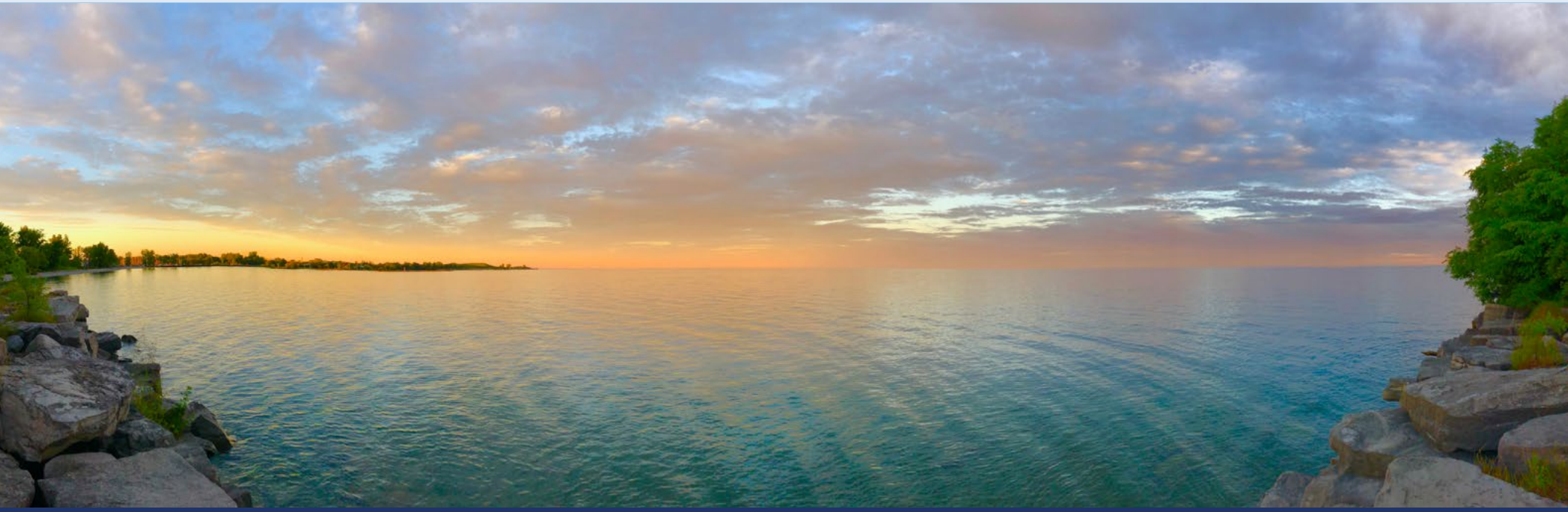

# Durham Region Corporate Climate Change Action Plan

## Executive Summary

The purpose of the Corporate Climate Change Action Plan ("Plan") is to provide a comprehensive approach to reducing greenhouse gas (GHG) emissions from the Region of Durham's corporate operations. This Plan responds to Regional Council's declaration of a climate emergency in January 2020.

Worldwide, climate scientists agree that fast rising global temperatures have created a climate crisis. In 2018, the Intergovernmental Panel on Climate Change (IPCC) released The Special Report on Global Warming of 1.5°C providing scientific evidence for the need to limit global warming to 1.5°C. The IPCC states that this is possible but "would require rapid, far-reaching and unprecedented changes in all aspects of society". To align with the IPCC and climate science, leading governments (national, subnational, and municipal), corporations, and institutions around the world are targeting deep GHG emissions reductions over the coming decade, with a view to achieving net zero emissions by mid-century or sooner. This Plan establishes corporate GHG emissions reduction targets for Durham Region that aligns with best practice.

As identified by the IPCC, significant action and investment are required in the next 10 years to avoid catastrophic impacts. The next five years are critical to putting Durham Region on the path to meet the Region's GHG emissions reduction targets. The Plan identifies five priority actions for the next five years (2021-2025) that can be embedded into Regional operations:

1. Incorporate a carbon budget management framework into the Region's business planning and forecasting process, and annual monitoring and reporting of progress against Council-approved emissions reduction targets (see Section 7);
2. Formalize a governance framework to build corporate capacity, align priorities, and share accountability in meeting the Region's targets (see Section 8);
3. Develop zero carbon asset portfolio standards and transition plans in facilities and fleet; pursue pacesetter pilot projects across corporate GHG-emitting sectors to close the gap to short- and medium-term corporate GHG targets (see Section 9);
4. Develop financing strategies for actions emerging from the carbon budget management framework including leveraging external funding and using innovative municipal financing approaches (Section 11); and
5. As part of the re-development of the Durham Strategic Energy Alliance (DSEA), lead the creation of a Corporate Energy Managers community of practice to share successes and lessons learned across Durham-based organizations with a low carbon or net zero mandate (see Section 12).

Staff will provide an annual update on the Plan, including an update of the annual corporate GHG inventory, progress towards mandated carbon budgets, and implementation updates on identified five-year priorities. A full review and update of the Plan, including guiding principles, goals, and GHG emission reduction targets and priority actions will be completed in 2025.

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## 1. Introduction

The climate science from the Intergovernmental Panel on Climate Change's (IPCC) The Special Report on Global Warming of 1.5°C is clear: allowing global temperature rise to exceed 1.5°C will disrupt global social, economic and ecological systems, with severe consequences for the most vulnerable populations. The IPCC report states: "Limiting global warming to 1.5°C would require rapid, far-reaching and unprecedented changes in all aspects of society". As a signatory to the 2016 Paris Agreement on Climate Change, the Government of Canada has committed to reaching net zero GHG emissions nation-wide by 2050 and has recently established legally binding legislation to meet rolling 5-year emission reduction targets (starting with Canada's target of reaching 30 per cent below 2005 level by 2030).[1]

Analysis conducted as part of Durham's Future Climate Study indicates that Durham Region will not be immune to climate impacts. Temperatures in Durham Region have already increased between 1 to 2°C since the middle of the 20th century, and under a "business as usual" trajectory, that trend is projected to continue. By the 2050's, average annual temperatures are projected to increase by an estimated 3°C in Durham Region, leading to a dramatic increase in extreme heat and precipitation events. This will exacerbate existing health risks for vulnerable residents and, without adequate mitigating strategies, could disrupt critical infrastructure systems leading to economic impacts. Expected economic and environmental impacts do not end there, amplifying the urgency of reducing GHG emissions.

Although current climate trends are alarming, the good news is that there is great economic opportunity in advancing expeditiously towards a low carbon world, including job creation, cost savings, air quality improvements, and more comfortable and durable buildings and infrastructure. Modelling to 2050 conducted as part of Durham Community Energy Plan (DCEP) indicated that adopting a low carbon pathway would generate upwards of $20 billion in cumulative energy cost savings from reduced energy consumption, and 210,000 direct person years of employment.[2]

On January 29, 2020, Durham Regional Council declared a climate emergency, joining a growing global movement calling for urgent action to avert the climate crisis. Major local, Regional, and national governments, corporations, and institutions have likewise made corporate net zero commitments including: Ontario Power Generation, General Motors, Ontario Tech University, and Enbridge Gas. The next five years are critical for monumental change.

The race is on! Let's get started.


1 Bill C-12 An Act respecting transparency and accountability in Canada's efforts to achieve net-zero greenhouse gas emissions by the year 2050. First Reading, November 18, 2020.

2 Durham Community Energy Plan.

## 2. Background, Mandate, and Strategic Alignment

Since Regional Council's declaration of a climate emergency in January 2020, and subsequent endorsement of the Region of Durham's Strategic Plan in May 2020, environmental sustainability, and corporate leadership in addressing climate change has been a central part of the Region's mandate. These decisions build on more than a decade of Regional Council decisions supporting the need to focus on climate action as a critical priority, guiding Regional policy, investment, and operations, namely:

- In 2009, Regional Council unanimously adopted the position that: "Scientific evidence overwhelmingly supports the conclusion that human activities are fundamentally altering the conditions for life on earth. Climate change and associated global warming is recognized as a severe threat to global systems with the potential for catastrophic outcomes" and directed the integration of corporate climate change initiatives into the Region's existing Business Planning, Asset Management and Risk Management programs, processes, and reporting requirements.[3]
- In 2010, Regional Council adopted community GHG emissions reduction targets consistent with the Intergovernmental Panel on Climate Change (IPCC) consensus on levels of decarbonization necessary to limit global warming to below 2°C to prevent catastrophic climate change:[4]
    * 5 per cent below 2007 levels by 2015;
    * 20 per cent below 2007 levels by 2020; and
    * 80 per cent below 2007 levels by 2050.
- In 2011, Regional Council approved both the implementation of annual Climate Change Update reporting and a corporate climate change operational protocol to ensure a robust, repeatable, consistent, and verifiable corporate carbon footprint (2007 baseline) and the ongoing monitoring of climate change and the carbon implications of Regional programs, plans, and initiatives.[5]
- In 2012, Regional Council endorsed the Durham Community Climate Change Local Action Plan (LAP) which established a long-term vision of "Durham Region is a carbon-neutral, sustainable, prosperous and resilient community with a high quality of life" and a mission to "work with our community to develop and advocate innovative policies, strategies and actions that address the threat of climate change."[6]
- In 2014, Regional Council approved the Region's first Climate Five-year Adaptation Plan, subsequently updated through the Business Planning Cycle, including Asset Management Planning.[7]
- In 2016, Regional Council approved the Durham Community Climate Adaptation Plan which included 18 proposed programs across seven theme areas to address resilience to climate impacts.[8]

3 Joint Committee Report 2009-J-37

4 Joint Committee Report 2010-J-24

5 Joint Committee Report 2011-J-26

6 Joint Committee Report 2012-J-32

7 Joint Committee Report 2014-J-1

8 Committee of the Whole Report 2016-COW-103

- In 2019, Regional Council approved:
    * the Durham Community Energy Plan, which included a modelled Low Carbon Pathway based on the implementation of six priority programs.[9] These two plans replaced the 2012 LAP as the guiding documents for community climate action in Durham Region; and
    * the Region's Asset Management Policy, which commits to consideration of climate adaptation and mitigation as a key aspect of Asset Management Planning.[10]
- In February 2020, Council directed staff to develop a Low Carbon Fleet Strategy.
- In June 2020, Regional Council approved an investment plan for the $5 million Climate Mitigation and Environmental Initiatives reserve fund, as well as a proposed conceptual program design for the Durham Home Energy Savings Program (D-HESP)

The Region of Durham Corporate Climate Action Plan (CCAP) has been developed in accordance with Regional Council's climate emergency declaration which directed staff to prepare a Plan that:

- establishes short-term (2025), medium-term (2030) and long-term (2050) GHG emissions reduction targets for the municipal corporation that position the Region as a leader in the community-wide effort to reduce GHG emissions;
- identifies short-term corporate climate action priorities for the next 4 years (2021-2025) and requirements to support implementation; and
- identifies how climate change considerations can be embedded across all elements of Regional business.


