

2021

Zero Carbon Whitby

The Corporate Plan To Reduce
Greenhouse Gas Emissions



Acknowledgements

The Town of Whitby acknowledges that we are on the traditional treaty territory of the Mississaugas of Scugog Island First Nation of the Mississauga Nation.

The Town respectfully shares in the responsibility of the stewardship and environmental protection of these ancestral lands.

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Introduction

Climate change poses a grave threat to humanity's future. In a global consensus, countries committed to limit global warming to significantly below 2°C, preferably to 1.5°C,¹ objective that requires a rapid reduction in greenhouse gases (GHG) emissions.

The Town of Whitby ("Whitby") declared a Climate Emergency in June 2019, joining nearly 2,000 jurisdictions in 34 countries.²

With the Declaration, Council committed to prepare a Corporate Climate Change Plan with updated targets and actions to reduce emissions from its municipal operations ("corporate operations").

Zero Carbon Whitby constitutes Whitby's Corporate Climate Action Plan, which is a framework for action as opposed to a long list of actions. The framework empowers staff to develop and implement actions from the bottom-up to meet GHG reduction targets by aligning capital and operating budgets with GHG reduction targets.

Achieving deep GHG emissions reductions from corporate operations is as much about organizational transformation as it is about technical solutions. In seeking to decarbonize, municipalities confront a range of challenges such as different risk appetites and fluctuating political leadership, as well as operational, financial, contractual policy, and legal constraints. The Town will incorporate climate considerations into decision making processes and ensure awareness and training of staff across the organization to ensure they have the resources, tools, and responsibility for implementing low-carbon life-cycle solutions and resilient infrastructure technologies.

This document outlines a management system to embed climate considerations within decision making in Whitby. The management system has two objectives:

¹ The Paris Agreement is a legally binding international treaty on climate change, which seeks to limit the global temperature increase in this century to 2 degrees Celsius above preindustrial levels, while pursuing the means to limit the increase to 1.5 degrees. For more information, see: <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

² As of March 2021, 1,910 jurisdictions and local governments covering 826 million people had declared climate emergencies. For more information, see: <https://climateemergencydeclaration.org/climate-emergency-declarations-cover-15-million-citizens/>

1. Systematically integrate consideration of climate change into the decision-making processes of the Town; and,
2. Provide a viable carbon management framework that aligns with the existing Business Planning Cycle to enable the Town to substantively address the climate emergency for its corporate operations.

The management system describes the mechanisms for how actions can be identified, quantified, prioritized, and balanced against the Town's other priorities. A key consideration is that the Town's population is projected to grow, and this growth requires new infrastructure. With careful planning, the new infrastructure can be both zero emissions and even contribute to reducing the GHG emissions of the existing operations.

Reducing the Town's GHG emissions is also an opportunity. Low or zero emissions solutions tend to have lower operating costs, stimulate new business opportunities, improve working conditions and enhance the Town's brand.

1. Principles

Zero Carbon Whitby is guided by the following principles, aligned with the principles which govern the strategic planning process.

- **Incorporate a long-term perspective:** Mitigating climate change requires consideration of the long-term, specifically to avoid locking in activities or systems that generate GHG emissions and will therefore need to be retrofit or undone in the future.
- **Establish linkages to broad organizational goals:** The imperative to address climate change overlaps with many other organizational priorities. The process underlying Zero Carbon Whitby aims to align these objectives.
- **Focus decisions on results and outcomes:** The impacts of decisions on GHG emissions have historically been opaque. Whitby's process aims to ensure that the path to GHG emissions is clear and that results will be transparent to inform future decisions.
- **Involve and promote effective communications with stakeholders:** Reducing GHG emissions requires new ideas from different people, and a whole organization approach.
- **Promote program efficiency and effectiveness:** Resources are constrained, and the municipality has, by necessity, to be concerned with the most effective actions.

2. A Corporate Target

Emissions reduction targets need to reflect the urgency of action required. The current best practice is to establish annual GHG emissions targets, as opposed to a target assigned to a single year in the future. Annual targets reflect the reality that every tonne of GHG emissions counts in limiting the degree of warming that will ensue. This approach underscores the importance of defining viable pathways in which annual emissions are continually brought down over time, because the trajectory matters as much as the end result.

Scientists have calculated the remaining GHG emissions that can be emitted to prevent warming from exceeding 1.5 °C; this is called the global carbon budget.³ Calculating a municipality's fair share of the remaining global carbon budget is complex. To simplify the process, an organization called Science-Based Targets has proposed an absolute reduction in emissions of 4.2% per year for 1.5°C alignment.⁴ In this approach, the Town of Whitby achieves net zero emissions by 2045. This target aligns with the Region of Durham's GHG reduction target for its operations. Under this trajectory, the Town's carbon budget totals 62,563 tCO₂e between 2022 and 2045, as illustrated in Figure 1.⁵

³ Intergovernmental Panel on Climate Change. (2018). *Global warming of 1.5°C*. <http://www.ipcc.ch/report/sr15/>

⁴ Science Based Targets (n.d.). Absolute-based approach. Retrieved from: <https://sciencebasedtargets.org/methods-2/>

⁵ Note that because Whitby's target achieves net zero by 2045, after this year, the Town's operations will have no additional net emissions, and the carbon budget remains the same if the duration considered extends to 2050 or 2100.

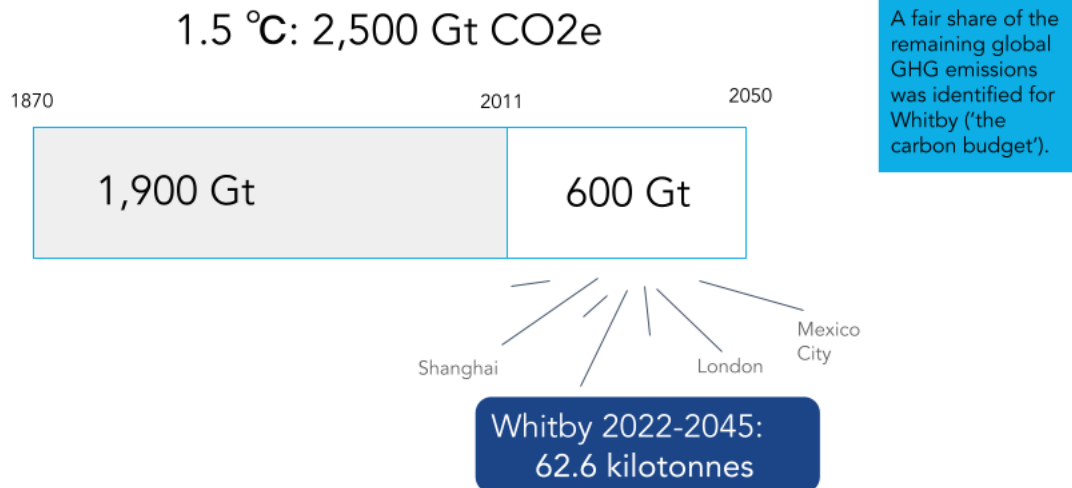


Figure 1. Town of Whitby’s share of the remaining global GHG emissions budget, 2022-2045

The trajectory is shown in Figure 2 and Table 1, capturing emissions for all of Whitby’s corporate operations. Data points for the annual emissions trajectory are included in Appendix 1. The Business as Usual (BAU) trajectory is a projection of emissions if the Town adds planned facilities to account for growth using current energy and emissions performance of buildings and fleet. The pink line (“Identified Measures”) reflects the trajectory of measures identified in energy audits completed by the Town.⁶ The blue line represents annual targets towards 2045, whereas the green line represents these annual targets in four-year bundles to align with the Town’s business planning timeline.

