Subject: Corporate Climate Change Action Plan

Report to: Planning and Economic Development Committee

Report date: Wednesday, May 7, 2025

Recommendations

1. That the proposed Corporate Climate Change Action Plan (CCAP), attached as Appendix 2 to Report PDS 11-2025, **BE APPROVED**; and
2. That Report PDS 11-2025 **BE CIRCULATED** to the Local Area Municipalities.

Key Facts

- The purpose of this report is to seek Council's approval for the Corporate Climate Change Action Plan (CCAP).
- This report provides an overview of the plan to achieve the Net-Zero target, with an initial focus set on practical actions to make meaningful progress in the short-term (by the end of 2028).
- In early 2023, a Corporate Greenhouse Gas (GHG) Inventory was completed, which established baseline emissions, and a Target Report was presented to Council to review and approve efforts to significantly reduce corporate emissions. A Council Resolution was passed, for a Net-Zero (in principle) Corporate emissions target by 2050.
- In the short-term the CCAP aims to reduce corporate emissions by 17.9% by 2028, aligned with the Net-Zero trajectory. This includes targeted reductions for each of the Region's major emissions contributors (Buildings, Water and Wastewater, Operational Waste, and Fleet).
- In the first five years of the Plan's implementation, actions will focus on existing end-of-life or asset maintenance capital infrastructure projects, alongside the development of foundational policies that integrate climate considerations into Regional services and projects. Any capital projects aligned with the Plan will be subject to Council approval through the annual budget process.
- This plan will reduce GHG emissions, lower operational costs, enhance energy resilience, foster community collaboration, and future-proof against rising energy costs, with updates every five years to ensure effectiveness and adaptability.

Financial Considerations

Initiatives identified in the Climate Change Action Plan will be brought forward through the annual budget process with business case analysis, evaluating GHG reduction impacts, life-cycle costs, and associated benefits for Council's consideration. The first five years of the plan identify projects that are currently planned upgrades and end-of-life replacements or aligned with other master plans. As well, any new projects will go through the Corporate Asset Management Resource Allocation model (CAMRA) to ensure strategic investment and prioritization.

External funding opportunities (i.e. Provincial and Federal funding) will be sought after to offset costs and enhance financial viability for any related projects.

Providing a precise total cost estimate for a 25-year plan is inherently challenging due to numerous unpredictable factors. Rapid advancements in technology, fluctuations in energy prices, shifts in government policies, regulatory changes, and evolving market conditions all impact project feasibility and costs. Additionally, the availability of external funding sources, such as federal and provincial grants, will vary over time. These uncertainties make it impractical to define an exact long-term financial commitment. Some costing estimates and further details are available in the approved 2024-2028 Energy Conservation and Demand Management Plan (CDMP). As well, to support prioritization and funding impacts staff will be completing GHG Reduction Feasibility and Pathway Studies to provide insights into site-specific costs and impacts as we continue toward the Net-Zero target. Any funding requests will be brought to Council through the annual budget process.

Analysis

Setting a Reduction Target (PCP Milestone 2)

The Corporate GHG Inventory provided a solid foundation for setting a corporate GHG emissions reduction target. On May 10, 2023, a Target Report presented to Council proposed an 80% reduction by 2050 (from 2018 levels). Following discussion, Council committed to a more ambitious Net-Zero by 2050 target, aligning with other Ontario municipalities and reinforcing the Region's commitment to sustainability. This target, formally endorsed by Council, fulfills the Partners for Climate Protection (PCP) Milestone 2, and sets the stage for the CCAP – Milestone 3.

The Plan: Short, Medium and Long-Term Targets (PCP Milestone 3)

The CCAP not only sets a clear path to Net-Zero emissions but also establishes the organization as a leader in sustainability. By prioritizing practical decarbonization strategies with measurable outcomes, the initiative demonstrates a commitment to proactive climate action. Emission reduction targets are structured into short-term, medium-term, and long-term goals, ensuring steady progress while integrating emerging technologies and best practices. This leadership has inspired seven of our Local Area Municipalities (LAMs), through out Niagara Climate Change Municipal Community of Practice (NCCMCP), to undertake their own Corporate Climate Action Plans, amplifying the impact of GHG reductions across the region. Beyond environmental benefits, the plan drives economic efficiencies through energy savings, fosters innovation, and enhances resilience by mitigating climate-related risks. It also improves public health by reducing pollution and promoting cleaner air. By leading with accountability and long-term vision, the CCAP not only strengthens corporate sustainability but also encourages a broader movement toward climate resilience and responsible growth.

Table 1 presents the organization's Short-term (by 2028) emissions reduction targets by sector (% reduction from 2018 levels). The overall corporate reduction target is 17.9% (4,385 tCO_2e), reflecting the combined sector impact and alignment with the Net-Zero goal over 25 years.

Table 1: Short-term emissions reduction targets, by sector

Sector	Short-Term Goal	Emissions Reduction (tCO2e)
Buildings	20.8%	2,630
Water and Wastewater	19.3%	1,213
Fleet	10%	353
Outdoor Lighting and Traffic Signals	0%	0
Operational Waste	10%	189
Total	**17.9%*** [1] **(reflects the Net-Zero trajectory)**	**4,385**

[1] The 17.9% overall reduction goal represents the organization's aggregated corporate emissions reduction target by 2028, aligned with the Net-Zero trajectory, rather than the direct sum of sector-specific reductions.

We recognize the imperative to transition towards Net-Zero emissions. However, it is important to be aware of the considerations that pose challenges to this transformation:

- Cost
    - The cost to decarbonize remains high.
    - Departments operate within budgets derived from taxpayers/ratepayers or limited public funds.
    - Project prioritization remains a challenge due to evolving infrastructure needs.
- Technological
    - Low-carbon solutions/technologies for some emissions sources are not yet mature.
    - Solutions/technologies at these stages (e.g. heavy-duty vehicles) of maturity are costly and carry technical risk.
- Operations
    - Broad buy-in (top-down) is necessary.
    - Clear delineation of departmental responsibilities and allocation of staff resources is required.
    - Effective collaboration across departments is essential as efforts often overlap cross-functional teams.
    - Political shifts pose a risk to continued execution as focus and priority given to its actions can fluctuate.

To address this, a pragmatic, three phase approach that balances environmental responsibilities with the realities of these challenges is proposed.

Phase 1: Short-term (0-5 years) – Foundational Policy Development and Strategic Investments: Leverage end-of-life opportunities, understand life cycle costs to minimize expenses, increase efficiency, and establish foundational sustainability policies and processes.

- Examples: Apply a climate lens, review internal resources, develop a corporate engagement plan, implement a decarbonization project assessment policy, implement a sustainable procurement policy, develop a green fleet plan and policy, complete low/no cost energy efficiency projects, evaluate opportunities for building consolidation, begin fuel-switching natural gas heating assets (at end-of-life) in buildings and WWW.

Phase 2: Medium-term (5-15 years) – Policy and Process with Initial Capital Investments: Enhance and solidify sustainable policies and processes while beginning initial capital investment projects to support future large-scale investments.

- Examples: Investigate potential partnerships (e.g. municipalities/organizations), complete capital energy efficiency projects identified in CDMP, review policies for energy management at leased facilities, fleet transition, complete a 5-year CCAP update.

Phase 3: Long-term (15+ years) – Intensive Capital Investment and Tackling the Balance: Make significant capital investments (leveraging funding where available) in advanced technologies/infrastructure and refine established policies to achieve deeper sustainability gains towards the Net-Zero target.

- Examples: Complete capital-intensive energy efficiency and generation projects, substitute the use of natural gas with low-carbon fuels (biogas/renewable natural gas (RNG) for WWW process heating, investigate and evaluate tackling “last mile” emissions, revisit and refine existing plans and policies.

Within Appendices 1 and 2 a structured plan is outlined in the form of action tables with these three distinct phases (short, medium, and long-term, respectively) that gradually lead the Region towards the Net-Zero target. Each phase is designed to strategically build upon the previous one, ensuring that impactful changes are made without overburdening financial resources. By focusing initially on cost-saving opportunities and policy development, a strong foundation is formed for the eventual capital investments needed to achieve deeper levels of decarbonization.

Climate Action Benefits and Future Forward

A strong CCAP enhances resilience, cost efficiency, and environmental responsibility in an era of economic and climate uncertainty. For example, with ongoing uncertainty with tariffs driving up energy costs, energy independence is crucial – local generation reduces reliance on volatile global markets while stabilizing expenses. Operational cost avoidance is achieved by optimizing energy efficiency and mitigating exposure to the Global Adjustment rate, which continues to rise due to peak demand charges and grid inefficiencies, ensuring long-term savings. Futureproofing through sustainable infrastructure will help the Region to adapt to regulatory shifts and climate risks, securing long-term viability. Additionally, lower emissions lead to reduced health impacts, improving air quality and community well-being.

The CCAP provides a strategic framework for reducing GHGs while integrating sustainability into core operations and long-term asset management. By aligning climate action with existing renewal cycles and leveraging external funding opportunities, it supports a fiscally responsible approach to decarbonization. The plan also ensures compliance with regulatory requirements, enables adaptation to emerging policies, and capitalizes on advancements in low-carbon technology. Endorsing the CCAP demonstrates leadership and a commitment to sustainability, positioning the Region to navigate future economic, environmental, and social challenges with confidence.

Alternatives Reviewed

Maintain the Status Quo

Failing to implement a Corporate Climate Change Action Plan would reduce our Regions' resilience to climate change impacts, lead to rising energy costs, and result in continued environmental harm, regulatory risks, and potential reputational damage.

Relationship to Council Strategic Priorities

- Green and Resilient Region – The Corporate Climate Change Action Plan is a key action under the Green and Resilient Region priority in Regional Council's 2023-2026 Strategic Priorities, helping to reduce emissions and build climate resilience.
- Effective Region – Implementing a Corporate Climate Change Action Plan enhances operational efficiency, reduces long-term costs, and ensures regulatory compliance, supporting a well-managed and future-ready region.
- Equitable Region – Climate action promotes environmental justice by reducing disproportionate climate impacts on vulnerable communities, ensuring a healthier and more sustainable future for all.
- Prosperous Region – By fostering low-carbon innovation and sustainable business practices, the plan supports economic growth, job creation, and long-term prosperity in the region.

Other Pertinent Reports

PDS 17-2023 Climate Change Update
(https://pub-niagararegion.escribemeetings.com/filestream.ashx?DocumentId=31292)

Conservation and Demand Management Plan (2024-2028)
(https://www.niagararegion.ca/culture-and-environment/pdf/2024-2028-energy-conservation-demand-management-plan.pdf)

CSD 7-2022 Appendix 1 2021 Corporate Asset management Plan
(https://pub-niagararegion.escribemeetings.com/filestream.ashx?DocumentId=26693)

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Appendices

Appendix 1	Corporate Climate Change Action Plan – Condensed Version
Appendix 2	Corporate Climate Change Action Plan – Full Report

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Corporate Climate Change Action Plan

Condensed Version

Niagara Region // May 7, 2025

Niagara Region | Growing Better Together

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Land Acknowledgement

Niagara Region is situated on treaty land. This land is steeped in the rich history of the First Nations such as the Hatiwendaronk, the Haudenosaunee, and the Anishinaabe, including the Mississaugas of the Credit First Nation. There are many First Nations, Métis, and Inuit from across Turtle Island that live and work in Niagara today. The Regional Municipality of Niagara stands with all Indigenous peoples, past and present, in promoting the wise stewardship of the lands on which we live. This commitment to stewardship aligns with Niagara's Corporate Climate Change Action Plan, reinforcing sustainable practices. By working together, we can honor these traditions and take meaningful action to address climate change for future generations.

Climate Change in Niagara

Niagara is experiencing significant climate challenges, including rising temperatures, increased precipitation, and more frequent extreme weather events. These shifts threaten both communities and the environment, disproportionately impacting vulnerable populations and escalating financial burdens.

Table 1 – Projected Climate Impacts in Niagara[1]

Climate Parameter	2020	2050	2080	Difference from Baseline to Long-Term
Mean Annual Temperature (℃)	8.7	10.7	12.3	+3.6
Days Above 30℃	10.4	23.9	39.4	+29.0
Total Annual Precipitation (mm)	1080.6	1135.0	1192.0	+111.4
Mean Annual Temperature (℃)	8.7	10.7	12.3	+3.6

Action Plan Framework

Niagara Region uses the Partners for Climate Protection program as its framework for climate change action. Niagara Region has completed Milestones 1 and 2. The Climate Change Action Plan represents Milestone 3 of this framework. This milestone focuses on the measurement, management, and reduction of greenhouse gas emissions from regional activities and facilities.

[1] Toronto and Region Conservation Authority. (2022). Climate Projections for Niagara Region (p. 2).

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Figure 1- Partners for Climate Protection Milestone Framework

Action Plan Overview

On May 22, 2023, Regional Council reinforced its pledge to combating climate change by approving a Net-Zero corporate greenhouse gas emission reduction goal by 2050 in principle. This target supports action on climate change mitigation and aligns Niagara Region with other municipalities working towards Canada's Net-Zero carbon emissions plan.

Targeted Reductions

Niagara Region plans to achieve this target with an initial focus set on practical actions to make meaningful progress in the short-term (by the end of 2028). To achieve this, Niagara Region aims to reduce Corporate emissions by 17.9 per cent. Targeted reductions in the short-term for the Region's major emissions contributors include:

- Buildings
- Water and Wastewater
- Operational Waste
- Fleet

Climate Action Benefits

Niagara Region's climate action initiatives will reduce greenhouse gas (GHG) emissions, lower operational costs, and enhance energy resilience through local energy generation. By prioritizing sustainability, the Region will lead by example, encouraging community collaboration

and driving long-term environmental and economic benefits. Additionally, these efforts will help future-proof operations by mitigating the impact of rising energy costs, ensuring cost avoidance and long-term financial stability.

Cost to Decarbonization
GHG emission reduction efforts will be integrated into operations and capital projects, aligning with asset renewal and the Corporate Asset Management Resource Allocation model (CAMRA) to ensure strategic, cost-effective investments. Projects will undergo business case analysis in the annual budget process, while external funding and master plan alignment will enhance efficiency. Given evolving technologies, energy costs, and policies, the plan remains adaptive, embedding climate action within core operations while supporting the Net-Zero goal.

Setting the Foundation
The longer-term path to Net-Zero will not be easy and will involve several financial, technological, and operational constraints. This plan recognizes these challenges and begins to set the required actions in motion to overcome them.

The Action Plan
Niagara Region has developed a pragmatic, phased approach that balances environmental responsibilities with cost restrictions, technological advances, and current operation practices. The following outlines a structured plan with three distinct phases (short, medium, and long-term) that gradually lead Niagara Region towards the Net-Zero target. Each phase is designed to strategically build upon the previous one, ensuring that impactful changes are made without overburdening financial resources. By focusing initially on cost-saving opportunities and policy development, a strong foundation is formed for the eventual capital investments needed to achieve deeper levels of decarbonization.

A Phased Approach

Short-term (0-5 years) – Foundational Policy Development and Strategic Investments:
Leverage end-of-life opportunities, understand life cycle costs to minimize expenses, increase efficiency, and establish foundational sustainability policies and processes.

