

FALL 2024 CARBON BUDGET UPDATE

2023-2026 Carbon Budget

Recommendation			
That the November 13, 2024, Financial and Corporate Services report FCS02532, be received for information.			
Requested Action		Information only	
ConnectEdmonton's Guiding Principle		ConnectEdmonton Strategic Goals	
CONNECTED This unifies our work to achieve our strategic goals.		Climate Resilience	
City Plan Values	PRESERVE		
City Plan Big City Move(s)	Greener as we grow	Relationship to Council's Strategic Priorities	Climate adaptation and energy transition
Corporate Business Plan	Managing the corporation		
Council Policy, Program or Project Relationships	<ul style="list-style-type: none"> • C567 - Green Building • C594 - Open Space Policy • C627 - Climate Resilience and related procedures • Community Energy Transition Strategy • Climate Resilient Edmonton: Adaptation Strategy and Action Plan 		
Related Council Discussions	<ul style="list-style-type: none"> • November 14, 2022, Financial and Corporate Services report FCS01478, 2023-2026 Carbon Budget 		

Executive Summary

- On November 14, 2022, Council was presented with the City of Edmonton's first carbon budget for the 2023-2026 budget cycle, one of the first municipal Carbon Budgets in Canada. The Fall Carbon Budget Update provides an annual update to the 2023-2026 Carbon Budget.
- The Fall Carbon Budget Update includes qualitative and, when possible, quantitative evaluations of the greenhouse gas (GHG) emission impacts for each budget request within

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the proposed 2024 fall supplemental capital, operating and utilities budget adjustments and can be used to inform financial investment decisions. The carbon budget is presented for information to augment capital and operating budget decisions.

- The majority of significant climate initiatives funded in the 2023-2026 budget cycle remain in the carbon budget and are not impacted significantly by the budget adjustments being submitted this fall.
- The 2023 Community GHG Inventory results show that 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 (CO₂e) or less in 2023. This target was not met, as 2023 community emissions in Edmonton were calculated to be 16.2 million tCO₂e. This is a 9.3 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.
- 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 from 2005 which is better than the target of 35 per cent by 2030.
- The Fall 2024 Carbon Budget Update evaluated the proposed actions to mitigate structural budget variances in the 2024 Fall Supplemental Operating Budget Adjustment and while the majority of the initiatives have no ability to impact GHG emissions, the cancellation of the Home Upgrades Program (Energy Poverty) will eliminate potential community emissions savings that would positively impact the carbon budget in 2025 and 2026. The ongoing reduction beyond 2026 will limit the opportunity for the City to extend or launch new community programs.
- This budget update also includes the impact of the removal of the Renewable Energy credits from the Carbon Budget for 2024 and 2025.

REPORT

In fall 2022, Administration presented the 2023-2026 Carbon Budget with the proposed capital and operating budgets, to inform and augment Council's financial decisions by providing qualitative and, when possible, quantitative assessments for the GHG emission impacts for each budget request within the proposed 2023-2026 operating and capital budgets.

The carbon budget helps guide decision-making and actions by providing additional carbon emissions information. GHG emission impacts for each budget request within the 2023-2026 capital, operating and utility budgets were used to inform financial decisions throughout the budget deliberation process. The carbon budget is not the same as a capital or operating budget, 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 City's multi-year approach to the Carbon Budgeting and Accounting Framework, the 2024 Fall Carbon Budget Update provides the annual update to the 2023-2026 Carbon Budget.