⁶ Detailed actions for each building are described in the following report: Efficiency Engineering (2021) Energy Audit Summary Report: Town of Whitby.

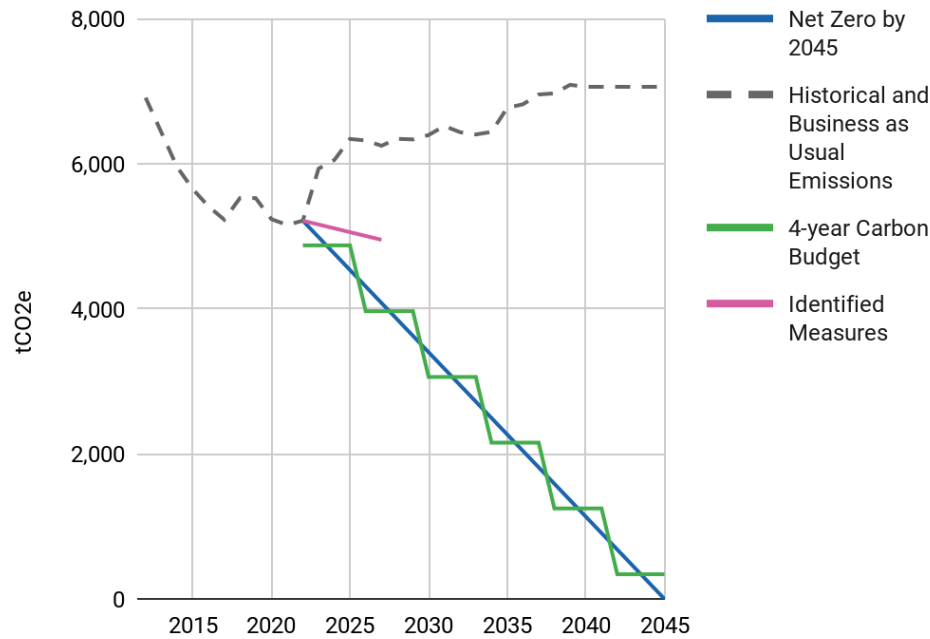


Figure 2. Emission target trajectory for corporate emissions, 2020-2045

The Plan recommends that Whitby adopt a target that aims to reduce corporate carbon emissions to net zero by the year 2045, while also setting four-year reduction targets consistent with this trajectory. Examining emissions in four-year increments also helps align emissions reduction measures with capital and operations planning and to incorporate new technologies and solutions. This method is consistent with the absolute reduction targets method, an approach widely adopted in the private sector, and with targets set by other levels of government.⁷

Table 1 describes key metrics for GHG emissions trajectory, including GHG emissions in 2019 (for a breakdown, see Appendix 1), cumulative emissions (the “carbon budget”), a 2030 target and a net zero target by 2045. The annual reduction of 4.3% is an indicator of the consistent effort to reduce emissions; in reality some years will achieve greater reductions, and other years less reductions.

⁷ Government of Canada’s GHG target for Canada is net zero emissions by 2050: See: <https://www.canada.ca/en/environment-climate-change/news/2019/12/government-of-canada-releases-emissions-projections-showing-progress-towards-climate-target.html>

Table 1: Key numbers for a net-zero-by-2045 target for corporate emissions.

Emissions in 2019	5,525 tCO ₂ e
Cumulative emissions from 2022 to 2045 ("carbon budget")	62,563 tCO ₂ e
Emissions in 2030	3,400 tCO ₂ e
% emissions reductions by 2030 (relative to 2019)	38%
Year net zero is achieved	2045
Annual percent reduction in emissions (relative to 2019)	4.3%

2. The Planning Framework

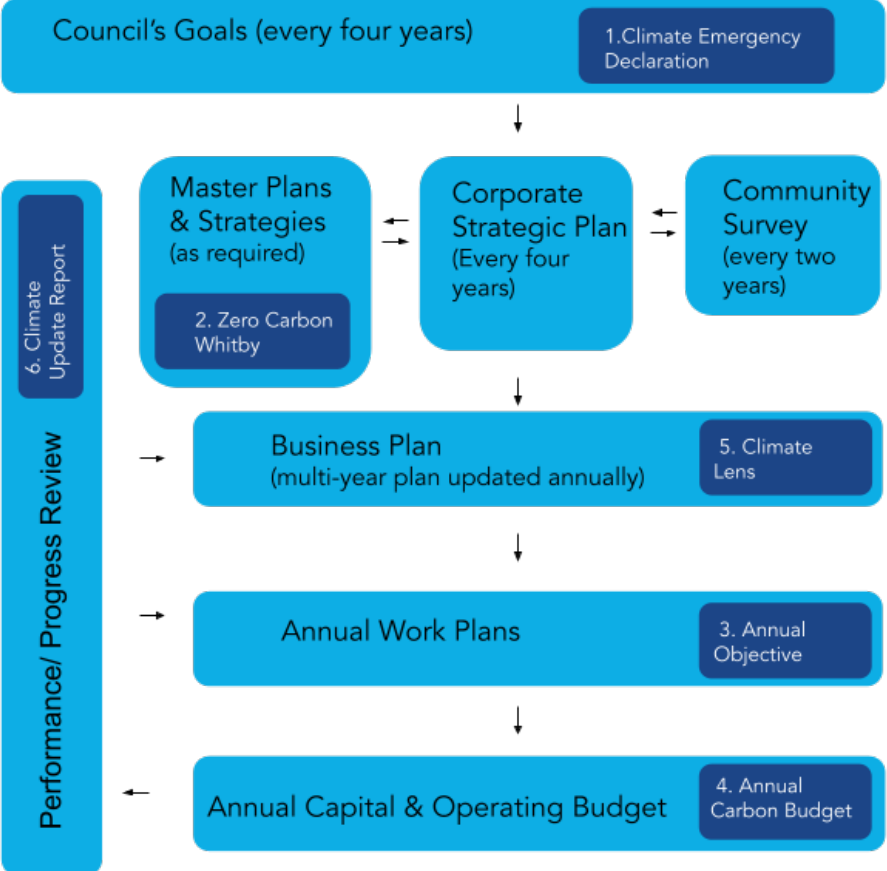


Figure 3. Town of Whitby Planning Framework incorporating climate considerations

2.1 Climate Emergency Declaration

The Town of Whitby declared a Climate Emergency in June 2019. The declaration acknowledged the significant threat climate change poses to both the current and future social, economic, and environmental well-being of the community. This declaration sets the context for the implementation of Zero Carbon Whitby.