9 Finance and Administration Committee Report 2019-A-19

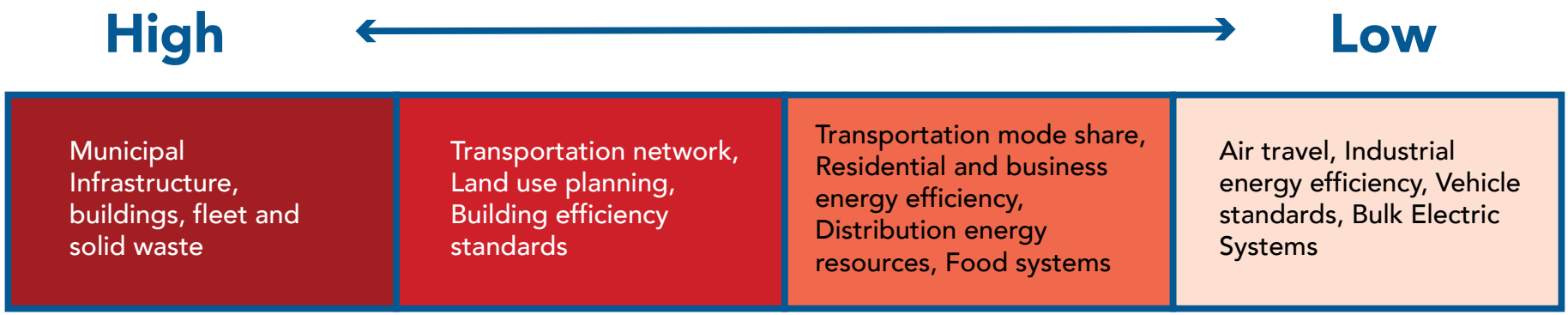
10 Committee of the Whole Report 2019-COW-16

## 2.1. Principles and Approaches Used to Develop This Plan

This Plan applies the following approaches, building on those proposed in the Durham Community Energy Plan:

- **Demonstrate municipal leadership through focus on areas of highest relative GHG influence:** While it is recognized that Regional corporate emissions represent a relatively small portion of total community-wide emissions (estimated at three per cent of total), and the Region has influence over community-wide emissions through policy and investment, leading by example in areas where the Corporation has a high level of influence (see Figure 1 below) is critical to setting the pace and catalyzing community action.
- **Reduce, improve, switch, generate:** The focus is first on reducing the amount of energy needed to maintain comfort and deliver services; secondly, improving energy efficiency of equipment (e.g. lighting, HVAC, etc.); thirdly, switching to low carbon fuels; and finally, generating energy through renewable sources (e.g. solar photovoltaic). This approach minimizes the cost of the energy transition by applying energy efficiency measures first to avoid oversizing mechanical and HVAC equipment or having to install additional generation capacity.
- **Lifecycle analysis:** Consistent with the Region's Asset Management Policy, continue to apply asset management practices to ensure that investment and operating decisions include the costs and benefits of options over their lifespan, and the application of consistent conservative methodologies for estimating future energy prices, with improvements to ensure the incorporation of the environmental and financial costs of carbon.
- **Iterative approach:** During the implementation period of this Plan, we expect new solutions will evolve, as new technologies emerge and/or social, economic, and environmental conditions change.
- **Collaborative implementation:** This Plan was developed through a 10-month process with key staff involved in the planning, design, and delivery of Regional projects. As a action plan, this Plan provides direction to decision-makers on necessary climate change outcomes, while providing flexibility on how actions may be implemented. This Plan recognizes that GHG emissions reductions must be carried out in a manner that also considers impacts to the level of service that the Region provides to residents and the associated resources and costs of delivering such services.

**Figure 1 - Regional corporate influence over GHG emissions**



## 3. Corporate GHG Quantification Methodology

Calculating corporate municipal GHG emissions can be complex due to the wide variety of services that the Region delivers. To be relevant, GHG inventories must reflect Regional operations, and the way in which it interacts with the community. GHG emissions are typically categorized into three groups or "scopes". Scope 1 covers direct emissions from owned or controlled sources, Scope 2 covers indirect emissions from the generation of purchased energy (e.g. electricity), and Scope 3 includes all other indirect sources that occur in an organization's value chain.

| Scope 1 | Scope 2 | Scope 1 |
|---|---|---|
| Facility fuel combustion | Purchased electricity | Purchased goods and services |
| Vehicle fleets | | Business travel |
| Fugitive emissions | | Employee commuting |

The Region has been tracking Scope 1 and 2 corporate GHG data since 2010 (with 2007 baseline data) using the Climate Change Operational Protocol which outlines how corporate GHG emissions are to be calculated and reported in a consistent manner. The Council-approved Protocol was developed based on the International Local Government GHG Emissions Analysis Protocol (IEAP) and uses the financial control approach as the basis for determining which emissions are in and out of scope. The Protocol is scheduled to be updated to reflect changes and advancements.

The protocol includes all elements of the Region's operations over which it has ownership as well as leased facilities' billed energy consumption, and fuel for leased vehicles. Where facilities are jointly owned, the estimations for Durham's portion of GHG emissions are included. The following sources of emissions are within the scope of the Region's GHG inventory:

**Building Emissions:** Includes energy consumption related GHG emissions from owned and leased facilities where the Region directly pays the utility costs.

**Fleet Emissions:** Includes energy consumption-related emissions from corporate vehicles owned and operated by Region of Durham Paramedic Services, Durham Regional Police Service, Durham Region Transit, and the Works Department. Fleet emissions do not include contracted fleet services (e.g. waste management). As noted in the Low Carbon Fleet Strategy, the on-road vehicles for 2019 include:

- Police: 451 units or 39.8 per cent of corporate fleet;
- Works: 329 units or 29.0 per cent of corporate fleet;
- Transit: 268 units or 23.7 per cent of corporate fleet; and
- Paramedics: 85 units or 7.5 per cent of corporate fleet.

**Landfill Emissions:** Includes fugitive methane emissions from six closed landfill sites that the Region maintains.

**Water Supply and Sanitary Sewerage Emissions:** Energy consumption from water supply and sanitary sewerage treatment, pumping and storage operations, and fugitive emissions from wastewater processing and biosolids incineration.

**Durham York Energy Centre (DYEC) Emissions:** Durham's share of DYEC emissions related to the processing of municipal solid waste.

## 3.1. Base Year Adjustments

The Region will establish 2019 as the base year for tracking corporate GHG reductions. When a significant change occurs that might confound the tracking of emissions over time, or progress towards goal achievement, then the Region may retroactively recalculate base year emissions. This recalculation may be done for significant changes to the data, inventory boundary, methods, or any other relevant factors. Significant changes that may trigger a base year recalculation include:

- Structural changes to ownership or control (e.g., merger, acquisition, divestiture, or outsourcing and insourcing of emitting activities);
- Changes in status of leased assets (e.g., ending leases or obtaining new leases);
- Changes in calculation methodology or improvement in the accuracy of emission factors or activity data; or
- Discovery of significant errors.

The Region will periodically submit its Corporate GHG inventory and methodology to external third-party review to ensure consistency with best practices.

11 Scope 3 emissions occur from sources owned or controlled by other entities in the value chain.

## 3.2. Limitations of the Region's current approach

The reported emissions for legacy landfill waste and wastewater processing are subject to a higher degree of uncertainty than those from the consumption of energy. Efforts will be made by staff to review and improve methodologies over time, particularly as the Works department develops GHG reduction strategies for the Region's water supply and sanitary sewerage systems (Section 9.4).

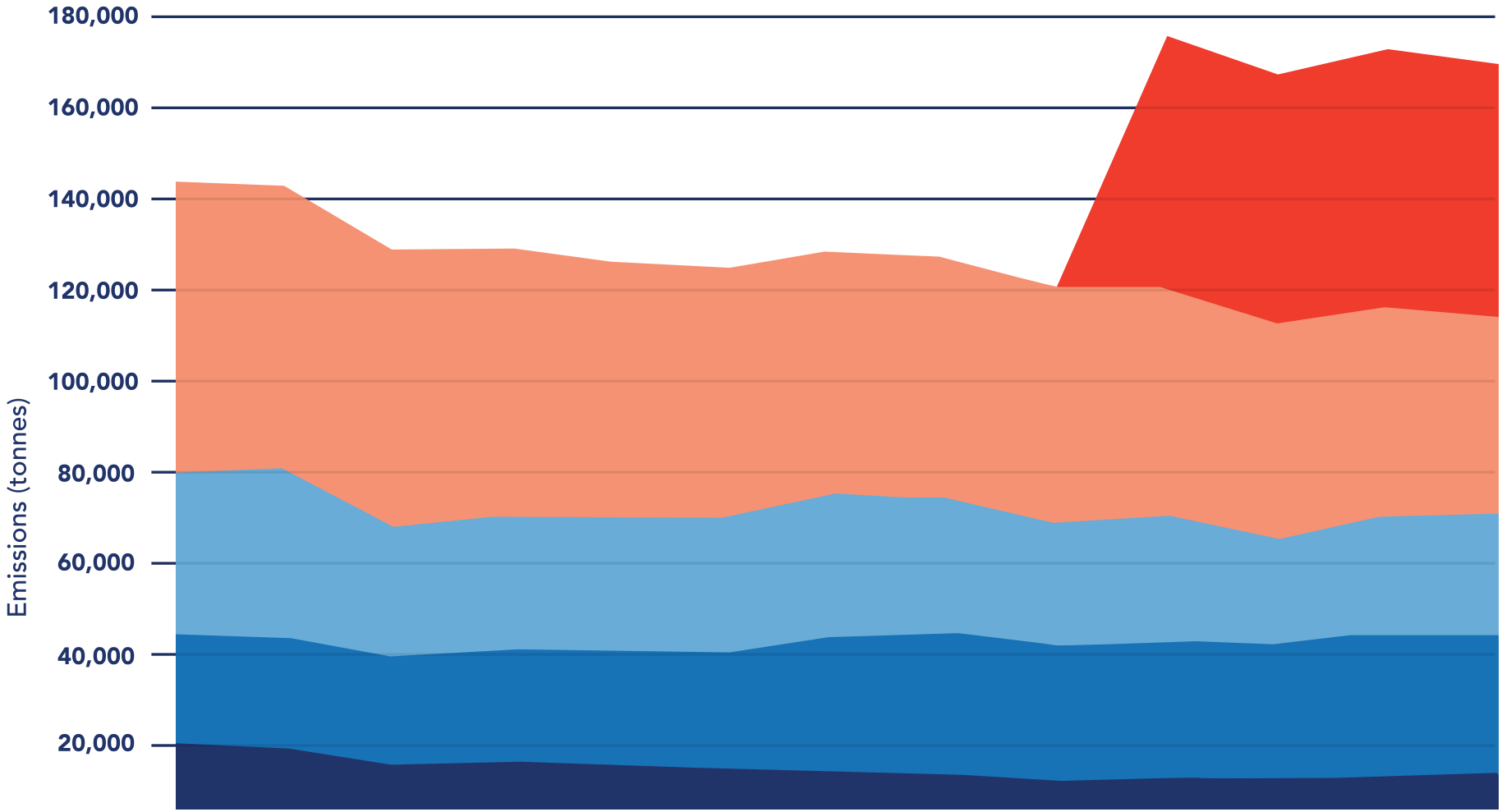
An additional area of improvement is in the Region's reporting of Scope 3 emissions.[11] Scope 3 emissions are not included in the Region's corporate annual GHG inventory reporting; however, it is recognized that the Region does have influence over key Scope 3 emissions categories including contracted waste haulage services, and employee commuting. As part of future updates to the Region's corporate GHG accounting protocol and Corporate Climate ActionPlan, staff will explore opportunities to include relevant Scope 3 emissions data for key value chain activities and influence reductions.

