CARBON BUDGET

FALL 2024 UPDATE

CITY OF EDMONTON

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CARBON BUDGET IN BRIEF

Setting the Context

The City of Edmonton's community greenhouse gas (GHG) emission reduction targets are 35 per cent by 2025, 50 per cent by 2030 (both from 2005 baseline levels) and becoming a carbon neutral community by 2050[1].

The Community Energy Transition Strategy needs to stand on a foundation where the City of Edmonton demonstrates climate solution leadership in its own decision-making, actions and advocacy. The City of Edmonton is demonstrating climate solution leadership in several ways:

- Establishing the corporate target of becoming an emissions neutral corporation by 2040, a decade ahead of the community's target.
- The City's green electricity contract came into effect in 2024. The solar facility is currently providing approximately 20 per cent of the City's renewable energy and the wind facility which is scheduled to come online in 2025 will provide the other 80 per cent of the renewable energy, effectively transitioning all corporate electricity to green electricity.
- Adoption of City Policy C627 Climate Resilience Policy requires all new City-owned construction to be built to an emissions neutral standard, limiting emission increases while growing as an organization.
- Being one of the first municipalities to implement a carbon budget alongside financial budgets, to guide the organization and Council in understanding how the City's financial investment decisions impact the achievement of emission reduction targets.

On November 14, 2022, Council was presented with the City of Edmonton's first carbon budget in conjunction with the capital, operating and utility budgets to support Edmonton's transition to a low-carbon future.

[1] As presented in the Community Energy Transition Strategy

What is a Carbon Budget?

Carbon budgets measure the amount of carbon dioxide equivalents (CO_2e) produced by a group - such as a company, household or community - to calculate how much emissions need to be reduced to achieve net-zero. Reaching net-zero means balancing the carbon released into the atmosphere with the amount removed from it.

Reaching net-zero emissions is necessary to limit rising temperatures to 1.5°C-2°C above pre-industrial levels. Scientific studies have shown increasing temperatures past the 1.5°C-2°C threshold means communities will continue to be significantly impacted by natural disasters like frequent severe weather events and declining biodiversity. The Canadian Prairies, including Edmonton, are one of the fastest warming regions in the world.

Extreme weather events due to the climate crisis are the second biggest risk affecting the world in the next two years, according to the World Economic Forum's Global Risks Report 2024, rising to the biggest risk over the coming 10 years. Human-caused climate change is already affecting many weather and climate extremes in every region across the globe.

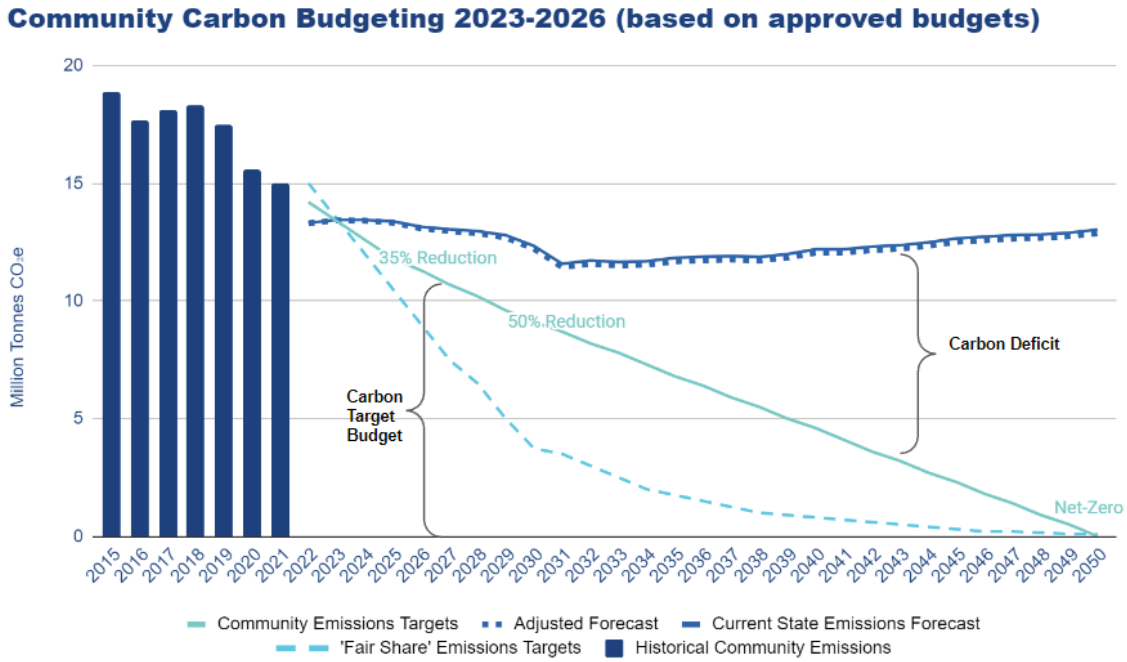
The 2023 Intergovernmental Panel on Climate Change (IPCC) report cautioned that GHG emissions will cause global warming to accelerate in the near future, likely reaching 1.5°C between 2030 and 2035. With current warming at approximately 1.1°C, existing climate policies are projected to lead to a 3.2°C increase by 2100. The report asserts with "very high confidence" that the dangers and negative effects of climate change will worsen as global warming intensifies. To stay under the 1.5°C threshold, emissions must be reduced by a minimum of 43 per cent by 2030 and at least 60 per cent by 2035, compared to 2019 levels. The current decade is crucial for achieving these reductions.

Many countries including Canada, China, the US and the EU – which are responsible for the greatest volume of carbon emissions – have pledged to reach net zero emissions between 2050 and 2060. This covers 76 per cent of emissions worldwide.

The City of Edmonton’s Carbon Budget

On November 14, 2022, Council was presented with the City of Edmonton’s first carbon budget in conjunction with the capital, operating and utility budgets to support Edmonton's transition to a low-carbon future.

Figure 1: Community Carbon Budget 2023-2026



The carbon budget helps guide decision-making and actions by providing additional carbon emissions information for the City of Edmonton as a community and as a corporation. GHG emissions impacts for each budget request within the 2023-2026 capital, operating and utility budgets were available to inform financial investment decisions throughout the budget deliberation process. The carbon budget differs from the capital and operating budgets in that it is not deliberated or approved; rather it is presented for information to guide capital and operating budget decisions.

As part of the multi-year approach to budgeting, the 2024 Fall Carbon Budget Update provides the annual update to the 2023-2026 Carbon Budget. The carbon budget is presented every four years with an annual update in the fall with the Supplemental Operating Budget Adjustments (SOBA) and Supplemental Capital Budget Adjustments (SCBA), the emission forecasts are also updated to include actual results from the prior year (and potentially any other changes to future forecast emissions). This fall update also includes assessments from the spring 2024 capital budget adjustments approved by Council.

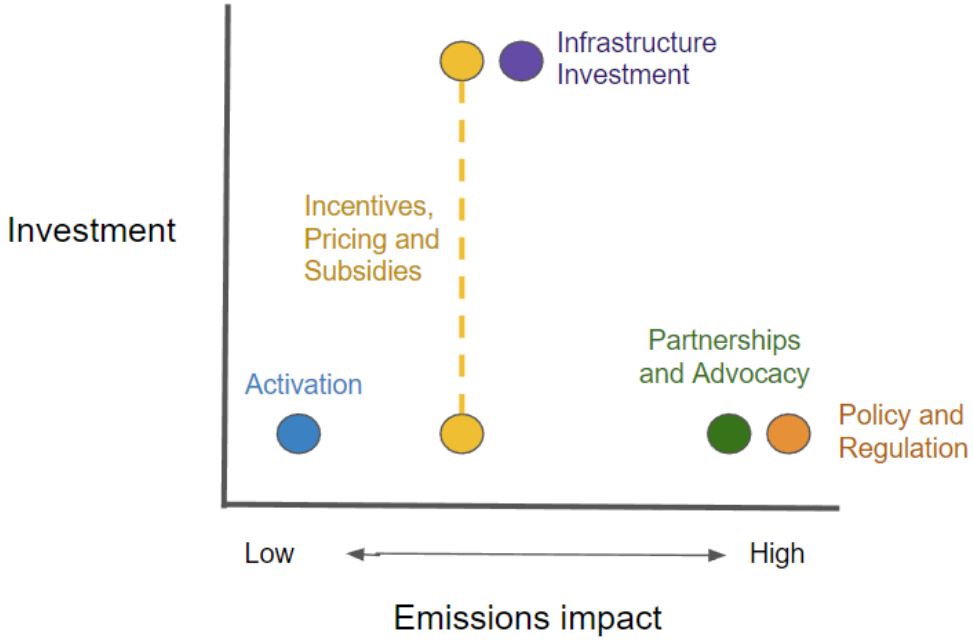
City Administration includes the assessments of potential GHG impacts for all proposed profiles being presented to council as an attachment to the spring SCBA and a complete carbon budget update to accompany the fall SOBA and SCBA.

Climate action levers

Municipal funding is limited and needs to be used effectively to make the most of what is available. This includes consideration of what can be completed by other orders of government (such as rebates, which can be given out by federal or provincial governments) versus actions only the City can do.