2.2 Zero Carbon Whitby – The Framework

Zero Carbon Whitby constitutes Whitby's Corporate Climate Action Plan, which is a framework for action as opposed to a long list of actions. The framework empowers staff to develop and implement actions from the bottom-up to meet GHG reduction targets by aligning capital and operating budgets with the targets.

2.3 Annual Objective

An annual letter from the Chief Administrative Officer will establish an objective for programs/departments to achieve the Town's emissions targets. The annual objective letter will establish corporate four-year emission reduction targets according to the overarching net-zero by 2045 trajectory aligning with the Corporate Strategic Planning time horizon. The letter will include:

- An emissions target for the following reporting period, noting applicable sectors or departments;
- An overview of the current emissions reduction status, including a review of actions taken and emissions reductions in the previous period;
- A review of proposed future actions and possible emissions trajectory if actions proceed; and,
- Strategic guidance on priorities for actions (for example, noting key gaps in action or strategic guidance on accounting).

2.4 Annual Carbon Budget

The foundation of the management system is the Carbon Budget. The Carbon Budget is a management framework analogous to setting financial budgets: it tracks the Whitby's annual progress on emissions relative to its targets and identifies carbon surpluses or deficits. The benefits of this approach are as follows:

- The idea of a budget is simple, and it is a familiar approach to planning in local governments.
- A Carbon Budget provides an overarching framework for greenhouse gas emissions management, extending over multiple years and over all aspects of municipal operations.

- The multiple year scope of the Carbon Budget aligns with the science of climate change -- it is the cumulative emissions to the atmosphere that will determine the extent of global warming.
- The Carbon Budget aligns with decision-making frameworks used by local governments for capital and operating budgets, frameworks in which investments, costs and benefits are assessed over multiple years and often involve trade-offs between early action and deferred spending.
- Like a financial budget, the Carbon Budget provides an accountability framework for achieving the organization's objectives; responsibility can be allocated to different departments while at the same time allowing line managers to manage their share of the budget and to identify priorities for early action that fit best with their mission and objectives.
- When combined with effective monitoring of emissions, the Carbon Budget also provides a framework for reporting progress on a consistent basis from year-to-year, while ensuring transparency and the feedback needed to make periodic adjustments to the budget.

2.5 Climate Lens

Once further details are conceptualized, projects will undergo detailed carbon accounting. GHG impacts are quantified for proposed projects in order to identify how the GHG emissions reductions align with the Carbon Budget for the period, and whether there is a deficit or surplus.

Project-level carbon accounting will be performed by staff within the Sustainability Division. Once the project-level carbon accounting is complete, Town staff can use existing project request forms and worksheets to summarize the emissions impact of potential projects. The Town can expand upon existing project request forms 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. This can be done in a centralized carbon accounting tool, where GHG impacts of all proposed projects can be summed to evaluate whether or not projects align with the Carbon

Budget. The Town will appoint a Carbon Budget Analyst, a role within Finance that is responsible for aggregating emissions across projects. The Sustainability Team will support staff with project-level carbon accounting, where required, to ensure consistency in calculation approaches across the organization.

2.6 Climate Update Report

An annual climate update report includes the GHG inventory, reporting requirements for the Global Covenant of Mayors and is aligned with the Task Force on Climate Related Financial Disclosures.

3. The Carbon Budget Process

3.1 How does the Carbon Budget work?

To apply the Carbon Budget, the Town will establish four-year targets for emissions reductions that are consistent with the net-zero-by-2045 trajectory and develop strategies for staying within those targets (or “budgets”). The Town 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.

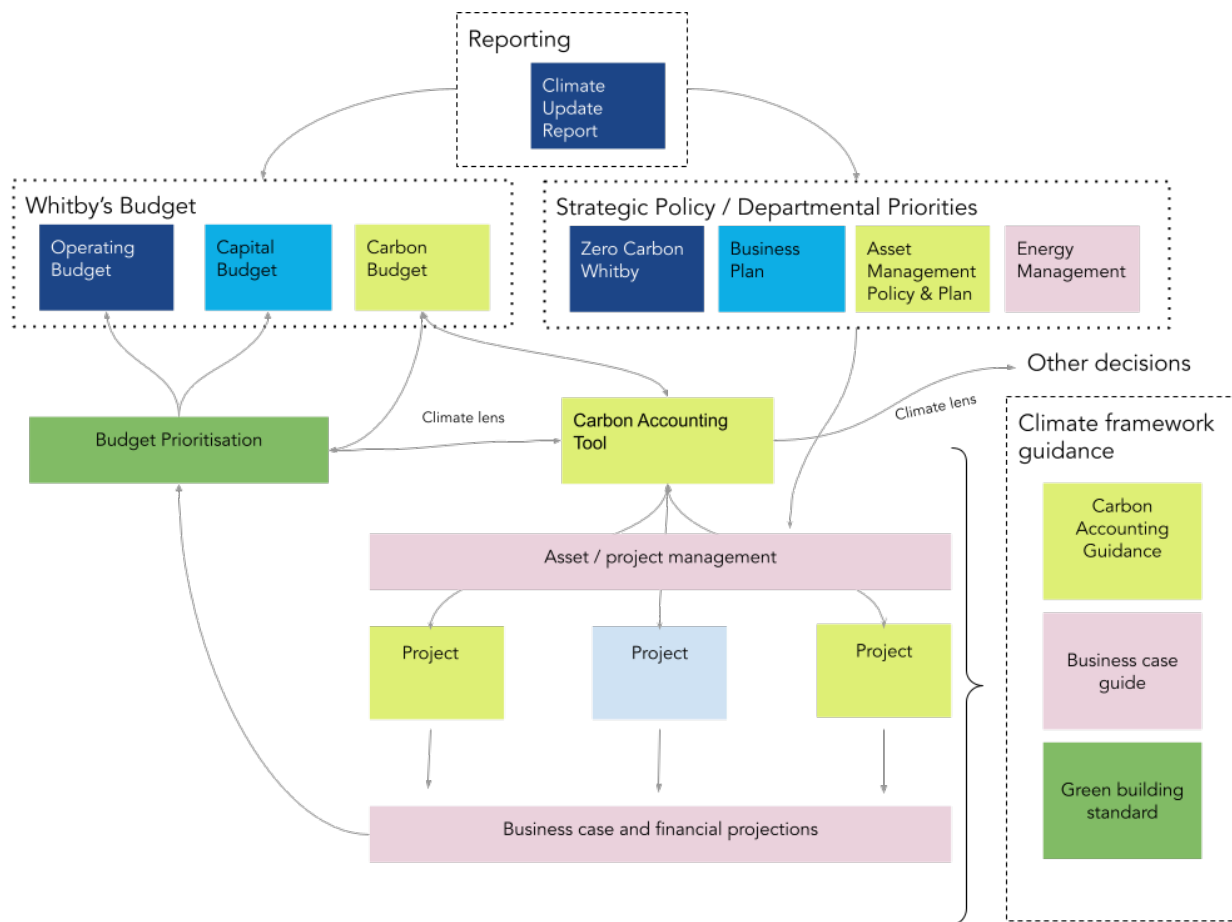


Figure 4. Town of Whitby Planning Framework incorporating climate considerations

The results of Whitby's efforts in each period will be tracked and reported through the 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 investments combined with the Town's GHG inventory.