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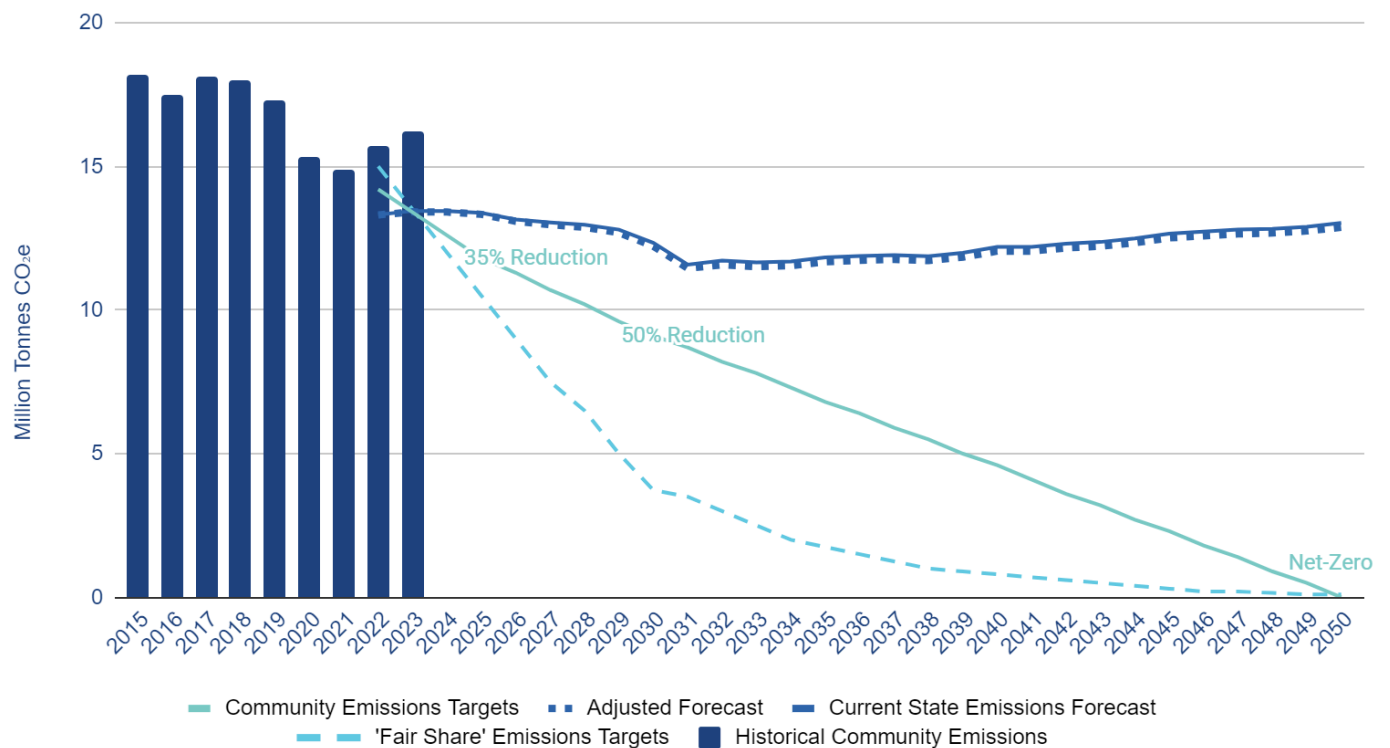
Following the same cycle as the capital and operating budget adjustments, the carbon budget is presented every four years with an annual update in the fall, along with the supplemental operating (SOBA) and capital (SCBA) budget adjustments. This fall update also includes assessments for the capital budget adjustments approved by Council in spring 2024 as well as any Council decisions made in fall 2023 that impact the Carbon Budget.

2024 Fall Carbon Budget Update

The 2023-2026 Carbon Budget (Attachment 1) shows further action is needed to achieve community and corporate carbon emissions targets. Overall, the results of the proposed fall 2023 capital, operating and utility budget adjustments are not significantly improving nor contributing to current GHG emission levels.

Community Emission Update

Community Carbon Budgeting - 2024 Budget Updates



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 (CO₂e) or less in 2023. This target was not met, as 2023 community emissions in Edmonton were calculated to be 16.2 million tCO₂e (14.2 tonnes per person). This is a 9.3 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. Based on this adjusted forecast, the year when the community carbon budget is forecasted to be depleted is 2036, one year