While the carbon budget does not specifically identify which projects to invest in, Administration has identified emission impacts for the various levers of change to help inform where limited resources could be spent to make the biggest impacts. The scale of investment varies for the levers of change.

Figure 2: Scale of City Investment varies for Levers of Change



Activation is about providing awareness, filling knowledge gaps and building capacity to encourage and support energy transition outcomes. Activation has a relatively low financial investment and low impact on emissions reductions as it relies on individual behaviour to take action.

Incentives, pricing and subsidies include applying a premium to cost or a reduction in cost to support a shared outcome or influence behaviour. This can include offsetting the costs of services and amenities for certain user groups or types of activities, or applying charges and fees for users through available financial mechanisms. Incentives, the financial investment

for Pricing and Subsidies ranges, and impact is low to medium, as this lever incentivizes but still relies on individual choices and behaviour.

Infrastructure Investment is about providing capital or operational investment in physical infrastructure, City assets, services and planning activities to activate and encourage specific energy transition outcomes. Infrastructure Investment has a high financial investment and medium impact, due to the magnitude of costs required for infrastructure upgrades and the operational emissions associated.

Partnerships and Advocacy require fostering relationships with private, community, institutional and not-for-profit entities to activate strategies, initiatives and actions to advance common goals, recognizing shared interests and aspirations. Partnerships and Advocacy are considered to be low financial investment, with a potentially high impact.

Policy and Regulation is a municipal planning instrument that can guide, direct, manage or shape how the City provides strategic direction for land, infrastructure or services to influence or change the behaviour of residents and markets or market groups. Policy and Regulation has low financial investment, and will have a high impact over time on reducing emissions for the areas the policy or regulation applies. Policy and regulation apply on a much broader scale than incentives, which is why the impact is higher.

Spring and Fall 2024 Carbon Budget Update Highlights

There are no items in the fall SCBA or SOBA that significantly increase or reduce emissions.

While the City has direct control over corporate emissions; financial investment in corporate emission reductions alone is not enough. Municipal funding will have a limited impact to meet community emission targets. Climate change is a collective problem requiring collective action. Climate solution leadership through reduction of operational emissions is part of a much larger effort, one that involves policy development, collaboration and support from other orders of government, private investment and the actions of all Edmontonians to achieve the targets outlined in the Community Energy Transition Strategy.

At the Community level there has been significant progress, as the Community has achieved and surpassed the 2030 energy efficiency target set in the Energy Transition Strategy. As of 2023 Edmonton's per capita energy use has reduced by 40 per cent, which is better than the target of 35 per cent by 2030.

The 2023-2026 Carbon Budget makes it clear: further and continued action is needed to achieve community and corporate carbon emission targets. Overall the impact of the

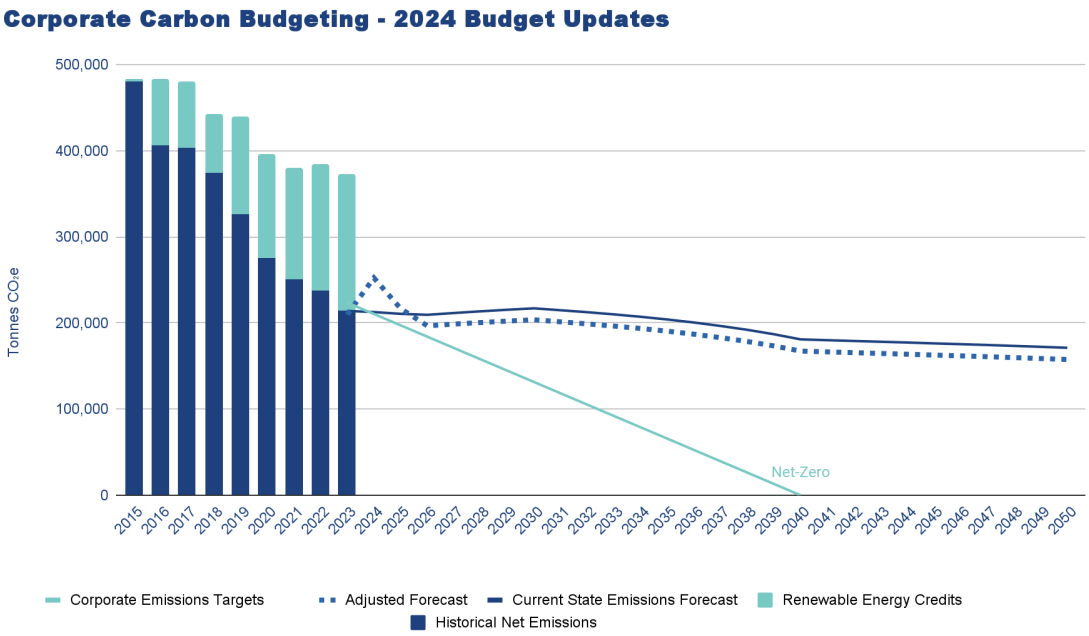
proposed fall 2024 capital, operating and utility budget adjustments will have a negligible impact on current greenhouse gas (GHG) emission levels.

The approved 2024 spring SCBA has a minimal impact on the carbon budget, but one project deserves special mention: the Kathleen Andrews Transit Garage Solar PV and Battery project. This project will increase the City's generation of renewable energy, reducing emissions in Pathway #1 (Renewable and Resilient Energy Transition). It also includes a pilot installation of a battery system that will increase the Ebus charging capacity at the facility. This could be a more cost-effective alternative to local grid enhancements for increasing charging capacity. The improvements to the electricity supply will directly support emission reductions in Pathway #3 (Low-Carbon City and Transportation) by increasing the capacity for zero-emission buses. The Kathleen Andrews project has a quantifiable GHG reduction of 74 tonnes of CO2e, additionally, learnings from this pilot project may enable further reductions in emissions in other projects.
A large majority of the adjustments brought forward within the spring and fall supplemental capital budget adjustment process are Project Development and Delivery Model (PDDM) adjustments to transfer approved funding between composite and standalone capital profiles; these transfers do not have an impact on the carbon budget unless funding for a project is increased or reduced resulting in scope changes.

This update to the Carbon Budget also reflects the impact of two motions passed during the fall 2023 budget deliberations that impacted the corporate carbon budget.

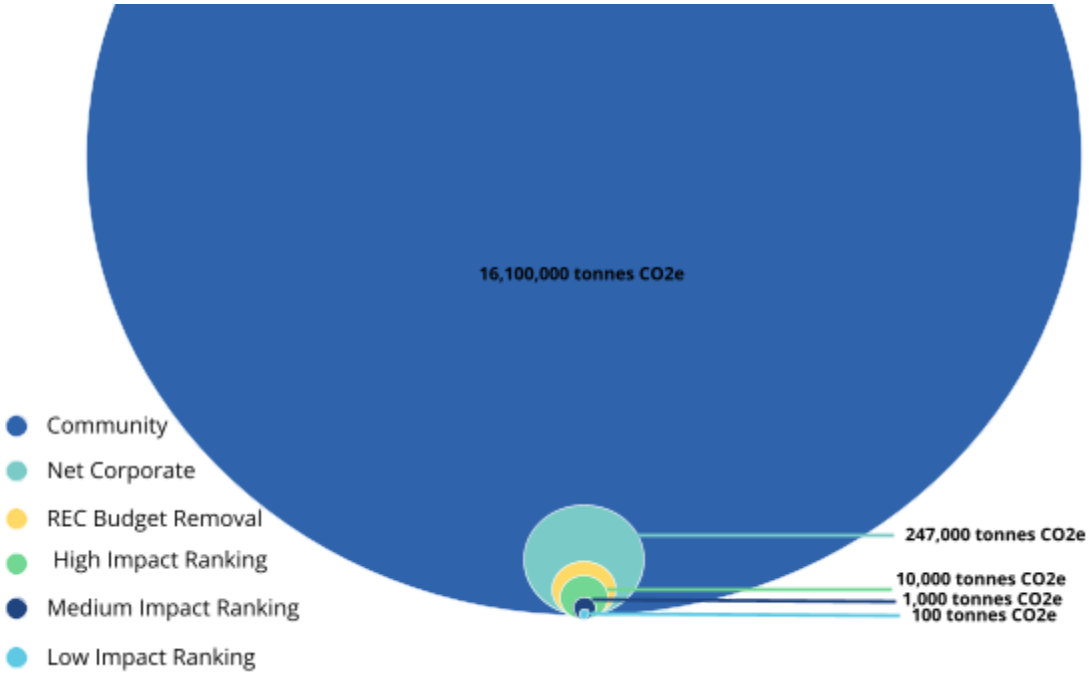
The first motion was that the operating expenditure budget for Renewable Energy Credits (RECs) be decreased by $3.3M for 2024 and 2025. This $3.3M reduction of the REC budget results in the corporation only purchasing about 20 percent of the RECs needed to offset the corporate electricity GHG emissions in 2024; which resulted in 65,000 tonnes being added back to the corporate emissions forecast for 2024 and 2025, this will be reflected in the historical net emissions for 2024 next year. The wind generation project is scheduled to be operational in late 2025. Starting in 2026 the wind and solar projects are expected to produce enough REC's on an annual basis to cover the civic operations' incremental electricity emissions until the 2030 timeframe. The City would then have REC's in excess of the City's electricity consumption and may choose to either sell them or use them to offset a portion or its natural gas emissions.