3.2 Integration into the Town's Budgeting Cycle

The Carbon Budget will be incorporated into the Town's existing Budgeting Cycle.

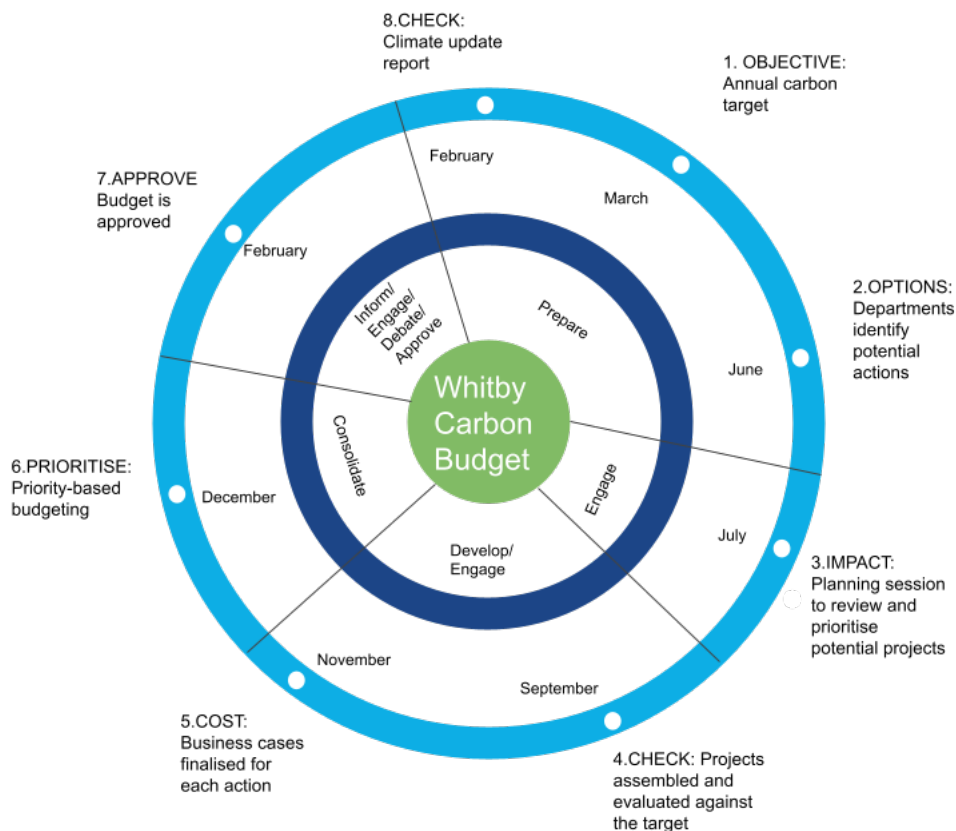


Figure 5. Town of Whitby Budget Cycle Incorporating the Carbon Budget

The Carbon Budget will be managed on an annual basis, as follows:

Phase 1: Prepare

1. Annual Objective: The target for the year will be identified in an annual objective issued in March.

2. Options: Departments/programs identify potential actions: Departments will identify actions to reduce GHGs in a manner that aligns with the corporate target and establish appropriate performance measures. Departments will prioritize multi-year emissions reduction opportunities, in conjunction with other departmental priorities, aligning with the Town's Business Plan. Examples of opportunity areas include:

- Decarbonization of existing buildings: the Town has identified a five year program of retrofit opportunities.⁸
- Net zero new construction: Net zero construction is increasingly a focus for new buildings, and the Town can require alignment with Tier 3 of the Whitby Green Standard.
- Renewable energy generation
- Fleet electrification
- Waste reduction

In addition to activities which directly reduce GHG emissions, the Town will also need to invest in enabling actions such as building capacity and expertise of staff, suppliers, Council and the community, novel financing strategies, and policy updates.

Phase 2- Engage

3. Impact: The Town will convene a planning session as a venue to review actions identified within individual departments/programs and preliminary estimates on the Carbon Budget and assess if any reprioritizations are necessary. The Strategic Conference will also serve as a means to collaborate across the organization and identify cross-departmental initiatives.

⁸ Detailed actions for each building are described in the following report: Efficiency Engineering (2021) Energy Audit Summary Report: Town of Whitby.

Phase 3- Develop/Engage

4. Check: The overall GHG impact of the proposed projects will be evaluated against the annual carbon budget in order to ascertain alignment. New projects will be identified as required if additional reductions are required.

5. Cost: Program and project-level studies will be completed to further refine and outline program, project, or initiative details including technical, environmental, financial, and operational implications, and risks and expenditure requirements, including business case analysis. This step will include emissions reduction studies or detailed project-level carbon accounting support to complement existing studies supporting Business Plans and Budgets.

Phase 4- Consolidate

6. Prioritize: GHG mitigation projects will be prioritized against other Town priorities using a method such as priority-based budgeting which supports the identification of synergies and trade-offs. At this stage, detailed annual Business Plans and Budgets are developed to align with Zero Carbon Whitby and the Town's Business Plan and Council's Goals.

Phase 5- Inform, Engage, Debate and Approve

7. Approve: The Budget (Carbon and Financial) is approved by Council and implementation begins.

8. Check: The impact of the projects is evaluated using the GHG inventory and other key performance indicators. The results are published in the Annual Climate Report.

4. Governance

The Zero Carbon Whitby Plan and supporting management tools and processes will be supported by clearly defined roles and responsibilities. Proposed responsibilities are described in Table 2 and visualized in Figure 6.