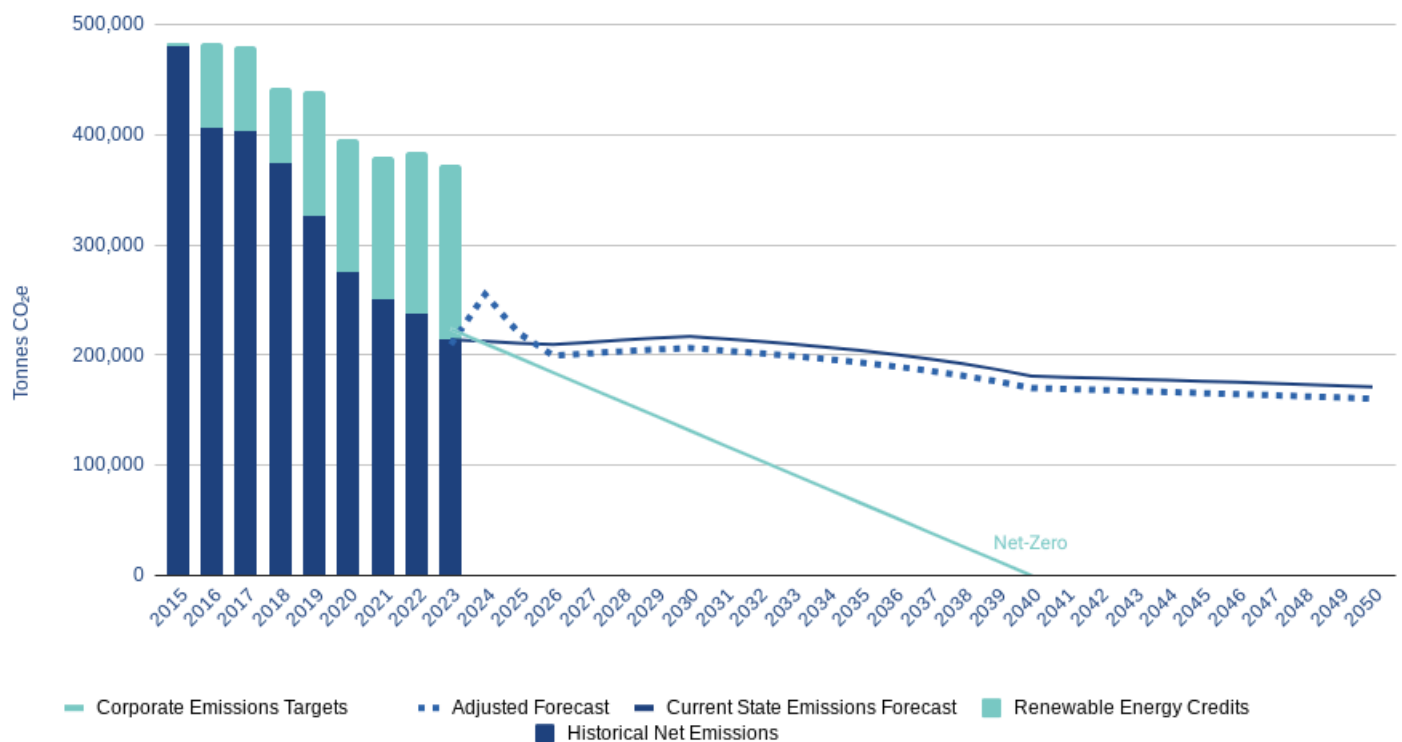
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earlier than forecasted in the 2023-2026 Carbon Budget. It is important to note that the increases observed in 2023 emissions are primarily due to increases in energy use in sectors that were impacted by the pandemic; specifically buildings, industrial, 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.

The Fall 2024 SOBA identifies proposed actions to mitigate structural budget variances. These have been evaluated for carbon impacts in Appendix A of Attachment 1. The majority of the initiatives have no ability to impact GHG emissions. However, the proposed cancellation of the Home Upgrades Program (Energy Poverty), (this program has not yet launched and its cancellation would not result in increased emissions in the Carbon Budget) would eliminate potential community emissions savings that would positively impact the carbon budget. 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 our ability to meet emission reduction targets. Additionally, the option to defer transit service improvements outlined in Attachment 7 (Options to address the Transit Fare Revenue Gap) of the Fall 2024 SOBA would also negatively impact community emissions as service levels will not be maintained to keep up with growth.

Corporate Emissions Update

Corporate Carbon Budgeting - 2024 Budget Updates



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A majority of the adjustments brought forward within the spring and fall supplemental capital budget adjustment process are for the Project Development and Delivery Model (PDDM) 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 reduced resulting in scope changes.

The approved 2024 Spring SCBA also has a minimal impact on the carbon budget; however, it included the largest GHG reductions in this year's cycle: the approval of the Kathleen Andrews Transit Garage Solar PV & Battery Projects and the Fire Station 7 (Highlands) Building Rehabilitation, resulting in emissions reductions of 74 and 41 tonnes of CO₂e respectively.