Figure 3: Corporate Carbon Budget 2023-2026



The removal of the REC budget means an increase in corporate emissions by 65,000 tonnes in the Corporate Carbon Budget. This is six and a half times the 'high impact' threshold outlined in the assessment methodology of the Carbon Budget.

Figure 4: Qualitative Assessment - Impact Thresholds



The second motion is to add 50,000 annual bus service hours for Edmonton Transit Service with funding from the tax levy utilizing 20 diesel buses funded by the LRT Reserve, in support of the implementation of the mass transit network. The 2023-2026 carbon budget included growth in transit service (including LRT growth) resulting in 23,700 tonnes of reductions in the community emissions annually after by 2026. Implementation of the mass transit network supports reducing community emissions by providing Edmontontonians with a lower emitting transportation option compared to personal vehicles. This decision moves up the budgeted community emissions reductions associated with service growth from 2027 to 2025.

The 2023-2026 carbon budget also assumed there would be no impact on the corporate emissions as a result of this service growth, assuming all service would utilize zero emission vehicles. The addition of 20 more diesel buses would increase corporate emissions by approximately 1,300 tonnes/year (65 t/y/bus), while facilitating up to one million new transit trips annually starting in 2025. These buses will incur carbon price costs of approximately $120,000/year in 2024 associated with the use of diesel. This annual cost is expected to increase to around $260,000 by 2030.

The Energy Transition Strategy identified implementing a mass transit network as a “Big Win” action. This service hour growth was previously intended to be met through the purchase of

battery electric buses, however, due to supply issues and costs associated with battery electric buses, the bus service hours are being provided through the purchase of modern diesel buses. The City remains committed to transitioning the bus fleet to a zero emission fleet over time as funding programs and fueling technology advances.

The impacts of these motions did not change the year the corporate carbon budget is expected to be depleted which is still expected to be 2032. However, the motions did move the depletion date closer to 2031.

Zoning Bylaw 20001 was adopted by City Council on October 23, 2023 and came into effect on January 1, 2024. The new bylaw helps to support the city's climate change goals by implementing regulatory changes to create a more climate resilient city by:

- Introducing mixed use zones, expanding neighbourhood business opportunities and enabling a greater variety of housing forms to create a compact city that can help reduce carbon emissions from transportation.
- Continuing to preserve natural areas and parkland along the river, creeks, ravines, and other areas designated for environmental protection.
- Reducing regulatory barriers to improving energy efficiency performance through the National Building Code.
- Increasing requirements for trees, shrubs or other landscaping for some new-larger scale developments and providing an increased incentive to preserve mature trees on all sites.

Climate and Emission Trends

Intergovernmental Panel on Climate Change (IPCC) AR6 report highlights, to date, emission reduction plans from around the world (formally called Nationally Determined Contributions) make it likely that warming will exceed 1.5 degrees Celsius between 2030 and 2052. Edmonton's 2023 GHG emission results show Edmonton is contributing to this warming.

Based on annual emission reduction targets to reach the 2025 goal, Edmonton's community emissions were targeted to be 13.4 million tonnes of carbon dioxide equivalent (CO_2e) or less in 2023. This target was not met, as 2023 community emissions in Edmonton were calculated to be 16.2 million tCO_2e (14.2 tonnes per person). This is an 11 per cent reduction in emissions from Edmonton's 2005 baseline year, however, a 26 per cent reduction in emissions was needed to reach the annual target. To get back

on track to meet the 2025 target through direct reductions, in 2024 Edmonton's emissions need to be reduced to 12.7 million tonnes (or less), equal to 30 per cent below 2005 emissions or 23 per cent below 2023 emissions. The trend for this year indicates that this target will not be met and there are no current initiatives or actions that will allow the necessary reductions to meet the target.

Based on this adjusted forecast, the year when the community carbon budget is forecasted to be depleted is now 2036, one year earlier than forecasted in the 2023-2026 Carbon Budget (see Table 4). This also applies to the corporate carbon budget which is now forecasted to be depleted in 2032 instead of 2033 (see Table 7).

The COVID-19 pandemic saw significant reduction in economic activity related to pandemic responses; therefore, emissions estimated in 2020 and 2021 are not reflective of an emission reduction trend. Edmonton's 2023 emissions were 9 per cent above the lowest annual emissions reported for the City in 2021. It is important to note that the increases observed in 2023 emissions are primarily due to increases in energy use in sectors that were impacted by the pandemic; specifically buildings, industrial, and transportation sectors. Although emissions have been increasing due to recovery from the pandemic; 2023 emissions remain 7 per cent below pre-pandemic levels in 2019.

If Edmonton's current emission trajectory continues, Edmonton's GHGreduction targets will not be achieved. Edmonton experiences the impacts of a changing climate caused by GHG emissions. According to the Insurance Bureau of Canada, in 2023 and for the second year in a row, Canada exceeded $3 billion in insured damage from natural catastrophes and severe weather events. Summer storms caused the most damage in Alberta, including damage from hail, tornados, and flooding. The number of hot days are also expected to increase from an average of one day per year over the 1961-1990 period to 16 days per year over the 2041-2070 period.

According to Environment Canada, in May 2023 in Alberta, temperatures averaged about 5 degrees warmer than normal – the warmest in 76 years of records. Among the hot spots, Edmonton broke records for May close to 6 degrees above normal. Spring in Alberta was also drier than in recent years and humidity was very low, pushing the start of the fire season much earlier than usual. Across Canada several major cities, including Kamloops, Calgary, Edmonton, Regina, Saskatoon and Yellowknife, experienced more than 200 hours of smoke.

As reported in the Climate Strategies Annual Update; from May to September 2023, a total of 36 days were recorded with an AQHI higher than 7, of which 19 days incidents

exceeded an AQHI of 10, indicating extremely poor air quality in Edmonton on those days. From May to September 2024, a total of 15 days were recorded with an AQHI higher than 7, of which 13 incidents exceeded an AQHI of 10. This trend aligns with broader climate change impacts, such as rising temperatures and more frequent wildfires, necessitating further analysis to understand and mitigate these growing risks.

The impacts of a changing climate affects the City of Edmonton as a corporation financially; City infrastructure has to be repaired after extreme weather events like wind storms or heat waves and additional support is necessary for at-risk members of the community during these events. In 2023 the City spent $16 Million on the Emergency Operations Centre's response to wildfires alone. In the long term, actions to reduce GHG emissions result in financial savings as less funding is required to address the impacts of extreme weather events.

Financial Pressures and Carbon Impacts

The Fall 2024 SOBA identifies proposed actions to mitigate structural budget variances These have been evaluated for carbon impacts in Appendix A. The majority of the initiatives have no ability to impact greenhouse gas emissions, however, one of the proposed actions is the reduction of the Community Energy Transition Strategy Program. For 2025 and 2026, this reduction results in the cancellation of the Home Upgrades Program (Energy Poverty). While this program has not yet launched and its cancellation would not result in increased emissions in the Carbon Budget, removing funding for this program will eliminate potential community emission savings that would positively impact the carbon budget. Home energy poverty programs aim to alleviate household energy poverty by providing income qualifying programing to financially support the installation of energy efficiency upgrades. While the focus of such programs are on energy savings, these energy savings also translate into emission reductions. Specific reductions from such programming is dependent on program uptake and the specific improvements undertaken, but experience from other programs has indicated that around 2-3 tonnes per home annually could be reduced through these energy efficiency improvements.

As the City looks for alternatives to address its significant financial pressures, further analysis will be necessary to assess the potential impacts of any proposed budget reduction measures on the carbon budget and the City's ability to meet emission reduction targets.

2024 CARBON BUDGET UPDATE

Overview

As part of the City's multi-year approach to budgeting, the 2024 Fall Carbon Budget Update provides this year's annual update to the 2023-2026 Carbon Budget. As such it presents changes and adjustments to the 2023-2026 Carbon Budget as well as updates to the forecasted emissions and previous years actual results.

The City has completed a GHG impact assessment of each budget request to provide decision-makers with a holistic view of the GHG impacts in the capital and operating budget adjustments. Refer to Appendix A: Listing of Proposed Budget Adjustments and GHG Impacts for a complete listing of individual budget requests and associated qualitative and quantitative GHG emission impacts.

The 2023-2026 Carbon Budget supports the transition to a low-carbon city by measuring and reporting progress towards short term and long term goals. This will allow Council and Administration to adjust strategies as necessary to achieve the targets outlined in the Community Energy Transition Strategy.

Just as the financial budgets are under pressure to fund the services the City provides, the Carbon Budget continues to deplete at a rate which will miss the targets the City has set for reaching net zero emissions by 2050 for the Community and 2040 for the Corporation.

A significant portion of grants from the other orders of government have a GHG component to them, and prioritizing this work allows the City of Edmonton to access funds that would otherwise not be available. For example the City's Emissions Reduction Alberta application for the Alberta Zero-Emissions Fleet Fueling Project was successful in securing funding of $6.9 million which will allow for Edmonton and municipalities in the Metro region to pilot hydrogen and diesel-hydrogen hybrid vehicle technologies which could enable almost 400 tonnes of reductions. Funding supports the implementation of transitional fueling systems and analyzes vehicle performance by collecting, analyzing and reporting data, providing recommendations and insights. This work will support commercialization strategies and the transition to a zero-emission fleet.