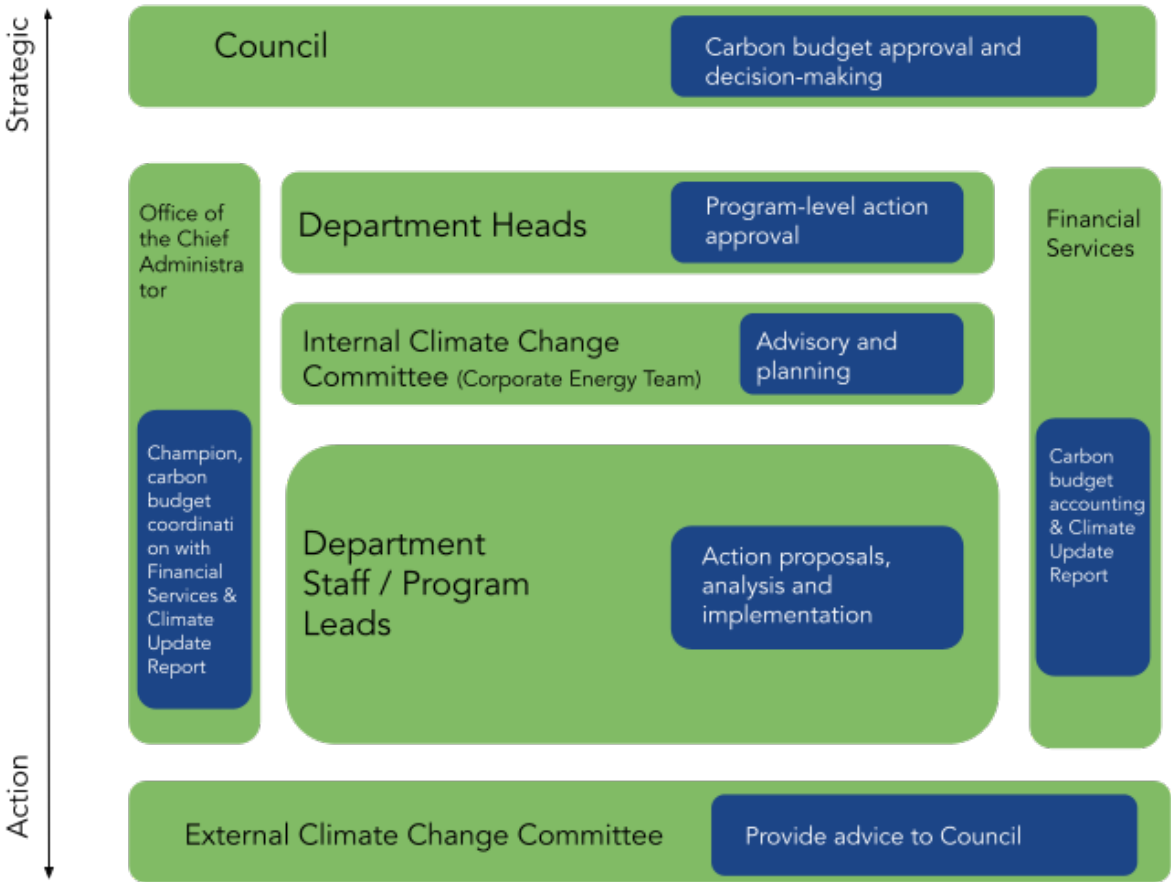


Figure 6. Key climate framework roles

Table 2. Key responsibilities

Group	Description	Responsibilities	Role
Town Council	Decision makers	The Town Council will: <ul style="list-style-type: none"> Review and approve the annual Carbon Budget. 	
Office of the Chief Administrator	Champion	The champion is the central hub of climate action, providing leadership, convening, coordinating, reporting, and analyzing. The Office will:	Sustainability Team

		<ul style="list-style-type: none"> ▪ Coordinate the Internal and External Climate Change Committees; ▪ Facilitate implementation of the Carbon Budget; ▪ Lead carbon accounting for projects; ▪ Act as an administrative resource for programs/departments; ▪ Provide transparency on progress to the organization and the community; ▪ Jointly prepare the Climate Update Report with the Financial Services Department; and ▪ Undertake or support project-level GHG accounting. 	
Financial Services	Carbon accounting	<p>The Financial Services Department will:</p> <ul style="list-style-type: none"> ▪ Ensure processes under the Carbon Budget processes are aligned with the Business Planning and Budget process, the Town’s financial framework, policies, procedures, and requirements; ▪ Evaluate the financial implications at the corporate level; and ▪ Jointly prepare the Climate Update Report with the Office of the Chief Administrator. 	
Department Head/Program Lead	Project/initiative identification, recommendation, studies and implementation	<p>Each department head or program lead will:</p> <ul style="list-style-type: none"> ▪ Integrate consideration of climate into Business Plans and Budget. 	
Internal Climate Change Committee	Cross-organizational coordination	<p>As climate change is a cross-program issue, a venue to support senior organizational decision-making is required. The Internal Climate Change Committee will:</p> <ul style="list-style-type: none"> ▪ Review proposed GHG reduction actions and implications within current year Business Plans and Budgets and forecasts; ▪ Propose additional actions if necessary, based on Strategic Conference, available funding, and longer-term asset/financial strategies, as well as current year and proposed forecasts; and ▪ Coordinate/facilitate assessment of cross-program or multi-program initiatives. 	Sustainability Lead
Town Staff	Distributed responsibility	<p>Responsibility for GHG reductions options development, analysis, and incorporation in program Business Plans and Budget. Responsibilities for implementing approved program changes will be embedded within job descriptions, including:</p> <ul style="list-style-type: none"> ▪ Evaluate the GHG impacts of program initiatives and projects; ▪ Develop performance measures for GHG reduction actions; ▪ Conduct strategic assessments and business case analysis, including implementation of an approved 	Support from the Carbon Budget Analyst & Sustainability Lead/Team

		<ul style="list-style-type: none"> climate lens and life-cycle analysis of GHG implications; Measurement and verification of implemented actions and actual GHG reductions; and Select staff to provide technical expertise during supporting studies, and energy-related data to inform analysis. 	
External Climate Change Committee	Volunteers appointed by Council	<ul style="list-style-type: none"> Provide advice to the Mayor and Council with respect to the Town's response to the climate emergency 	Sustainability Lead

Implementing the Carbon Budget will require continuation of existing roles, as well as new or revised roles and responsibilities, as outlined in Table 2.

Revised responsibilities and new roles inevitably mean a need for increased capacity building for relevant staff across the organization. For those with expanded job responsibilities, capacity building is likely to include:

- Dedicated training for specific responsibilities;
- Clear guidance and tools for applying the Framework to existing processes;
- Established liaisons at the Financial Services Department and in the Office of the Chief Administrator for resourcing, problem-solving, and resolution of any cross-program issues; and
- Access to online resources and corporate-wide tools.

6. Finance

6.1 Financial Impacts

The financial impacts of achieving the GHG target have been evaluated at a high level, but further analysis is required in particular to assess the avoided costs resulting from lower electricity and natural gas expenditures.

Table 3. Financial impacts

Sector	Financial impacts
New construction	New construction costs to achieve net zero can range from 4% to 15% depending on the building type and design. ⁹
Retrofits	Retrofitting all the buildings in the municipality to net zero at a high level is estimated to cost between \$40 and \$60 million. The reduced operating costs have not yet been evaluated. ¹⁰
Fleet	The cost will be minimal as light duty electric vehicles are projected to be at cost parity by 2030 and the price of heavy-duty vehicles is also declining. Increased capital costs are also offset by lower operating costs. There may be some additional infrastructure costs for charging infrastructure depending on how this is procured.

6.2 Climate-Informed Financial Analysis Guidelines

Incorporating climate change considerations into investment decisions ensures that the societal costs of emissions are reflected, weighting investments in favour of projects which reduce emissions compared to a business-as-usual approach. This approach requires that

⁹ CAGBC (2019). Making the Case for Building to Zero Carbon. Retrieved from: https://www.cagbc.org/cagbcdocs/advocacy/Making_the_Case_for_Building_to_Zero_Carbon_2019_EN.pdf

¹⁰ This analysis is based on the application of costs identified by SSG to buildings owned or operated by Whitby. A high-level assessment, this number should not be used for budgetary or policy decisions.

the Town will consistently apply life cycle costing for business cases in order to capture the avoided energy and emissions costs of low or zero carbon investments.