## 4. Review of the Region's 2019 Corporate GHG Emissions Profile

The corporation has made substantial progress with GHG reductions in key areas. These are illustrated in Figure 2 which displays the Corporate GHG emissions inventory in tonnes of carbon dioxide equivalent ($tCO_2e$) from 2007 to 2019. In addition to successful initiatives since 2014, which avoided close to 40 million kilowatt hours of electricity (excluding avoidance through peak demand curtailment initiatives) and avoided natural gas usage of approximately 12 million cubic metres, a large proportion of corporate reductions were related to the provincial phase out of coal-powered plants in 2013-2014, which reduced corporate-wide electricity-related emission intensity.

With DYEC operations beginning in 2016, net corporate GHG emissions rose by 53,700 tCO2e. However, it is critical to note that DYEC operations largely eliminated long-haul waste trucking to and disposal in distant landfill sites outside of the Region. The related emissions avoidance and reductions are not reflected in the corporate GHG inventory due to the approved calculation methodology, including contracted third-party fleet and landfill emissions for managing Region- generated waste are not included in the Region's corporate GHG footprint. Further, landfills are not required to calculate and report on GHG emissions under the Ontario GHG reporting program. A lifecycle analysis completed by the Region confirms a net GHG reduction benefit associated with DYEC as compared to the landfill disposal alternative, as referenced as Attachment #4 in Report #2021-A-3. Nonetheless, waste management operations present a long-term challenge for corporate decarbonization that will require innovative solutions.

## Figure 2 - Corporate GHG emissions inventory from 2007 to 2019 Framework




| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Durham York Energy Centre | - | - | - | - | - | - | - | - | - | 55,600 | 55,000 | 57,000 | 55,800 |
| Solid Waste Landfills | 64,800 | 62,500 | 60,400 | 58,300 | 56,400 | 54,400 | 53,000 | 53,000 | 51,800 | 49,600 | 47,500 | 45,500 | 43,300 |
| Water Supply & Sanitary Sewerage | 35,100 | 37,300 | 29,100 | 30,400 | 29,700 | 30,500 | 32,600 | 30,000 | 27,900 | 28,300 | 23,300 | 26,600 | 27,400 |
| Vehicle Fleets | 24,500 | 24,700 | 23,700 | 24,000 | 25,200 | 25,800 | 29,000 | 30,900 | 29,400 | 30,100 | 30,000 | 31,000 | 30,300 |
| Facilities & Traffic Signals | 19,400 | 18,400 | 15,000 | 15,700 | 14,700 | 13,600 | 13,800 | 12,900 | 11,600 | 11,800 | 11,300 | 12,600 | 12,700 |
| Total (Net Durham Share) | 143,800 | 142,900 | 128,200 | 128,400 | 126,000 | 124,300 | 128,400 | 126,800 | 120,700 | 175,400 | 167,100 | 172,700 | 169,500 |

## 5. The Path Forward – Corporate Carbon Budget Management Framework

From 2007 to 2019, corporate GHG emissions have increased by 18 per cent, largely attributable to the operation of DYEC beginning in 2016. Increasing emissions are typical for many growing municipalities. While many GHG reduction projects are underway, the Region's population is projected to double over the coming decades, leading to increased demand for services and supporting infrastructure (and therefore increased GHG emissions), unless there is a corporate management focus on bending the curve through operating efficiency and low carbon aligned investment across the organization. Responding to the climate emergency declaration requires a leadership focus on an absolute emissions reductions pathway that aligns with scientific evidence regarding the urgency of limiting global temperature rise to less than 1.5°C.

The goal of the Plan is to formalize a corporate carbon budget management framework (the "framework") for the Region to embed climate considerations as part of operational and investment decision-making, enabling concerted efforts to achieve substantial corporate GHG emissions reductions over the coming decades. The framework does not prescribe how the Region will achieve its GHG targets; rather, it describes the mechanisms to identify, quantify, prioritize, and balance climate actions among other Regional priorities.

The framework has four parts:

1. **Emission Reduction Targets:** science-based GHG emissions reduction targets that chart a trajectory to net zero corporate GHG emissions[12];
2. **Carbon Budget Management Framework:** a process to enable the acceleration of ambitious climate action aligned with the GHG emissions reduction targets, and to provide transparent monitoring and reporting of progress to Council and the public;
3. **Supporting Business Planning Cycle Elements:** key tools, documents, and actions for climate-informed decision-making, aligned with existing business planning processes; and,
4. **Governance Structure:** identification of roles and responsibilities for implementation of the carbon budget management framework.

## 6. Emission Reduction Targets

Emission reduction targets are developed to establish the level of change necessary to guide GHG reductions. Traditionally, a long-term target was assigned to a single year in the future; however, change can be slow and the urgency to address climate change often only appeared as the target date neared. Since it is the cumulative atmospheric emissions that impact the degree of global warming over a period of years, immediate actions are more impactful than delayed actions implemented simply to meet an end target.

Best practices reveal that setting a carbon budget with short, medium, and long-term emission targets that align with the science to limit global warming is most effective at reducing and tracking annual emissions. Defining viable pathways and corporate initiatives that reduce emissions continually over time are significant, as early and ongoing progress matters as much as the result.

12 Net zero emissions means achieving a balance between GHGs put into the atmosphere and those taken out through carbon sequestration activities (e.g. tree planting). This state is also referred to as carbon neutrality.

## 6.1. Corporate Target and Trajectory

While corporate emissions from Regional operations are a small percentage of overall GHG emissions in Durham Region (estimated at approximately three per cent of total), leading by example is critical to set the pace, spur innovation, and catalyze community action. Given the urgency conveyed in Regional Council's climate emergency declaration, the Region will establish a long-term corporate target of 100 per cent emissions reductions by 2045, five years ahead of the federal government's target of net zero nationwide by 2050.

The Region's corporate GHG emissions reduction targets are consistent with those set by other municipalities that have declared a climate emergency as outlined below.

**Table 1 - Municipal Corporate GHG reduction targets**

**Region of Peel:** 43% reductions by 2030, relative to 2010 levels.

**City of Edmonton:** 50% reductions by 2030, relative to 2005. Longer-term carbon neutral goal.

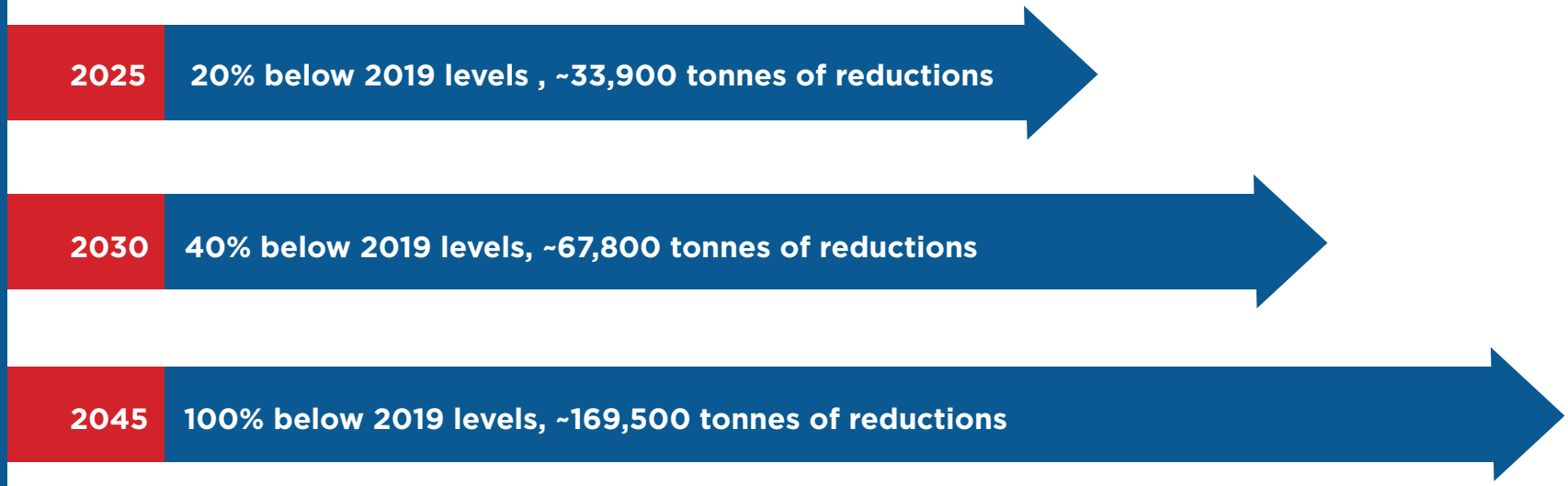
**City of Vancouver:** 50% by 2020, relative to 2007.

**City of Ottawa:** 50% by 2030 and 100% by 2040, relative to 2012 levels.

**City of Toronto:** 65% by 2030, net zero by 2050 or sooner.

Five-year targets can be drawn in alignment with the net zero trajectory for 2025 and 2030, as outlined in Figure 3. For trending and reporting purposes, 2019 will serve as the baseline.