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Table 2 – Short-term Plan Actions

Actions	Type	Timing	GHG Impact	Cost
Complete a comprehensive review of existing policies.	Policy	Immediate	N/A	Internal resourcing
Begin fuel-switching natural gas heating assets (at end-of-life) in buildings and W&WW to low carbon sources.	Project	Ongoing	High	$$$
Implement a decarbonization project assessment policy.	Policy	Immediate	N/A	Internal resourcing
Apply a Climate Lens to align investment decisions.	Policy	Immediate	N/A	Internal resourcing
Perform a review of internal resources to ensure appropriate resourcing for climate action efforts.	Process	Immediate and Ongoing	N/A	Internal resourcing
Implement a sustainable procurement policy prioritizing sustainable good or products.	Policy	Future	N/A	Internal resourcing
Secure top-down support.	Process	Immediate and Ongoing	N/A	Internal resourcing
Develop a corporate engagement, education, and awareness plan.	Plan	Immediate and Ongoing	N/A	Internal resourcing
Implement policy to investigate the prevention of like-for-like replacement of natural gas assets at end of life.	Policy	Immediate	N/A	Internal resourcing
Implement policy for Net-Zero requirement for all new constructed Regional buildings.	Policy	Immediate	N/A	Internal resourcing
Complete low/no-cost energy efficiency projects.	Project	Immediate	Low	$
Enact a policy and provide training to reduce Fleet emissions.	Policy	Immediate	N/A	Internal resourcing
Complete a Green Fleet Plan and Policy.	Policy	Immediate	N/A	Internal resourcing
Electrify (to hybrid or fully electric) light-duty fleet vehicles.	Project	Immediate	High	$$

Actions	Type	Timing	GHG Impact	Cost
Develop a unified policy/procedure (between Waste Management and Facilities) to collect solid waste data.	Policy	Immediate	N/A	Internal resourcing
Conduct regular waste audits to identify the types and volumes of waste generated.	Process	Ongoing	N/A	Internal resourcing
Develop a waste reduction plan.	Plan	Immediate	N/A	Internal resourcing
Annual Update of GHG Inventory	process	Future	N/A	$/Internal resourcing

Medium-term (5-15 years) – Policy and Process with Initial Capital Investments: Enhance and solidify sustainable policies and processes while beginning initial capital investment projects to support future large-scale investments.

Table 3 – Medium-term Plan Actions

Actions	Type	Timing	GHG Impact	Cost
Investigate potential partnerships with other municipalities and organizations to pool resources.	Process	Immediate	N/A	Internal resourcing
Stay current on decarbonization technologies.	Process	Ongoing	N/A	Internal resourcing
Create a process for and identify pilot small-scale decarbonization projects.	Process	Ongoing	N/A	Internal resourcing
Complete capital energy efficiency projects.	Project	Future	Medium	$$
Electrify or de-carbonize fleet.	Project	Future	High	$$$
Review policies for energy management at leased facilities.	Policy	Immediate	N/A	Internal resourcing
Evaluate opportunities for building consolidation	Policy	Immediate	N/A	Internal resourcing
Complete 5-year Climate Change Action Plan updates.	Process	Future	N/A	$$

Long-term (15+ years) – Intensive Capital Investment and Tackling the Balance: Make significant capital investments (leveraging funding where available) in advanced technologies/infrastructure and refine established policies to achieve deeper sustainability gains towards the Net-Zero target.

Table 4 – Long-term Plan Actions

Actions	Type	Timing	GHG Impact	Cost
Complete capital-intensive energy efficiency and generation projects.	Project	Future	Medium	$$$
Substitute the use of natural gas with low-carbon fuels.	Project	Future	High	$$$
Investigate and evaluate methods for tackling “last-mile” emissions.	Project	Future	High	$$$
Revisit and refine existing plans and policies in support of the Climate Change Action Plan.	Policy	Future	N/A	Internal resourcing

Short-term Plan Focus (0-5 Years)
The short-term phase focuses on driving immediate GHG reductions while laying the foundation for long-term decarbonization. Key actions include applying a climate lens to all projects and operations, refining, and developing policies, and launching staff engagement and awareness initiatives. Priority measures – such as energy efficiency upgrades, fuel switching, and electrifying the light-duty fleet – are selected for their potential to deliver quick and measurable emissions reductions. Asset replacements will be strategically leveraged to avoid like-for-like substitution of high-emission equipment. Life cycle cost analysis will support these efforts, ensuring that climate-focused decisions are also fiscally responsible and avoid future retrofit needs. Together, these actions demonstrate early progress toward Net-Zero while embedding emissions reduction into everyday decision-making.

A Phased, Strategic and Adaptive Path to Sustainable Energy Investment
To ensure sustained emissions reductions over time, a phased and adaptive investment strategy was adopted. This approach balances long-term GHG goals with the need to respond to evolving technologies, fluctuating energy markets, and regulatory changes. All projects will be evaluated through a GHG-focused business case analysis during the annual budget cycle, integrated into the CAMRA process to align with asset renewal timelines and climate priorities. External funding and alignment with master plans will be pursued to maximize impact. By

embedding climate action into the core of planning and operations, this strategy ensures that all investments remain flexible, future-ready, and anchored in the pursuit of Net-Zero

Corporate Climate Change Action Plan

Regional Municipality of Niagara

Niagara Region

May 7, 2025

Land Acknowledgement

Niagara Region is situated on treaty land. This land is steeped in the rich history of the First Nations such as the Hatiwendaronk, the Haudenosaunee, and the Anishinaabe, including the Mississaugas of the Credit First Nation. There are many First Nations, Métis, and Inuit from across Turtle Island that live and work in Niagara today. The Regional Municipality of Niagara stands with all Indigenous peoples, past and present, in promoting the wise stewardship of the lands on which we live. This commitment to stewardship aligns with Niagara's Corporate Climate Change Action Plan, reinforcing sustainable practices. By working together, we can honor these traditions and take meaningful action to address climate change for future generations.

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List of Acronyms/Abbreviations

APSC: Action Plan Sub-Committee

BEV: Battery electric vehicle

BAU: Business-as-usual

CCAP: Corporate Climate Change Action Plan

CDMP: Conservation and Demand Management Plan

CO_2: Carbon dioxide

DEI: Diversity, Equity and Inclusion

DHW: Domestic Hot Water Heating

EMS: Emergency Medical Services

FCM: Federation of Canadian Municipalities

GFPP: Green Fleet Plan and Policy

GHG: Greenhouse gas

ICE: Internal combustion engine

IESO: Independent Electricity System Operator

ICLEI: Local Governments for Sustainability (formerly International Council for Local Environmental Initiatives)

KOG: Keen on Green

LEED: Leadership in Energy and Environmental Design

PCP: Partners for Climate Protection (framework)

REC: Renewable energy credits

RMON: Regional Municipality of Niagara

tCO_2e: Tonnes of carbon dioxide equivalent

Executive Summary

This Corporate Climate Change Action Plan (CCAP) represents a pivotal point in the Regional Municipality of Niagara's (RMON's) overall climate action strategy. This CCAP was developed in alignment with Council Priorities for 2023-2026 and Energy Conservation and Demand Management Plans (CDMPs).

In early 2023, the RMON completed a Corporate GHG Inventory which established baseline emissions (for the base year of 2018) as 24,455 tonnes of CO2 equivalent (tCO_2e). On May 10th, 2023, a Target Report to Regional Council was presented to review and approve efforts to significantly reduce Corporate emissions. Following engagement, a Council Resolution was passed, for a Net-Zero (in principle)[1] Corporate emissions target to be reached by 2050 - aligning with several other Ontario municipalities and demonstrating an unwavering commitment to sustainability. This CCAP provides an overview of the RMON's plans to achieve this target, with an initial focus set on practical actions to make meaningful progress in the short-term (by the end of 2028).

In the short-term the RMON aims to reduce Corporate emissions by 17.9%, aligned with the Net-Zero trajectory. This includes targeted reductions for each of the RMON's major emissions contributors (Buildings, Water and Wastewater, Operational Waste, and Fleet). An Action Plan Sub-Committee (APSC) of Regional staff was established and engaged to set these goals as well as to inform the plans described in this CCAP. GHG reduction costs will be integrated into ongoing operations and aligned with asset renewal. Projects will be assessed on a case-by-case basis, with funding opportunities explored. They will be brought forward through the annual budget process with business case analysis, evaluating full life-cycle costs, GHG reduction impacts, and associated benefits. Projects will also go through the Corporate Asset Management Resource Allocation model (CAMRA) process to ensure strategic investment and prioritization. In the interim, some costing estimates and further details are available in the approved 2024-2028 CDMP, with further analysis available through ongoing Feasibility Studies funded by the Federation of Canadian Municipalities' Green Municipal Fund.

RMON's Net-Zero plan includes three phases – short, medium, and long-term – each building on the last to ensure progress without straining finances. Early actions focus on cost-saving measures and policies, paving the way for later investments in decarbonization. Key steps include adopting efficient electric heating, switching to electric/hybrid vehicles, improving buildings, optimizing operations, and managing

[1] The term "Net-Zero (in principle)" indicates a preliminary commitment to achieving Net-Zero corporate emissions by 2050, subject to further evaluation and potential adjustment upon the review and adoption of the Corporate Climate Change Action Plan.

waste. Climate resiliency, like handling increased rainfall and heat, ensures durable infrastructure. The CCAP sets actions in motion, reaffirming RMON's commitment to GHG reduction, building resilience, and ensuring a sustainable future.

Living Document

The CCAP is designed as a dynamic and evolving framework, recognizing the fluid nature of environmental challenges and the need for adaptive strategies. As such, it is acknowledged as a Living Document that will undergo regular reviews and updates to accurately reflect ongoing changes, such as the addition or removal of Corporate facilities, advancements in technology, shifts in regulatory and environmental landscapes, as well as changes in the RMON's internal policies to support this Plan. These updates are essential to ensure the CCAP remains relevant and serves as an effective guide towards the RMON's sustainability goals. The process for reviewing and updating the CCAP will occur every five years in alignment with the CDMP and other strategic master plans. This coordinated approach ensures climate initiatives are integrated with broader sustainability and development goals, fostering a more resilient and sustainable Region.

Background

Local Context

Niagara Region is situated between Lake Ontario and Lake Erie. It is the traditional land of many First Nations; including the Hatiwendaronk, Anishinaabe and Haudenosaunee people, who have lived here for thousands of years before European exploration and settlement. It is rich in natural resources that helped sustain the original people for generations and served as a natural trade route between the north and south; a tradition that continues to this day. Niagara Region is the place where many treaty agreements were formed, building alliances among nations, including the eventual creation of Canada.

Today, Niagara Region, with its 12 municipalities, is celebrated for its captivating natural landscapes and urban attractions, as well as fertile farmlands, scenic vineyards, and the impressive Niagara Escarpment. Encompassing 1,854 square kilometers, the Region features diverse urban centers, rural communities, and conservation areas. Niagara relies on Ontario's electricity grid, which blends nuclear, hydroelectric, natural gas, and renewable sources. Natural gas is the main heating fuel, supplemented by heating oil in remote areas and increasing use of electric heating technologies like heat pumps.

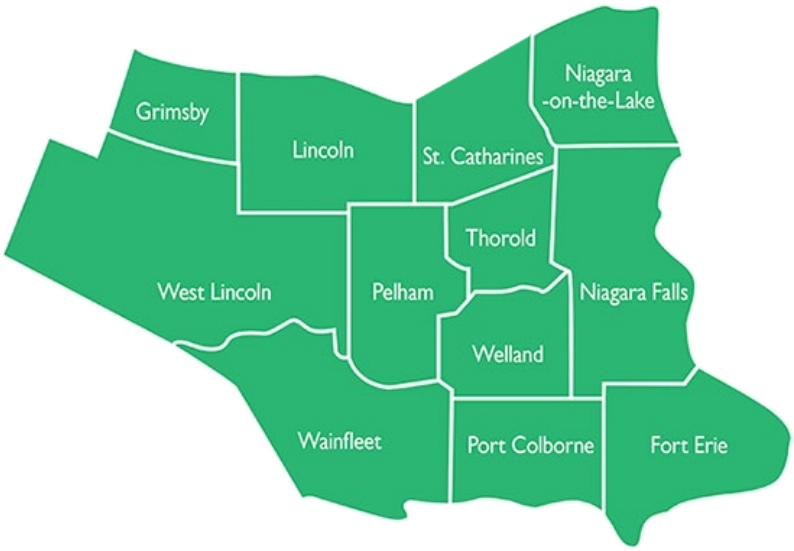

Figure 1 - Map of Niagara Local Municipalities[2]

Gasoline and diesel remain the primary transportation fuels, but there is growing interest in sustainable mobility through alternative fuels and electric vehicles.

[2] Local Municipalities - Niagara Region, Ontario. (n.d.). www.niagararegion.ca. https://www.niagararegion.ca/government/municipalities/default.aspx

The Niagara Region, celebrated for its rich heritage, vibrant arts scene, and world-renowned Niagara Falls, also values its agricultural roots and thriving wine industry, blending rural and urban lifestyles. This cultural richness provides opportunities for innovative climate strategies, starting with this CCAP. Influenced by provincial and federal regulations, including Ontario's emissions targets and the Pan-Canadian Framework, this CCAP aligns with initiatives for emissions reductions, energy efficiency, and sustainable practices at both Corporate and Community levels.

The Niagara Region boasts a population of almost 500,000 and is expected to increase to roughly 700,000 by 2051[3] (or an average of 1.1% annually). Most of this population is concentrated in St. Catharines, Niagara Falls and Welland. The median age is 46 years old and roughly half of the residents are employed in either sales/service, trades or business occupations[4].

The RMON enhances community quality of life by providing essential services and infrastructure; managing local governance, public safety, water and wastewater services, transportation networks, and even maintaining landfill sites that have been transformed into natural areas. The RMON plans and supports sustainable urban development and economic development initiatives. In collaborating with residents and businesses, the RMON fosters a sense of belonging through diverse community programs, events, and initiatives promoting a thriving, inclusive, and vibrant local environment.

The accomplishment of the above depends on the collective efforts of the RMON's talented and dedicated staff who work diligently to balance the demands of the present while planning for the possibilities of the future.

Partners for Climate Protection (PCP) Program and RMON's Climate Action Milestones

The Partners for Climate Protection (PCP) program[5] is a framework established by the Federation of Canadian Municipalities (FCM) and the Local Governments for Sustainability (ICLEI – formerly the International Council for Local Environmental Initiatives) organizations. This framework helps Canadian municipalities tackle climate change through a five-milestone (Figure 2) program, each building on the last, to create a comprehensive decarbonization and sustainability plan.

[3] Niagara Region. (2022). Niagara Official Plan (p. 14) [Review of Niagara Official Plan].
[4] Statistics Canada. (n.d.). 2021 Census of Population. https://niagaraknowledgeexchange.com/wp-content/uploads/sites/2/2022/04/2021-Census-Profile_Niagara-regional-Municipality-Census-Division_Statistics-Canada.pdf
[5] Program - Partners for Climate Protection. (n.d.). Www.pcp-Ppc.ca. https://www.pcp-ppc.ca/program

Figure 2 - Partners for Climate Protection Milestone Framework

The PCP program offers two streams: Corporate and Community. This CCAP represents Milestone 3 of the Corporate Stream, focusing on internal operations, specifically on the measurement, management, and reduction of GHG emissions from Municipal activities and facilities.

The RMON joined the PCP program in 2009, initiating a strong commitment to sustainability and climate protection. In 2021, the RMON declared a climate emergency to acknowledge the urgency of addressing environmental challenges, mobilize resources for sustainable initiatives, and prompt decisive action to mitigate the impacts of climate change on communities throughout the Niagara Region. Since then, the RMON's climate action efforts have increased substantially – adding climate change focus to policies, forming partnerships, and increasing investments in decarbonization measures.

Figure 3 provides a brief overview of the RMON's climate action milestones.