Process Updates

Carbon budgeting is still relatively new to the City of Edmonton. The City is still undertaking training and expanding corporate capacity building. Three years after the City first incorporated a carbon budget into its financial budgeting process, the corporation continues

to find ways to integrate it into the City's existing processes and mainstreaming it across the corporation. Some initiatives that are aligned closely with the Carbon Budget include the new Environment and Climate Review sections in the Council Report, as well as the work being led out of the Climate Task Force such as the Corporate Climate Targets and the Decision Making Framework, which aims to incorporate climate impacts into decision making across the corporation.

2024 Carbon Budget Adjustments (Spring and Fall)

The following tables outline the capital, operating and utility budget adjustments with quantifiable community and corporate GHG emission impacts. Further details on approved budget requests, including those with unquantifiable impacts, are included in Appendix A: Listing of Budget Requests and GHG Impacts. There are no requests in the 2024 Utility Budget Adjustments that have GHG impacts.

Emission reductions (bracketed) are considered favourable and emission reducing. Positive emissions are unfavourable, increasing emissions compared to 2023 levels.

Table 1: Proposed Fall Budget Adjustments with Quantifiable GHG Emissions Impact

Name of Budget Request (Capital profile or Operating service package)	**2026 Quantified Emissions Impact (tonnes)** *Brackets indicates GHG Reductions*	**Community /Corporate /Both**	**Proposed 2024 Fall Budget Request ($000s)**
Vehicle and Equipment Replacement	15	Corporate	375

Table 2: Unfunded Fall Budget Adjustments with Quantifiable GHG Emissions Impact

Name of Budget Request (Capital profile or Operating service package)	**2026 Quantified Emissions Impact (tonnes)** *Brackets indicates GHG Reductions*	**Community /Corporate /Both**	**Proposed 2024 Fall Budget Request ($000s)**
Turf and Horticulture Enhanced Service Levels	392	Corporate	5,232 (Operating and Capital)

Table 3: Approved Spring Budget Requests with Quantifiable GHG Emissions Impact

Name of Budget Request (Capital profile or Operating service package)	2026 Quantified Emissions Impact (tonnes) *Brackets indicates GHG Reductions*	Community /Corporate /Both	Approved 2023 Spring Budget Request ($000s)
Kathleen Andrews Transit Garage Solar PV & Battery Projects	(74)	Corporate	5,879
Fire Station 7 (Highlands) Building Rehabilitation	(41)	Corporate	11,499
Canora Supportive Housing	266	Community	27,699
Garneau Supportive Housing	148	Community	15,740

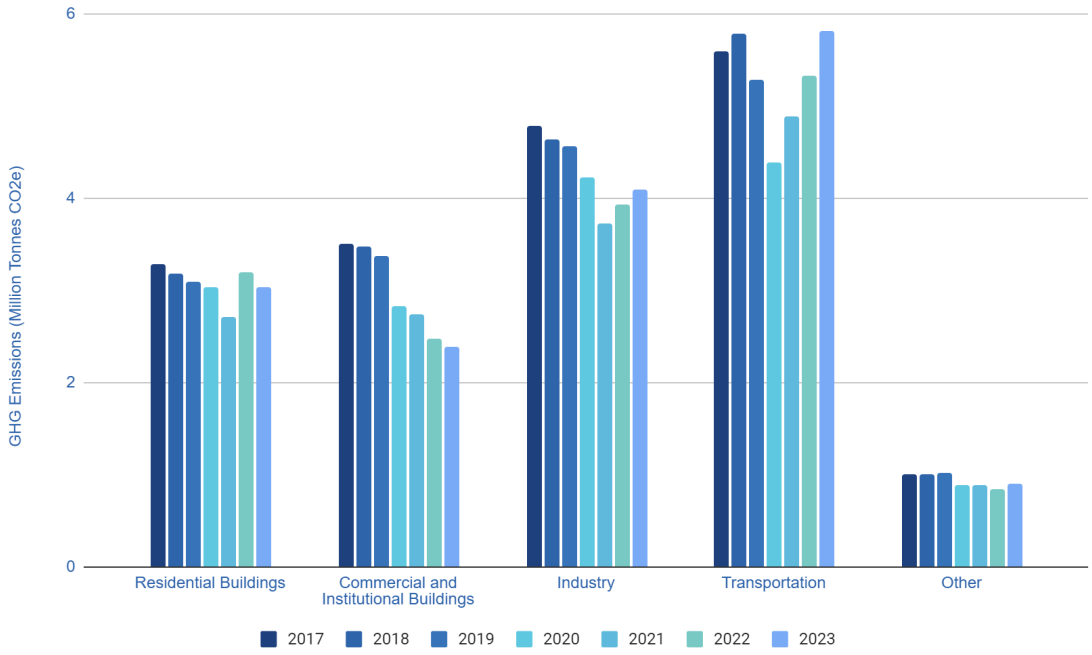
Overall the quantifiable impact of the proposed 2024 Spring and Fall budget adjustments will have a net negative impact on Corporate emissions of approximately 314 tonnes of CO2e. The approval of the Turf and Horticulture Enhanced Service Levels unfunded service package would add an additional 392 tonnes of CO2e.

Not all budget requests have quantifiable impacts; the City has numerous initiatives underway that contribute to achieving GHG reduction targets, although not all are quantifiable with the tools available today.

2024 Community Carbon Budget Update

Edmonton's 2023 Community GHG Inventory shows the city's GHG emissions are not decreasing over time and are not on track to meet the 2025, 2030 and 2050 emissions targets. Transportation emissions comprise the largest proportion (37%) of the total community emissions with industry (25%) and residential buildings (18%) being the next largest sources of emissions.

Figure 5: Edmonton Community GHG Emissions by Reporting Sector



Positive trends are developing at the community level in Edmonton. The Community has achieved and surpassed the 2030 energy efficiency target set in the Energy Transition Strategy. As of 2023 Edmonton's per capita energy use has reduced by 40 per cent, which is better than the target of 35 per cent by 2030. Community installation of solar photovoltaic in the City has steadily increased, with over 2000 installations in 2023 for a total connected capacity of approx. 50,000 kW.

The City of Edmonton's Electric Vehicle (EV) Strategy has seen positive outcomes, with community adoption exceeding initial projections. By 2022, EV registrations reached 2,300, surpassing the forecasted 1,300. This upward trend continued in 2023, with a 44 per cent increase resulting in over 3,300 registered EVs. However, charging infrastructure has lagged, with only 72 charging stations available by the end of 2022. Limited charging infrastructure may hinder additional EV adoption. The number of charging stations increased to 101 in 2023, and further expansion is necessary to support continued EV adoption and reduced GHG emissions.

The following graph shows the community current state emission forecast and a revised forecast updated for the GHG impacts of budget requests proposed in the 2024 Fall SOBA

and SCBA, compared to Edmonton's reduction targets that align with the Paris Agreement, and the community "fair share" carbon emission targets.

Figure 6: Community Carbon Budget 2024 Updates

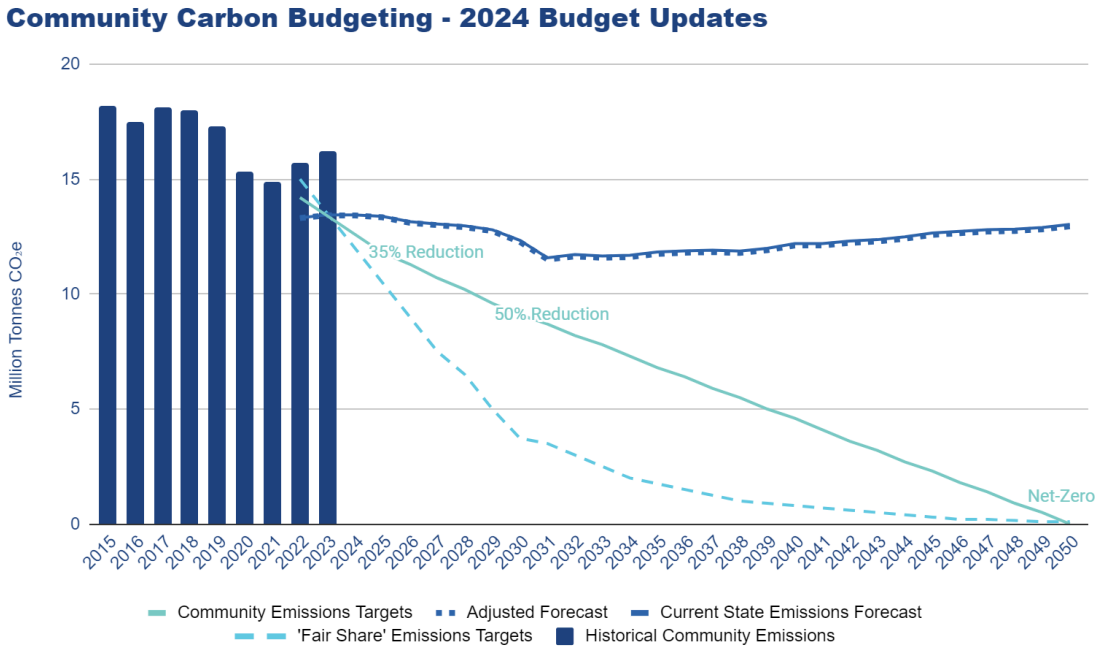


Table 4: Community Carbon Budget

	Carbon Budget 2024-2050 (Available GHG Emissions)	Year Carbon Budget is Depleted (Based on Adjusted Forecasts)
Community Carbon Budget *(targets that align with the Paris Agreement)*	144 million tonnes CO2e	2036*