The Town will adopt an internal price on carbon that is consistent with the Government of Canada's carbon pricing schedule that reaches \$170/tCO₂e by 2030. The internal price on carbon will be used in project-level life cycle cost analysis or investment decisions to avoid locking in investments that will impose a carbon and financial burden on the Town in the future.

The Town will provide organization-wide guidance for incorporating climate change considerations into financial analysis for individual projects, including templates, reporting, and analysis of best practices. The specific details of how financial analysis will be performed for municipal assets in relation to climate change will be guided by the Financial Services Department.

6.3 Financing Strategies

Key barriers to deep retrofits and low-carbon pathways include availability of capital and expertise, and the structure of financing arrangements. Many projects commit to GHG targets initially, but as the project progresses, value engineering and other decisions undermine the GHG performance of the project. Three strategies are identified for addressing this challenge:

- **Making the green premium the standard option:** One way to remove the green premium is to make the zero emissions approach the default. For example, the Town of Whitby will apply the Town's Green Standard as a requirement for new construction.
- **Addressing the incremental cost:** A revolving loan fund is a mechanism to reduce overall capital requirements through the recycling of capital while providing a stable source of capital and expertise. As a result, transaction costs to internally finance low-carbon projects decrease. Figure 7 illustrates how a revolving loan fund works, in which projects are financed and avoided costs are used to repay a fund. The fund itself can be capitalized from a blend of sources including loans, grants and operating budget contributions.

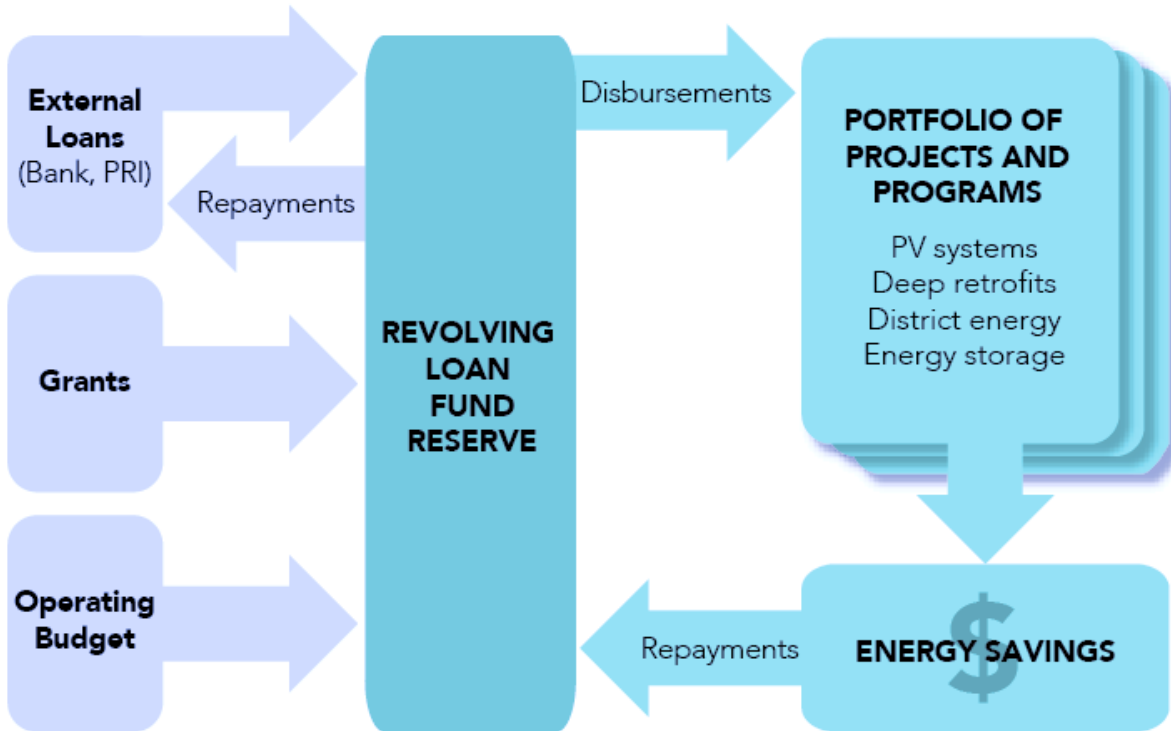


Figure 7. Conceptual model of the revolving loan fund

There are new sources of funding for low carbon facilities from the Federation of Canadian Municipalities and the Government of Canada. The Canada Infrastructure Bank is also a new source of capital that can be explored for financing retrofits or other low carbon actions.

7. Risk Management

The risk of climate change assumes two forms for the Town. The first risk, which is addressed by Zero Carbon Whitby, is described as **transition risk**. As the world transitions to low or zero carbon policies and technologies, investments that the Town has made previously can become more expensive if they result in GHG emissions. Transition risk can also impact the Town's revenues as businesses and households could also be adversely impacted by the energy transition. **Physical risk**, the impact of climate change on the ability of the Town to provide services to the community, is the second category of risk. While physical risk is the subject of a separate analysis, the management system approach described in Zero Carbon Whitby can also incorporate evaluation of climate adaptation strategies.

7.1 Asset Management

Municipalities in Ontario are required by law to manage their assets according to a Strategic Asset Management Policy and Asset Management Plan that ensures adequate levels of service.¹¹ While the Town's Asset Management Plan does not address climate change,¹² the Strategic Asset Management Policy identifies climate change as a factor to be considered in prioritization of asset management decisions.¹³ The direct alignment of carbon budget planning with asset management is a core strategy in reducing the financial burden of decarbonizing the Town's operations.

- **Replacement of like for low carbon like:** In an ideal world, assets are replaced at the end of life, like for like. A light car is replaced with a light car. In a low carbon strategy, when this decision is made, a light car is replaced with an "electric" light car, which, depending on the low carbon option may impose an incremental capital cost. If on the other hand, the electric light car is purchased prior to the

¹¹ Government of Ontario. (2018). O. Re. 588/17: Asset Management Planning for Municipal Infrastructure.

¹² Town of Whitby (2017). Municipal Asset Management Plan. Retrieved from: <https://www.whitby.ca/en/town-hall/resources/Plans-Reports-and-Studies/Municipal-Asset-Management-Plan.pdf>

¹³ Town of Whitby (2019). Strategic Asset Management Policy. Retrieved from: <https://www.whitby.ca/en/town-hall/resources/Plans-Reports-and-Studies/CA-250-Strategic-Asset-Management-Policy.pdf>

end of life of the light car, this means some or all of the remaining capital value of the light car is forfeit.

- **Consideration of lifecycle costs:** In most cases low or zero carbon options have a “green premium”, which is decreasing as these options become the default. However, this green premium is offset by reduced operating costs, as the low or zero carbon options are more efficient. If lifecycle accounting is not used, this benefit is not captured in asset management planning.
- **Avoiding lock-in:** The policy context around climate change is evolving rapidly as the world comes to terms with the severity of the climate crisis. If the asset management decision-making does not contemplate a policy context with strict financial penalties for GHG emissions, the municipality may make investments that need to be undone in the near or medium term or impose a financial burden. For example, the current federal policy on carbon pricing drives up the cost of natural gas relative to electricity by 2030. An investment in a natural gas boiler may make financial sense today but is likely to become a white elephant in 2030 if the \$170/tonne carbon price is implemented.