The accelerated timeline for depletion also applies to the corporate carbon budget, which is now forecasted to be depleted in 2032 instead of 2033.

During the fall 2023 budget deliberations two motions were passed that impacted the Corporate Carbon Budget.

The first motion was for the operating expenditure budget for Renewable Energy Credits (RECs) to be decreased by \$3.3 million for 2024 and 2025. Preliminary analysis of a \$3.3 million reduction of the REC budget results in the corporation only purchasing about 20 per cent 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. In late 2025, a wind farm constructed under a renewable attributes purchase agreement is expected to be fully operational. The commissioning of this wind farm and the City's acquisition of RECs from the wind farm may enable the City to offset more GHG emissions than in 2024; however not all corporate electricity emissions are expected to be covered by this agreement. The City's acquisition of RECs from this wind farm facility is expected to bring the corporate emission forecast back down to the line reported in this year's Carbon Budget Update.

The second motion was to add 50,000 annual bus service hours for Edmonton Transit Service 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 2026. Implementation of the mass transit network supports reducing community emissions by providing Edmontonians 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 services 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.

Community Insight

The 2023 Climate Change and Energy Perception Report found that 74 per cent of respondents agree climate change is a concern, and 73 per cent of respondents agreed immediate action is needed, and must be considered with all of the competing priorities. These results are stable relative to a year ago, and relative to five years ago.

Perspectives from Edmontonians regarding the 2023-2026 budget are outlined in the October 31, 2022, Communications and Engagement report CE01489, Budget 2023-2026 Community Insights. One key theme from this engagement was that participants are concerned about the future and want the City to set long-term plans that take action to improve environmental sustainability and address impacts of climate change.

Additionally, through engagement on The City Plan and to update the Community Energy Transition Strategy, Edmontonians shared their excitement and desires for a low-carbon future. However, there is no clear consensus on actions, approaches and timing.

Administration gathered feedback and input in the development of the carbon budget and accounting framework through discussions with the Energy Transition Climate Resilience Committee. Overall the committee supported the City's direction with the development of the framework and provided valuable insight into further developing the process and their feedback led to some of the process improvements included in this carbon budget update.

GBA+

Finding statements from GBA+ research for the City's Energy Transition Strategy include:

- People and families experiencing low-income are disproportionately impacted by climate change because they lack the financial means to implement mitigation and adaptation measures in their homes and communities.
- Women, Indigenous, black and other marginalized people and groups will experience the impacts of climate change more than non-marginalized people and groups as they may already be subject to socio-economic inequalities, and climate change can cause an increase in exposure and susceptibility to the adverse effects of climate change as well as decrease the ability to cope and recover from damages suffered.

The University of Alberta completed research¹ to explore community vulnerability and resilience in Edmonton in 2021. Finding statements from this research include:

- Older adults are at higher risk from weather and air pollution events.
- Social deprivation (limited interaction with society) and material deprivation (limited ability to afford goods and services) affect sensitivity to weather events and air pollution.

Actions to address these findings are outlined in the Energy Transition Strategy.

¹ CitiesIPCC. "Climate Change, Older Adults And Immigrants: Exploring Community Vulnerability And Resilience. Final report," August 31, 2021

Environment and Climate Review

This report provides an annual update of the carbon budget based on the proposed 2024 fall supplemental capital, operating and utilities budget adjustments. See Attachment 1 for a detailed analysis of emission impacts, with key climate implications summarized as follows:

- **Budget and carbon accounting adjustments:** The proposed adjustments to the fall 2024 capital, operating, and utility budgets are not expected to significantly affect current GHG emission levels in a way that hinders or advances the City's progress to date.
- **Carbon budget depletion:** The Carbon Budget continues to deplete at a rate that is not likely to enable the City to meet established carbon reduction targets (Table 9 of Attachment 1).
- **Deficit implications:** The carbon budget measures total GHG emissions and establishes a path and target date for the corporation and community to achieve carbon neutrality. Delaying progress toward this goal or experiencing annual carbon deficits may increase future investment costs to address these shortcomings.