** This is one year earlier than reported in the 2023-2026 Carbon Budget, this shift is due to the 2022 actual emissions being higher than forecasted.*

Table 5: Community Carbon Deficit

Annual tonnes CO2e	2025	2030	2050
2023-2026 Carbon Budget Deficit (A)	1,530,000	3,120,000	12,880,000
2023 and 2024 Budget Updates (B)	1,200	1,400	1,400**
2024 Updated Carbon Deficit (C) = (A + B)	1,530,000*	3,120,000*	12,880,000*

** The 2024 budget updates fall below the significance threshold for the community carbon budget, which is 10,000 tonnes. Therefore the resultant carbon deficit remains unchanged from the values reporting in the 2023-2026 Carbon Budget. Emission changes below the significance threshold continue to be tracked internally, such that the cumulative impact of small changes is accounted for in future carbon budget updates.*

***Values presented in the table for GHG impacts of budget updates for 2050 are based on extrapolations and are subject to change.*

2023-2026 Focus

Tables 4 and 5 above focus on the community targets from the Community Energy Transition Strategy from 2022 to 2050. This section provides insight specifically for the 2023-2026 budget period and how the proposed budget requests impact the emissions forecast.

Table 6: 2023-2026 Community Carbon Targets and Deficit

	GHG Emissions (thousand tonnes CO2e) 2023-2026
2023-2026 Carbon Budget Forecast (A)	53,250
2023 and 2024 Budget Updates (B)	4
Adjusted Carbon Budget(C) = (A + B)	*53,250**
Community Emissions Target (D)	49,100
Carbon Deficit (C - D)	4,150

** The 2024 budget updates fall below the significance threshold for the community carbon budget, which is 10,000 tonnes. Therefore the resultant carbon deficit remains unchanged from the values reporting in the 2023-2026 Carbon Budget. Emission changes below the significance threshold continue to be tracked by the City, such that the cumulative impact of small changes is accounted for in future carbon budget updates.*

Based on the current state emissions scenario and impacts quantified from the 2023-2026 Carbon Budget, the cumulative community emissions would be 53.25 million tonnes of CO2e over 2023-2026. The quantifiable impacts of the 2023 budget updates would increase

emissions by 1,400 tonnes. These 2023 budget updates fall below the significance threshold for the Community carbon budget, and therefore the carbon deficit of 4,150 thousand tonnes remains unchanged.

2024 Corporate Carbon Budget Update

In contrast to the community carbon emissions, which relies primarily on policy, other orders of government and private investment, the City of Edmonton is able to have a direct impact on its corporate emissions with its investment decisions.

The following graph provides a summary of the preliminary annual corporate emission targets compared to the current state emissions. The corporate emissions target is to be net neutral by the year 2040, as indicated in the Community Energy Transition Strategy.

Although the City is close to achieving its corporate emissions reduction target over 2023-2026, more investment is required to achieve the emission reduction targets by 2040. The path forward to setting and achieving the corporate targets for becoming an emission neutral corporation by 2040 is discussed in the Looking Forward section of the 2023-2026 Carbon Budget. This includes actions such as integrating climate resilience into the City's services and processes, prioritizing climate and energy transition considerations in decision-making, and setting ambitious policy targets to accelerate the transition. They also include continuously seeking ways to reduce operational emissions through procuring low-carbon energy and carbon offsets, scaling up climate resilience retrofits and energy efficiency improvements in City facilities, and expanding solar photovoltaics and energy storage on its infrastructure. Additionally, the City is transitioning to a zero-emission fleet and equipment while exploring hydrogen infrastructure.

Figure 7: Corporate Carbon Budget 2023-2026

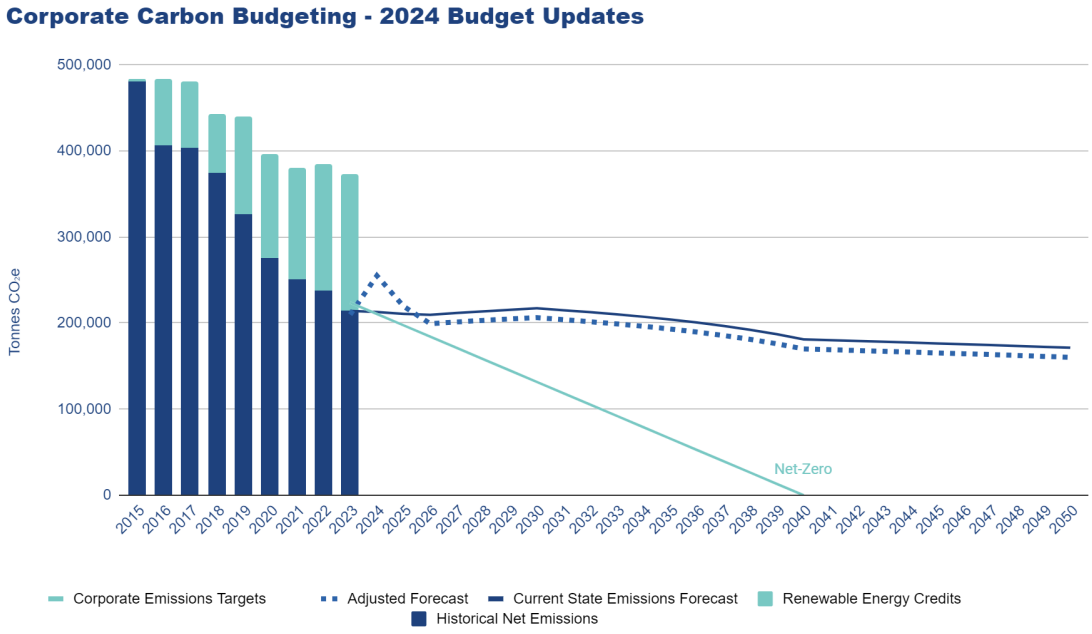


Table 7: Corporate Carbon Budget

	Carbon Budget 2024-2040 (Available GHG Emissions)	Year Carbon Budget is Depleted (Based on Adjusted Forecasts)
Corporate Carbon Budget	1.54 million tonnes CO2e	2032*

** This is one year earlier than reported in the 2023-2026 Carbon Budget, this shift is due to the 2022 and 2023 actual emissions being higher than forecasted.*

Table 8: Corporate Carbon Deficit

Annual tonnes CO2e	2040**
2023-2026 Carbon Budget Deficit (A)	169,000
2023 and 2024 Budget Update Impacts (B)*	1,000
2024 Budget Update Deficit (C) = (A + B)	170,000*

**The Corporate Carbon Budget significance threshold is 1,000 tonnes, and therefore the 2023 budget update impacts are rounded up to 1,000 tonnes and increase the reported deficit from the 2023-2026 carbon budget.*
***Values presented in the table for GHG impacts of approved budget requests for 2040 are based on extrapolations and are subject to change.*

Table 9: 2023-2026 Corporate Carbon Targets and Deficit

	GHG Emissions (thousands of tonnes) 2023-2026
2023-2026 Carbon Budget Forecast (A)	816
2023 and 2024 Budget Updates (B)	68
Adjusted Carbon Budget (C) = (A + B)	884
Preliminary Corporate Emissions Target (D)	816
Carbon Deficit (C - D)	68

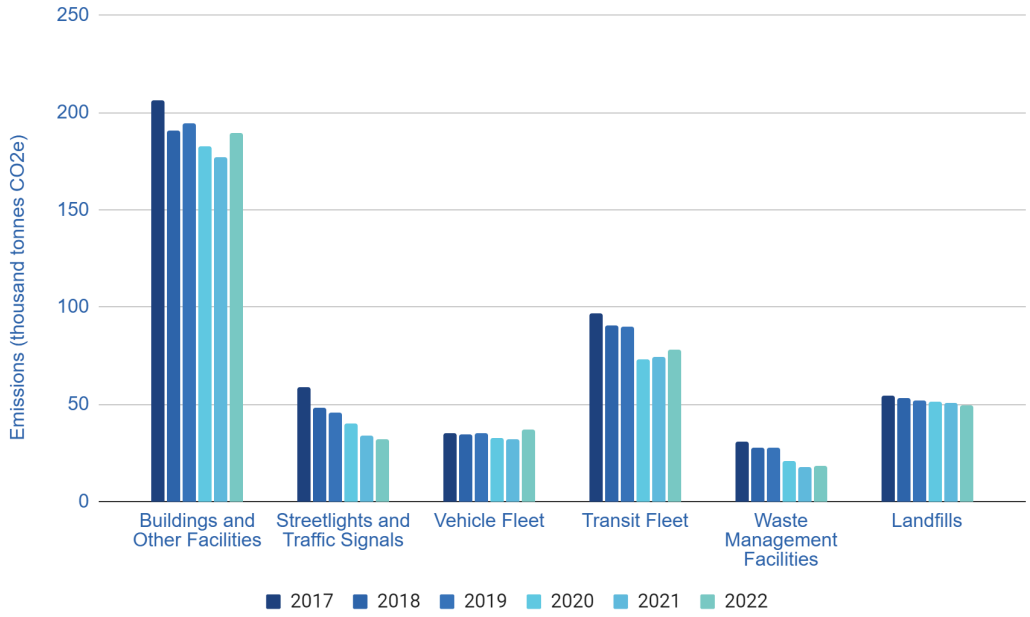
Based on the forecasted current state emissions scenario (which includes the renewable electricity purchase) and impacts quantified from the 2023-2026 Carbon Budget, the corporate emissions would be 816,000 tonnes of CO2e over 2023-2026. The quantifiable impacts of the 2023 and 2024 budget updates would increase emissions by 68,000 tonnes, resulting in 884,000 tonnes CO2e of emissions between 2023-2026. This exceeds the preliminary corporate emissions targets over the 2023-2026 time period of approximately 816,000 tonnes CO2e, resulting in a carbon deficit of 68,000 tonnes.