**Figure 3 - Proposed Durham Region Corporate GHG reduction targets**



## 7. Carbon Budget Management Framework

The carbon budget is a management approach akin to setting financial budgets, as it tracks the Region's annual progress on emissions relative to its targets and identifies carbon surpluses or deficits. Annual carbon budget reporting will also identify five- and ten-year carbon projections relative to future five-year targets and five- and 10-year operations and capital projections. To apply the carbon budget, the Region will establish five-year targets for emissions reductions that are in line with the net zero by 2045 trajectory and develop strategies for meeting those targets. The Region will use the emissions target in each period as a key planning consideration that informs the identification and development of projects and initiatives. The first phase of the carbon budget will run from 2022 to 2025.

While the carbon budget is a relatively new process, it aligns with, and can be incorporated into the Region's existing Business Planning Cycle, as identified in the Region's Long-Term Financial Framework. The carbon budget process is organized into six phases, which are intended to integrate into existing elements of the Business Planning Cycle as summarized in Figure 4 on the following page.[13]

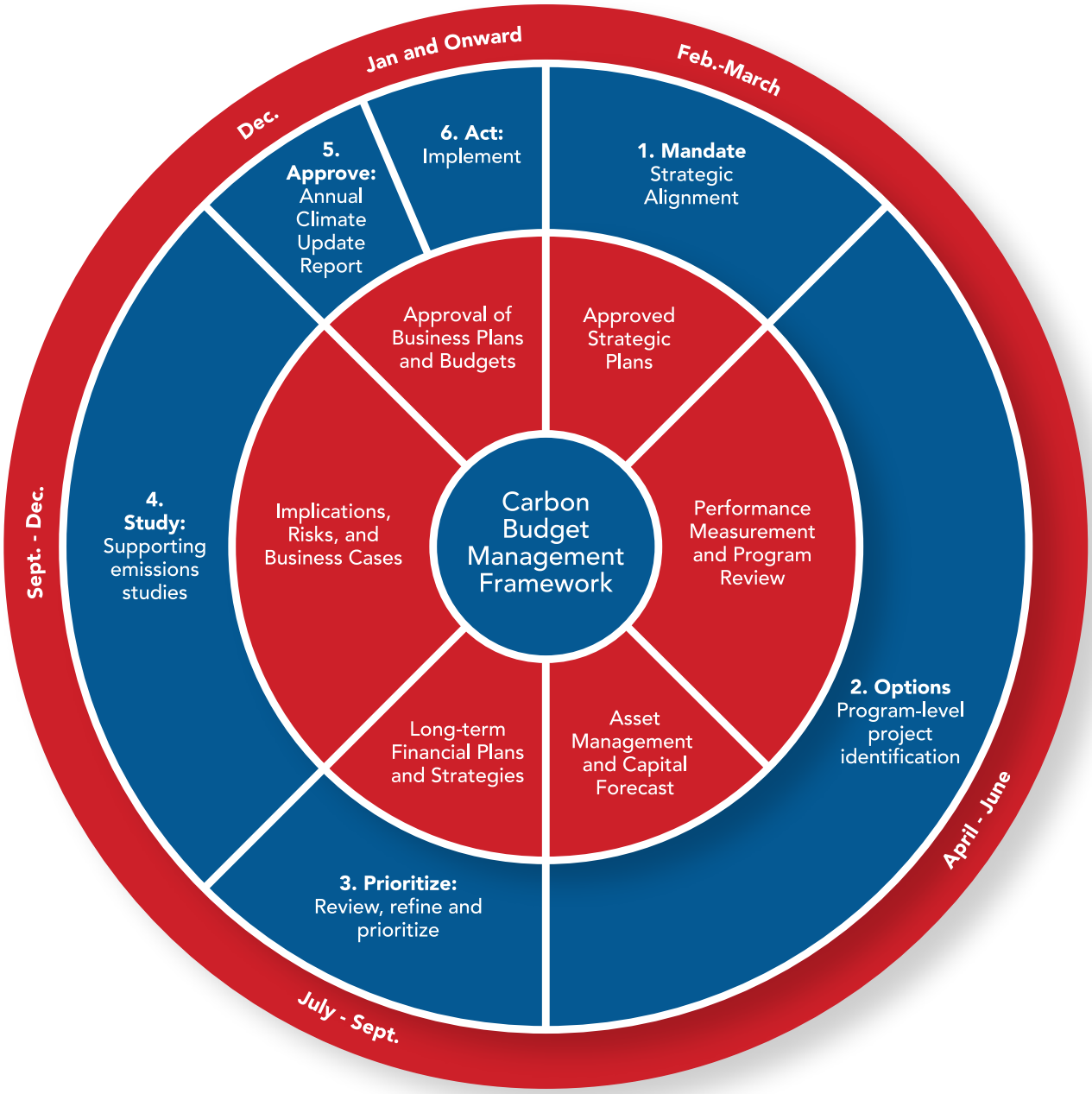

13 It should be noted that the Region is also undertaking a Business Planning and Budget Review and Modernization Program that may impact the timing and nature of the business planning process. The Carbon Budget process would be updated to reflect any adjustments to the business planning process and budget cycle.

## Figure 4 - Illustration of Carbon Budget Management Framework

The carbon budget management framework also includes new and existing supporting elements to ensure consistency with the Region's business planning process. Some of these elements already exist, several require modification to an existing process or tool, and other elements are new.

These supporting tools, documents and processes are organized according to their corresponding carbon budget/ business planning and budgets phase, which are described below.

The results of the Region's efforts in each period will be tracked and reported through the Annual Climate Update Report, reported concurrently with the Business Plans and Budgets. Every year the carbon budget will be calculated using carbon accounting data from approved initiatives combined with the Region's GHG inventory.



## 7.1. Mandate

**Corresponding Business Planning and Budget Phase:** Strategic Planning

**Timeline:** the annual launch of the Business Planning and Budget process

Strategic planning provides clear context and direction for Regional actions and initiatives and initiates the business planning cycle. Business plans and budgets are at the outset focused on prioritizations based on the approved Regional Strategic Plan, various aligned master plans and operational strategies, and the Regional Official Plan.

The framework will embed prioritization of carbon reductions through the:

- Climate Emergency Declaration;
- Carbon Budget Management Framework;
- Region's Strategic Plan; and
- Long-Term Financial Framework.

### 7.1.1. Climate Emergency Declaration

**Status:** In place

The Region of Durham declared a climate emergency in January 2020. The declaration mandates the development of a Corporate Climate Action Plan that includes targets, requires the consideration of climate change throughout Region business, and recognizes climate change as a strategic priority.

### 7.1.2. Carbon Budget Management Framework

**Status:** In development

The Framework, as detailed in this document, will be operationalized the Region as part of annual business planning and budget processes.

### 7.1.3. Strategic Plan

**Status:** In place

Environmental sustainability is the first goal identified in the Durham Region Strategic Plan: 2020-2024, which was endorsed by Regional Council in March 2020.[14] "Goal 1.5: Demonstrated leadership in sustainability and addressing climate change", specifies climate change as a strategic priority for the Region.

14 Region of Durham. (2020). Durham Region Strategic Plan 2020-2024.

### 7.1.4. Long-term Financial Framework

**Status:** In place

Durham has a strong financial and business planning framework, placing the Region among a select group of Canadian municipalities that have maintained a Triple A credit rating. Durham's Long-term Financial Planning Framework provides an integrated focus on funding Regional Council's priorities, accommodating growth, and investing in infrastructure and service levels while maintaining stable taxes and user rates. The Financial Framework is guided by the principles of financial flexibility, sustainability, and affordability and highlights the importance of planning for climate change.

## 7.2. Options Identification

**Corresponding Business Planning and Budget Phase:** Performance Measurement/Program Review, Asset Management and Capital Forecast

**Timeline:** April – June

Departmental operational plans are annually assessed at the program level as part of the Business Plans and Budget development process to ensure program-based budgets are tied directly to implementation of the current Council-approved Strategic Plan. Under the carbon budget management framework, programs would also develop multi-year emissions reduction opportunities/options in partnership with the Corporate Energy and Emissions Implementation Support Team (see Section 8). Annually, programs review and update preliminary operational and capital forecasts and performance measurement during this phase, in close collaboration with asset managers both at the asset class level and corporate asset management. Five-year operational and ten-year capital forecasts including financing strategies are refined on an annual basis through the Business Planning Cycle.

Program areas will be supported by a suite of supporting tools to identify emissions reduction projects, including the following:

### 7.2.1. Climate Lens and Project-Level Carbon Accounting

**Status:** To be developed

In the early phases of project conception in the program review phase, projects can be assessed qualitatively, using simple screening tools or checklists that provide an indication of the GHG impact without quantifiable data.[15] This can be used in preliminary analyses of options, or when not enough information on a project is known to develop a detailed GHG assessment.

15 Several models can be followed for checklists, including by Clean Air Partnership, namely Clean Air Partnership. (2020). Climate Lens Tool

Once further details are conceptualized projects will undergo preliminary quantitative carbon accounting. Project-level carbon accounting worksheets will be provided to Project Managers to support identification of emissions reduction potential from a given initiative, calculated according to the corporate carbon accounting protocols and methods for the project in question. Project Managers will be supported by a newly appointed Carbon Analyst. The Office of the CAO and Finance Department will jointly sponsor training for project managers on carbon accounting and use of the project-level worksheet.

Once the project-level carbon accounting is complete, Regional staff can use existing project initiation document worksheets to summarize the estimated emissions impact of potential projects. The Region can expand upon existing project initiation documents and processes to include standardized templates for inputting carbon accounting data by sector, climate adaptation and resilience impacts and other information, as required. These forms can also include standardized data by sector for staff to use in analysis, including relevant global warming potential data, emissions factors, and other assumptions.

Project-level carbon accounting data would then be aggregated across all projects in a centralized carbon accounting tool, where GHG impacts of all proposed projects can be summed to evaluate whether projects align with the Carbon Budget. The Carbon Accounting Tool will not be widely used within the Region; rather it is a tool that would be managed by an expert, the Carbon Analyst —an explicit role within the organization that is responsible for aggregating across projects. The Carbon Analyst should also support Regional staff with project-level carbon accounting, where required, to ensure consistency in calculation approaches across the organization. The Analyst will be supported by the Corporate Energy and Emissions Implementation Support Team.

While there it is urgency to implement a carbon budget management framework, it is recognized that it will take time to build capacity on carbon accounting within the organization, develop processes and evolve reporting approaches.