Climate Considerations for Fall 2024 Budget Update

- **Energy poverty and climate resilience:** As Edmonton continues to experience extreme weather events resulting from climate change, the energy requirements for heating and cooling homes will increase, disproportionately affecting low-income and marginalized communities. These groups are often most impacted by climate change and require support through programs that improve energy efficiency and lower utility costs. Ensuring equitable access to climate resilience initiatives is highlighted in Strategic Principle #7 of the Climate Resilient Edmonton: Adaptation Strategy and Action Plan.
- **Public transportation and land use efficiency:** Providing transit service achieves GHG reduction targets through increased ridership and improved land use efficiency. ETS ridership is projected to reach 60 million in 2024, growing from 53 million in 2023². Adequate public transportation encourages higher-density development, which reduces growth in the developing area over the long term. This urban density shift lowers the pressure for greenfield development, protects natural habitats and agricultural land, and reduces the need for new road networks, which conserves resources and reduces environmental impact.
- **Natural infrastructure maintenance:** Advancing the transition towards lower-emissions and emissions-neutral fleet and equipment will be required to support the maintenance of natural infrastructure and decrease the associated GHG emissions currently estimated in the 2024 Fall Carbon Budget Update. Additionally, prioritizing the naturalization of eligible grassy areas and shrub beds would help reduce maintenance requirements and contribute to the City's Climate Resilience goals as per the developing Naturalization, Restoration & Reclamation Plan.

² City of Edmonton. "Transit Ridership Outpaces Population Growth." [News Release](#). October 8, 2024.

Environmental Outcomes of Climate Action

Climate action is intrinsically connected to environmental outcomes. Failure to meet GHG reduction targets could have a range of general environmental and social implications, spanning the following:

- **Habitat alteration and ecosystem disturbances:** Changing climatic conditions, such as altered temperature and precipitation patterns, are expected to cause a shift in species distributions as plants and animals respond to these new conditions. Changes in ecosystem interactions are anticipated as behavior and population dynamics change because of altered food and/or habitat provisions³.
- **Invasive species and disease risks:** New climatic conditions can create favorable environments for invasive species to establish, which has the potential to outcompete native species. Similarly, a warming climate may increase pest and disease risks as already witnessed through the recent spread of Dutch Elm disease and the emerald ash borer from eastern to western Canada^{4,5}. The City has robust monitoring programs for these and other concerns, and has taken action to limit the spread of a recent instance of Dutch Elm disease.
- **Biodiversity loss:** The combination of habitat alteration, the introduction of invasive species, and changing climatic conditions in which species are maladapted may lead to declines in biodiversity⁶. This loss can undermine the overall resilience of ecosystems and their ability to provide essential ecosystem services.

Environmental Benefits of Planning and Policy Changes

Attachment 1 also discusses the significance of Zoning Bylaw 20001 in relation to climate resilience, where recent urban planning improvements better align with and help facilitate The City Plan's "Greener as we Grow" strategic commitment. A sustained commitment to advancing projects and plans that support The City Plan, Edmonton's Community Energy Transition Strategy and Action Plan, and other relevant strategic objectives can help the City achieve the following environmental benefits:

- **Conserving land:** Prioritizing dense urban development can minimize land conversion and reduce greenfield developments at the edges of the city. This helps protect valuable agricultural land and natural greenspaces.
- **Ecological services:** The river valley and ravine system is a significant ecological network that provides ecosystem services such as water and air purification, surface water runoff mitigation, and ambient air cooling to reduce urban heat island effects. Protecting and enhancing natural area connectivity in the river valley and ravine

³U.S. Environmental Protection Agency. (2024). Climate change impacts on ecosystems. <https://www.epa.gov/climateimpacts/climate-change-impacts-ecosystems>

⁴Canadian Food Inspection Agency. (2024). Dutch elm disease. Government of Canada. <https://inspection.canada.ca/en/plant-health/invasive-species/plant-diseases/dutch-elm-disease>

⁵Natural Resources Canada. (2024). Emerald ash borer. <https://natural-resources.canada.ca/our-natural-resources/forests/insects-disturbances/top-forest-insects-and-diseases-canada/emerald-ash-borer/13377>

⁶IPCC (2014). "Climate Change 2014: Impacts, Adaptation, and Vulnerability." Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.

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systems will continue to support biodiversity by providing sufficient core wildlife habitat and linkages.

- **Natural infrastructure:** The installation and preservation of existing trees and shrubs encourages environmental stewardship during new development, protects existing natural infrastructure, and helps support Edmonton's Urban Forest Management Plan.

Attachment

1. Carbon Budget - Fall 2024 Update