7.2 Task Force on Climate-Related Financial Disclosure

The Task Force on Climate-Related Financial Disclosures (TCFD) is a framework for assessing and reporting on climate risk. TCFD was convened by the Financial Stability Board (FSB), an international body composed of national banks that makes recommendations on the global financial system. The TCFD framework constitutes a comprehensive framework for reporting on all the dimensions of the Town’s response to climate change. The TCFD effectively bridges climate-related risks and opportunities and their linkage to strategy, risk management and governance, and is quickly becoming the default reporting framework for public companies. TCFD is currently being piloted as a structure for annual reports by a number of Canadian cities.¹⁴

¹⁴ CPA (2019). Enhancing Climate-related Disclosure by Cities: A Guide to Adopting the Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD).

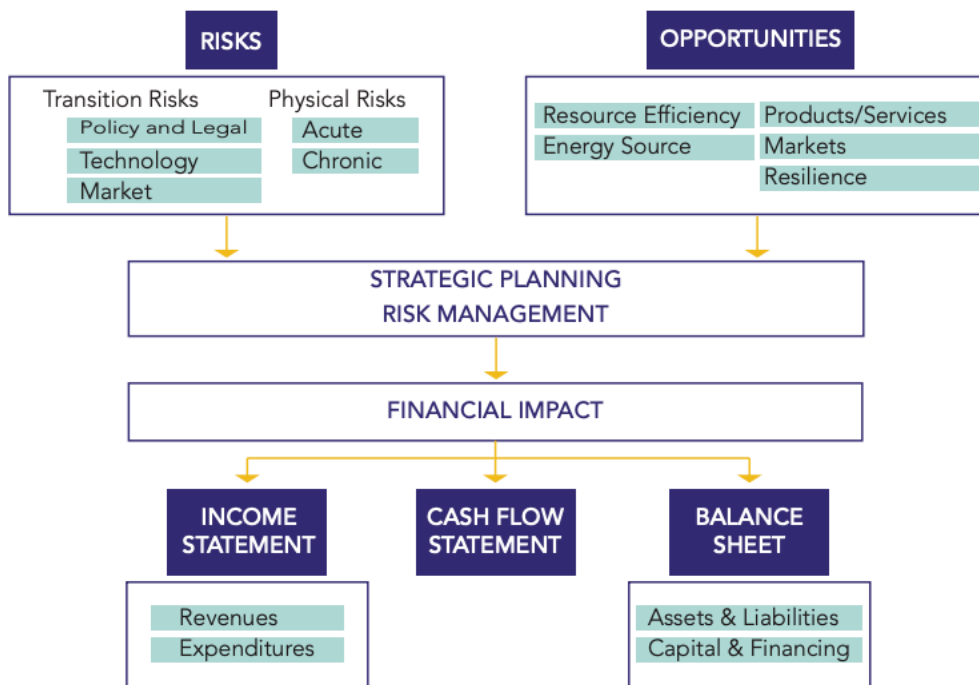


Figure 8. The reporting framework for TCFD

8. Conclusion

Zero Carbon Whitby is a mechanism to:

- Further incorporate consideration of climate change into the Town's Business Planning and Budget processes;
- Highlight trade-offs, synergies and opportunities related to financial and GHG reduction decisions;
- Track the impacts of initiatives, actions and policies in the context of annual and cumulative GHG targets;
- Align with the existing financial accountability frameworks;
- Enhance transparent reporting of climate change initiatives; and
- Improve climate literacy throughout the organization.

Climate change requires a whole-of-organization approach, which in turn implies further organizational transformation. The process is an enhanced process through which the Town can achieve greater GHG emissions reductions while continuing to mainstream climate change through existing processes.

Appendix 1: Annual GHG Emissions Projections

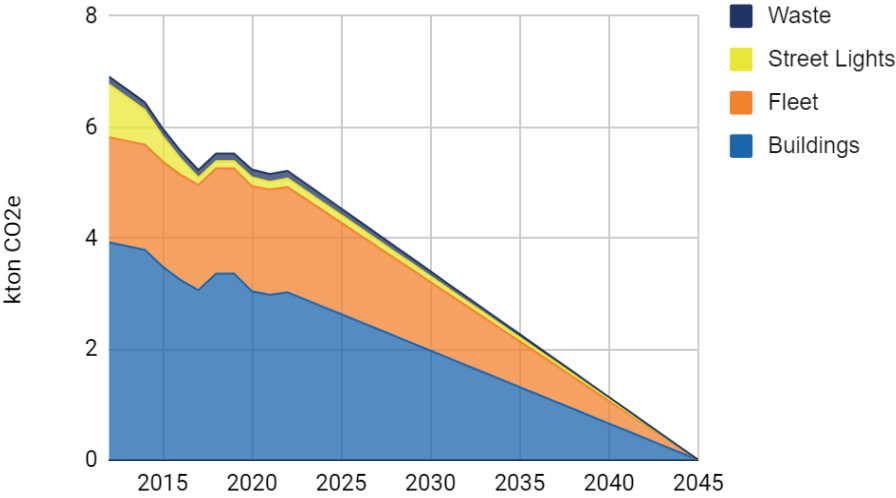


Figure 9. Emissions targets under a net-zero by 2045 pathway, in ktCO2e, by category.

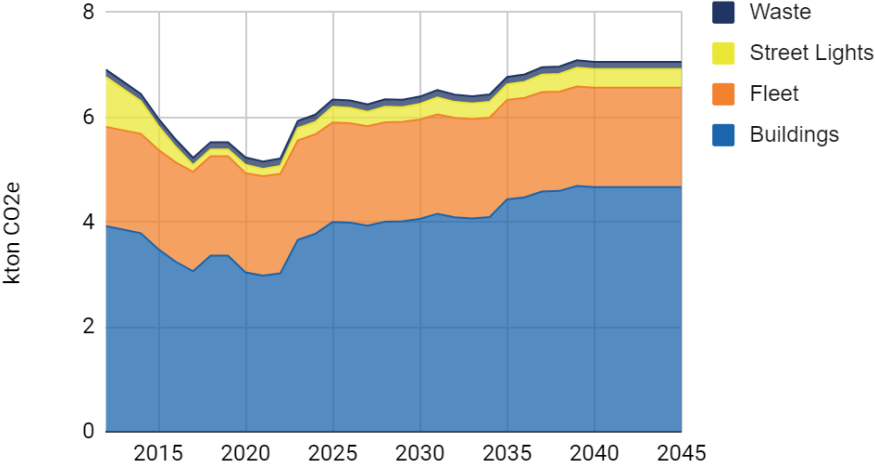


Figure 10. Emissions pathway under a business-as-planned scenario by 2045, in ktCO2e, by category.