### 7.2.2. Climate Action Key Performance Indicators (KPIs)

**Status:** Some in place - to be expanded and formalized

KPIs will be used to track program and department-level progress on emissions reductions, and how well processes are supporting climate-informed decision making. KPIs can be used to evaluate program performance on emissions reductions and identify new opportunities for subsequent Business Planning Cycles. At a minimum, program-level indicators will include:

- Asset-level energy and/or emissions intensity; and,
- Program-level total emissions.

Using the sample key performance indicators outlined in **Table 2.** below as a starting point, the Office of the CAO will work in collaboration with the Carbon Analyst, the Internal Audit Division of the Finance Department, and an inter-departmental group of relevant technical leads to develop a full suite of carbon key performance indicators which will be incorporated into Strategic Plan dashboard indicators, and tracked and reported on as part of the Annual Climate Update report to provide transparency and accountability to Regional Council on progress against targets outlined in this Plan.

## Table 2 – Sample Corporate Climate Action Plan Sample Key Performance Indicators

### Facilities

1. Number of deep energy retrofits completed (annual and cumulative total)
2. Cumulative kW of installed solar photovoltaic (PV at Regional facilities (linked to Strategic Plan)
3. Total annual energy consumption and GHG emissions from Regional facilities (includes both owned and leased)
4. Number of EV charging stations installed at Regional facilities (annual and cumulative)

### Fleet

5. Percent of annual fleet vehicle procurement that is low carbon – by each Fleet Group, and overall Corporate Fleet (linked to Strategic Plan)
6. Percent of on-road hybrid or electric vehicles by Fleet Group and by corporate fleet
7. Total corporate GHG emissions from Regional fleets (by fleet group)

### Water Supply and Sanitary Sewerage

8. Total $m^3$ of sanitary sewerage processed per capita
9. Total $m^3$ of water supply treated per capita
10. Energy per unit of sanitary sewerage processed ($GJ/m^3$)
11. Energy per unit of water supply treated ($GJ/m^3$)
12. Total GHG emissions from water supply and sanitary sewerage services

### Waste

13. Carbon metrics for waste will be developed as part of the Long-term Waste Management Plan

### 14.7.2.3. Operational Carbon Performance Reviews

**Status:** Requires modification

Operational reviews are often focused on energy management and monetary savings, although carbon equivalent reductions are also estimated where there is data available (e.g. embedded energy manager programs). Energy management reviews are already occurring at Regional facilities, as prescribed under the Region's Corporate Energy, Conservation and Demand Management Plan. Such performance reviews will formalize review of operational emissions performance compared to mandated targets, in addition to existing energy metrics.

For example, the Region can require that energy audits include explicit requirements for quantifying operational carbon performance and that audits will be performed along with Building Condition Assessments. This information would inform asset management processes for buildings.

### 7.2.4. Asset Climate-Risk evaluation in Asset Management

**Status:** In place

Municipalities in Ontario are required by regulation to manage their assets according to a Strategic Asset Management Policy and Asset Management Plan that ensures adequate levels of service.[16] Through long-standing asset management and risk management processes, the Region conducted asset and operational risk and vulnerability assessments for years before they were provincially required. Renewal, rehabilitation, and replacement of assets, informed by asset and risk management planning, provide further opportunity to consider options for low-carbon alternatives.

Climate mitigation and adaptation is prominently identified as one of the Region's goals in its Strategic Asset Management Policy.[17] In the Region's Asset Management Plan, each asset class is to be analyzed from a climate mitigation and adaptation perspective. This information would then be used to inform and prioritize emissions reduction projects.

### 7.2.5. Carbon Standards for Capital Projects

**Status:** In development

The Region is currently developing a standard for corporate facilities ("Durham Standard") that will include energy and carbon performance requirements for new construction and major retrofits of existing facilities by the Region, including all corporate buildings. Carbon and energy standards will be developed for other asset classes, including fleet and existing buildings. This offers set standards for replacement of assets with low-carbon options.

## 7.3. Prioritize

**Corresponding Business Planning and Budget Phase:** Program-based Business Plans, Budgets and Forecasts, and Long-term Financial Plan and Strategies

**Timeline:** July – September

While options development, timelines, and costing are initially developed in program areas to achieve Strategic Plan objectives within specific programs, corporate-wide project prioritization of GHG reduction initiatives will also be informed through an annual collaborative and cross-departmental director-level strategic conference meetings. Prioritized projects/initiatives are to be considered within subsequent year Business Plans and Budgets, five-year operational forecasts, and ten-year capital forecasts. The prioritization meetings and any follow-ups will occur in the third quarter to inform finalization of detailed Business Plans and Budgets. The Framework includes the following mechanisms:

16 Government of Ontario. (2018). O. Re. 588/17: Asset Management Planning for Municipal Infrastructure.

17 Region of Durham. Strategic Asset Management Policy.

### 7.3.1. Prioritization Criteria for Evaluating GHG Reduction Projects

**Status:** Requires modification

The Region's current Business Planning and Budget process relies on program areas to identify key criteria—aligned with the Region's current Council-approved Strategic Plan—to prioritize expenditures within individual Business Plans and Budgets. Strategic goals for each program are embedded within the business plans to ensure transparency on how investments support Strategic Plan implementation.

The Framework will also support cross-program evaluation of GHG reduction options by establishing criteria that includes GHG reduction impact. Criteria can be weighted so that their relative importance across priorities can be incorporated. Budget items, programs and/or initiatives that reduce emissions, can then be assessed for their impact in achieving the criteria. This provides an opportunity to compare initiatives across programs.

The emissions impact (measured as $tCO_2e$ relative to business as usual) of a given GHG reduction project will become a criterion, along with other criteria of importance beyond climate mitigation, including those identified in the Region's Strategic Plan (such as cost, impact to community vitality, climate resilience, asset state of good repair, etc.). GHG emissions data for projects/initiatives will come from project-level carbon accounting.

### 7.3.2. Carbon Budget Analysis

**Status:** To be developed

The GHG impacts of each project/initiative approved through Business Plans and Budgets will be included in the calculation of the subsequent annual Carbon Budget, which is then evaluated against five-year emissions reduction targets.[18] Program-level data will come from project-level carbon accounting. Similarly, where feasible, projects/initiatives identified in the longer term will be accounted for in long-term financial and carbon forecasts related to operations and capital programs.

The Annual Climate Update Report will report on projected emissions reductions associated with items implemented in the same fiscal year. Because the carbon and financial business plans and budget are concurrent, the carbon budget will be an estimate, and can be subject to revision once further details on project implementation are known. Furthermore, although they are closely related, the Carbon Budget does not replace annual reporting on the Region's corporate GHG inventory, which provides a complete snapshot of the Region's total emissions.

18 Four years in first iteration of this framework (2022-2025)

### 7.3.3. Strategic Conference Meetings

**Status:** To be developed

The Region will convene a series of Director-level strategic conference meetings as a venue to review GHG reduction projects identified within individual departments/programs and preliminary estimates on the carbon budget to assess if any reprioritizations are necessary. The strategic conference meetings will also serve as a means to collaborate across the organization and identify cross-departmental initiatives.

## 7.4. Study

**Corresponding Business Planning and Budget Phase:** Implications, Risk, and Business Cases Development

**Timeline:** September – December

Program and project-level studies are completed to further refine and outline details including technical, environmental, financial, and operational implications, and risks and expenditure requirements, including business case analysis.

Under the Framework, this step will include detailed emissions reduction studies or project-level carbon accounting support to complement existing studies supporting Business Plans and Budgets (including future corporate-wide Property Tax and User Rate Guidelines, and Water and Sewer Rate study). Supporting studies and business case development can also be enhanced to better reflect the financial dimensions of climate change through the climate-informed financial analysis guidelines proposed below:

### 7.4.1. Climate-Informed Financial Analysis Guidelines

**Status:** In development

Incorporating climate change considerations into financial analysis better reflects the societal costs of emissions and can help to overcome capital cost barriers of emissions reduction projects compared to a business-as-usual approach. The Region already uses a life-cycle costing approach, which is important to reflect the long-term benefits of emissions reduction actions.

The Office of the CAO will collaborate with staff in the Works and Finance departments to provide organization-wide guidance and training for incorporating climate change considerations into financial analysis for individual projects, including templates, reporting, and analysis of best practices.

## 7.5. Approval

**Corresponding Business Planning and Budget Phase:** Approval of Annual Business Plans and Budget

**Timeline:** December

At this stage, annual detailed Business Plans and Budgets that are informed by the Framework and the Region's Strategic Plan, and in alignment with the Region's Long-Term Financial Framework and annual Council approved Guideline are presented to Regional Council for deliberation and approval. Approval is within the context of specific reporting on targets, GHG reduction initiatives, and progress in meeting mandated targets as part of the Framework. Climate-specific reporting concurrent with the annual Business Plans and Budget approvals will include an Annual Climate Update Report.

### 7.5.1. Annual Climate Update Report

**Status:** Requires modification

The Annual Climate Update Report will include prior year corporate GHG inventory reporting compared against the carbon budget, as well as reporting on a broader suite of program-level key performance indicators. The Annual Climate Update Report will also include a forward-looking five and ten-year carbon forecast that factors in the impact of planned actions relative to the carbon budget.


### 7.6. Act

**Timeline:** January and onwards

Following the approval of the annual Business Plans and Budget, program areas will implement, manage, and monitor emissions reduction initiatives/projects with support from a cross-departmental Corporate Energy and Emissions Implementation Support Team (see Section 8). The implementation of projects/initiatives and their tracking and performance measurement would inform subsequent strategic assessments, (re)prioritizations, and continuous improvement in subsequent years, based on the Strategic Plan:

#### 7.6.1. Innovative Project/Initiative Delivery Mechanisms

**Status:** To be developed

Innovative programming will be required to achieve deep emissions reductions within financial and other constraints. Staff across the organization will be encouraged to look to new innovative solutions and effective collaborations across departments to achieve emissions reductions. Viable pilot projects are to be encouraged, even if the GHG impact is unclear at the outset. This will require a corporate culture of experimentation based on calculated risk, with willingness to assess and learn from failures through objective evaluation practices. The Region will continue to stay engaged within municipal climate networks to be informed of, and to support new innovative programming.

## 8. Governance Structure

To support the integration of the carbon budget management framework across the organization, a governance structure will be operationalized, building upon recommendations from the Council-approved 2019 - 2024 Energy Conservation and Demand Management Plan. Engagement will be focused on key departments and divisions with responsibility for the design, construction, operation, and financing of emissions generating assets, as outlined in Table 3.