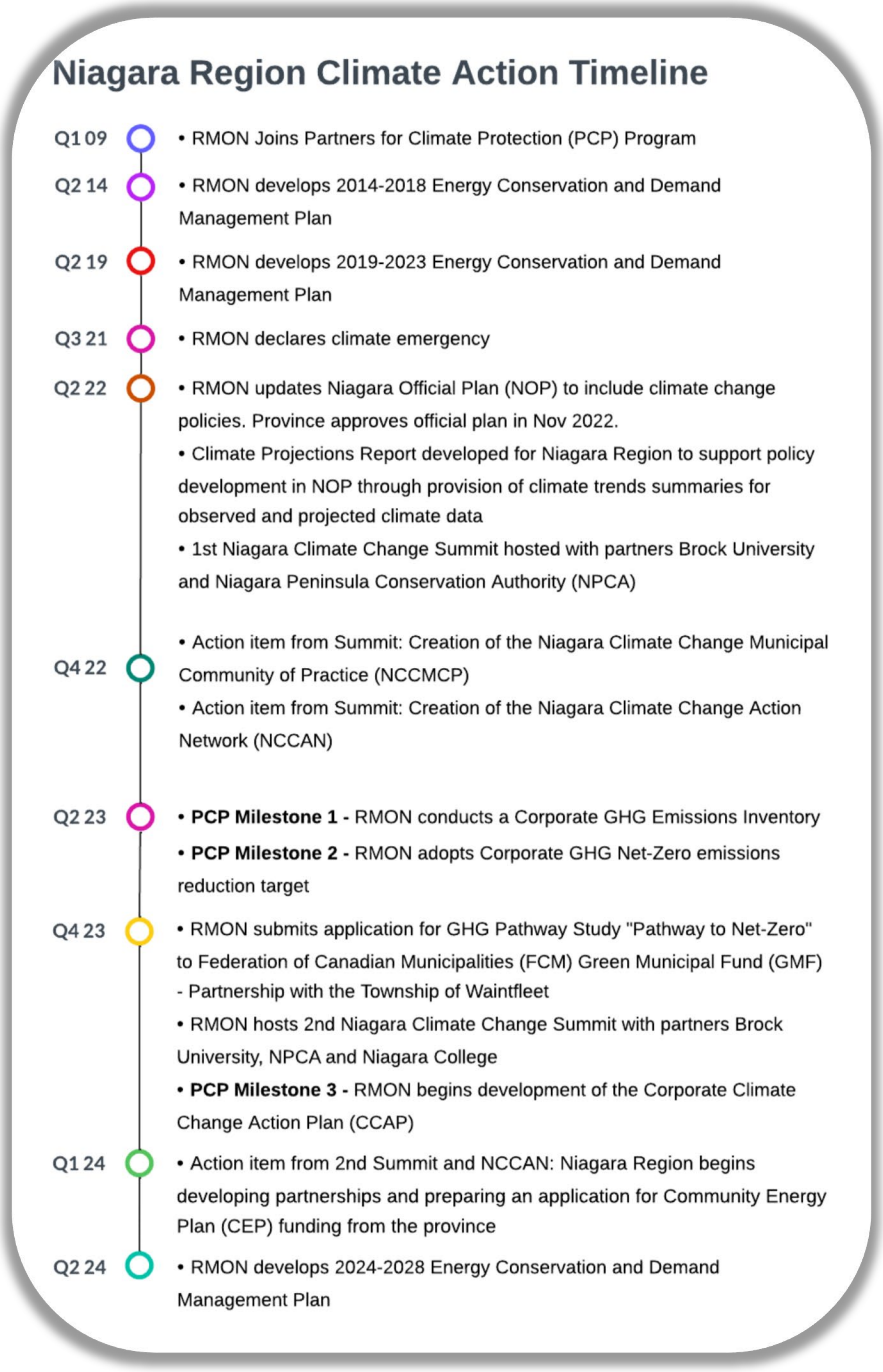

Figure 3 - RMON Climate Action Timeline

As outlined, the RMON has completed PCP Corporate Milestones 1 and 2. This report satisfies the requirements of Corporate Milestone 3 – Development of a Corporate Climate Change Action Plan.

Plan Development

Strategic Alignment with Existing Policies and Plans

The CCAP aligns with Council's 2023-2026 Strategic Priorities, specifically the Green and Resilient Region priority, supporting the RMON's mission to serve residents, businesses, and visitors through leadership and effective community services. The actions are guided by the Strategic Lenses of:

- Sustainability and climate change
- Diversity, equity, inclusion and Indigenous reconciliation
- Innovation
- Fiscal responsibility

The CCAP operates in accordance with the CDMP, promoting energy efficiency and reducing GHG emissions. Recognizing that it takes energy to deliver services to the public, the plan also complements the GHG Reduction Feasibility and Pathway Studies, which aim to achieve Net-Zero emissions by examining strategies for significant emission reductions in 12 archetype buildings, and Regional Headquarters.

Climate Change Lens

Incorporating a climate lens into daily regional business involves adopting a strategic approach that prioritizes environmental sustainability, resilience, and economic considerations. This lens will ensure that every decision and action consider the implications for climate change mitigation and adaptation. By integrating this perspective, the RMON can enhance operational efficiency, reduce GHG emissions, and contribute positively to community efforts to combat climate change.

Staff completed the DeGroote School of Business Capstone Project – Integrating Climate Change into our planning and the decision-making process – demonstrating the importance of aligning with Corporate goals and Council Strategic Priorities through a climate lens. It highlighted how this approach fosters innovation in sustainable practices, boosts the Region's reputation, and attracts environmentally conscious interested parties (e.g. investors). It also highlighted how addressing climate risks and opportunities proactively helps future-proof operations against regulatory changes, resource constraints, and market shifts.

Embracing a climate lens is a strategic advantage that drives long-term fiscal responsibility and resilience while playing a pivotal role in shaping a sustainable future for communities. To this end, the work of the Capstone Project will be analysed, and recommendations and tools will be adapted for implementation to support a Corporate climate lens.

Corporate Engagement, Education, and Awareness Action-Plan Sub Committee

Engagement is crucial for a successful CCAP, bringing diverse perspectives, consensus, solutions, credibility, and sustainability. A Regional Action Plan Sub-Committee (APSC) was formed in the development of the CCAP to:

1. **Gather Expertise and Perspectives:** APSC includes representation from various regional departments and interested parties, ensuring comprehensive coverage of climate impacts across sectors such as infrastructure, public health, and finance.
2. **Coordinate Holistic Climate Action:** APSC integrates strategies across departments (energy, waste management, transportation), enhancing planning and execution coherence for effective climate initiatives.
3. **Pool Resources:** APSC consolidates departmental resources, data, and tools to efficiently allocate them towards climate initiatives.

Establishing the APSC was pivotal, leveraging expertise and fostering collaboration for successful CCAP implementation. Regular meetings generated detailed discussions with feedback and strategies integrated throughout the CCAP. Questionnaires and surveys gathered broad insights, informing a well-rounded strategy reflecting APSC expertise and regional perspectives towards achieving sustainability goals.

Broad Corporate Engagement

Effective Corporate Engagement, Education, and Awareness are vital components of the CCAP. By fostering a well-informed workforce, the RMON can ensure that every employee understands their role in achieving the organization's climate change goals. Awareness and education not only empower employees but also drive behavioral changes necessary for reducing Corporate emissions.

A structured framework is required to enhance staff understanding and participation in climate action initiatives. In the short-term, the RMON will develop a Corporate climate change engagement, education, and awareness plan to accomplish this, which may include:

1. **Steering Committee**: Forming a steering committee to guide RMON’s CCAP. This committee would oversee the implementation of the plan actions and make key decisions on future projects, ensuring they align with organizational goals. The committee will also track progress and provide direction for long-term energy and sustainability planning.

2. **Monthly Vine Posts:** Utilizing the internal newsletter, Vine, to regularly feature updates on RMON's sustainability efforts, success stories, and practical tips for employees to contribute to emission reductions.

3. **Educational Campaigns and Contests:** Launching engaging campaigns such as an "Energy Savings Challenge," where departments compete to reduce their energy use. Winners can receive recognition or rewards, creating a fun, competitive environment that promotes active participation.

4. **"Did You Know?" Campaign:** Developing a series of eye-catching infographics or short videos that highlight surprising facts about climate change, RMON's specific targets, and the impact of individual actions. These may be shared via email blasts, posted in common areas, or featured on the Vine.

5. **Workshops and Training Sessions:** Organizing workshops that detail the CCAP's goals and train RMON staff on how they can contribute. These sessions can cover topics such as recycling and energy conservation techniques.

6. **Digital Information Hub:** Further utilizing the Climate Change Vine page, which serves as a resource center for all things related to RMON’s climate initiatives. This can include CCAP updates, progress reports, educational materials, and an FAQ section to address common questions and misconceptions.

7. **Feedback Mechanisms:** Establishing channels for employees to provide feedback on the CCAP’s initiatives, suggest new ideas, and report any issues. This could be through regular surveys, suggestion boxes, or an interactive digital forum.

8. **Leadership Endorsement and Role Modeling:** Encouraging senior leaders and department heads to actively participate in these initiatives and model sustainable behaviors. Leadership endorsement can significantly boost employee morale and participation rates.

By integrating these strategies, the RMON will not only increase Corporate awareness and education but also foster a culture of sustainability that is critical to achieving its climate action goals.

Tackling the Climate Issue

Climate Change and the Greenhouse Effect

The Earth's temperature relies on the equilibrium between the energy entering and leaving its system. When sunlight reaches the Earth, it can either be absorbed or reflected. The majority of it is absorbed by the Earth's surface and warms it - a natural process that is essential to maintain life. Solar energy that is reflected back to space does not contribute to the Earth's warmth.

Climate change results from the Earth's natural energy balance being disrupted by greenhouse gases (GHGs), which trap heat in the atmosphere like a blanket. This phenomenon, known as the greenhouse effect, is worsened by human activities. The results are changes in the Earth's climate ("climate change") which can have detrimental effects on human health as well as to natural ecosystems[6].

The Paris Agreement[7], a critical international treaty, aims to limit global temperature rise to well below 2 degrees Celsius, urging nations to reduce GHG emissions and adopt sustainable practices. Mitigating climate change not only curbs temperature rise but also improves air quality, public health, and economic opportunities through energy efficiency and renewable energy investments. Integrating mitigation and adaptation strategies is crucial for building resilience against climate impacts and ensuring sustainable development worldwide. These principles underpin the RMON's Corporate Climate Change Action Plan.

Climate Change in Niagara

Niagara faces significant climate challenges, including increased warmth, precipitation, and extreme weather events. These changes pose risks to both people and the environment, especially affecting vulnerable groups and increasing financial burdens. To address these challenges, the RMON commissioned a climate projections study from the Toronto and Region Conservation Authority in February 2022. This study analyzed regional climate data and highlighted distinct climate differences between the north and south regions of Niagara, influenced by orographic and elevation factors.

[6] United States Environmental Protection Agency. (2021, April 15). Basics of Climate Change. Www.epa.gov. https://www.epa.gov/climatechange-science/basics-climate-change
[7] United Nations. (2015). The Paris Agreement. United Nations. https://www.un.org/en/climatechange/paris-agreement

Table 2 outlines the study results for temperature and precipitation projections for the Niagara Region under a Business-As-Usual (BAU) scenario (that is, a collective high emissions pathway that projects continued increases to GHG concentration beyond the end of the century).

Climate Parameter	2020	2050	2080	Difference from Baseline to Long Term
Mean Annual Temperature (°C)	8.7	10.7	12.3	+3.6
Days Above 30°C	10.4	23.9	39.4	+29.0
Total Annual Precipitation (mm)	1080.6	1135.0	1192.0	+111.4

Table 2 - Projected Climate Impacts in Niagara[8]

The climate projections study highlighted the unique regional vulnerabilities by broadly dividing the region into north and south. General conclusions can be drawn about how the projected changes will affect various communities throughout the region. This underscores the need for further plans, such as a Niagara Adaptation Plan, and a Community Energy Plan (CEP), to emphasize diversity, equity, and inclusion (DEI) and to be responsive to these challenges. Heat mapping at the dissemination area level could be particularly useful in understanding these impacts. Meanwhile, the CCAP, as a Corporate plan, also integrates DEI principles to ensure that the organization's policies and actions contribute to addressing these issues.

Charting a Sustainable Tomorrow

The Current (Baseline Emissions Inventory - PCP Milestone 1)

In March of 2023, the RMON completed a Corporate GHG Inventory[9] (for the base year of 2018) following the PCP protocol, which detailed the RMON's emissions profile. This inventory, fulfilling PCP Milestone 1, serves as the RMON's guide towards a low-carbon future by documenting the RMON's carbon footprint and providing insights to inform strategic decarbonization efforts.

[8] Toronto and Region Conservation Authority. (2022). Climate Projections for Niagara Region (p. 2).
[9] ICLEI Canada. (2023). Niagara Region 2018 Corporate Baseline GHG Emissions Inventory.

To understand an emissions profile, it is critical to understand the different emissions Scopes. Table 3 provides a description of the three Scopes of emissions and provides examples of the RMON's specific contributors within each Scope.

Emissions Scope	Scope General Description	RMON-specific Corporate Emissions Sources
Scope 1	Direct emissions from owned or controlled sources, like onsite fuel combustion, industrial processes, and owned vehicles, directly within the organization's operational boundaries.	• Mobile fuel combustion for fleet vehicles • Stationary fuel consumption for building/facility heating • Waste collected from RMON-owned facilities and housing units • Biogas flaring (WWW)
Scope 2	Indirect emissions from purchased electricity, heat, or steam generation, occurring at the facilities of energy providers but resulting from the organization's consumption.	• Stationary consumption of electricity for corporate buildings and assets
Scope 3	Indirect emissions from activities beyond an organization's direct control, such as business travel, supply chain operations, product use, and disposal, influencing the environment but lying outside immediate organizational boundaries.	• Landfill emissions • Police vehicles • Mobile combustion in vehicles for community waste collection • Region staff driving to and from work

Table 3 - Scopes of Emissions

Another fundamental decision in the development of the Corporate GHG Inventory was selection of the Inventory boundary which establishes which emissions sources/Scopes will be included. An Operational Control boundary was selected which includes Scope 1 and Scope 2 emissions. This boundary specifies that the inventory will include 100 per cent of the emissions from operations where the RMON has the ability to introduce and implement policies, procedures and practices that directly influence the emissions.

In 2018, the RMON's total Corporate GHG emissions were **24,455tCO2e**. A summary of the emissions sector breakdowns from the GHG inventory are shown in Table 4 and Figure 4 below.

Sector	GHG Emissions (tCO_2e)
Buildings	12,668
Fleet	3,526
Outdoor Lighting and Traffic Signals	91
Water and Wastewater	6,280
Operational Waste	1,890
Total[10]	**24,455**

Table 4 - RMON 2018 Corporate Emissions Distribution by Sector (Table)

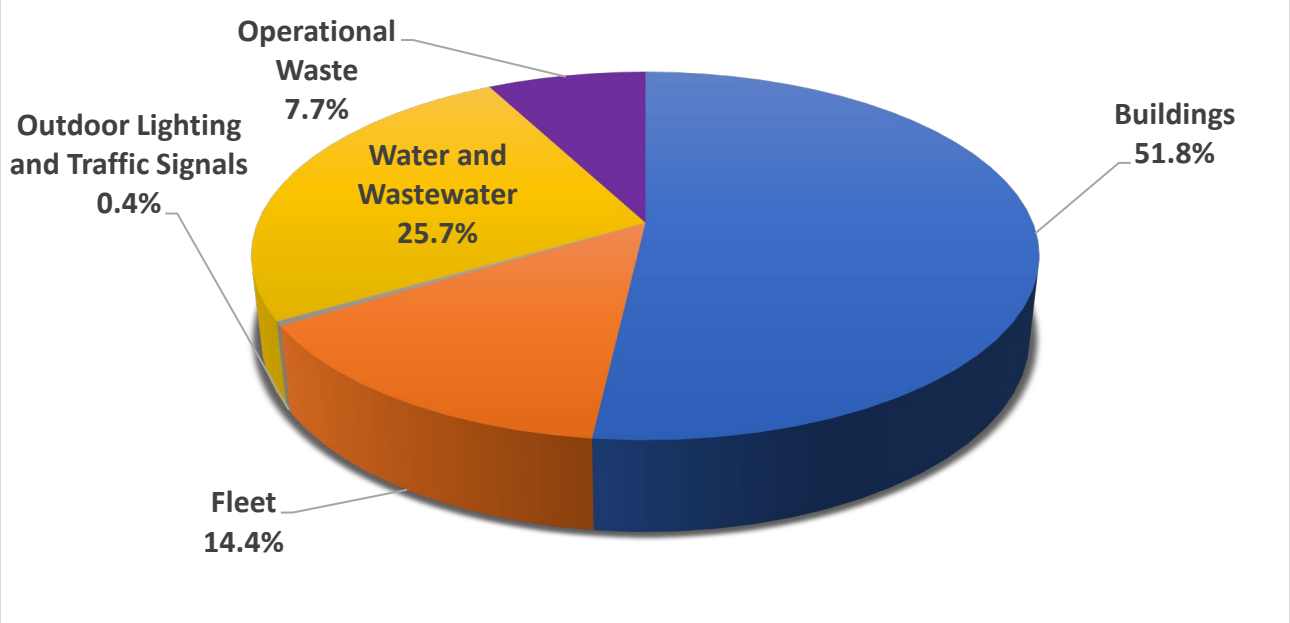

Figure 4 - RMON 2018 Corporate Emissions Distribution by Sector (Pie Chart)

Business-As-Usual GHG Emissions Forecast

A Business-As-Usual (BAU) emissions forecast was completed to project the RMON's future emissions levels. This forecast assumed current practices, policies, and trends would continue without significant alterations or interventions. This emissions forecast, developed by expert consultants, was modelled in alignment with the most up-to-date

[10] Values may not sum to total due to rounding

population forecasts from the RMON Development Charges Background Study[11]. It is a useful tool when making decisions related to energy and emissions mitigation strategies.