In 2023, the City's net Corporate GHG emissions were 51 per cent below Edmonton's 2005 baseline emissions. The City also saw a 10 per cent reduction from 2022 net emissions levels. The City of Edmonton's corporate emissions make up approximately two per cent of the total emissions within the community.

Net GHG emissions represents the overall balance of emissions produced and emissions removed from the atmosphere (through carbon storage from the urban forest) or emissions avoided by purchasing renewable energy certificates. These reductions are both included in the 'Negative Emissions' illustrated in Figure 6.

The City's net GHG emissions have been decreasing over the last five years. These reductions have come from various sectors. Emissions from City of Edmonton buildings, transit fleet and streetlights have decreased, while emissions from the light duty fleet have remained relatively unchanged (see Figure 8).

Figure 8: Edmonton Corporate GHG Emissions by Reporting Sector



Additionally, corporate emissions have been offset by the purchase of renewable energy certificates, resulting in the offset of all corporate electricity use emissions in 2023 and equating to a reduction of 41 per cent of the 2023 emissions. Further emissions reductions from corporate trees reduced another one per cent of 2023 emissions. To reach the 2040 target for carbon neutral corporate operations requires another 215,000 tonnes of annual emissions reductions, which equates to 51 per cent of the 2005 emissions baseline.

Offsets and credits are key instruments in achieving emission reductions. Emission offsets are generated by projects that have voluntarily reduced their greenhouse gas emissions and are verified by a third party in accordance with the Standard for Validation, Verification and Audit. Emission offset projects must meet the requirements in the Technology Innovation and Emissions Reduction (TIER) regulation, the Standard for Greenhouse Gas Emission Offset Project Developers, and a relevant Alberta-approved quantification protocol.

There are no scenarios to meet net zero goals in which offsets are not included.

Appendix A - Listing of Proposed Budget Adjustments and GHG Impacts

Spring 2024 Suplemental Capital Budget Adjustments

			Pathway								
Profile ID	Profile Name	CETS Action	1	2	3	4	2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request ($000)	Description of GHG Impacts
Spring 2023 Supplemental Capital Budget Adjustments											
New Standalone Profiles Requesting Funding from Existing Approved Profiles											
SCBA-C-2024-00042	Kathleen Andrews Transit Garage Solar PV & Battery Projects	☑	↓		↓		(74)	↓	Corporate	5,879	The project will increase the City's generation of local renewable energy and decrease Pathway 1 emissions. The project includes piloting the installation of a battery system that will increase the Ebus charging capacity at the facility, and may prove to be a cost effective alternative to local grid enhancements for increasing charging capacity. The improvements to electricity supply will support reducing Pathway 3 emisions by increasing capacity for zero-emissions buses directly and enabling further reductions from the learnings from the pilot. Direct Emissions Impact - Immaterial: Associated with the increased instantaneous charging capacity and electric bus use associated with the pilot battery project. Indirect Emissions Impact - Low: Associated with the installation of the solar PV system and the contribution to reducing Alberta's grid electricity."
SCBA-C-2024-00019	Fire Station 7 (Highlands) Building Rehabilitation	☑	—	↓	?	?	(41)		Corporate	11,499	The rehabilitation of Fire Station 7 will reduce Pathway 2 emissions and have no other measurable impacts. There will be no change in building function, other than the addition of gear room. There is no renewable energy component of this project. Modelling estimates a GHG reduction of 34% for the building. pathway 3 is affected by the inclusion of two additional parking stalls and indoor parking for 5 bikes. Pathway 4 is affected by minor landscaping work which includes 3 additional trees. Direct emissions impact - Immaterial: associated with an upgraded building envelope and replacing mechanical equipment. No indirect emissions impact.
SCBA-C-2024-00041	Yellowhead Trail Rehabilitation: 107 Street to Fort Road	☐					Not Quantified		-	7,742	Rehabilitation profile. Not net changes to the existing configuration. Yellowhead Freeway project has been already assessed as part of the 2023-2026 Carbon Budget work.

SCBA-C-2024-00027	50 Street Bridge (B202) Rehabilitation over Whitemud Drive	☐					Not Quantified		-	12,536	Rehabilitation profile. No net changes to the existing configuration.
SCBA-C-2024-00033	Dawson Bridge (B005) Rehabilitation	☐					Not Quantified		-	19,960	Rehabilitation profile. No net changes to the existing configuration.
SCBA-C-2024-00017	Canora Supportive Housing	☐		↑			266		Community	27,700	Canora Supportive Housing project is partially funded by the City but will not be owned or operated by the City. This project will be built 20% better than code requirements to meet a CMHC grant requirement. This project does not follow C627 requirements to be built ready for renewable energy. The only known impacts are in Pathway 2. Direct emissions - Low - Associated with the operations of the new building. No indirect emissions impact.
SCBA-C-2024-00021	Garneau Supportive Housing	☐		↑			148		Community	15,740	Garneau Supportive Housing project is partially funded by the City but will not be owned or operated by the City. This project will be built 20% better than code requirements to meet a CMHC grant requirement. This project does not follow C627 requirements to be built ready for renewable energy. The only known impacts are in Pathway 2. Direct emissions - Low - Associated with the operations of the new building. No indirect emissions impact.

Fall 2024 Suplemental Capital Budget Adjustments

			Pathway								
Profile ID	**Profile Name**	**CETS Action**	**1**	**2**	**3**	**4**	**2026 GHG Emissions Impacts (tonnes CO2e)**	**Enabling**	**Community /Corporate /Both**	**2023-2026 Budget Request ($000)**	**Description of GHG Impacts**
Fall 2023 Suplemental Capital Budget Adjustments											
SCBA-C-2024-00108	Vehicle and Equipment Replacement	☐			↑		15		Corporate	375	Purchase of 3 new vehicles to support the maintenance work for the Citadel Theatre as part of the lease agreement. Enabling Emissions Impacts - None Direct Emissions Impacts - Immaterial

Fall 2024 Suplemental Operating Budget Adjustments

Service Package Name	CETS Action	Pathway 1	Pathway 2	Pathway 3	Pathway 4	2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request ($000)	Description of GHG Impacts
Fall 2024 Suplemental Operating Budget Adjustments										
Council Directed (unfunded)										
Turf and Horticulture Enhanced Service Levels	☐			↑		392		Corporate	5,232 (operating and capital)	The profile includes both the purchase of new vehicles and equipment and increased service levels of the equipment, resulting in increased emissions in Pathway 3. No impact is expected in Pathway 1, 2 and 4, and there are no enabling emissions impacts. Direct Emissions Impact - Low: associated primarily with the increased service levels proposed, resulting in increased fuel use.
Centre City Optimization	☐					Not Quantified		N/A	6,368	No impacts on pathway emissions.
Centre City Optimization - BIA	☐					Not Quantified		N/A	6,725	No impacts on pathway emissions.
Citadel Theatre - Lease Approval	☐					Not Quantified		N/A	1,361	No impacts on pathway emissions. Addidional maintenance vehicles impact reflected in the capital request.
Boards and Commissions (unfunded)										
EFCL - CLIP Budget Request	☐					Not Quantified		N/A	475	No impacts on pathway emissions.
EFCL - CLOG Budget Requests	☐					Not Quantified		N/A	266	No impacts on pathway emissions.
Explore Edmonton - Change in Base Budget	☐					Not Quantified		N/A	8,100	No impacts on pathway emissions.
Impacts Managed Internally (ncluded in Proposed Fall SOBA)										
Cancellation of Home Upgrades Program (Energy poverty)	☐		↓			Not Quantified		Community	-3,600	Home energy poverty programs aim to alliviate household energy poverty by providing income qualifying programing to financially support the installation of energy efficiency upgrades. While the focus of such programs are on energy savings, these energy savings also translate into emissions reductions. Specific reductions from such programing is dependent on program uptake and the specific improvements undertaken, but experience from other programs has indicated that around 2-3 tonnes per home annually could be reduced through these energy efficiency improvements. Decreases expected in Pathway 2 emssions. No impacts expected to Pathway 1, 3 and 4, and no enabling impacts.