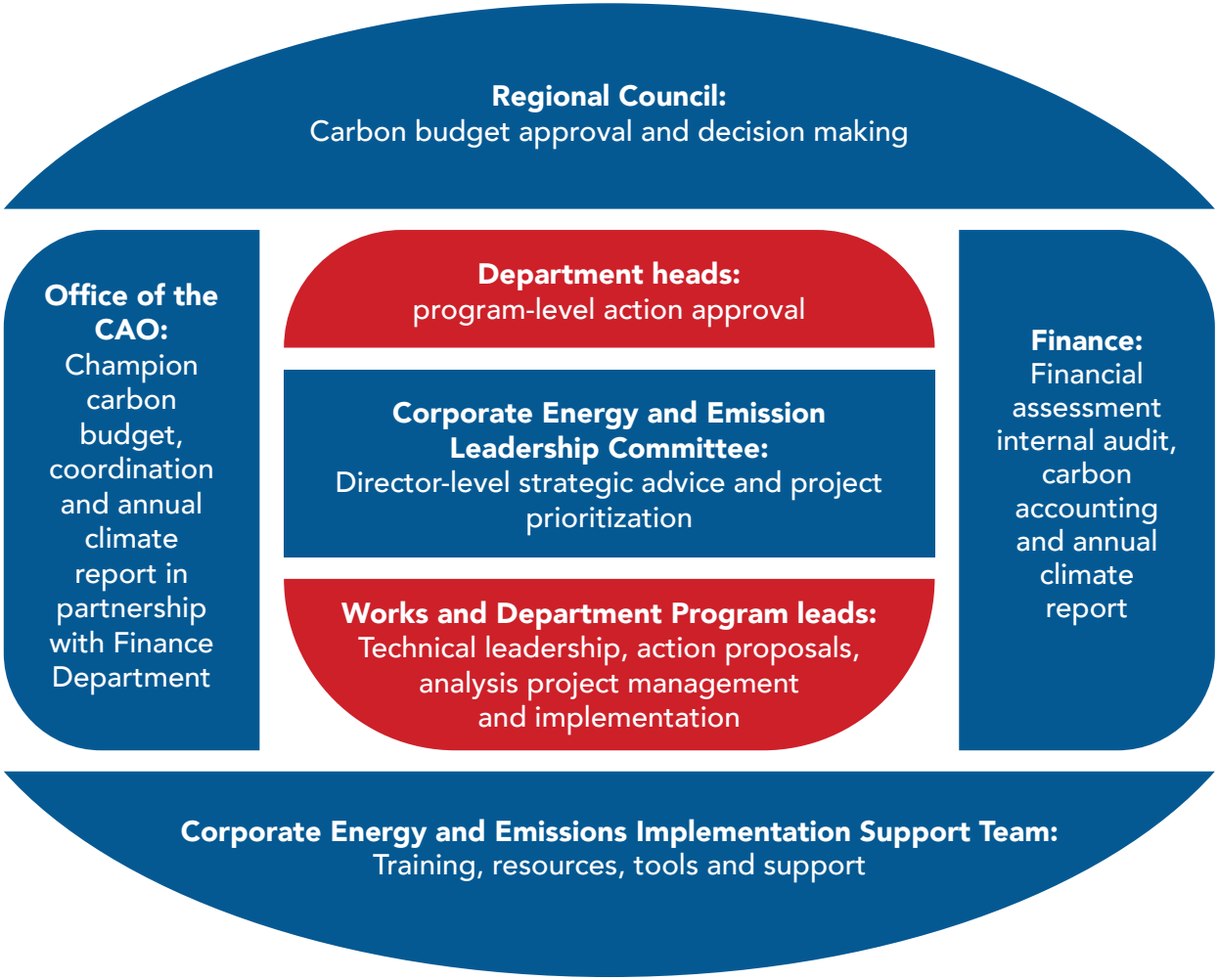
### Table 3 - Corporate carbon management – key Departments and Divisions

**Department and Divison:**

- Office of the CAO, Strategic Initiatives
- Finance Department, Financial Planning and Purchasing, Budget Planning
- Social Services, Business Affairs and Financial Management
- Transit, Maintenance, Business Services
- Works Department, Business Services, Environmental Services, Waste Management Services

Implementing the Carbon Budget will require the creation or enhancement of existing cross-departmental engagement committees as visualized in Figure 5.

## Figure 5 - Carbon Budget Implementation Governance Structure




This structure includes the development of a Director-level Corporate Energy and Emissions Leadership Committee that will host the annual Strategic Conference meetings to review and inform prioritization of potential capital and operational emissions reduction projects, as part of the Business Planning Process. This Committee will also provide an advisory role for implementation of the carbon budget management framework.

A Corporate Energy and Emissions Implementation Support Team consisting of staff across key departments and divisions will facilitate the training, tools, resources, and support to ensure staff have the capacity to implement low-carbon lifecycle solutions. This team will be an evolution of the current Energy Advisory sub-committee, and respond to a recommendation from the Region's Energy Conservation and Demand Management plan to "Formalize a Corporate Network that Establishes Clear Lines of Authority and Accountability for Energy Management"

Implementing the Carbon Budget will require continuation of existing roles, as well as new or revised roles and responsibilities, including the appointment of a Carbon Analyst. Any new staff requests required to address the scope of climate re-prioritization across the organization will need further assessment with reporting and approvals through 2022 and subsequent annual Business Plans and Budgets.

## 9. From Concept to Implementation – Strategic Summaries by Operating Area

### 9.1. Solid Waste

The Region is a leader in municipal waste management, with an annual waste diversion rate consistently above 60 percent, driven by innovative waste management initiatives. Examples include the DYEC facility which began operations in 2016, and the Blackstock landfill mining project which was completed in 2019 and eliminated GHG emissions from that legacy landfill site. Projected population growth, and the accompanying increase in waste disposal, will create challenges in reducing emissions from the solid waste sector over the medium to long-term.

The Works Department Solid Waste Division is developing a new Long-term Waste Management Plan (Waste Plan) 2021 to 2040 which includes as a guiding principle "demonstrate leadership in sustainability to address the climate crisis by reducing greenhouse gas emissions from waste management activities".[19] This Plan is instrumental and timely, given projected population growth over the period to 2040.

Key waste management objectives relating to GHG reductions over the next 20 years include:

- Increase diversion of organic waste from single-family homes (Food and Organic Waste Policy Statement targets 70 per cent), apartments and condominiums (Food and Organic Waste Policy Statement targets 50 per cent); construct and operate a Mixed Waste Pre-sort and Anaerobic Digestion facility to manage organic waste;
- Continue to manage GHG emissions from legacy closed landfills through innovative approaches; and
- Explore ways to mitigate corporate GHG increases associated with the planned increase in DYEC capacity and population growth over the coming decade.

#### 9.1.1. Mixed Waste Pre-sort and Anaerobic Digestion / Renewable Natural Gas

Building on Durham's history of innovative waste management initiatives, the Region is planning to build a new Mixed Waste Pre-sort and Anaerobic Digestion (AD) Facility which will remove organics, non-combustible material, and recyclables from garbage bags to further increase diversion from disposal and reduce processing requirements and GHGs at DYEC. The facility will be a first-of-its-kind, fully integrated waste management initiative in North America. Anaerobic digestion will be used to convert organic waste (source separated organics from green bin and organics extracted from mixed garbage wastes) to generate biogas which will be upgraded into renewable natural gas (RNG). RNG can be sold or used to reduce facility reliance on conventional (non-renewable) natural gas.

With a currently planned operations date of 2024, preliminary projections indicate the AD facility may generate upwards of 4 million $m^3$ of RNG annually in its initial years of operation, which would have the potential to offset approximately 7,500 $tCO_2e$ annually through the displacement of facility-based natural gas use. Based on preliminary estimates, assuming household growth and related waste tonnage growth, AD facility RNG production is projected to scale-up to more than 6 million $m^3$ annually towards the end of the initial 20-year facility operating period, which would have the potential to offset more than 10,000 $tCO_2e$ annually through the displacement of conventional natural gas usage. Assuming sufficient RNG volumes and an enabling framework by Enbridge (subject to regulatory approval) to utilize RNG as part of the Region's natural gas purchases, an RNG strategy for internal utilization is under consideration for achieving material GHG emission reductions in Regional facilities.

Staff continue to investigate the potential to utilize RNG as part of the Region's natural gas purchase as a strategy for achieving material GHG emission reductions in Regional facilities. The investigation considers RNG volumes, enabling framework, regulatory approval, associated agreements, and financial implications and will be the subject of future Council reports.

19 Long-term waste management strategy

### 9.1.2. Legacy Landfill Biocover Pilot

In 2019, legacy landfills were responsible for an estimated 43,300 $tCO_2e$ or 26 per cent of the total 169,500 $tCO_2e$ corporate GHG emissions. Methane emissions from the legacy landfills will continue as the waste slowly decomposes. Since methane is 25 times more potent than carbon dioxide, addressing methane is the fastest and most effective way to reduce GHG emissions.

Building on the success of the 2018-2019 Blackstock Landfill mining pilot project, which is assumed to have eliminated GHG emissions from that legacy landfill site, staff are exploring solutions for the Region's other closed landfill sites. At the largest site in Oshawa, staff are developing a pilot project that will evaluate the potential for an alternative landfill cover system to biologically convert the methane from decomposing waste into carbon dioxide. If 50 percent of the site's emissions were treated at an 85 percent efficiency, it would result in an overall decrease in methane emissions of up to 12,000 $tCO_2e$ annually. If the pilot is successful, it has potential to be rolled out to other Regional landfill sites. In total the potential result could be a GHG emissions reduction of approximately 37,000 $tCO_2e$ annually. The landfill biocover pilot, proposed to launch in 2022, is being funded from the Climate Mitigation and Environmental Initiatives Reserve Fund and may be eligible for senior government funding under the Green Municipal Fund, and/or other sources facilities. The investigation considers RNG volumes, enabling framework, regulatory approval, associated agreements, and financial implications and will be the subject of future Council reports.

### 9.1.3. Durham York Energy Centre (DYEC)

DYEC plays a central role as an alternative to landfill and a local solution for the processing of residual post-diversion residential waste, and as such has reduced GHG emissions associated with long-haul waste trucking to southwestern Ontario or New York State and methane leakage from distant landfill sites. However, given the Region's GHG quantification methodology (see Section 3) these reduced or avoided emissions are not captured in the corporate inventory. Although, DYEC operations have resulted in an increase in corporate GHG emissions since the start of operations in 2016, it reduces total lifecycle emissions, and is consistent with the corporate climate principles outlined in Section 2.1. While DYEC is generating electricity for the Ontario grid, under the power purchase agreement with the Independent Electricity System Operator (IESO), the Region is unable to claim the environmental benefits of that electricity generation against its corporate GHG inventory.