In the BAU model, typical of most municipal organizations, population growth is the primary driver of Corporate energy use and emissions. As the Niagara Region expands, it is anticipated that more facilities will be required to accommodate this growth. Although regulations promoting high-efficiency and green energy systems will help minimize emissions associated with new facilities and infrastructure, the influence of population growth is expected to have a greater overall impact on the RMON's emissions profile.

Currently electricity consumption is a small overall contributor to the RMON's emissions profile. This is a result of low emissions intensity in the current electricity supply in Ontario. However, it is expected that this will increase in the future. While fuel-switching fossil fuel consumption to electricity is widely accepted as the key to a low-carbon future, projected increases to the emissions intensity of the Ontario electricity grid may also require further investment in distributed renewable energy resources to produce that electricity cleanly.

A summary of the BAU emissions forecast for the RMON's Corporate operations is provided in Figure 5 and Table 5 below.

[11] Watson & Associates Economists Ltd. (2022). Development Charges Background Study - Regional Municipality of Niagara. In Niagara Region. https://www.niagararegion.ca/business/property/pdf/2022-dc-background-study.pdf

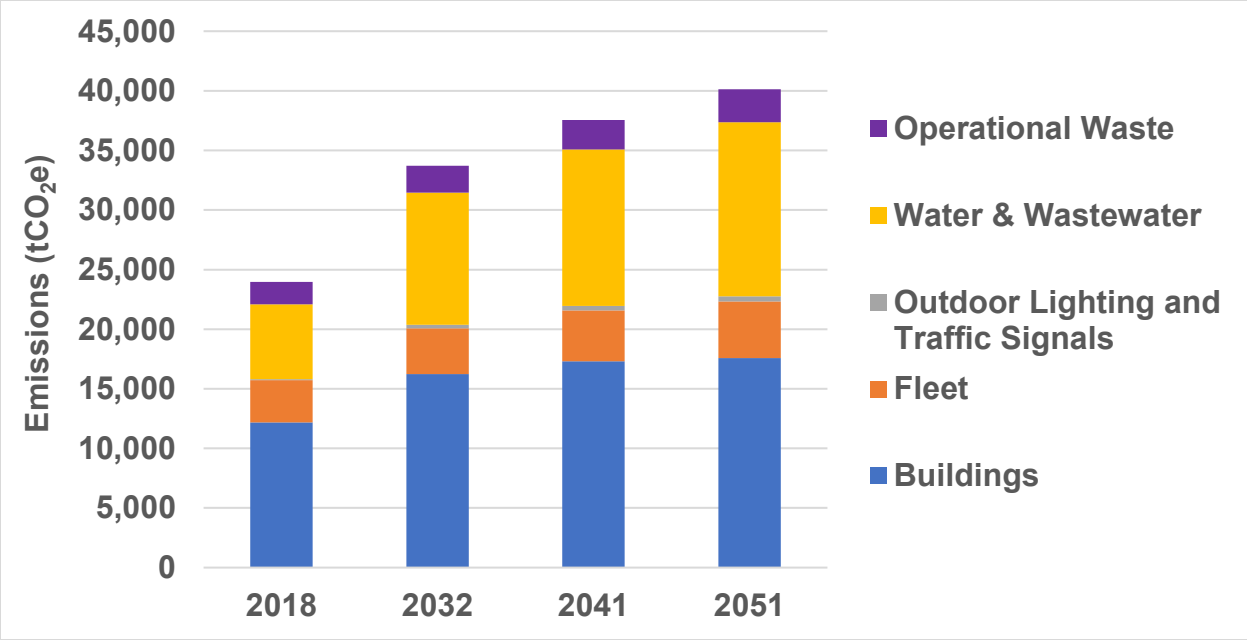

Figure 5 - RMON BAU Projected Emissions to 2051 (Plot)

Sector	2018 tCO_2e	2032 tCO_2e	2041 tCO_2e	2051 tCO_2e
Buildings[12]	12,186	16,235	17,297	17,568
Fleet	3,526	3,846	4,282	4,765
Outdoor Lighting and Traffic Signals	91	299	374	416
Water and Wastewater	6,280	11,085	13,129	14,610
Operational Waste	1,890	2,242	2,469	2,777
Totals	**23,973**	**33,707**	**37,551**	**40,136**

Table 5 - RMON BAU Projected Emissions to 2051 (Table)

[12] Per GHG Inventory, 2018 building emissions totals vary from baseline as waste management facilities are excluded due to lack of gross floor area data for this subsector.

The results are telling – without mitigation, the RMON will see an expected 67% rise in Corporate emissions between 2018 and 2051. Energy expenditures are also projected to increase between 37% (low-cost scenario) and 86% (high-cost scenario) by 2051[9]. This represents an increase of between $6.6M to $17.8M annually.

This requires an urgent call for decisive action. This trajectory demands immediate strategic interventions and collaborative departmental efforts to steer the course towards something more sustainable. In doing this, the RMON also demonstrates a commitment to the community through a lead-by-example approach.

The Future (Setting a Reduction Target - PCP Milestone 2)

The Corporate GHG Inventory provided a thorough understanding of Corporate emissions which was the basis for establishing an aggressive but achievable emissions reduction target. The goal of this target is to set the foundation, direction, and time horizon for emissions reductions efforts.

On May 10, 2023, a Target Report was prepared and presented to Council which proposed an 80% emissions reduction target by 2050 over 2018 levels. This presentation generated significant interest and discussion. The result of that engagement was commitment to set an ambitious target of Net-Zero emissions by 2050. This target aligns with several other Ontario municipalities and demonstrates the RMON's unwavering commitment to sustainability.

This Net-Zero target (in principle) was formally endorsed by Council and thus became the RMON's commitment. The establishment of this target satisfied the requirements of the PCP program Milestone 2 (Setting a Reduction Target) and was an essential step in laying the foundation for this CCAP (Milestone 3).

Short and Long-Term Targets

In formulating the CCAP, the RMON focused on practical decarbonization actions and corresponding outcomes/goals. To set quantifiable emissions reduction targets, these are divided into short (accomplished in less than 5 years) and longer-term targets (requiring greater than five years).

In the short term, the RMON's efforts will generally concentrate on foundational policies and the actions described in this CCAP prioritized by their relative cost to decarbonize (i.e. $/tCO$_2$e reduced). The 2024-2028 CDMP provides these technical metrics for a variety of proposed projects in the Buildings and Water and Wastewater (WWW) sectors. The RMON will tackle energy efficiency retrofits, implement new policies to reduce waste, and begin to electrify light-duty vehicles and heating systems in alignment with the capital replacement schedules for those assets.

Table 6 outlines the organization's 2028 emissions reduction targets by sector, expressed as percentage reductions below 2018 levels. Although the sector-specific GHG reduction targets total 60.1%, the overall Corporate GHG reduction target is **17.9%** (4,385 tCO2e), reflecting the combined impact of all sectors and alignment with the Net-Zero goal.

Sector	Short-Term Goal (2028)	Emissions Reduction (tCO2e)	Primary Enablers
Buildings	20.8%	2,630	• Electrify space and domestic hot water (DHW) heating systems at end-of-life • Prioritize natural gas efficiency measures
Water and Wastewater	19.3%	1,213	• Electrify space and domestic hot water heating systems at end of life • Prioritize natural gas efficiency measures • Leverage low-carbon fuels (either electricity or RNG) for process heating
Fleet	10%	353	• Replace end of life light-duty vehicles (estimated quantity of 30) with hybrid or fully electric vehicles
Outdoor Lighting and Traffic Signals	0%	0	• N/A – See notes below
Operational Waste	10%	189	• Enhance solid waste data collection strategies to enable informed analyses and identification of opportunities • Set waste reduction targets/policies as well as provide education and training to raise awareness, foster sustainable habits and improve compliance

Sector	Short-Term Goal (2028)	Emissions Reduction (tCO2e)	Primary Enablers
Total	**17.9%*** [13](reflects the Net-Zero trajectory)	**4,385**	

Table 6 - RMON Short-term Goals by Sector

Some notes related to these short-term goals:

- The 2024-2028 CDMP process used 2023 data to calculate Scope 1 and 2 emissions for Buildings and WWW. A 20% reduction target was then established for these sectors relative to the emissions in 2023 (CDMP base year). The expectation is this 20% reduction below 2023 levels will be accomplished by the end of the CDMP period in 2028. Since the base year for this CCAP is 2018 (per the RMON's GHG Inventory), those 20% reduction targets were translated back to equivalent reductions from 2018 (instead of 2023 per the CDMP) to maintain alignment.
- A high-level assessment of the remaining useful life of natural gas assets, conducted as part of the 2024-2028 CDMP, indicated that roughly 16% of natural gas assets in Construction, Energy & Facilities Management buildings as well as 29% of natural gas assets in Niagara Region Housing buildings will be due for replacement between 2024-2028. While preliminary and not comprehensive, this datapoint supports the premise that the short-term goals are reasonable to anticipate.
- The GHG reduction potential for Outdoor Lighting and Traffic Signals in the short-term is minimal, therefore has been assumed to be 0% for conservativeness.

For the longer term, the RMON's strategy will primarily include enhanced policy support and deeper capital investment to further electrification in the Fleet, Buildings, and WWW sectors. In Wastewater plants, the RMON will begin to focus on capital-intensive projects to leverage low-carbon fuels (such as RNG) in place of natural gas for emission-intensive anaerobic digestion processes. The importance of implementing policies that align with achievement of Corporate climate change goals was previously mentioned. For Operational Waste, in particular, policy support will be required to influence the real human aspect of reducing solid waste and reaching deeper levels of decarbonization. The RMON's overall approach is designed to achieve short-term

[13] The 17.9% overall reduction goal represents the organization's aggregated corporate emissions reduction target by 2028, aligned with the Net-Zero trajectory, rather than the direct sum of sector-specific reductions.

environmental responsibilities while positioning the organization to achieve the longer-term goal of Net-Zero by 2050.

Figure 6 provides a visual of emissions reductions between the 2018 baseline and 2028 targets. It also provides projections beyond 2028 towards the overall 2050 Net-Zero target.

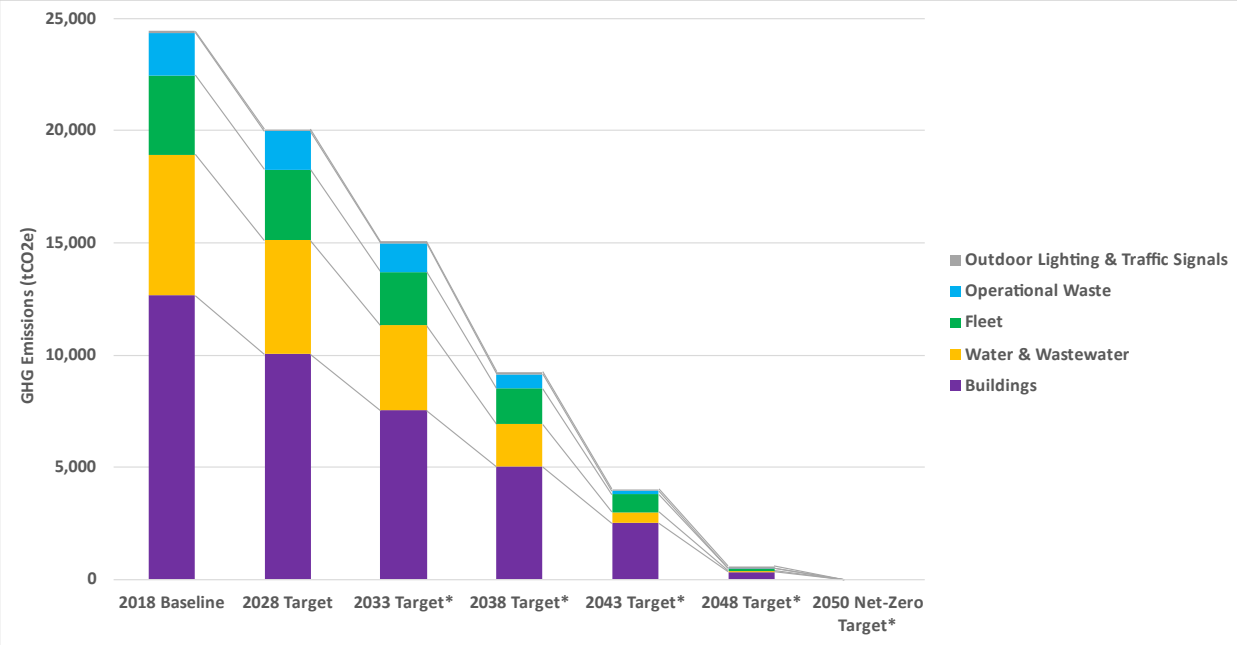

Figure 6 - RMON 2018-2050 GHG Reduction Timeline (Visual)

Achieving the Net-Zero target will require reaching the deepest decarbonization levels possible in each of these emissions sectors. There are a significant number of external factors (e.g. electricity grid emissions factor, availability of new technologies) that will impact the potential to achieve this goal. As a result, long-term goals set now, so far from the 2050 milestone are inherently uncertain. This is particularly true for more specific goals such as percentage reduction target by sector. For this reason, the 2033-2050 periods illustrated in Figure 6 (labelled with asterisks) are for visual purposes only and should not be treated as accurate representations of targets or progress in that timeframe. In practice, and as previously described, the emissions from these sectors will be reduced to the extent possible then the remainder will be offset.

Progressing further towards 2050, updates to this CCAP will provide more specific information about these longer-term potentials and set future (2033, 2038, etc.) emissions reductions targets. Activities such as the detailed analyses of the RMON's GHG Reduction Pathway Studies will provide additional information to improve the accuracy of interim projections towards achievement of the 2050 goal.

The Plan (Corporate Climate Change Action Plan - PCP Milestone 3)

This Corporate Climate Change Action Plan outlines the RMON's strategy to achieve Net-Zero GHG emissions by 2050, informed by the Corporate GHG Inventory. It includes proactive measures for climate adaptation and resilience, aligned with Council's 2023-2026 Strategic Priorities. It emphasizes Corporate engagement, education, and awareness by incorporating feedback from regional departments and developing a plan to empower staff. The plan aligns with existing policies, federal and provincial laws, and ensures clarity with measurable, financially viable actions. It fosters a culture of sustainability, embedding climate action throughout the organization while adopting resilient strategies to address climate impacts.

