully be addressed by implementing the six actions contained in the 2023/2024 Climate Change Road Map. External challenges and risks, including electrical grid capacity and ensuring clean generation are beyond scope of the Roadmap and require continued advocacy to the Province.
 - As the climate emergency worsens, the Region is also increasing focus and making inroads with community partners to help accelerate the broader response.
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DISCUSSION

1. Background

The scientific community has been clear that deep and rapid cuts to greenhouse gas (GHG) emissions in this decade is critical if the world is to avoid the dire consequences of climate change. The latest report from the Intergovernmental Panel on Climate Change (IPCC), representing the world's leading scientists, concludes that humans are the main drivers behind more intense heat waves, precipitation, flooding, and fires. NASA has reported that 2022 was the 5th warmest year on record, and the last nine consecutive years have been the warmest nine on record. The IPCC warns that the world is close to reaching irreversible tipping points, and bold action to mitigate climate change must scale and accelerate.

In 2022, Peel experienced multiple extreme weather events that devastated individuals, families or entire neighbourhoods and required an enhanced response from the Region, area municipalities and other agencies to ensure the safety of residents and continuity of municipal services that the community relies upon. Notable examples of extreme weather events in 2022 include the following:

- In February, flooding due to unseasonably warm temperatures required that more than 50 homes be evacuated in the Churchville neighbourhood within the City of Brampton.
- In May, a destructive storm (later identified as a “derecho”) with 120 km/h winds swept through Peel causing fatalities, downed trees, property damage and leaving thousands without power.
- In August, a nearly stationary storm over the City of Brampton and the southern portion of the Town of Caledon led to many areas receiving approximately a month's worth of rain (100 millimetres) in just hours.
- In late December, a severe snowstorm closed schools in Peel, disrupted holiday travel plans and delayed public transit.

Municipalities have a crucial role in responding to the impacts of the climate emergency as they are responsible for managing key infrastructure and services that are essential to community resilience and well-being. This is especially critical for vulnerable populations who are often the most negatively impacted by climate change.

Like most of the world, the Region of Peel's climate emergency response has been impacted by the turbulent environment of recent years. We have experienced a pandemic, the war in Ukraine, supply chain constraints, inflationary pressures, and provincial policy changes; all contributing to a delay in climate action and undermined international cooperation as countries have prioritized their own national interests over global issues.

In the face of these major threats and uncertainties, Regional Council has remained steadfast in its commitment to responding to the climate emergency, exemplified by approving \$40 million in climate action funding in the 2023 budget, the largest investment to date. This builds on previous commitments, including, declaring a climate change emergency and correspondingly approving the Region's Climate Change Master Plan (2019).

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Climate Change Master Plan (CCMP)

The CCMP provides direction and a pathway of actions needed to achieve the Region's 2030 climate change outcomes and help catalyze community climate action. The CCMP has two primary outcomes:

- Reduce corporate GHG Emissions to 45 per cent below 2010 levels by 2030
- Be Prepared by providing a safe, secure, and connected community through ensuring Regional services and assets are more resilient to extreme weather events and future climate conditions.

The primary outcomes are enabled by three supporting outcomes: Build Capacity, Invest, and Monitor and Report. In total, the CCMP is comprised of 20 actions.

In these rapidly changing and uncertain times, it is increasingly important that the Region makes informed decisions and undertake initiatives that build organizational capacity, usher in new ways of thinking, foster deep collaboration and increase accountability. As such, 2022 accomplishments are reported in the next sections using the lens of Knowledge, Innovation and Transparency.

2. Accomplishments in 2022

The Region can be proud that it has completed all five corporate milestones of the Partners for Climate Protection (PCP) framework for reducing GHG emissions. In implementing the PCP framework, the Region joins leading municipalities across Canada in responding to the climate emergency.

Within this climate leadership context, initial implementation of the CCMP focused on building organizational capacity, identifying funding mechanisms, planning innovative pilot projects and establishing supportive policies and plans. After three years of CCMP implementation, these initial actions are still ongoing with many of the remaining 20 actions still to be completed or started as per a 10-year plan. It is by first establishing a strong foundation for climate action that the Region should be positioned for accelerated action soon. However, if the increased scale and pace of the response is not realized, achieving the 2030 climate change outcomes are at risk.