In the context of corporate decarbonization, the DYEC will become a strategically more important area of focus over time, particularly as other corporate sources (e.g. facilities, fleet, water/sewer) decline over the coming decade and given short- and long-term capacity increases planned for the facility. While a short-term net zero carbon strategy for DYEC is outside of the scope of this Plan to 2030, Regional staff will:

- As part of any future DYEC capacity increases, and increased electricity generation from the facility, work to retain future carbon credits as an offset against corporate electricity related GHG emissions inventory where financially feasible as part of advocacy and negotiations with relevant provincial government agencies;
- Explore the possibility of using waste heat within other Regional or surrounding facilities, such as the adjacent prosed AD facility, wastewater facilities, etc.;
- Explore opportunities to offset emissions in neighboring facilities through beneficial utilization of waste heat, including participation in district energy systems; and
- Continue to monitor opportunities to reduce or offset emissions through developing technologies including carbon capture and ash utilization.

## 9.2. Facilities

The Region's Energy Conservation and Demand Management Plan (CDM Plan) has guided energy management in corporate facilities since 2014. As a result of the first CDM Plan, endorsed by Regional Council on June 4, 2014 (Report #2014-J-17), Regional staff implemented a multitude of measures which enhanced energy efficiencies across program areas. These measures significantly improved processes and systems to ensure energy management is a key consideration in day-to-day functions and planning activities. The CDM Plan did not include GHG reduction targets for facilities. While facility emissions declined from 2012 to 2017, they have since increased, partly due to new facilities operations (e.g. new DRT Maintenance Facility in Oshawa and Sunderland RDPS station) and increased natural gas consumption at wastewater facilities (see Section 9.4).

The Region's CDM Plan was updated in May 2019 covering the period to 2024.[20] The 2019 to 2024 Plan includes four overarching goals:

1. Formalize a corporate network that establishes clear lines of authority and accountability for energy management; (Durham Region Corporate Climate Action Plan Page 27)
2. Enhance corporate energy awareness, education, and information sharing;
3. Standardize approaches and continue integration of energy conservation into asset management, business planning and budgets; and
4. Enhance energy monitoring, performance measurement and reporting.

This Corporate Climate Action Plan does not supplant the 2019-2024 CDM Plan, but rather provides additional direction including overarching corporate GHG reduction targets, as well as a focus on undertaking deep energy retrofits and lower carbon new builds in the facilities asset portfolio as described below. To minimize costs associated with the energy transition, this Plan provides high-level direction to utilize a planning and design framework that prioritizes actions that (1) reduce energy use (e.g. behaviour change, envelope improvements), (2) improve the use of energy (e.g. HVAC equipment, lighting), and (3) switch from the use of carbon-intensive fuels to less or zero carbon intensive fuels (e.g. heat pumps). Actions in all three areas are necessary, as well as the need to further investigate the potential to generate local renewable low, or zero-carbon energy. Reducing and improving energy use not only reduces emissions directly, but it also reduces the renewable energy generation needed, especially when accompanied by significant fuel switching. This prioritization framework is summarized in Figure 6.

20 Regional Municipality of Durham CDM Plan 2019-2024

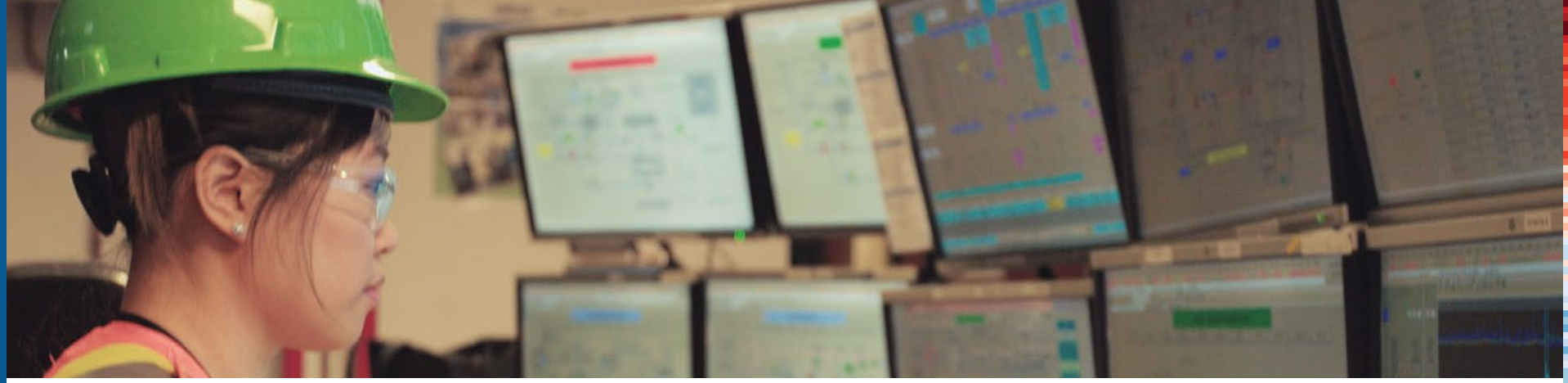
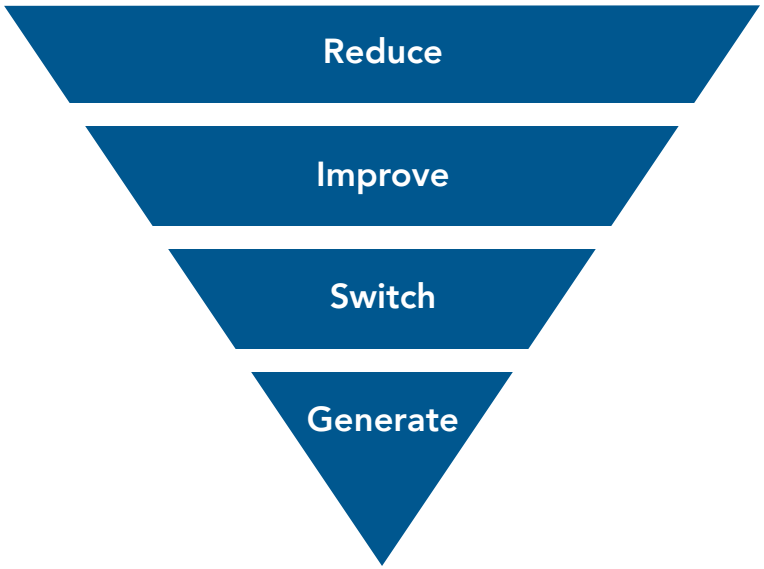


**Figure 6 - Prioritization Approach for Facilities Emissions Reductions**




**Reduce** the amount of energy needed to maintain building services through energy efficient envelope and windows.

**Improve** the energy efficiency of equipment (e.g. heating, ventilation, and air conditioning).

**Switch** to lower carbon fuels (e.g. from natural gas to renewable natural gas and/or electricity.)

**Generate** energy through on-site renewable energy (e.g. solar PV).

### 9.2.1. Undertake Deep Retrofits of Existing Buildings

Most Regional facilities currently use fossil fuel combustion heating systems. The current practice is to carry out retrofits to a modern standard as equipment reaches end of life. This Plan provides direction to conduct all major asset renewal retrofits to a lower-carbon standard, which will require an updated approach, summarized below:

- Consolidate scheduled retrofits to achieve greater impact with fewer disruptions, prioritizing maximum benefits at a single facility over minor improvements at multiple facilities. For example, conduct all scheduled retrofits at a property in the year of greatest capital expense; and
- Implement fuel switching from fossil fuel combustion systems towards high-efficiency heat pump technologies.

The expected impacts of implementing a lower-carbon standard for retrofits are:

1. Higher up-front capital costs;
2. Reduced life-cycle cost, resulting from better performing, more efficient buildings, as well as avoiding the cost of implementing a second retrofit later to achieve lower-carbon standard;
3. Lower GHG emissions by replacing carbon-intensive fossil fuel with low- or zero carbon electricity;
4. Lower energy use since heat pump technology is much more efficient than the highest efficiency combustion equipment; and
5. Reducing the risk of future cost burden related to retaining carbon-intensive equipment which will become increasingly costly to operate as prices increase for fossil fuels alongside carbon prices, and a limited renewable natural gas (RNG) supply.

Regional staff within the Works Department will work with program areas to create zero carbon transition plans for facilities with major equipment reaching end of life before 2030. Any buildings with major renewal occurring before 2030 should develop a zero-carbon transition plan prior to completion of work. The transition plan should:

6. Present a non-combustion alternative to the asset's current system. Investigate any foreseen challenges to fuel switching (such as electrical infrastructure limits, space constraints, etc.) and develop a plan which overcomes these challenges while aligning with natural renewal cycles where possible to reduce cost and disruption;
7. Conduct a life cycle cost analysis using a consistent template and consistent inputs across the organization considering emissions savings, operational costs, capital costs, equipment life, internal carbon price, and other relevant factors;
8. Consider efficiency and peak demand reduction improvements and on-site renewables that will be implemented alongside fuel switching;
9. Include the cost of conducting zero carbon transition studies in five year operating and ten-year capital plans; and
10. Include retrofits in the five-year operating and ten-year capital forecast submissions.

In the cases where complete electrification is not viable, renewable natural gas (RNG) supply may serve to offset fossil fuel use in the short term.

Retrofits are the most critical strategy in facilities over the next decade, given that new facilities built over the coming decade will make up a small share of the total portfolio in 2030. Aligning with a corporate net zero trajectory would require an average of three to four deep energy retrofits of existing facilities per year, starting in 2022. Project management capacity and expertise within the Works Department Design, Construction and Asset Management Group (DCAM) will be expanded up to coordinate and deliver portfolio-wide deep retrofits at the pace required to align with the corporate net zero trajectory. **Additional resources required to carry out this plan are currently under investigation and will be identified in future Business Plans and Budgets with recommendations for Regional Council approval.**

### 9.2.2. Lower Carbon New Builds

Currently, new construction for Region-owned facilities is required to achieve a level of performance comparable to or higher than Leadership in Energy and Environmental Design (LEED) Silver Certification. This standard does not achieve a zero emissions target. LEED does not set GHG intensity targets for building types, and therefore does not enforce the lower-carbon targets necessary to achieve Durham's emission reduction goals.

Through the development of the "Durham Standard" Works Department Design, Construction, and Asset Management (DCAM) team will update construction processes and policies to propose:

- A definition of "lower-carbon" construction that strives towards zero carbon levels of performance using the prioritized framework outlined in Figure 6;
- A requirement to evaluate a lower-carbon design with defined performance targets;
- A standard by which to evaluate the financial feasibility of lower-carbon design, e.g. 20-year lifecycle cost does not increase;
- A process allowing exemptions to be made due to technical feasibility, such as an unavoidably high-temperature requirement for process loads;
- An approvals process enforcing observance of these design and construction requirements and methods;
- A method to identify a lower-carbon target as a project requirement in design/construction procurement documents; and
- A process to regularly identify planned facility construction projects and monitor compliance.