The Net-Zero Strategy

The RMON's Net-Zero Strategy stands as a pillar of commitment to combatting climate change. As the world navigates a critical juncture in collective environmental responsibility, this comprehensive Plan serves as the RMON's ultimate guide.

At its core lie three fundamental pillars of decarbonization – efficiency/waste management, electrification, and green energy. These pillars have sequential components that are interconnected, and those relationships are described in this section. These guiding pillars are then applied to the sectors and subsectors of the RMON's operations to drive GHG reductions across the organization and strive towards the 2050 Net-Zero goal.

Three Guiding Pillars of Decarbonization

Efficiency/Waste Management

Efficiency and waste management are fundamental to the RMON's decarbonization strategy. Energy efficiency optimizes processes and uses innovative technologies to minimize energy waste while maximizing effectiveness. For instance, upgrading to energy-efficient LED lighting and enhancing building insulation can significantly reduce energy consumption and improve comfort within facilities. Considering efficiency and waste management can achieve greater output with fewer resources, leading to reduced GHG emissions from energy use.

In Corporate settings, effective waste management involves strategies such as reducing and reusing office supplies, recycling paper, plastic, and other materials, and implementing composting for organic waste from cafeterias or offices. By minimizing solid waste for disposal, an organization's carbon footprint can be reduced.

Electrification

Following implementation of efficiency measures there are often opportunities to "fuel-switch" sources of energy to lower carbon alternatives. More specifically, electrification involves transitioning from fossil fuel-based systems to electric-powered alternatives. From a decarbonization perspective, this is beneficial for two reasons (the second being incremental to the first):

1. **Lower Emissions Intensity per unit Energy:** In general, electricity generation and transmission related emissions on a per kilowatt-hour (kWh) of energy basis are lower than that for an equivalent kWh of fossil fuel consumption. This remains true except in areas using significant high-carbon (coal, diesel) methods for electricity generation.
2. **Relatively clean Ontario electricity grid:** In Ontario, electrification serves as a leading decarbonization measure due to the province's predominately low-carbon electricity grid. With a substantial share of nuclear, hydroelectric, and renewable sources, powering electrical loads with Ontario's grid results in far fewer Scope 2 emissions (with Ontario's electricity factor being 30gCO_2e/kWh consumed[14]) than when powered by grids more dependent on fossil fuels.

As a result of the above drivers, transitioning energy end-uses such as transportation and heating from fossil fuel sources to electricity leads to significant emissions reductions.

This shift is evident in the transportation sector with the growing adoption of battery electric vehicles (BEVs) and the move away from internal combustion engine (ICE) vehicles – in alignment with the federal government plan (Canada's Electric Vehicle Availability Standard[15]) for all new vehicles sold in Canada to be zero-emissions (tailpipe) by 2035. By embracing BEVs, organizations can reduce reliance on gasoline and diesel automotive fuels and lower emissions for transportation. Similarly, electrifying heating systems to reduce or eliminate natural gas consumption can result in meaningful emissions reductions. An example of this is implementing commercial heat pump technologies which have additional safety benefits.

[14] Environment and Climate Change Canada. (2023). NATIONAL INVENTORY REPORT 1990 –2021: GREENHOUSE GAS SOURCES AND SINKS IN CANADA Part 3. Government of Canada (p. 67). Environment Canada. https://publications.gc.ca/collections/collection_2023/eccc/En81-4-2021-3-eng.pdf
[15] Government of Canada. (2023, December 19). Canada's Electric Vehicle Availability Standard (regulated targets for zero-emission vehicles). Www.canada.ca. https://www.canada.ca/en/environment-climate-change/news/2023/12/canadas-electric-vehicle-availability-standard-regulated-targets-for-zero-emission-vehicles.html

Green Energy

The final stage of decarbonization involves deploying green energy generation, such as solar photovoltaic or biomass/biogas, which are carbon neutral and renewable. Ontario's electricity grid currently has a low emissions factor; however, it is projected to increase in the future. In that case electrification would not be as beneficial for GHG emission reductions where loads are reliant on grid-connected generation. This may require additional investment in on-site renewable energy to ensure cleaner electricity production.

Implementing renewable energy should follow efficiency and electrification for several reasons:

1. **Cost-effectiveness:** Initial efficiency improvements and electrification are generally more cost-effective, requiring less capital than establishing renewable energy systems.
2. **Reduced Energy Demand and Optimization:** Efficiency measures reduce overall energy demand by optimizing processes and minimizing waste. This decreases the required capacity and cost of future renewable energy installations.
3. **Behavioral Transition:** Prioritizing efficiency and electrification helps transition mindsets and behaviors toward sustainability. It prepares individuals for electric alternatives and fosters a culture of sustainability before introducing renewable energy generation, demonstrating the benefits of decarbonization.

Efficiency and electrification lay a strong foundation for integrating green energy generation, maximizing its value and impact.

Sector-Specific Emission Insights

This section provides insights into the emissions for each of the RMON's emissions sectors. It also provides examples of some of the decarbonization actions that the RMON is already taking. A list of future, potential decarbonization projects is provided in Appendix A.

Buildings

As of 2018, Buildings accounted for **51.8%** of the RMON's Corporate emissions profile. This sector is the largest emissions contributor, driven mainly by electricity and natural gas use.

Energy consumption in buildings is dependent on several factors including building designs/envelopes, the efficiency of mechanical systems as well as occupant behaviour.

The path to decarbonizing buildings involves improving energy demand (efficiency) and the sources of energy (electrification and renewable energy sources).

To better understand the complex nature of energy consumption throughout the RMON's building portfolios, analyses were completed to estimate energy (electricity and natural gas) consumption and subsequent GHG emissions by end-use, informed by the results of previous building audits.

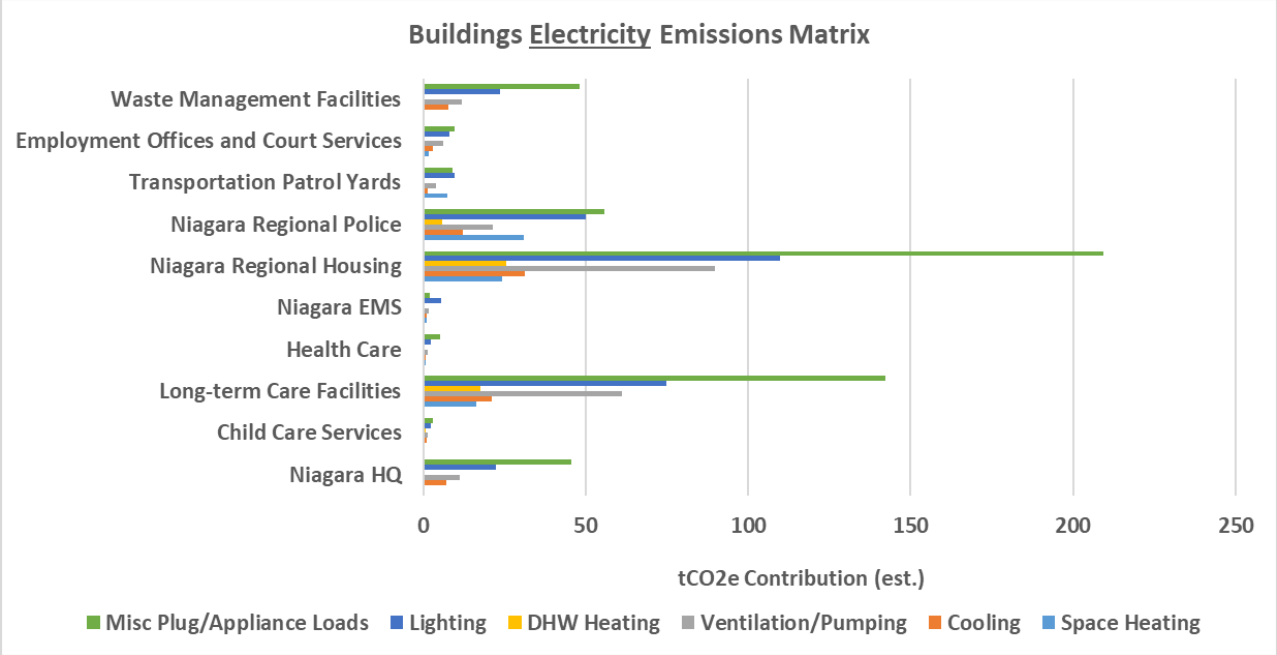

Figure 7 – 2018 Buildings Electricity Emissions by End-use

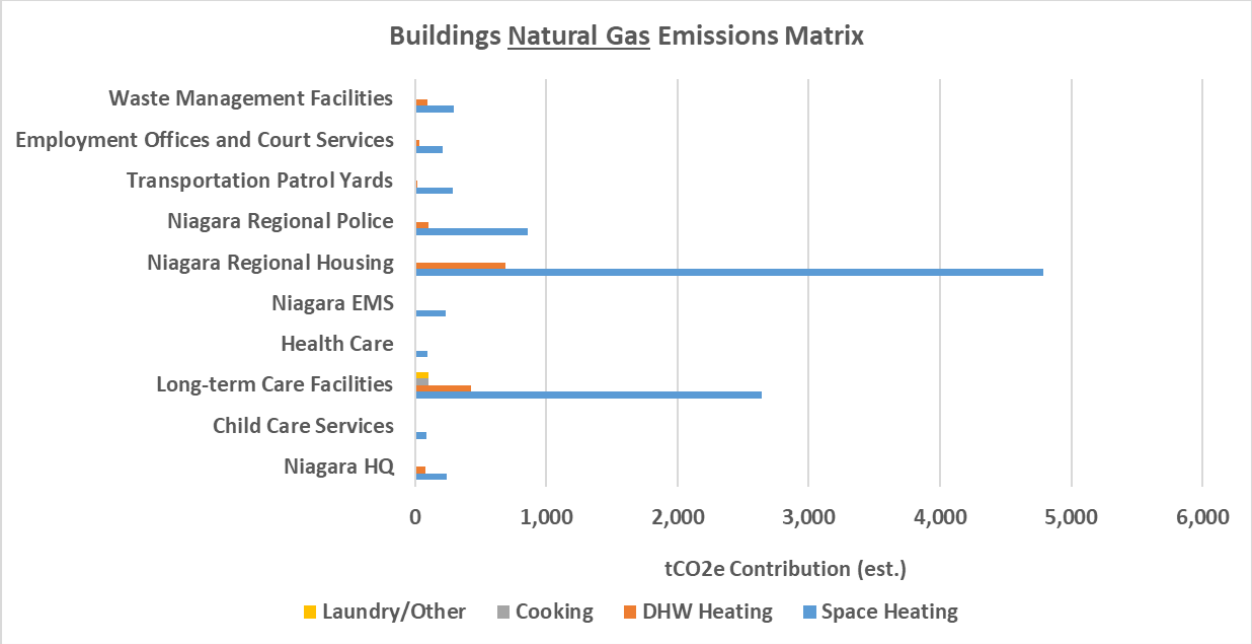

Figure 8 – 2018 Buildings Natural Gas Emissions by End-use

On the electricity side (Figure 7), miscellaneous plug loads (including office equipment) and appliance loads are estimated to contribute the largest amount to energy consumption and subsequent emissions. Lighting and HVAC (namely cooling and ventilation) are also notable contributors, followed by small amounts of electric space heating and domestic hot water heating.

On the natural gas side (Figure 8), space heating contributes significantly to the RMON's consumption and emissions profile, followed by domestic hot water heating. For perspective, the combined contributions from space heating and domestic hot water heating are estimated to account for roughly 89% (11,205 tCO_2e) of total emissions in the buildings sector. This observation shows the importance of addressing these end-uses in the journey towards the 2050 Net-Zero goal.

Two significant commitments for buildings that are currently being tabled for discussion at the RMON are:

1) Implementation of a policy to investigate the prevention of like-for-like replacement of natural gas domestic hot water (DHW) or space heating equipment at their respective end of life.
2) Require all new constructed Regional buildings owned or paying utility costs to be Net-Zero, including design considerations like rooftop support for solar PV and energy storage. This reduces operational emissions, enhances resiliency, and offsets embedded carbon from construction.

These commitments are essential for reaching the Net-Zero target. The RMON is also investigating implementation of ISO 50001 energy management standards across the organization. Concurrently, as previously mentioned, the RMON is conducting GHG Reduction Pathway Studies for 12 buildings to develop strategies for significant emissions reductions, aiming for Net-Zero. Finally, the RMON is exploring a geothermal energy project at the headquarters facility in Thorold to reduce operational costs and GHG emissions by reducing natural gas use for heating. This could serve as an example for similar initiatives at other RMON facilities.

Water and Wastewater

As of 2018, Water and Wastewater accounted for **25.7%** of the RMON's Corporate emissions profile. The WWW sector is energy-intensive primarily due to the nature of the treatment and pumping processes involved.

Wastewater treatment involves energy-intensive steps to remove pollutants and harmful substances to make water safe for discharge or reuse. Significant pumping power is required to move water and wastewater through pipes and processes. Additionally, as demand for clean water rises through population growth and more stringent standards for wastewater treatment are implemented the energy consumption and corresponding emissions from this sector are likely to increase. Also, WWW plants are sizable facilities that have their own non-process requirements (e.g. space heating, DHW, lighting) that also contribute to the RMON's emissions profile.

For these reasons, the WWW sector plays a critical role in the broader context of the CCAP. To achieve a more detailed understanding of where the RMON's emissions in this sector originate, analyses were conducted to estimate energy (electricity and natural gas) consumption and subsequent GHG emissions by end-use.