a) Reduce GHG Emissions

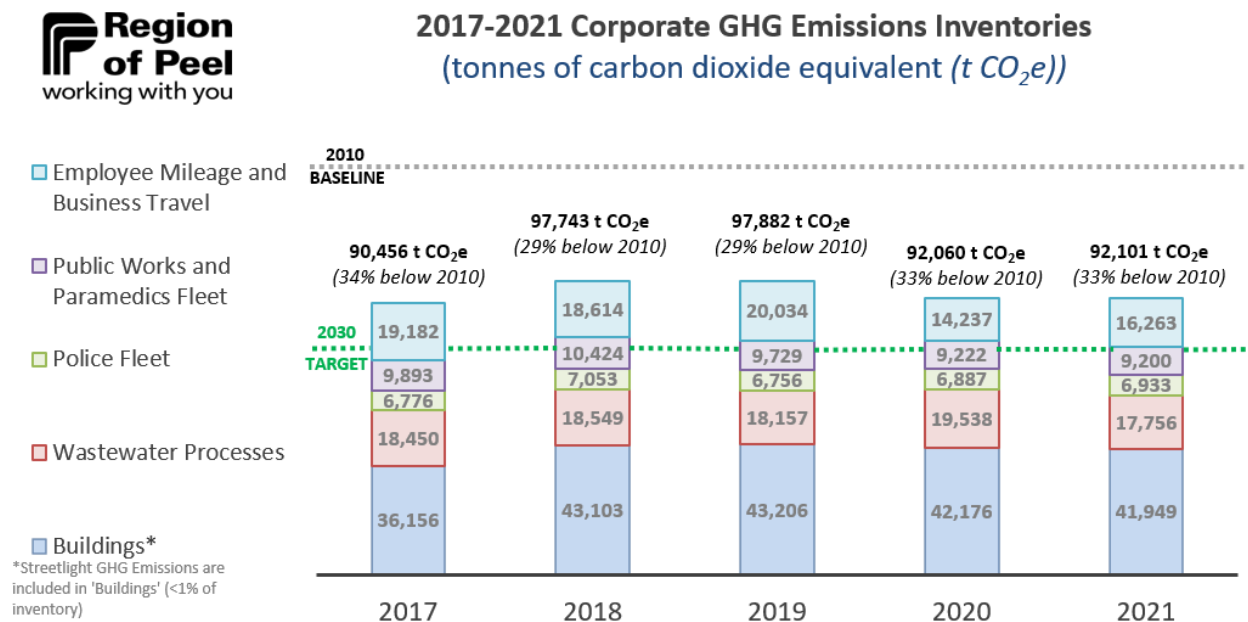
Current State

In the most recent GHG emissions inventory (2021), the Region's corporate emissions were 33% below 2010 levels. The Region's climate actions successfully offset growth but did not achieve further GHG reductions relative to the previous year (See Figure 1). For context, the majority of the total reduction to date and relative to 2010 levels, is attributed to the 2014 coal phase-out from Ontario's electricity generation. Based on the 2021 inventory, Regional buildings remain the largest source of GHG emissions (45%) followed by wastewater processes (19%), employee commuting (18%), public works and paramedic fleet (10%) and Peel Regional Police fleet (8%). While GHG emissions remained static between 2020 and 2021, notable variances by source are as follows:

- An increase in employee commuting emissions resulted from a significant number of contract staff reporting to Mass Vaccination Clinics.
- Notable reductions in wastewater process emissions, specifically from less diesel use.
- Modest reduction in natural gas usage across all Regional buildings.

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Figure 1: Recent Corporate GHG Emissions Inventories [tCO₂e]



Examples of progress in 2022 on “Reduce GHG Emissions” actions have been highlighted in Table 1. They are specific to how they support the knowledge, transparency, and innovation necessary for accelerated and scaled climate change action.

Table 1: 2022 Reduce Emissions Knowledge, Innovation and Transparency Project Highlights

Knowledge	Transparency	Innovation
An Electrical Demand Study was initiated for 124 Regional sites to assess grid and site electricity capacity requirements and constrains to enable HVAC fuel switching, Electric Vehicle (EV) charging station infrastructure, solar and geothermal generation and 5G cell tower upgrades.	Submitted eight advocacy responses for supportive climate change policies and programs to enable CCMP implementation, including climate change funding, the phase-out of natural gas-generated electricity, enabling clean decentralized electricity and increasing the resiliency of the grid.	Assessed and qualified 70 Peel Living sites for utility energy conservation programs. The estimated annual savings are 19,700 m ³ of natural gas and almost 2 million kilowatt hours (94 tCO ₂ e).
The Thermal Stability Study of Wastewater Infrastructure was completed and identified 100-130 megawatts of thermal energy recovery capacity, which can be used as a low carbon heating source for future district energy plants.	Peel Regional Police is designing their new Operational Support Facility and Division buildings to the Region’s Corporate Net Zero Emissions (NZE) Building Standard to ensure they do not contribute new emissions.	20 Plug-in Hybrid Vehicles were added to the Region's fleet and 10 Level 2 charging stations were installed for Public Works and Paramedics.