The Region will update associated processes and policies including reviewing and revising the current 10-year capital forecast. Council approval will be required for additional funding for planned and future construction projects. These processes will be implemented and applied to all construction projects in pre-construction or earlier phases.

## 9.3. Corporate Fleets

The Region is committed to minimizing fleet GHG emissions through efficient operations and incorporating low and zero emissions vehicles into its fleet where operationally feasible. For existing fleet, the Region will continue to implement best management practices, including anti-idling, light-weighting idle reduction technologies, trip optimization, driver training, downsizing, right-sizing, and fuel switching.

Transitioning the fleet is a corporate priority. Given an average 10-year fleet vehicle lifespan, there is an opportunity to achieve substantial emissions reductions to 2025 and 2030 by shifting annual vehicle procurement (both new and replacement) towards low and zero carbon options.

In direct support of the Region's climate commitments, Durham Region fleets will adopt low-carbon mobility solutions, deploy supporting infrastructure in its facilities and modernize its fleets as follows:

- Target an annual average of 75 percent of new unmodified light-duty vehicle purchases will be zero emissions vehicles (ZEVs) or hybrids between 2022-2025;
- Target an annual average of 100 percent of new unmodified light-duty[21] vehicle purchases will be zero emissions vehicles (ZEVs) or hybrids between 2026-2030, with the priority given to zero emissions vehicles across all fleets where operationally feasible;
- Recognizing that the Region's police and paramedic Fleets require a high degree of operational capability, these fleets will continue to use more environmentally friendly technologies, such as hybrid, in the short-term with a view to exploring and transitioning towards ZEV options as the market develops in the latter half of the decade;
- The transition of the Transit fleet to low carbon options requires extensive planning in considering the facility infrastructure requirements, operational and financial impacts. As such, DRT will continue as planned to procure hybrid and battery electric vehicles for evaluation purposes in 2021/2022 and target to complete a full electric vehicle feasibility study in 2021 that addresses the facility infrastructure requirements, operating and financial impacts to transition to a fully electric vehicle fleet, including a multi-year vehicle acquisition plan. In the interim, DRT will also explore options to reduce and improve energy consumption on existing vehicle systems that reduce emissions (e.g. deployment of transit signal priority, anti-idling technologies);
- Fleet management will be optimized to achieve the targets, including exploring options for heavy duty vehicles, assessing ZEV charging infrastructure needs and applying telematics to analyze vehicle usage and optimize energy consumption and operational planning; and
- While recognizing that contracted fleet (e.g. waste management services) are outside of the scope of the Region's reported corporate GHG emissions, Solid Waste Management division staff will explore opportunities to reduce emissions through procurement and contract management as part of the update to the Long-term Waste Management Plan.

21 Refers to light duty vehicles that do not have any special equipment installed, such as specialized maintenance/repair services. See categories 3 and 4 in Appendix 1 of Treasury Board Guidance on Fleet Management

Based on fleet analytics modelling conducted as part of the development of this Plan, a fleet electrification pathway could result in a more than 70 percent reduction in corporate fleet related emissions, declining from 30,300 $tCO_2e$ in 2019 to approximately 9,100 $tCO_2e$ in 2030. However, facility infrastructure upgrades necessary to enable electrification need to be identified and costed as part of the identification of a viable fleet-wide transition plan.

Each of the four Regional fleet groups (Public Works, Region of Durham Paramedic Services, Durham Region Transit and Durham Regional Police Service) will evaluate unique combinations of low carbon fleet recommendations based on operating needs, availability of models, corporate budgets, vehicle conditions, and necessary upgrades to facilities and infrastructure to create scenarios that meet their operational requirements.

### 9.4. Water Supply and Sanitary Sewerage Infrastructure

The primary means for utilities to reduce their contributions to climate change is to effectively manage GHG emissions resulting from their operations. In 2021, the Works Department will initiate a study to develop climate action strategies for the Regional infrastructure for the water supply and sanitary sewerage systems. These strategies, once developed, will provide a more comprehensive road map for GHG emissions management, and will incorporate the elements listed below:

- Determination of the appropriate methodology for calculating GHG emissions for each system based on best practices of comparable utilities;
- Determinations of the appropriate GHG emission baseline for tracking progress;
- Identification of the appropriate key performance indicators for each system;
- Identification of priority areas for focus within existing operations and facilities;
- Development of strategies for efficiently minimizing GHG emissions as Regional infrastructure is expanded to accommodate growth; and
- Determination of operational and financial impacts related to each implementation strategy.

## 10. From Concept to Implementation - Pacesetter Projects for the next 5 years

Corporately, the Region is aligning with the net zero trajectory by 2045. Enhanced technologies and best practices have enabled staff to plan for energy conservation, reducing operating costs, and building better. Table 4 provides a potential pathway of identified short-term GHG emissions reduction opportunities either being considered, planned or underway that support achievement of the proposed 2025 target.

## Table 4 - Proposed/Potential Short-term Corporate GHG Reduction Priorities to 2025[22]

| Regional Operating Area | GHG Reduction Initiative(s) | Potential GHG reduction impact by 2025 |
|---|---|---|
| Solid Waste | Internal utilization of renewable natural gas generation from anaerobic digestion and other Regional processes. | 0-7,500 $tCO_2e$ |
| Solid Waste | Landfill biocover pilot. | 12,000 $tCO_2e$ |
| Facilities | Deep energy retrofits of existing buildings in corporate portfolio. | 1,000-2,000 $tCO_2e$ |
| 4 Fleet Groups including Paramedics, Police, Transit, and Works | Pursue battery electric and hybrid electric vehicles for all corporate-owned fleets, where operationally feasible. With an estimated baseline of approximately 28,500 tCO2e in 2019, this targe repesents a 7% to 14% GHG reduction by 2025. | 2,000-4,000 $tCO_2e$ |
| Total | | 15,000 - 25,500 $tCO_2e$ |
| GHG emissions reduction target | | 33,900 $tCO_2e$ |
| % of Target | | 44% to 75% |

Assuming successful implementation of these potential GHG reduction opportunities, the Region will have achieved between 40 to 75 percent of its 2025 target. The above initiatives as well as additional emissions reduction opportunities will be identified through subsequent asset level decarbonization studies and brought forward for Council approval as part of the Annual Business Planning and Budget Cycle.

22 All projects/initiatives/program changes beyond 2021 Business Planning approvals are subject to Council approval in subsequent Business Plans and Budgets

## 11. From Concept to Implementation – Climate Financing Strategy

Through its investment decisions, the Region may either grow in a climate compatible manner, or lock into a high-emission, inefficient or unsustainable path for decades to come. Capital investment for climate action will be critical for success and needs to be aligned and integrated with the Region's Long-Term Financial Plan. Building on Regional Council's 2019 decision to establish a Climate Mitigation and Environmental Initiatives Reserve Fund, climate financing strategies will be needed to outline how the actions of the Plan will be funded. The strategies will position the Plan's funding needs in the Region's ten-year capital forecast, while looking to mitigate impacts to the property tax base and utility rate through pursuit and advocacy for external funding from senior levels of government and other public and private sector sources.

As part of the implementation of this Plan, Regional staff will develop a climate financing strategy which will include the following activities:

- Convene internal stakeholders and industry experts to explore potential for innovative climate change financing across key corporate GHG emitting sectors;
- Work with local area municipalities, and GTA-wide partners (e.g. The Atmospheric Fund) to aggregate projects to scale financing and GHG impact;
- Mobilize more funding from senior levels of government, and the Canada Infrastructure Bank, leveraging this Plan as evidence of commitment along with committed capital funding as leverage for match funding requirements;
- Apply an equity and inclusion lens to climate-related investment, given that climate impacts are poised to disproportionately affect low-income and vulnerable residents in the Region;
- Explore innovative financing tools, to support achievement of corporate and community climate GHG goals; and
- Strengthen data collection and reporting on climate-supportive investment by the Region as part of the implementation of the carbon budget management framework.

## 12. From Concept to Implementation – Durham Strategic Energy Alliance, Corporate Energy Managers Community of Practice

A growing number of public and private sector organizations headquartered, or with significant operations, in the Region are embarking on a shared path towards net zero corporate emissions, including: Ontario Power Generation, General Motors, Ontario Tech University, and others.

These organizations share challenges given similarities in facilities and fleet composition, and organizational hurdles to overcome. As a collective effort within the Region, one of the greatest assets will be the opportunity to share experiences and lessons learned across organizations. A platform to aggregate projects and attract low carbon investment would also be a collective benefit.

As part of the revitalization of the Durham Strategic Energy Alliance (DSEA), the Region will lead the creation of a Corporate Energy Managers community of practice of corporate energy and facilities managers in Durham. The focus will be on large organizations with high energy use, as well as organizations with a shared corporate decarbonization commitment. To ensure a broad range of experience and perspectives, the community of practice will solicit representation from across all sectors.

The community of practice will use the shared experience of seasoned property and environmental managers to help energy managers develop the best possible energy efficiency and GHG emissions reductions tactics and strategies.

Membership in the community of practice will be focused on:

- Energy managers with direct responsibility for managing energy and utilities including electricity, natural gas, vehicle fuels, district energy, and water;
- Facility managers responsible for energy usage in their buildings;
- Environment/sustainability staff that are also responsible for corporate energy usage; and
- Finance staff responsible for utility account management including bill verification, payment, and energy commodity procurement.

The DSEA member organizations will work together to solve collective challenges, realizing the following benefits:

- Reduced energy consumption and utility costs;
- Reduced GHG emissions; and
- Improved investment attractiveness and leverage from public and private sector low and zero carbon financing.

## 13. Conclusion

The Durham Region Corporate Climate Action Plan responds to Council's declaration of a climate emergency and provides a transparent process for the public to track what their municipal government is doing to reduce GHG emissions from corporate operations. Building on past successes this Plan will contribute towards meeting the Region's corporate target to reduce emissions by 20 percent by 2025 and 40 percent by 2030, all over 2019 levels.

Much remains to be done to position Durham to meet its short, medium, and long-term GHG reduction targets. It will require collaboration across departments to develop innovative solutions, and unprecedented action and investment from the Region and senior levels of government to make it happen.

The carbon budget management framework detailed in this plan provides a process for continuous improvement as we strive to meet our corporate objectives. Let's work together to make it happen!