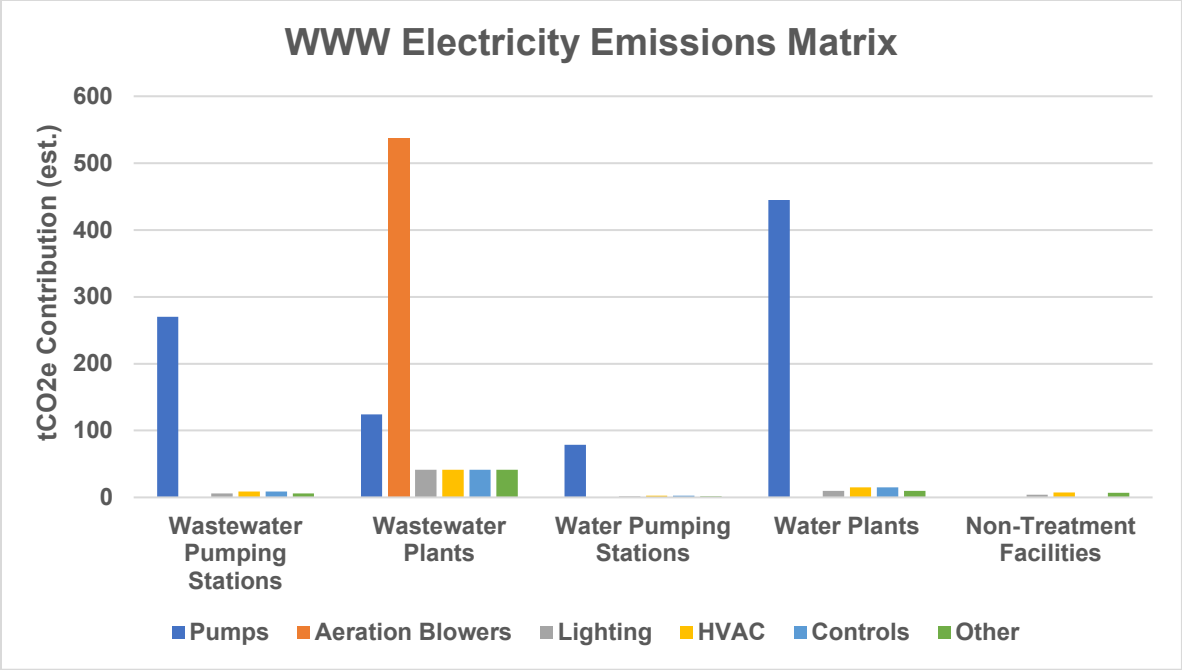

Figure 9 – 2018 WWW Electricity Emissions by End-use

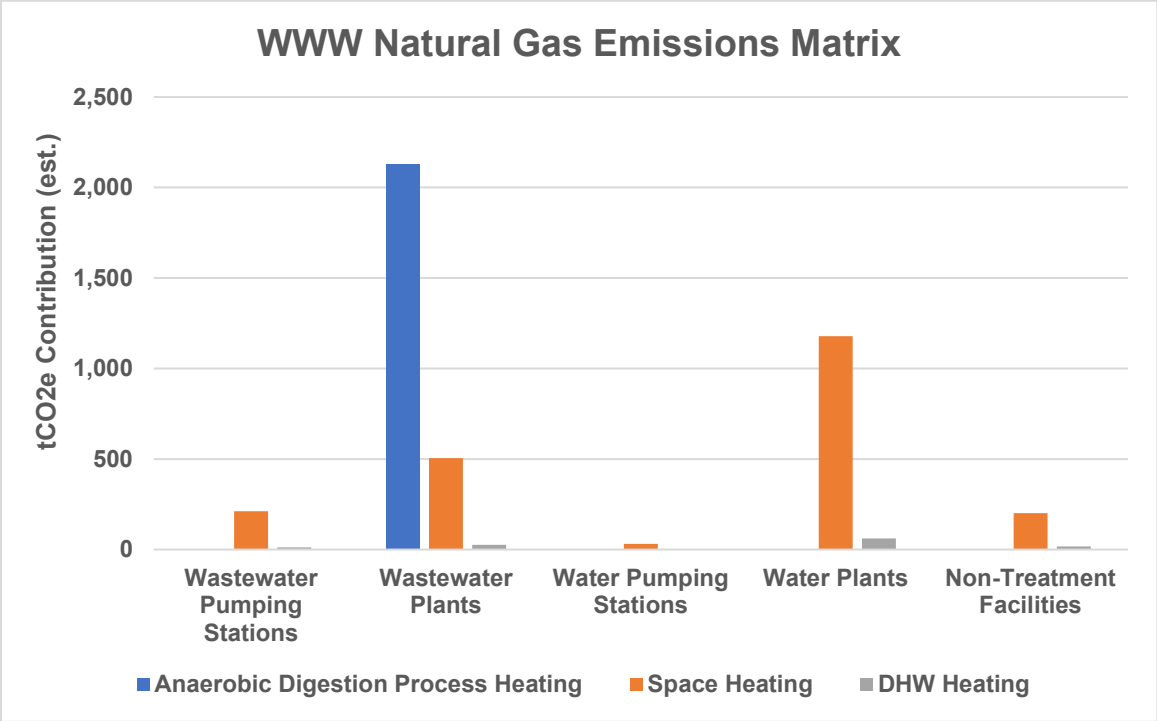

Figure 10 – 2018 WWW Natural Gas Emissions by End-use

Based on the end-use analyses (Figure 9 and Figure 10), the RMON's largest emissions contributors are natural gas used for anaerobic digestion process heating and space heating, and electricity for aeration blowers and pumps. Anaerobic digestion at the wastewater treatment plants breaks down organic matter using microorganisms

to produce biogas (mainly methane and carbon dioxide) and digestate. This process requires heat to maintain optimal conditions for microbial activity, and the combustion emissions from this heat source contribute significantly to overall process emissions. Since 2018, the RMON has harnessed over 6 million cubic meters of biogas annually from this process, which has been primarily used in boilers to recycle heat back into the digestion process or for space heating. This circular approach results in lower emissions compared to using natural gas alone. However, challenges remain with biogas availability and demand matching. To address this the RMON is exploring other solutions including renewable natural gas (RNG) opportunities to further decarbonize this process.

Additionally, the RMON has integrated the Envision™ Sustainable Infrastructure Framework[16] into new site designs. This framework evaluates sustainability and resilience across various infrastructure types offering a comprehensive assessment of water and energy use, waste generation, GHG emissions reductions, and renewable energy integration. As the CCAP aligns with the CDMP, it is important to note that a 20% emissions reduction target for water and wastewater treatment facilities has been set as the target by the end of 2028.

[16] Envision Canada - Envision Canada. (2023, January 3). https://envisioncanada.com/about-envision-canada/

Fleet

As of 2018, the RMON's vehicle Fleet accounted for **14.4%** of the RMON's Corporate emissions profile. Figure 11 breaks this down further by vehicle type.

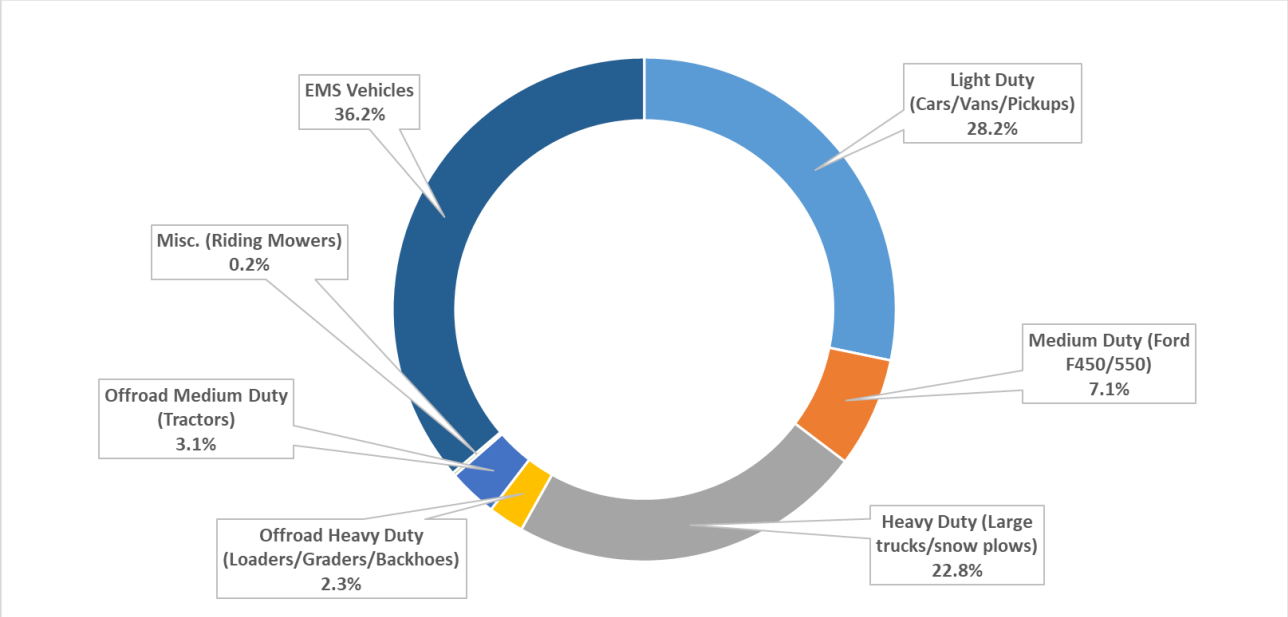

Figure 11 – 2018 Fleet Emissions by Vehicle Type

In summary:

Emergency Medical Services (EMS) vehicles are the largest contributor at 36% of fleet emissions

Light-duty (cars/vans/pickups) vehicles are the second largest contributor at 28% of fleet emissions

Heavy-duty (large trucks/snowplows) are the third largest contributor at 23% of fleet emissions

The remaining contributions are related to medium-duty, offroad and miscellaneous vehicle types.

As it relates to the Guiding Pillars of Decarbonization, both efficiency and electrification/fuel switching efforts can reduce fleet emissions meaningfully. More fuel-efficient vehicles are typically cost-effective measures but have a smaller GHG reduction potential. Fuel switching by investing in fully electric vehicles will achieve much deeper GHG reductions but can have cost and technology challenges.

A Green Fleet Plan and Policy (GFPP) will be developed in alignment with Council Strategic Priorities for 2023-2026 and this Net-Zero by 2050 pathway. The GFPP will lay out the specific plan and strategies to reduce the environmental impact of the RMON's vehicle fleet. This will include transitioning to electric or hybrid vehicles, implementing fuel-efficient practices and policies, and investigating the feasibility of other alternative fuels. Fleet size and route optimization will also be considered in the GFPP.

For many non-light-duty vehicle types there are currently technology constraints that limit the ability to fuel-switch to low-carbon alternatives (e.g. EMS vehicles). Technology continues to change rapidly in this space. The GFPP will play a critical role by enabling continuous market research, with the support and expertise of the Economic Development department, so the RMON can stay informed of the most recent developments. The results of the GFPP and this market research will inform fleet-related actions in future CCAP updates. This GFPP as well as the availability of funding are key to the successful decarbonization of the RMON's vehicle fleet.

Outdoor Lighting and Traffic Signals

As of 2018, Outdoor Lighting and Traffic Signals accounted for **0.4%** of the RMON's Corporate emissions profile. At that point the RMON had already converted all roadway lighting to efficient LED technology, and over half of the warning beacons were solar powered and did not consume electricity from the grid. Since 2018, the RMON has also finalized the conversion of traffic signals to LED. Ultimately, the generation emissions of the Ontario grid will play a significant role in the emission trends for Outdoor Lighting and Traffic Signals.

Operational Waste

As of 2018, Operational Waste accounted for **7.7%** of the RMON's Corporate emissions profile. These contributions are proportional to the volume of solid waste generated from waste bins at municipally owned facilities and housing units, as well as from the treatment of this waste. From a Corporate perspective, the RMON's goal is to reduce and divert the volume of solid waste generated at its facilities as much as possible. This is a shared responsibility between RMON and its employees.

Waste Management

The RMON's Keen on Green committee is responsible for waste reduction initiatives and annual waste audits on the RMON Headquarters and Niagara Regional Police Services Headquarters (per the requirements of Ontario Regulation 102/94). The Keen on Green (KOG) committee was established with a mandate to identify and implement initiatives to minimize waste and increase diversion at these facilities. This cross-departmental committee, which includes Waste Management staff, meets at least four

times annually and is dedicated to promoting practices to reduce waste. Figure 12 highlights some of the initiatives that the KOG committee are actively facilitating.

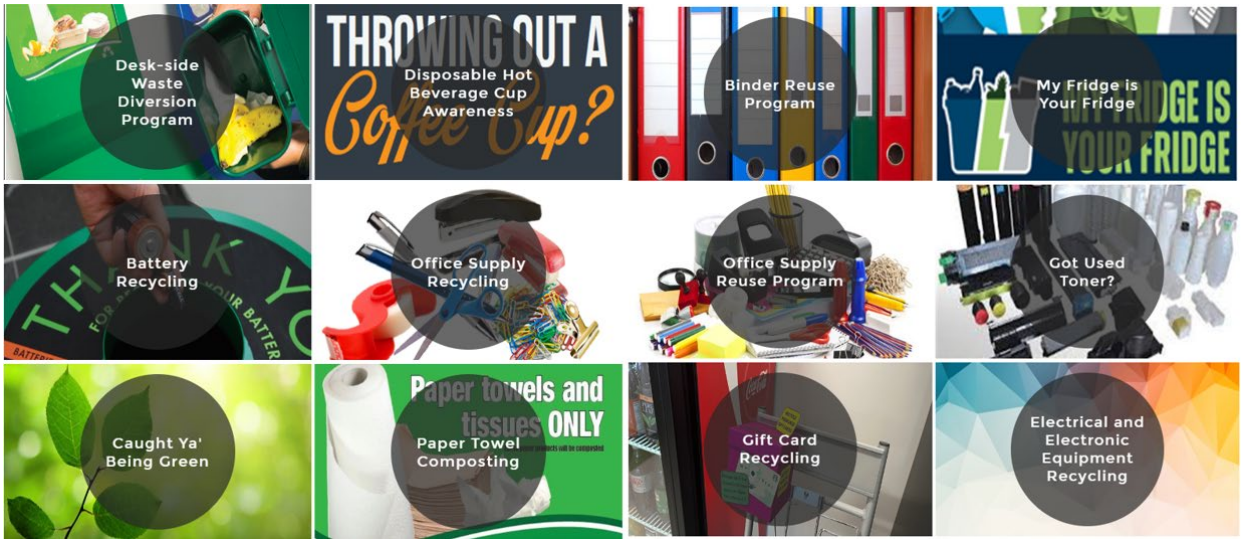

Figure 12 - Active Keen on Green Initiatives

The RMON is also currently developing a Waste Management Strategic Plan (WMSP) that aligns with the CCAP time horizon. This plan aims to assess the current waste management system and develop direction/system options to establish a preferred system. This plan also includes a life cycle assessment to quantify potential GHG decreases or increases attributed to the options.

Also, Sustainable Procurement will be integrated into the broader Social Procurement initiative at Niagara Region, ensuring that the Region's purchasing decisions not only support environmental sustainability but also contribute to positive social outcomes. By embedding sustainability into the procurement processes, the aim will be to drive positive change across the Region's supply chain, fostering economic equity and environmental stewardship while meeting the organization's broader social and environmental goals.

Facilities

Facilities and operations staff also each play their own critical roles in reducing solid waste in their respective facilities. While decarbonization measures in other areas (such as fleet and buildings) are primarily driven by technology changes, the opportunities for decarbonization in Operational Waste have a large behavioural component. As a result, Facilities staff play an important role in promoting practices to reduce solid waste at the sites under their management.

Having access to quality, facility-specific solid waste data is also essential to identify and act on the most significant opportunities in this space. The RMON's data collection efforts for the GHG inventory provided valuable insights on methods to collect and handle this data. The RMON continues to investigate the best approaches to accomplish this while balancing the resources required.

Tackling the Balance

Though comprehensive implementation of the CCAP through waste/energy efficiency, electrification, and on-site renewables will significantly reduce Corporate emissions, the RMON acknowledges that complete elimination is not achievable. Energy consumption and solid waste cannot be reduced to zero, therefore addressing residual emissions is crucial for reaching the Net-Zero target.

To address these challenges, the RMON will explore offsite renewable energy projects to attain Renewable Energy Credits (RECs), which certify that electricity was generated from renewable sources, to offset grid emissions. Where feasible the RMON will also consider opportunities for sale of biogas (from WWW) to acquire carbon credits to offset residual emissions.

Additionally, carbon sequestration initiatives, including tree planting and a forthcoming Greening Strategy, will help neutralize the RMON's environmental impact. Finally, the RMON continues to investigate carbon capture (such as methane capture in landfills) and storage solutions as technology is advancing rapidly in this space.

There are significant opportunities for the RMON to reduce Corporate emissions before turning to any of these "last-mile" efforts, however this commitment is important to ensure that the CCAP's approach evolves with advancements.

The Action Plan

The RMON recognizes the imperative to transition towards Net-Zero emissions. However, it is important to be aware of the considerations that pose challenges to this transformation:

- **Cost**
  - The cost to decarbonize remains high
  - Departments operate within budgets derived from taxpayers/ratepayers or limited public funds
  - Project prioritization remains a challenge due to evolving infrastructure needs
- **Technological**
  - Low-carbon solutions/technologies for some emissions sources are not yet mature
  - Solutions/technologies at these stages (e.g. heavy-duty vehicles) of maturity are costly and carry technical risk
- **Operations**
  - Broad buy-in (top-down) is necessary
  - Clear delineation of departmental responsibilities and allocation of staff resources is required
  - Effective collaboration across departments is essential as efforts often overlap cross-functional teams
  - Political shifts pose a risk to continued execution as focus and priority given to its actions can fluctuate

To address this, the RMON proposes a pragmatic, three phase approach that balances environmental responsibilities with the realities of these challenges.