Appendix B - Description of Assumption Categories

The development of the carbon budget required various assumptions that can be categorised as follows:

1. **General assumptions:** these are assumptions that were made to help clarify and define the overall process that was developed. This may also include assumptions on how to deal with different types of profiles such as composites, strategy related profiles, and operating impacts of capital.
2. **Assumptions specific to PATHWAY 1: Renewable and Resilient Energy Transition**
3. **Assumptions specific to PATHWAY 2: Emission Neutral Buildings**
4. **Assumptions specific to PATHWAY 3: Low-Carbon City and Transportation**
5. **Assumptions specific to PATHWAY 4: Carbon Capture and Nature-Based Solutions**

General Assumptions	
Item	**Assumption**
General scope boundaries	The community and corporate GHG inventories help to set the scope of the type of operational emissions that are considered in evaluation of the budget. Different sectoral emissions sources are provided to help clarify scope decisions. **Community emissions align with the following sectors:** - Residential buildings - Agriculture, forestry and fishing activities - Manufacturing industries and construction - Non-specified sources - Commercial and institutional buildings and facilities - Energy industries - Fugitive emissions - On-road transportation - Transboundary transportation - Off-Road transportation - Aviation transportation - Rail Transportation - Waste - Agriculture, Forestry, and Other Land Use - Industrial Processes and Product Uses **Corporate emissions align with the following sectors:** - Buildings & Other Facilities - Streetlights & Traffic Signals

General Assumptions	
	- Vehicle Fleet - Transit Fleet - Waste Management
Scope of Emissions included in carbon budgeting	The quantified carbon budget only includes Scope 1 (direct emissions) and Scope 2 emissions (electricity related emissions). The corporate GHG inventory includes those emissions sources that are directly within the operational control of the City. The community GHG inventory includes emissions sources within the City boundary.
Projects substantially completed prior to 2023	The carbon budget does not include GHG impact assessment for capital projects that were approved through previous capital budgets, that are substantially complete, with cash flow extending into 2023 and beyond. The GHG emissions of these projects will be incorporated into annual GHG emissions updates once they are in service.
Boards and Commissions	Capital profile requests for all Boards and Commissions have been assessed for GHG impacts. Operating service package requests for Boards and Commissions have not been assessed for GHG impacts, but will be incorporated into annual GHG emissions reporting if approved by City Council.
Emissions quantified by pathway	Pathway 1: relates to emissions associated with energy supply including Solar PV deployment, and capturing landfill gas for energy use Pathway 2: relates to emissions associated with energy use within buildings and facilities Pathway 3: relates to emissions from transportation and urban design including street lighting. Pathway 4: relates to emissions from land use change, and sequestration from tree planting. This would also include any industrial carbon capture equipment if included.
Qualitative assessment benchmark	The comparison for the qualitative assessment of the pathway emissions is the 2021 emissions inventory.
Quantitative assessment benchmark (community current state emissions forecast)	For the community carbon budget, the 'Business-as-Planned' Scenario from Edmonton's City Plan has been adopted as the current state emissions forecast, which reflects the most recent emissions forecast prepared for community emissions. This scenario assumes that growth occurs according to the City's approved statutory land use plans and historical growth patterns prior to adoption of The City Plan. Therefore the carbon budget impacts compared against the current state community emissions illustrate the progress towards carbon reductions as The City Plan is implemented.
Quantitative assessment benchmark (corporate current state emissions forecast)	The corporate current state emissions forecast does not assume growth in the City's transit, waste or vehicle fleet, streetlighting electrical load and assumes modern equivalent replacement of any vehicles reaching their end of life. It assumes no new emissions producing facilities and decreasing emissions associated with the City's landfills.

General Assumptions	
Rounding	• All figures related to community emissions have been rounded to the nearest 10,000 tonnes. If less than 10,000 tonnes they will be presented as <10,000 tonnes. • All figures related to corporate emissions have been rounded to the nearest 1,000 tonnes. If less than 1,000 tonnes they will be presented as <1,000 tonnes. • Individual project quantifications are presented to the nearest 100 tonnes. If less than 100 tonnes they will be presented as <100 tonnes.
Materiality	Description of the GHG impacts, as well as magnitude of direct and enabling GHG impact (if any). The direct and enabling GHG emissions impacts were assessed for: • immaterial (<100 tonnes of CO2e), • low (100 to 1,000 tonnes of CO2e), • medium (1,000 to 10,000 tonnes of CO2e), • or high (10,000 or more tonnes of CO2e) impacts. The impacts are not necessarily directional. For example there may be uncertain impacts that are considered “medium” because they could have emissions impacts in the 1,000 to 10,000 tonnes of CO2e range increasing and also have some impacts that are decreasing.
City of Edmonton's green electricity procurement	The qualitative assessment does not consider the City of Edmonton's green electricity purchases as part of the evaluation. However, the quantitative calculation presented in the report does consider the City's green electricity purchases.
Operating impacts of capital (OIC)	Any related emissions from operations have been reported within capital GHG assessments.
Renewal (including fleet)	Renewal is considered to have no material emissions impact as this is not actively replaced with high energy efficiency equipment. In some cases there will be efficiency improvements due to modern equivalent standards, but these will not be quantified or evaluated. The general assumption is that renewal is considered business as usual, and any inherent efficiency improvements will be captured in future GHG inventories.
Quantification of capital project composites for the Neighbourhood Renewal Program and Energy Transition Strategy	The scope of work included within the Neighbourhood Renewal Program and the Energy Transition Strategy Implementation composite profiles is vast. Due to the quantification limitations discussed in the 2023-2026 Carbon Budget, only portions of these composite projects were quantified for GHG emissions impacts. Once considering the full scope of the projects, and as more details become known, the projects will have more GHG emissions impacts than the amount reported. • Neighbourhood renewal - only includes net impact of tree changes • Energy Transition Strategy Implementation composite - only includes estimate impact of Clean Energy Improvement Program

General Assumptions	
Profiles that involve enhancing data availability and use within the corporation	As per the foundation of the Community Energy Transition Strategy, data-driven decision making is critical to make informed decisions for energy use and emissions. Therefore any profiles or packages that result in improved data gathering and use will decrease enabling emissions.
Pathway #1: Renewable and Resilient Energy Transition	
Item	**Assumption**
Interaction of City installation of solar PV and green electricity procurement	In 2026 the City will have emissions neutral electricity. While solar PV will lead to a decrease in electricity requirements from the grid, that electricity will already be emissions neutral as per the City's green electricity contract and will therefore have no net impact.
Quantification of Landfill Gas to Renewable Natural Gas	Quantification of GHG impacts are estimated to align with the City's GHG Inventory methodology rather than other measurements and estimates taken related to Alberta's Technology Emissions Innovation Regulation.
Pathway #2: Emission Neutral Buildings	
Item	**Assumption**
Emissions impacts of City buildings designed prior to 2021 (when City Policy C627 was adopted)	These buildings meet the previous City Policy C532 that had a requirement that buildings would be designed with 40 per cent lower emissions than energy code from 2011, but will still lead to an increase in emissions overall.
Solar PV generation in new City buildings that meet City Policy C627	Emissions associated with solar installations in new city owned buildings that adhere to City Policy C627 are included in the overall emissions neutrality of the building and are not broken out for quantification or qualifications. Pathway 1 emissions for any new City buildings adhering to City Policy C627 are ranked as 'no impact'.
Energy retrofits as part of renewal	Energy retrofits as a part of a facility renewal will be segregated into two pathways if the retrofit includes solar PV or other renewable systems. The emissions impact from the retrofit component will be reported as an emissions reduction within Pathway 2 and the solar component will be shown as a decrease for Pathway 1.
Retrofits to buildings that have not yet had any design or scoping work done	Retrofits to buildings that have not yet had any design or scoping work done, will not be going through construction this budget cycle, and have no land use changes will not be quantified until the scope and energy study are completed.
Energy "Plug Use" (Such as Computers)	Energy "Plug Use" (Such as Computers) directly impact Pathway 2 emissions similar to other building systems.
Open City Technology (IT) impacts	It is assumed that all budget requests related to Open City and Technology do not increase server room requirements. If at any point additional server space is required, this would be brought forward as a new growth or renewal profile and emissions increases associated with this growth would be assessed at that time.