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<p>The Peel Zero Emission Vehicle Strategy, developed through the Peel Climate Change Partnership, was presented to Regional and local Councils. The Strategy contains sixteen actions to accelerate EV adoption in the community.</p>		<p>In partnership with Ontario Clean Water Agency's Innovation, Technology and Alternate Delivery team, the Region of Peel is piloting an innovative biosolids diversion project at the G.E. Booth and Clarkson Wastewater Treatment Plants.</p>
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Additionally, progress was made in 2022 on a number of projects that are anticipated to bring further emissions reductions or avoidances and demonstrate innovation such as retrofitting Weaver's Hill Affordable Housing Building to be net zero emissions, the Lakeview Village District Energy development and further electrifying the fleet.

Future Outlook

To meet its 2030 target of 45 per cent below 2010 levels, the Region needs to reduce the current inventory by approximately 16,600 tCO₂e and avoid any new GHG emissions due to growth.

The approved Region's Official Plan projects 16 per cent population growth over the next decade. If the Region did no climate action it has been estimated that emissions would increase in pace with growth. In that context, corporate emissions in 2020 and 2021 would have been higher than currently reported and the outlook for emissions considerable more challenging (blue dashed line - Figure 2). (Note: further increase in new GHG emissions associated with anticipated accelerated growth to achieve objectives of the *More Homes Built Faster Act, 2022*, has not been considered in this report; this risk was identified in the presentation to Council on February 23, 2023). Implementing the Region's currently funded Reduce Emissions projects, (orange line – Figure 2)), can offset the GHG emissions associated with planned growth-induced demand for Regional services. However, offsetting growth alone will not result in significant progress and the Region will still fall short of meeting the 2030 target.

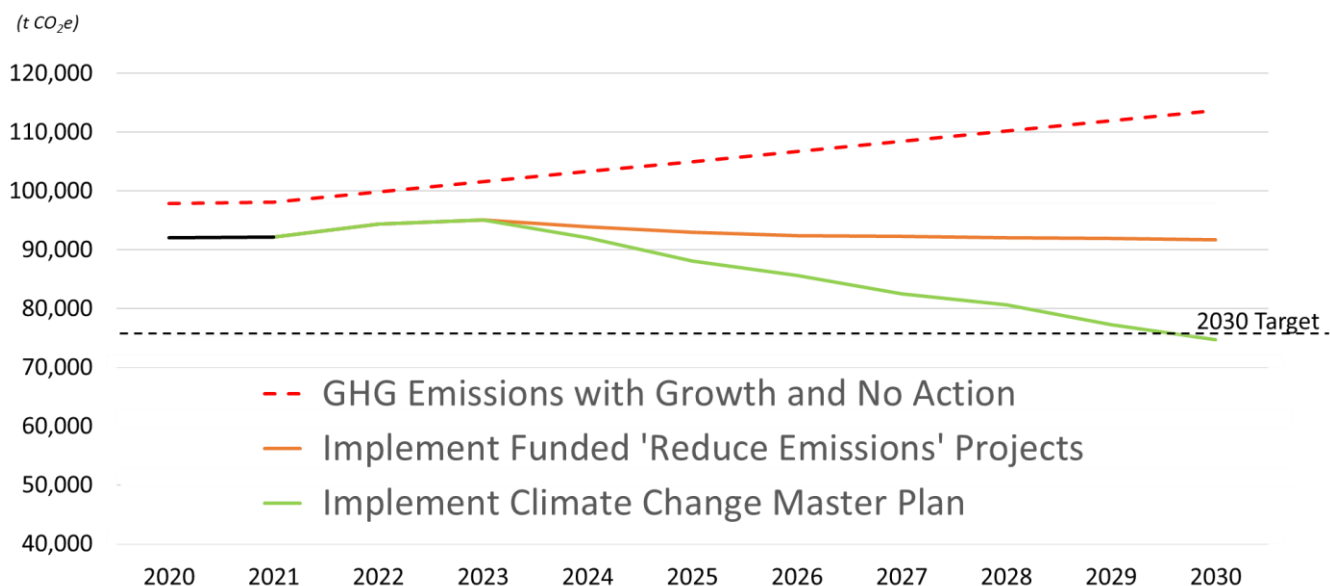
The full implementation of the CCMP (green line – Figure 2) can allow the Region to meet its GHG emission reduction targets. This would be more ambitious than what is currently funded and includes:

- Constructing all new buildings to the Region's Net Zero Emissions (NZE) Standard
- Implement the Housing Energy and Emissions Management Plan (*fuel switching for select State of Good Repair projects, 11 NZE building retrofits, and 13 buildings decommissioned*)
- NZE building retrofit of 7120 Hurontario
- Install charging infrastructure and purchase electric vehicles when replacing TransHelp, Public Works, Paramedics and Police vehicles
- Reduce biosolids incineration at wastewater treatment plants by 10%
- Maintain current Flexible Work Policy to sustain remote working

The full implementation of the CCMP will require increases to budget and staff capacity and will require greater alignment with Regional priorities for improved efficiencies and timely implementation. It will also require Ontario's grid electricity to remain clean and available in greater capacities to service Regional properties.

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Figure 2: 2020-2030 GHG Emissions Inventory Trajectories



If the electricity grid becomes dirtier, as is currently forecasted, realizing deep emissions reductions will become more challenging for the Region. The Region should continue its strong advocacy to the Province on improving grid mix and capacity. Should challenges persist with reducing the entire 16,600 tCO₂e, the Region can also look to supporting projects in the community to reduce emissions and still provide the global benefits of climate change mitigation.

b) Be Prepared

Current State

Similar to many municipalities, there is a clear need to strengthen the Region's knowledge of risk exposure and vulnerability to climate hazards. This is essential to inform the considerable investment necessary to Be Prepared, adapt critical infrastructure to unavoidable impacts and, ultimately, build a safer, resilient community. Addressing these knowledge gaps expeditiously is paramount to help ensure that service continuity is not compromised, and damage and loss costs do not inflate due to climate change.

Accordingly, the Region is prioritizing inventorying and assessing Regionally-owned infrastructure and services to determine resilience to climate risks. Examples of progress in 2022 on "Be Prepared" actions have been highlighted in Table 2. They are specific to how they support the knowledge, transparency, and innovation necessary for accelerated and scaled climate change action.

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Table 2: 2022 Be Prepared Knowledge, Innovation and Transparency Project Highlights

Knowledge	Innovation	Transparency
Initiated the Enterprise Climate Change Risk, Assessment to inform how the Region integrates climate change considerations into asset management policy and practice. This key project is anticipated to be completed in 2024.	Completed an inventory and condition assessment of the Natural Green Infrastructure Assets (street trees, shrubs) in Regional Road Right-of-Ways and produced a State of Infrastructure Report to support asset management planning of these assets.	Completion of Urban Forest Best Practice Guides which will strengthen Peel’s ability to grow, manage and maintain a healthy urban forest that will enhance the quality of life for Peel residents through a planning horizon of 2033.
Completed Extreme Heat Emergency Response and Critical Services Review with Public Health to update emergency response plans for climate related emergencies	New buildings to consider Climate Change Resiliency as part of the Region’s new NZE Building Standard for New Construction. Worked with Peel Regional Police and Peel Regional Paramedic Service to apply the new Climate Change Resiliency assessment for new construction projects underway.	Final year Inflow and Infiltration (I and I) Remediation Program completed. It included removing all sources of I and I that could reasonably be done and developing an infrastructure plan for the next 30 years. This work is expected to reduce the risk of sanitary sewer back up and overflow into the environment.

Future Outlook

To improve the Region’s overall understanding and response to the climate emergency the CCMP is focused on building understanding of the risks and costs to adapt infrastructure. This includes actions planned to enhance, maintain, and monitor progress to substantially improve the Region’s preparation for delivering resilient services and protecting residents from climate change.

c) Build Capacity, Invest, Monitor and Report

Current State

Build Capacity, Invest, Monitor and Report are supporting outcomes of the CCMP which will enable the implementation of the primary outcomes by providing employees with the knowledge, skills and resources necessary to succeed. Examples of progress in 2022 on Enabling actions have been highlighted in Table 3. They are specific to how they support the knowledge, transparency, and innovation necessary for accelerated and scaled climate change action.

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Table 3: 2022 Enabling Actions Knowledge, Innovation and Transparency Project Highlights

	Knowledge	Innovation	Transparency
Build Capacity	Region's anti-idling awareness campaign has resulted in a decline in idling (and a 20 tCO ₂ e reduction.)	Approval of the Corporate NZE Policy and Standard for New Construction. The standard is being applied to five new construction projects to avoid new emissions.	New capital business cases were informed by climate change implications ensuring that climate change is embedded into the Region's business processes.
Invest	Assessed applicability of Green Bond Frameworks as a mechanism to finance the actions of the CCMP.	Secured \$350,000 in external funding to support the implementation of innovative energy projects and increase electric vehicle charging infrastructure in the community.	
Monitor and Report	Collaborated with Conservation Authorities to build key performance indicators to measure effectiveness of climate actions.		The Region's 2021 GHG inventory was completed and emissions are 33% below 2010 levels.