Phase 1: Short-term (0-5 years) – Foundational Policy Development and Strategic Investments: Leverage end-of-life opportunities, understand life cycle costs to minimize expenses, increase efficiency, and establish foundational sustainability policies and processes.

Phase 2: Medium-term (5-15 years) – Policy and Process with Initial Capital Investments: Enhance and solidify sustainable policies and processes while beginning initial capital investment projects to support future large-scale investments.

Phase 3: Long-term (15+ years) – Intensive Capital Investment and Tackling the Balance: Make significant capital investments (leveraging funding where available) in

advanced technologies/infrastructure and refine established policies to achieve deeper sustainability gains towards the Net-Zero target.

Tables 7 to 9 below outline a structured plan with these three distinct phases (short, medium and long-term, respectively) that gradually lead the RMON towards the Net-Zero target. Each phase is designed to strategically build upon the previous one, ensuring that impactful changes are made without overburdening financial resources. By focusing initially on cost-saving opportunities and policy development, a strong foundation is formed for the eventual capital investments needed to achieve deeper levels of decarbonization.

Note: Cost ($ to $$$) and GHG Impact (LOW to HIGH) included in Tables 7 to 9 are for relative comparison. Additional details related to these metrics for those “Project” type actions (that directly impact GHG emissions) can be found in Appendix A.

Table 7: Short-term (0-5 years) – Foundational Policy Development and Strategic Investments

Action Description	Type	Project	Timing	GHG	Cost	Lead	Current
Complete a comprehensive review of existing policies and adjust (as necessary) to prioritize sustainability and integrate climate action: • Integrate CCAP with strategic and asset management planning to minimize conflicts and promote synergy • Align service delivery with climate objectives, reducing carbon emissions	Policy	N/A	Immediate	N/A	Internal Resourcing	Climate Change Team	HIGH
Begin fuel-switching natural gas heating assets (at end-of-life) in buildings and WWW to low carbon sources (such as heat pumps) per the 2024-2028 CDMP	Project	B-8 W-3	Ongoing	HIGH	$$$	Energy Management, WWW	HIGH
Implement a decarbonization project assessment policy that: • Prioritizes life-cycle costing (LCC) • Consider provincial and federal legislation	Policy	N/A	Immediate	N/A	Internal Resourcing	Public Works and Corporate Services	HIGH

[1] See Appendix A for the referenced project examples.

Action Description	Type	Project	Timing	GHG	Cost	Lead	Current
• Explores alternative financial models, such as a revolving energy fund							
Apply a Climate Lens to align investment decisions with climate action goals through: • Evaluating the weighting of decarbonization projects within CAMRA • Considering both quantitative financial benefits and qualitative benefits (public health, biodiversity, resilience) to prioritize projects • Assigning an internal "cost of carbon" to contextualize qualitative benefits	Policy	N/A	Immediate	N/A	Internal Resourcing	Climate Change Team, Asset Management	HIGH
Perform a review of internal resources to ensure appropriate resourcing for climate action efforts with dedicated personnel and within departmental teams • Maintain APSC or develop another diverse group with interdepartmental representation • Plan for appropriate resources, including expertise in climate initiatives and	Process	N/A	Immediate and Ongoing	N/A	Internal Resourcing	Climate Change Team, Human Resources	MED

Action Description	Type	Project	Timing	GHG	Cost	Lead	Current
comprehensive training for existing staff • Partner with external experts, consultants as needed							
Implement a sustainable procurement policy prioritizing sustainable good or products	Policy	N/A	Future	N/A	Internal Resourcing	Procurement, Waste Management	MED
Secure top-down support and buy-in for the CCAP by: • Engaging senior management and political leaders for authority and resources • Demonstrating Corporate prioritization of climate action	Process	N/A	Immediate and Ongoing	N/A	Internal Resourcing	Council, Senior Leadership	HIGH
Develop a Corporate climate change engagement, education, and awareness plan to cultivate a culture that values sustainability: • Encourage and empower staff to contribute ideas and initiatives • Recognize and celebrate achievements in sustainability to reinforce commitment • Embrace flexibility, learning, and inclusivity	Plan	N/A	Immediate and Ongoing	N/A	Internal Resourcing	Climate Change Team, Waste Management, Energy Management	HIGH

Action Description	Type	Project	Timing	GHG	Cost	Lead	Current
Implement policy to investigate the prevention of like-for-like replacement of natural gas assets at end of life	Policy	N/A	Immediate	N/A	Internal Resourcing	Energy Management, WWW, Asset Management	HIGH
Implement policy for Net-Zero requirement for all new constructed Regional buildings	Policy	N/A	Immediate	N/A	Internal Resourcing	Climate Change Team, Energy Management, Asset Management	HIGH
Complete low/no-cost energy efficiency projects	Project	B-1 B-2 B-3	Immediate	LOW	$	Energy Management, WWW	HIGH
Enact a policy and provide training to reduce Fleet emissions through: • Driver education program • Idle reduction policy/implementation of auto shutoff technologies • Advanced route planning • Vehicle right-sizing checklist	Policy	F-1	Immediate	N/A	Internal Resourcing	Fleet	MED
Complete Green Fleet Plan and Policy (GFPP)	Policy	N/A	Immediate	N/A	Internal Resourcing	Fleet, Economic Development	HIGH
Electrify (to hybrid or fully electric) light-duty fleet vehicles	Project	F-2	Immediate	HIGH	$$	Fleet	HIGH
Develop a unified policy/procedure (between Waste Management and Facilities) to collect solid	Policy	N/A	Immediate	N/A	Internal Resourcing	Waste Management, Facilities	HIGH

Action Description	Type	Project	Timing	GHG	Cost	Lead	Current
waste data for future inventories and track reduction progress							
Conduct regular waste audits to identify the types and volumes of waste generated. Leverage data to identify areas for improvement	Process	O-1	Ongoing	N/A	Internal Resourcing	Waste Management, Facilities	MED
Develop a waste reduction plan to influence behaviour and raise awareness about its CCAP importance: • Set facility waste reduction targets and assign responsibility • Provide ongoing training on proper waste management practices	Plan	O-2	Ongoing/ Immediate	N/A	Internal Resourcing	Waste Management, Facilities	MED
Annual Update of GHG Inventory	Process	N/A	Future	N/A	$/Internal Resourcing	Climate Change Team	MED

Table 8: Medium-term (5-15 years) – Policy and Process with Initial Capital Investments

Action Description	Type	Project Ref.	Timing	GHG Impact	Cost	Lead Responsibility	Current Priority
Investigate potential partnerships with other municipalities and organizations to pool resources, share costs, access larger funding opportunities, and exchange knowledge and best practices	Process	N/A	Immediate	N/A	Internal Resourcing	Climate Change Team	MED
Stay current on decarbonization technologies by: • Performing market research • Collaborating with research institutions and industry experts to exchange information and insights • Attending conferences, workshops, and seminars focused on energy and sustainability innovations	Process	N/A	Ongoing	N/A	Internal Resourcing	Climate Change Team, Energy Management, WWW, Fleet, Economic Development	LOW
Create a process for and identify pilot small-scale decarbonization projects to: • Gain insights into operational, technical, and financial aspects • Identify specific hurdles such as infrastructure requirements etc.	Process	N/A	Ongoing	N/A	Internal Resourcing	Energy Management, Fleet, WWW, Urban Design	LOW

Action Description	Type	Project Ref.	Timing	GHG Impact	Cost	Lead Responsibility	Current Priority
• Collect real-world data and staff feedback to inform planning, budgeting, and scaling strategies • Build confidence and pave the way for wider acceptance and adoption of decarbonization measures							
Complete capital energy efficiency projects	Project	B-4 B-5 B-6 B-7 W-2 W-4 W-5 W-6 L-1 L-2	Future	MED	$$	Energy Management, WWW	MED
Electrify or de-carbonize fleet	Project	F-3	Future	HIGH	$$$	Fleet	LOW
Review policies for energy management at leased facilities	Policy	N/A	Immediate	N/A	Internal Resourcing	Energy Management	MED
Evaluate opportunities for building consolidation	Policy	N/A	Immediate	N/A	Internal Resourcing	Asset Management	MED
Complete 5-year CCAP updates	Process	N/A	Future	N/A	$$/Internal Resourcing	Climate Change Team	LOW

Table 9: Long-term (15+ years) – Intensive Capital Investment and Tackling the Balance

Action Description	Type	Project Ref.	Timing	GHG Impact	Cost	Lead Responsibility	Current Priority
Complete capital-intensive energy efficiency and generation projects	Project	B-9 W-1 W-7	Future	MED	$$$	Energy Management, WWW	LOW
Substitute the use of natural gas with low-carbon fuels (biogas/RNG) for WWW process heating	Project	W-8 W-9	Future	HIGH	$$$	WWW	LOW
Investigate and evaluate methods for tackling "last-mile" emissions: • Renewable energy credits • Carbon offsets • Carbon storage and sequestration	Process	N/A	Future	MED	$$$	Climate Change Team, Energy Management, WWW, Fleet	LOW
Revisit and refine existing plans and policies in support of the CCAP	Policy	N/A	Future	N/A	Internal Resourcing	Climate Change Team	LOW

Cost to Decarbonize

The costs of achieving our GHG reduction goals will be embedded into ongoing operations, ensuring a financially responsible approach to decarbonization. Rather than requiring a separate budget, these investments will be integrated into existing capital projects through asset renewal, end-of-life replacements, and asset management processes. Initiatives from the CDMP will be brought forward through the annual budget process with business case analysis, evaluating GHG reduction impacts, life-cycle costs, and associated benefits. By aligning projects with planned upgrades and end-of-life replacements, additional financial impact can be minimized while maximizing efficiency. Projects will also go through the CAMRA process to ensure strategic investment and prioritization. Through a collaborative, cross-departmental approach, external funding opportunities will be sought after to offset costs and enhance financial viability. Further, aligning our efforts with other master plans will ensure consistency across initiatives and provide further benefits, such as streamlined processes, enhanced coordination, and a unified approach to long-term planning. This will also help optimize resource allocation and ensure that GHG reduction goals are integrated into broader community and organizational objectives.

Providing a precise cost estimate for a 25-year plan is inherently challenging due to numerous unpredictable factors. Rapid advancements in technology, fluctuations in energy prices, shifts in government policies, regulatory changes, and evolving market conditions all impact project feasibility and costs. Additionally, the availability of external funding sources, such as federal and provincial grants, will vary over time. These uncertainties make it impractical to define an exact financial commitment. Instead, this plan is designed to be adaptive, integrating climate action within ongoing operations while remaining flexible to emerging opportunities and changing economic conditions. Some costing estimates and further details are available in the approved 2024-2028 CDMP. Additionally, the upcoming GHG Reduction Feasibility and Pathway Studies will provide insights into site-specific costs and impacts as we continue toward the Net-Zero target. Collectively, the CCAP is not a standalone initiative but an integrated strategy that embeds climate action within core operations, balancing emissions reductions with responsible fiscal planning.

Operational Costs

The Net-Zero Strategy's primary drivers of emissions reductions (aligning with the Guiding Pillars of Decarbonization) each impact operational costs differently:

- **Efficiency:** Projects reduce operational costs by reducing energy consumption.

- **Electrification:**
  - **Buildings and WWW:** Air-source heat pumps increase short-term costs. Heat pumps are more efficient, but electricity is currently more expensive than natural gas. Long-term costs may break even due to rising natural gas prices from the Federal Carbon Charge. Ground-source/geothermal systems are significantly more efficient at low temperatures but have much higher capital costs.
  - **Fleet Vehicles:** Electrification decreases operational costs since driving via electricity is cheaper than gasoline or diesel. A recent Canadian study found 95% of electric vehicles have lower total ownership costs than comparable gasoline vehicles.
- **Green Energy:** Projects like solar photovoltaic systems reduce operational costs by producing free energy, offsetting utility energy purchases.

Measurement and Evaluation Plan

A plan to continuously measure and evaluate progress towards the Net-Zero goal is critical to keeping the CCAP actions on track and achieving the expected emissions reductions. Specific departmental responsibilities are essential, as each department contributes uniquely to these goals. While departmental KPIs (e.g., Water and Wastewater emissions per megalitre of treated flow) provide context, the short and long-term goals focus on absolute emissions reductions. Therefore, progress must be tracked based on total emissions without normalization.

Table 10 provides an overview of the RMON's two main commitments for the measurement and evaluation of progress – formal GHG inventory updates and interim tracking via annual reviews between those formal inventories. Each department has their own responsibilities and is committed to providing the data necessary to accurately quantify emissions and track progress.

Action	Process/Outcome	Frequency	Data Required
Update of GHG Inventory	• Formal GHG Inventory update following PCP Protocol • Outcome: an inventory report which outlines emissions from all sources and compares to 2018	Every 5 years	• Electricity and natural gas data for all Corporate buildings (including Housing, Long Term Care) • Electricity and natural gas data for all Water and Wastewater plants and pumping stations

Action	Process/Outcome	Frequency	Data Required
	levels as well as the short-term goals established		• Operational Waste data for all Corporate buildings • Vehicle fuel consumption for all fleet vehicles
Interim Reviews	• Department-specific reviews of progress in between formal GHG Inventory updates • Data to be fed into a common platform • Outcomes are numerical/graphical representations of annual emissions results for departments to compare against 2018 baseline and short-term goals established	Annually	• Same as above for 5-year formal GHG Inventory updates

Table 10 - Measurement and Evaluation Actions

Performing annual reviews ensures departments stay on track towards short-term targets and allow for time to reevaluate or pivot. They also serve as reminders of the targets and promote continuity/continued momentum if resourcing in departments change. Finally, they make data collection routine so that provision of data for future inventories is streamlined.

With the benefits of annual reviews come one major challenge: resourcing constraints for data collection and calculations. To overcome this, the RMON will investigate new carbon accounting software to assist in automating some of these tasks and to compile data on a common platform. The RMON will also investigate the feasibility of leveraging software that is currently being used for these purposes.

Comprehensive Perspectives: Beyond Decarbonization

The Role of DEI

Diversity, Equity and Inclusion (DEI) is central to the RMON. From establishing a DEI Advisory Committee to working with community members to develop the DEI Action Plan for 2023-2027, the RMON is committed to advancing equity, building welcoming and inclusive communities and workplaces, while eliminating barriers and forms of discrimination.

The RMON has a Corporate commitment to DEI and through this example is leading the way for more inclusive Community climate action in the future. What the RMON does as an organization can also affect the wider community. Understanding this, the RMON considers how actions might impact communities right from the start of the planning process. This process ensures that the RMON is making a positive contribution to their well-being and the environment.

The RMON understands that a robust CCAP must go hand in hand with a commitment to DEI. From a Corporate perspective, the RMON's approach to addressing climate challenges is rooted in the belief that a diverse and inclusive workplace fosters innovative, resilient, and sustainable solutions. The significance of DEI in this regard is two-fold:

- Diversity is not only a source of strength but a critical factor in an organization's ability to confront climate change effectively. A commitment to inclusivity ensures that the perspectives, experiences, and unique insights of the RMON's diverse team shape climate strategies.
- The decarbonization actions described in this CCAP, as well as climate change, may have varying effects on different communities and individuals. The CCAP acknowledges these potential disparities and aims to consider diverse impacts, striving to enhance positive outcomes where possible.