Table 4. Emissions targets under a net-zero by 2045 pathway, in tCO₂e

	Buildings	Fleet	Streetlights	Waste	Total
2017	3,061	1,897	129	141	5,228
2018	3,358	1,897	129	141	5,525
2019	3,358	1,897	129	141	5,525
2020	3,038	1,897	158	141	5,235
2021	2,978	1,897	139	141	5,156
2022	3,022	1,897	153	141	5,214
2023	2,891	1,815	146	135	4,987
2024	2,760	1,732	140	129	4,760
2025	2,628	1,650	133	123	4,534
2026	2,497	1,567	126	116	4,307
2027	2,365	1,485	120	110	4,080
2028	2,234	1,402	113	104	3,853
2029	2,103	1,320	106	98	3,627
2030	1,971	1,237	100	92	3,400
2031	1,840	1,155	93	86	3,173
2032	1,708	1,072	87	80	2,947
2033	1,577	990	80	74	2,720
2034	1,445	907	73	67	2,493
2035	1,314	825	67	61	2,267
2036	1,183	742	60	55	2,040
2037	1,051	660	53	49	1,813
2038	920	577	47	43	1,587
2039	788	495	40	37	1,360
2040	657	412	33	31	1,133
2041	526	330	27	25	907
2042	394	247	20	18	680
2043	263	165	13	12	453
2044	131	82	7	6	227
2045	0	0	0	0	0

Table 5. Emissions pathway under a business-as-usual scenario by 2045, in tCO₂e, by category

BAU	Buildings	Fleet	Streetlights	Waste	Total
2012	3,921	1,897	950	141	6,909
2013	3,854	1,897	786	141	6,678
2014	3,788	1,897	622	141	6,448
2015	3,482	1,897	457	141	5,977
2016	3,244	1,897	293	141	5,575
2017	3,061	1,897	129	141	5,228
2018	3,358	1,897	129	141	5,525
2019	3,358	1,897	129	141	5,525
2020	3,038	1,897	158	141	5,234
2021	2,978	1,897	139	141	5,155
2022	3,022	1,897	153	141	5,213
2023	3,660	1,897	233	141	5,931
2024	3,776	1,897	235	141	6,049
2025	4,002	1,897	300	141	6,340
2026	3,988	1,897	293	141	6,319
2027	3,931	1,897	277	141	6,246
2028	4,006	1,897	298	141	6,342
2029	4,014	1,897	282	141	6,334
2030	4,061	1,897	295	141	6,394
2031	4,159	1,897	322	141	6,519
2032	4,092	1,897	304	141	6,434
2033	4,067	1,897	297	141	6,402
2034	4,095	1,897	304	141	6,437
2035	4,434	1,897	297	141	6,769
2036	4,474	1,897	307	141	6,819
2037	4,582	1,897	333	141	6,953
2038	4,594	1,897	336	141	6,968
2039	4,689	1,897	359	141	7,086
2040	4,667	1,897	354	141	7,059
2041	4,667	1,897	354	141	7,059
2042	4,667	1,897	354	141	7,059
2043	4,667	1,897	354	141	7,059
2044	4,667	1,897	354	141	7,059
2045	4,667	1,897	354	141	7,059

Appendix 2: Annual Objective Letter

The following are aspects of the annual objective letter:

Context

The Town of Whitby has committed to taking meaningful action on climate change. The Town continues to advance initiatives designed to reduce corporate emissions. In 2019, the Town declared a Climate Emergency.

Reaffirm the Town of Whitby's Long-term Corporate Emissions Target

The Town has committed to reduce its corporate emissions to net zero by the year 2045. This target is aligned with global climate science to mitigate the negative impacts of climate change.

The Town is managing this trajectory using four-year Carbon Budgets. Carbon budgets are similar to financial budgets: surpluses and deficits are tracked against the target. In the first phase (2022-2025), the Carbon Budget will be used for reporting and management. In subsequent phases, performance on the Carbon Budget will influence the emissions ceiling for future phases.

4-Year Carbon Budget Ceiling

The Carbon Budget for the 4-year period of 2022-2025 is 19,494 tCO₂e (4,874 tCO₂e x 4 years) for all corporate energy-related emissions from the Town of Whitby. Departments and Programs will collaborate to achieve this target. The four-year Carbon Budget is shown annualized in Figure A2.1. In the 2022-2025 period, average annual emissions subject to the Carbon Budget should be 4,874 tCO₂e.

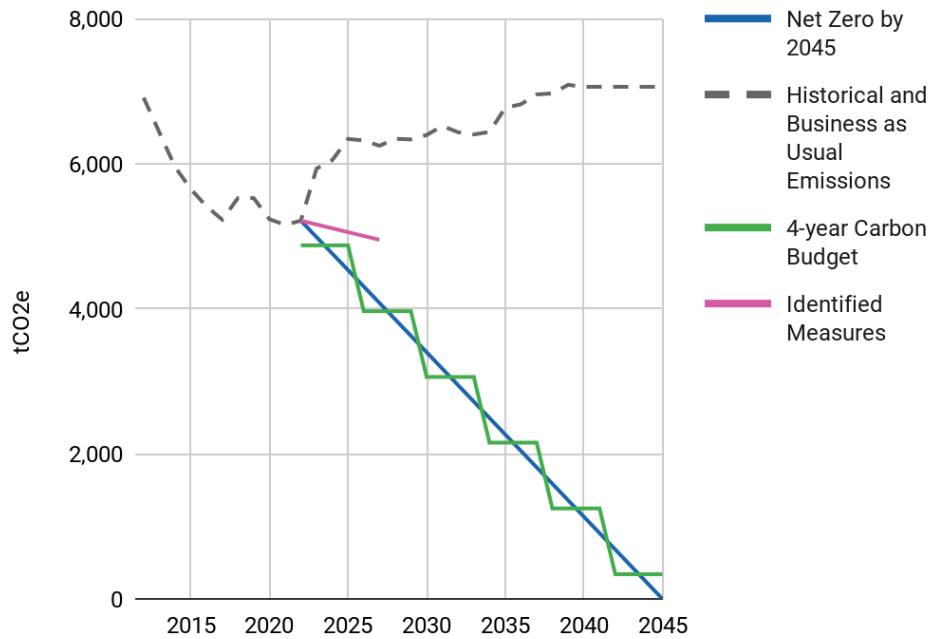


Figure 11. Sample Carbon Budget progress for inclusion in Annual Objective Letter.

Overview of Current Status

In the year (2020), the Town’s corporate emissions were _____ tCO₂e. This is _____ tCO₂e above the net-zero by 2045 trajectory.

In the previous reporting period (>2021), the Town of Whitby has taken on the following initiatives:

- (List initiatives with associated reductions if possible. In the first year, this will refer to recent actions prior to implementation of the Carbon Budget.)

In the current reporting period, the Town of Whitby has taken on the following initiatives:

- (List initiatives that have been approved in this reporting period. In the first year, this will be blank.)

The following initiatives are planned for the current reporting period (2022-2025):

- (List initiatives that are planned to occur within the current reporting period, the year, and potential emissions reductions.)

Strategic Priorities

- Sector or departmental review of gaps
- Strategic guidance on priorities for actions

SSG