Future Outlook

Achieving the Region's climate change outcomes will require greater implementation of the CCMP's enabling actions. An area of immediate focus will be the implementation of recently completed Climate Action Engagement Plan. The Engagement Plan will help staff and the community navigate through the change necessary to respond to the climate emergency. This will be supported by improving awareness of the risks and empowering staff with the knowledge and skills necessary to respond.

Community Action

As the climate emergency worsens, the Region has a critical role to play in delivering resilient services, safeguarding residents from climate risks and ensuring actions are guided by equity. There is opportunity for a greater role in the community working with area municipalities and community stakeholders to lead or support under resourced climate change actions or shared priorities. A number of key initiatives to advance strategic collaborative climate change initiatives to reduce Peel's community greenhouse gas emissions and build resiliency are highlighted below. (See Appendix I for details);

- Peel Climate Change Partnership
- Centre for Community Energy Transformation
- Peel Residential Energy Program
- Tamarack Institutes Climate Change Transition Cohort

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3. Challenges

The Region declared a health emergency due to the COVID-19 pandemic in early 2020 and resources were redeployed to the response, impacting climate change work over the subsequent two years. The Region's current response to the climate emergency is occurring in a parallel with a series of other priorities or crisis that include the pandemic recovery, the war in Ukraine, global inflation, systemic racism and housing affordability. Combined with limited resources to address these significant challenges, the timing and pace of CCMP implementation is challenged at meeting 2030 outcomes are at-risk.

To help overcome this challenge the Region has built a Climate Change Roadmap which consist of six key actions to be completed over the next two years.

Climate Change Roadmap

The 2023-2024 Climate Change Roadmap will support future work by establishing the foundation for scaling and accelerating the implementation of the CCMP needed in the second half of this decade:

1. Develop Program specific Energy and Emissions Management Plans (EEMPs) for 80% of the Region's GHG emissions. These EEMPs will establish Program Area GHG reduction targets with corresponding action plans.
2. Complete the Enterprise Climate Change Assessment (in progress). This project will account for risk exposure of Regional infrastructure assets to climate hazards and cost the adaptation response.
3. Evaluate and adapt Levels of Service to account for a sustained climate emergency response.
4. Develop a Climate Emergency Financing Strategy. This project will guide how the Region will raise and govern sustained climate change funding.
5. Climate Emergency Innovations projects focusing on collaborative opportunities that are currently encountering risk aversion or capacity constraints, specifically, on-site renewable energy and green infrastructure projects.
6. Peel Climate Emergency Response Plan focused on more frequent, longer and back-to-back extreme weather events with the objective to maintain continuity of critical services.

RISK CONSIDERATIONS

Risks to achieving the Region's 2030 GHG reduction target and climate change outcomes (corporate and community) have been discussed in the body of the report. The main risks and management responses are summarized as follows:

1. Climate actions do not accelerate and scale soon and within this decade. Implementing the six actions on the 2023/2024 Climate Change Roadmap will help move the Region from incremental response to accelerated and scaled.
2. Ontario's electricity grid continues to become dirtier, increasing corporate and community-scale emissions. Continued and more coordinated advocacy to the Province remains a priority.
3. Anticipated accelerated growth this decade, and corresponding infrastructure planning, are not governed by net zero emissions standards. Ongoing collaboration with community partners that increase opportunities for community GHG emissions reductions will be prioritized.

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FINANCIAL IMPLICATIONS

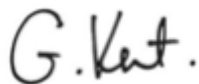
In the 2023, the Region of Peel made a \$40 million investment in climate change action, its largest to date. With the CCMP estimated requirements of a \$300M - \$400M investment that is needed to reduce corporate GHG emissions, significant funding is still needed. As the Region's improves the understanding of climate change risk and adapts, it is anticipated that substantially more investment will be needed.

CONCLUSION

The climate emergency is on the Region's doorstep. To date, Peel is making incremental progress but continues to face challenges with enabling the greater expediency and scale needed to meet the 2030 Climate Change Master Plan outcomes of *Reduce Emissions* and *Be Prepared*. However, the opportunity to lead the response at a corporate and community level has never been greater. It is a response that will require strong, sustained leadership and deeper investment as the Region's navigates through the necessary transformative change.

APPENDICES

Appendix I - Collaborative Community Climate Change Actions



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