There are several facets of the CCAP strategy that combine to meet the above goals:

1. **Diverse Team Engagement:** The RMON actively engages with staff, valuing their input and leveraging their diverse perspectives to inform strategies for decarbonization and resilience. Forums for dialogue are created through the Climate Change Working Group and Action Plan Sub-Committee, providing opportunities for a variety of perspectives in the decision-making process.
2. **Decarbonization Action Engagement:** The RMON recognizes that actions to decarbonize may have noticeable impacts to individuals close to those projects. As an example, upgrading a lighting system can enhance productivity and

comfort for staff and building occupants. However, this upgrade can also negatively impact individuals with specific sensory sensitivities or visual impairments (through changes in lighting intensity or color temperature). In the planning stage of these projects, the RMON will ensure appropriate engagement (with RMON staff, customers, the community) and exercise careful consideration to ensure that compromises and disadvantages are minimized. This approach aligns with DEI principles by recognizing and valuing the diverse requirements of all and striking an appropriate balance between the RMON's decarbonization commitments and the well-being of those influenced by the actions.

3. **Equitable Resource Allocation:** Resources are allocated thoughtfully, considering the unique needs and vulnerabilities of different departments or teams. The RMON will prioritize investments that are fiscally responsible, promote resilience and ensure that benefits are distributed equitably.
4. **Accessible Information and Support:** The RMON's communication strategies are inclusive and accessible, aligning with the guidelines in the Accessibility for Ontarians with Disabilities Act (AODA) to ensure effective information dissemination to the RMON team and the public. Various mediums are utilized to cater to diverse preferences and needs. The RMON's digital platforms are optimized for accessibility, featuring screen reader compatibility and alternative text for images, and public information is made accessible across multiple channels. Internally, the RMON strives to provide all team members with access to information and support, fostering an inclusive environment that enhances the team's collective ability to address climate change effectively.
5. **Diversity in Leadership:** The RMON actively promotes diverse representation in leadership roles, recognizing that diverse perspectives at the top drive innovative climate strategies and ensure inclusivity in decision-making processes.

Through a commitment to DEI the RMON is not just positively influencing the organization's carbon footprint but also fostering an environment where every employee feels valued, included, and empowered to contribute to the organization's collective climate goals.

Climate Change Adaptation and Resiliency

Climate change effects are already impacting the RMON and its communities. So, while the RMON strives to meet the Net-Zero goal through the CCAP's strategies, the organization must also plan for climate change resilience and adaptability in both short and long-term decisions. This involves adjusting to more frequent extreme weather events, to minimize potential harm to ecosystems, societies, and economies. Resilience means building the capacity to withstand and recover from these impacts to ensure sustainability and well-being.

Land use planning is crucial for reducing human, environmental, and financial risks associated with climate change. Efforts to increase resiliency are essential for reducing the effects of extreme weather events. Emergency and disaster management, along with public health initiatives, are critical for preparedness. Climate change significantly affects human health through heat stress, disease spread, and air quality. This makes public health an important consideration for mitigation and adaptation policies, especially for vulnerable populations. The RMON plans to lead by example through the CCAP and support wider community efforts in an upcoming Community Climate Change Action Plan.

To that end, seven of the RMON facilities are LEED (Leadership in Energy and Environmental Design) Silver certified, demonstrating the organization's commitment to efficient, sustainable, and resilient green buildings. LEED certification credits include measures like protecting natural habitats, rainwater management, and heat island reduction, which has been achieved in several current facilities. The RMON is not only assessing LEED certification for existing buildings through the Building Operations and Maintenance stream but has also implemented backup generators at all EMS bases to ensure service continuity.

Public Health is conducting a Climate Change and Health Vulnerability Assessment for the Niagara Region. Completion of this study is expected by mid/end of 2025. It will identify serious health hazards from climate change. This assessment will guide resource allocation to reduce health risks and improve outcomes. Figure 13 outlines the indicators reviewed in this assessment.

Air Quality	Extreme Temperatures	Other Weather Events	Straospheric Ozone Depletion	Food and Waterborne Illnesses	Vectorborne Diseases
• Air Quality Health Index • ED visits for Chronic Obstructive Pulmonary Disorder and asthma	• Tree canopy cover • ED visits for cold- and heat-related illnesses, myocardial infarction and hypertension		• ED visits for sunburns • Incidence of melanoma	• Enteric illness rates (campylobacter enteritis, salmonellosis, giardiasis, cryptosporidiosis, and verotoxin-producing E.coli)	• Incidence of Lyme disease and West Nile Virus illness
• Health vulnerabilities related to air pollution	• Population statistics for health vulnerabilities related to extreme heat	• Key socioeconomic population health vulnerabilities related to extreme weather	• Population statistics for vulnerability to ultraviolet radiation	• Key population health vulnerabilities related to food and waterborne illnesses	• Key population health vulnerabilities related to Vectorborne disease

Figure 13 - Climate Change and Health Vulnerability Assessment Indicators

Additionally, Public Health is conducting Health Impact Assessments (HIA) on qualifying projects. The initiation of an HIA is tied to the risk categories the RMON considers in the

capital allocation planning system. Integrating the results of the HIAs into future CCAP updates would offer several benefits including:

- informed decision-making that prioritizes health and well-being
- enhanced employee productivity through better workplace environments
- improved community relations by addressing local health concerns
- thoughtful alignment of service delivery with health and environmental considerations

The RMON's WWW teams are prioritizing climate change resiliency and adaptation by following the Envision™ Sustainable Infrastructure Framework for new site designs. Key sections of the framework include the Natural World and Climate and Resilience, awarding points for protecting the environment, managing stormwater, and assessing climate vulnerabilities and risks to maximize site resilience. The new South Niagara Wastewater Treatment Plant will undergo Envision™ pre-assessment and verification.

As previously mentioned, additional details regarding the RMON's plans for climate change adaptation and resiliency will be outlined in the RMON's upcoming Community Climate Action plan.

Putting it All Together

This Corporate Climate Change Action Plan is a comprehensive framework aimed at achieving Net-Zero Corporate greenhouse gas emissions by 2050. This plan focuses on strategy and policy enablers that will facilitate the implementation of decarbonization actions across the RMON's various emissions sectors. By prioritizing efficiency, waste management, electrification, and green energy, the RMON is setting the foundation for a sustainable future.

The RMON is committed to integrating climate resiliency and adaptation into planning processes to ensure that infrastructure and services remain robust in the face of changing climate conditions. Through continuous review and alignment with evolving environmental policies, the CCAP remains a dynamic and effective guide. This approach reflects the RMON's dedication to sustainability, resilience, and the well-being of the Niagara Region.

Appendices

Appendix A – Technical Decarbonization Project List

Legend:

Cost Implications (Capital)	GHG Reduction Potential (tCO_2e/year)
$: < $10,000 **$$:** > $10,000 to < $100,000 **$$$:** > $100,000 **N/A:** Estimation not available or applicable	**LOW:** < 5 tCO_2e **MEDIUM:** > 5 < 30 tCO_2e **HIGH:** ≥ 30 tCO_2e **N/A:** Estimation not available or applicable

ID	Sector	Measure	Cost[18]	GHG Reduction Potential	Priority
B-1	Buildings	Retrofit lighting to LED	$$	LOW	LOW
B-2	Buildings	Implement smart lighting controls	$	LOW	LOW
B-3	Buildings	Use thermostat setbacks during unoccupied times	$	LOW	LOW
B-4	Buildings	Implement Building Automation Systems for HVAC, lighting	$$	MEDIUM	MEDIUM
B-5	Buildings	Building envelope enhancements (windows, insulation, leak sealing)	$$$	LOW	LOW
B-6	Buildings	Heat/energy recovery ventilation in buildings	$$	MEDIUM	MEDIUM
B-7	Buildings	Install high-efficiency, condensing natural gas boilers and advanced thermostat controls	$$	LOW	MEDIUM
B-8	Buildings	Transition natural gas-fired space and water heating systems to electric GSHP and ASHP technologies	$$$	HIGH	HIGH
B-9	Buildings	Integration of solar PV in buildings	$$$	LOW	MEDIUM
W-1	WWW	Process heat recovery in WWW	$$	HIGH	HIGH
W-2	WWW	Install high-efficiency natural gas condensing water heaters	$$	LOW	MEDIUM
W-3	WWW	Transition natural gas-fired water heating systems to electric GSHP and ASHP technologies	$$	HIGH	HIGH
W-4	WWW	Ensure right sizing of pumps/pump motors through audits and data analysis	$$	MEDIUM	LOW

[18] The Cost and Estimated GHG Reduction Potential for Decarbonization Measures/Actions for the Buildings/Fleet/WWW sectors are reflective of per-unit upgrades (i.e. one facility, one vehicle).

Cost and GHG metrics will also vary based on other factors (e.g. size of facility).

ID	Sector	Measure	Cost[18]	GHG Reduction Potential	Priority
W-5	WWW	Use premium efficiency motors/high efficiency turbo blower technologies	$$	MEDIUM	LOW
W-6	WWW	Implement variable frequency drives where feasible on pumps and blowers	$$	MEDIUM	LOW
W-7	WWW	Implement advanced aeration blower controls at wastewater plants	$$$	HIGH	LOW
W-8	WWW	Harness and utilize biogas to supplement/offset natural gas consumption for process heating, space heating as well as potential cogeneration	$$$	HIGH	HIGH
W-9	WWW	Leverage RNG (in place of natural gas) for anaerobic digestion processes	$$$	HIGH	HIGH
F-1	Fleet	Driver education, idle reduction policy/auto shutoff technologies, vehicle right-sizing, route planning, advanced fleet management systems, employ ePTOs	$$	MEDIUM	MEDIUM
F-2	Fleet	Light-duty fleet electrification	$$	MEDIUM	HIGH
F-3	Fleet	Medium and heavy-duty fleet electrification	$$$	HIGH	LOW
L-1	Outdoor Lighting and Traffic Signals	Replace remaining warning beacons with solar alternatives	$$$	LOW	LOW
L-2	Outdoor Lighting and Traffic Signals	Investigate adaptive/smart lighting controls	$$$	MEDIUM	LOW
O-1	Operational Waste	Conduct regular waste audits to identify the types and volumes of waste generated	$	N/A	MEDIUM

ID	Sector	Measure	Cost[18]	GHG Reduction Potential	Priority
O-2	Operational Waste	General behavioural: • Maintain accessible, clearly labeled recycling programs • Set specific waste reduction targets and assign responsibility • Monitor and regularly report progress towards waste reduction targets • Provide ongoing training on proper waste management practices • Raise awareness of the importance of waste reduction for Net-Zero goals • Encourage composting and use of composted materials • Foster friendly competition to incentivize waste reduction efforts	$$	MEDIUM	MEDIUM

Table 11 - Decarbonization Action List (Full)

Appendix B – Potential Funding Sources

Funding Source/Program Name	Funding Entity	Program Description	Funding Amount
Green Municipal Fund	FCM	Funding to implement studies and capital projects at Milestone 4. Several funding streams available	Both loans and grant funding that vary based on project.
Zero Emissions Vehicle Infrastructure Program (ZEVIP)	Natural Resources Canada (NRCan)	Funding towards the deployment of electric vehicle (EV) chargers (Level 2 and 3) and hydrogen refuelling stations across Canada. It operates on an annual calendar of application windows.	Up to 50% of project costs. Max funding amount: Level 2: $5000/connector Level 3: $75,000/connector
Save On Energy - Instant Discounts Program	IESO	Instant, point-of-sale discounts available for a variety of lighting products.	Ranges from $2/unit for T5 LED tubes to $140/unit for high-lumen LED Highbay fixtures
Save On Energy - Retrofit Program[i]	IESO	Provides prescriptive and custom (based on energy and demand savings) incentives for a variety of electricity reduction measures (lighting, HVAC, motors, compressed air, VFDs)	Custom incentives: the higher of $1200/kW or $0.13/kWh of savings. Prescriptive incentives vary based on measure type, size, application. Some incentive caps apply.
Save On Energy - Energy	IESO	Rewards organizations on a pay-for-performance basis for electricity reductions over a number of years. Some restrictions on eligible facilities apply.	$0.04/kWh and $50/kW of Summer Peak Demand Savings,

Funding Source/Program Name	Funding Entity	Program Description	Funding Amount
Performance Program			capped at 20% of Baseline values.
Incentives for Zero-Emission Vehicles (iZEV and iMHZEV)	Transport Canada	Point of sale incentives for the purchase or lease of eligible vehicles which range from light to heavy-duty battery-electric, plug-in hybrid and hydrogen fuel cell vehicles.	Range:low as $625 for a 12-month lease of a light-duty plug-in hybrid vehicle to $200,000 for the purchase of certain heavy-duty zero-emission vehicles.
Enbridge Natural Gas Efficiency Programs	Enbridge	A range of prescriptive and custom programs providing incentives to for upgrading to energy-efficient natural gas equipment (e.g. boilers, MUA units, energy recovery ventilators). Specific programs for affordable housing and multi-unit residential buildings. Funding also available for on-site energy assessments in some circumstances.	Range based on equipment type, size and application. Enbridge Energy Solutions Advisors are available to consult with.
Low Carbon Economy Fund (LCEF)	Government of Canada	Provides financial support for organizations to implement large GHG reduction projects and employ low-carbon technologies. Competitive program with the most successful project types being: • Waste diversion • Biomass retrofits • Industrial retrofits • Anaerobic digesters • Waste heat recovery • HVAC system retrofits	Applicants may request from $1-25M in funding. Max cost-share specific to municipalities is 50%, therefore an eligible project must have expenditures (project costs) >$2M.

Funding Source/Program Name	Funding Entity	Program Description	Funding Amount
		• Carbon capture and utilization • District energy system upgrades	
Save On Energy – Industrial Energy Efficiency Program	IESO	Merit-based program that supports customers across Ontario in improving their industrial processes and implementing system optimization projects. Minimum 2,000MWh electricity savings is required.	Up to $5 million in incentives for each project, capped at 75% of eligible project costs.
Canadian Infrastructure Bank – Green Infrastructure Programs	Canadian Infrastructure Bank, in partnership with SOFIAC	Provides financing to reduce investment barriers and decarbonize buildings. Offers a team of experts that work with the public and private sector as well as other market participants to modernize and improve the energy efficiency of existing buildings.	Varies based on project

Table 12 - Potential Funding Sources

Appendix C – Regulatory Review Framework

The CCAP is a Living Document that requires systematic reviews to adapt to evolving climate and energy regulations. Continuous monitoring will also identify changes and inform adjustments. Inclusive engagement is important to align strategies with updated regulations, foster transparency, compliance and departmental accountability. Finally, regular reviews and thorough documentation ensure ongoing alignment with policy and demonstrate the RMON's commitment to continuous improvement.

Table steps through the RMON's 8-step, systematic Regulatory Review Framework, which will be led by the Climate Change team, and the Steering Committee once established.

Step	Process(es)
Regulatory Monitoring	• Continuously monitor federal and provincial climate-related acts, policies, and legislation.
Regular Updates and Alerts	• Ensure that climate change, energy and sustainability related groups receive regular updates and alerts on changes or new regulations related to climate change.
Impact Assessment and Analysis	• Evaluate the effects of regulatory changes on the existing CCAP. • Identify areas requiring adaptation or alignment for compliance. • Organize changes by impact (low/medium/high) and time horizon criticality (immediate/1-5 years/5+ years).
Staff Engagement	• Collaborate to discuss implications of regulatory changes and develop strategies for CCAP integration.
Plan Adjustment and Alignment	• Modify the plan to ensure alignment with updated regulations. • Document revisions and rationale for transparency.
Implementation and Training	• Communicate revised plan and provide necessary training for understanding and compliance.
Periodic Review and Audits	• Establish scheduled reviews to compare the plan against evolving regulatory standards. • Allow for timely adjustments.
Documentation and Reporting	• Maintain detailed records of compliance reviews (timing, depth), modifications (tracked changes), and training (methods, attendees). • Prepare regular reports to Council showcasing compliance efforts and improvements.

Table 13 - Regulatory Review Framework

[i] The Niagara Region has been identified by the IESO as an area where electricity constraints exist. As a result, regional incentive adders (incremental to base incentives) have been made available in some jurisdictions within Niagara to further encourage update in the Retrofit program.