General Assumptions	
Impacts of increased construction	Emissions from construction activities are considered 'embodied carbon' and are not currently assessed within carbon budgeting. Future iterations of this work may consider these impacts.
New emissions neutral buildings	Growth buildings are assumed to adhere to City Policy C627 and therefore be designed to be emissions neutral with renewable energy production. This neutrality means these buildings will have no impact to Pathway 1 or 2 emissions. In situations where a new emissions neutral building is constructed to replace an existing facility, the potential decreased emissions from the decommissioned facility is not assumed unless the decommissioning cost is specifically included as part of the capital profile request.
Building retrofits with increased emissions listed as part of the Community Energy Transition Strategy	There are certain facilities that have not been operational for many years and will be undergoing retrofits that will improve energy efficiency, and therefore be in support of the Community Energy Transition Strategy's goals. However, there will also be a new overall emissions increase (low or immaterial) to the City because the buildings have not been operational for the last few years.
New park facilities	New park facilities (bathrooms, pavilions, etc.) are expected to consume energy for their operation and lead to increases in pathway 2 emissions.
Pathway #3: Low-Carbon City and Transportation	
Item	**Assumption**
Quantification of transportation related projects	Transportation-related budget requests were combined as a composite to estimate travel demand and the resultant impacts of greenhouse emissions for the entire transportation system, which is a more accurate approach to quantifying GHG impacts rather than on an individual project basis. To provide further perspective of the emissions impacts related to different transportation modes, the Transit, Road, and Active mode composites were evaluated separately and quantified for GHG emissions impacts.
Transit, road, and active transportation profiles	The direct emissions impacts of the transportation composite profiles were evaluated based on the changes in transportation system capacity and assumed use (e.g., increase or decrease capacity and use of each travel mode). For example, the direct impacts of a transit profile that expands transit capacity decrease pathway 3 emissions as the result of a shift of travel from personal vehicle use to transit. The decrease in automobile use results in decreased fuel consumption which in turn reduces pathway 3 emissions. Enabling emissions impacts of transportation composite profiles include the emissions impacts associated with potential induced travel on the respective mode considering the population and employment growth patterns as a result of the investments. For example, considering future population growth a new transit investment increases transit accessibility which could stimulate the Transit Oriented Development (TOD) along the related transit corridor. The expected growth of population and TOD typically provide opportunities for residents living in TOD to access amenities within a short distance by either transit or active modes. This

General Assumptions	
	would enable reduced automobile dependency for the residents living in TOD which in turn reduces the GHG emissions.
New and renewed parking lots and bike racks	New parking lots result in more personal vehicle trips. This would encourage driving and thus would increase pathway 3 emissions. New bike racks provide opportunities for safe/secure bike parking which would encourage more biking. This can shift driving trips to bike trips which would decrease pathway 3 emissions. Renewal work done to the active transportation network maintains current use, and considering future population growth this renewal enables emissions decreases. Renewal work done to parking lots maintains current use, and considering future population growth this renewal enables emissions increases.
Transportation safety related profiles	Enhancing and maintaining transportation safety can enable indirect emissions impacts and will likely reduce mobility/transportation related emissions. Programs or initiatives (such as automated enforcement, safe crossing or neighbourhood speed limits) tend to increase speed compliance, encourage use of active travel modes and thus reduce GHG emissions impacts.
Bike paths and pedestrian paths (active network)	Any addition to active transportation capacity (sidewalks, trails, etc.) results in direct emissions reductions for pathway 3. Renewal work done to the active transportation network maintains current use and enables emissions reductions when considering future growth of the City.
Transit renewal	Transit renewal profiles maintain transit service levels, which enables emissions reductions when considering future growth of the City.
New transit garages	These facilities are emissions neutral facilities. The assets (LRV and buses) are not included in the direct impact assessment. These facilities enable significant emissions reductions associated with mass transit access and future emissions neutral vehicle storage and maintenance requirements.
Pathway #4: Carbon Capture and Nature-Based Solutions	
Item	**Assumption**
Quantification for natural asset impacts of City owned development projects	If there are projects that do not have a defined location or footprint, quantifications will not be completed as it is too early to provide an accurate assessment.
Soccer fields and open space turf	Soccer fields and open space turf do not support emissions sequestration and would be considered the equivalent of developed land.
Natural asset protection	The assumption is that natural areas would have been developed if not protected. Ongoing enabling emissions are associated with the lands' increased ability to sequester carbon over time.

General Assumptions	
Naturalization, greenery, vegetation, landscaping, and low impact development (LID)	Naturalization is considered to decrease pathway 4 emissions related to returning developed lands back to a natural state. Profiles including greenery, vegetation, landscaping, and low impact development are not considered as decreases to pathway 4 due to these aspects not currently being included in the current quantification methodology.
Irrigation within capital profiles	Some capital projects include installation of irrigation. These were considered immaterial for assessment although increased water use and the associated energy of processing and pumping water do exist.
Trees added through development processes	Only corporately owned trees will be calculated, in alignment with the current inventory. Trees that are planted by the City along the right of way for new development will be captured. Privately planted trees are not included.
Transition to or from farmland or turf	Natural asset transitions to or from farmland or turf were not calculated in the quantifications. Farmland and turf cause emissions both from the land use and from the operations that maintain them. The City's natural asset calculation tool currently includes a factor for farmland that includes both the operations and the land use. However, the scope of the GHG inventory only includes the natural asset land use, not the emissions from operations to maintain. Since the inventory and the tool used to calculate emissions impacts are not aligned, the tool could not be used for quantification purposes.

Appendix C - Key Terminology

Adaptation - Lowering the risks and negative impacts and embracing potential opportunities associated with climate change so that communities and ecosystems are prepared to cope with new climate conditions.

Climate Resilience - The ability to prepare for, recover from and adapt to severe weather; ocean warming and acidification; extended periods of drought and extreme temperatures, and other deleterious effects of climate change.

Community Carbon Budget - The amount of GHG emissions permitted for the municipality of Edmonton based on emission targets over a period of time.

Community Carbon "Fair" Share Budget - The amount of GHG emissions permitted for the municipality of Edmonton, over a period of time, based on C40's methodology to assign a "fair" proportion of the global carbon budgets to C40 cities.

Corporate Carbon Budget - The amount of GHG emissions permitted from City-owned and operated assets and operations based on emission targets over a period of time.

Current State Emissions - The amount of GHG emissions inventory (emissions actuals for the years 2015 to 2021) plus the long term emission forecast amounts (for the years 2022 through to 2050).

Carbon Capture - A process where carbon dioxide (CO2) is separated (captured) from industrial and energy sources, and can be either stored and used to create a new product.

Carbon Deficit/Surplus - The annual difference between GHG emissions and the emission targets. A deficit implies that the current state emissions are greater than the target emissions. For future forecast purposes the deficit/(surplus) is measured against the forecasted emissions.

Carbon Neutral - A carbon neutral community or corporation is where the net per-person greenhouse gas emissions is zero. Carbon neutral energy is energy with net zero greenhouse gas emissions.

Decarbonization - The process of stopping or reducing the release of greenhouse gases into the atmosphere.

District Energy System - Local, centralized energy systems that produce and distribute thermal energy (heating and/or cooling) for customer use.

Embodied Carbon - The total of all GHG emissions that result from the manufacture and supply of construction products and materials, as well as the construction process itself.

Energy Model - A study that is done on a building to estimate the proposed energy use of a building after construction or a retrofit. These are the most accurate way to determine the emissions associated with new construction or a retrofit project.

Emission Targets - Desired levels of maximum annual GHG emissions based on a percentage reduction from the 2005 baseline year to achieve GHG emission goals.

Emissions Neutral/Emissions Neutral Building - An Emissions Neutral building is a building that is highly energy efficient and: a) uses only Renewable Energy for its operations on an annualized average basis (this may include either on or offsite generated Renewable Energy), OR b) produces and supplies onsite Renewable Energy in an amount sufficient to offset the annual greenhouse gas emissions associated with the energy consumed for its operations.

Enabling - Refers to the indirect emissions impact of a project. A project or initiative that would not have a direct impact on GHG emissions within a pathway, but rather support other work to be done to either increase or decrease emissions.

Energy Transition - A risk management approach designed to: (1) diversify a community's energy mix and reduce its dependence on fossil fuels, (2)reduce greenhouse gas emissions to levels that are consistent with limiting the long-term rise in the average global temperature to 2°C, (3) ensure energy delivery systems (for electricity and natural gas) are resilient and durable to the forces of climate change, (4) increase self-sufficiency with respect to its electrical power and heating needs and (5) position itself to participate in what is potentially the largest economic opportunity humankind has ever experienced

Green Electricity - Electricity that comes from natural sources such as sunlight, wind, rain, tides, plants, algae and geothermal heat. These energy resources are renewable, meaning they are naturally replenished.

Greenhouse Gas (GHG) - Gases such as carbon dioxide, methane and nitrogen oxide which actively contribute to the atmospheric greenhouse effect. GHGs also include gases generated through industrial processes.

Low-Carbon Energy - Energy that is produced using significantly lower amounts of carbon dioxide emissions than is emitted from fossil fuel energy.

Nature-Based Solutions - Actions to protect, sustainably use, manage and restore natural or modified ecosystems, which address societal challenges, effectively and adaptively, providing human well-being and biodiversity benefits.

Emission reductions - emission reductions (or GHG removal) is the opposite of GHG emissions. Emission reductions refers to eliminating or reducing sources of emissions that currently exist or are expected to occur.

Net Zero - Net zero emissions are achieved when emissions of greenhouse gases are balanced by removals. Emissions should be reduced as close to zero as possible and remaining emissions would be balanced by an equivalent amount of carbon removal, through nature-based solutions or technology.

Renewable Energy - Energy that is obtained from natural resources that can be naturally replenished or renewed within a human lifespan. These resources include moving water, wind, biomass, solar, geothermal, and ocean energy.

Renewable Natural Gas - Renewable source of methane gas (the primary component of natural gas) created through the breakdown of organic matter in the absence of oxygen. There are many different processes and waste types that can be used to produce renewable natural gas.

Sequestration - Capturing and storing greenhouse gases in natural assets such as plants and vegetation, which reduces the amount of greenhouse gases in the atmosphere.

Social cost of carbon - An estimate of the economic damages associated with a small increase in carbon dioxide emissions (conventionally one metric tonne).

Solar PV - Photovoltaic cells (also known as solar panels) are semiconductors made up of silicon atoms that convert the sun's energy into electricity.