

# Responses to City Council Questions on the 2023–26 Proposed Carbon Budget

Parameters:

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Question removed due to duplication:

- 23-006CB

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-001CB

**Document Page #:** 41

**Asked By:** Councillor Stevenson

## **Question:**

- a) How much carbon could be saved if capital projects that were approved before Policy C627 and are still at design stage were required to be emissions neutral?
- b) What would the capital cost implications of this approach be (as an order of magnitude or percentage)?
- c) What would the potential operating savings be (as an order of magnitude or percentage)?

## **Answer:**

**Planning and Environment Services Branch**

a) There are no projects that are funded in the budget that are still at design stage which were approved before Policy C627. However, there are two capital projects that are in the early construction stages.

Lewis Farms Community Recreation Centre and Library - quantified to emit 1,400 tonnes CO<sub>2</sub>e annually therefore if this project were to be re-designed as emissions neutral it would eliminate these emissions.

Valley Zoo - Nature's Wild Backyard Phase II - not quantified due to a lack of data, no energy model completed at this point in time.

b) The capital cost associated with transitioning these projects to emissions neutral projects are:

Lewis Farms Community Recreation Centre - This project is currently designed to meet C532 requirements including LEED Silver. Meeting Policy C627 would require significant redesign. In addition to the changes to meet the emissions neutral requirement, the design would need to be updated to meet all current codes, legislation and other City policies that have evolved and changed since design was started six years ago. The design cost for this update is estimated at \$20 million (-50% to +100%). In addition, this could increase the schedule by 2 to 4 years. The percentage increase for the construction cost to comply with C627 is difficult to estimate without a better understanding of the design implication. At a high level, the construction cost could increase by 25% to 50% (\$50 to \$100 million). These costs would include all changes required to meet current codes, legislation and other City policies, not only those required for C627.

Valley Zoo - Nature's Wild Backyard Phase II - Meeting Policy C627 would require significant redesign for Nature's Wild Backyard Phase 2 as the project is currently designed to meet the Sustainable Building Policy C532 which is a target of LEED silver. The "Under Building" is the only structure, (of 4) over 600 sq.m, that the C627 policy would apply to. As part of the design validation stage the project team has requested that the Prime Consultant complete a comparative analysis, reviewing the feasibility of the current design to meet the C627 policy. This analysis will be complete in Q1 2023, but at a high level, we believe the percentage increase for the capital cost to comply with C627 could be in the 25% to 50% range for redesign costs and construction costs. This could equate to a \$10 to \$20M impact on this project. These costs would include all changes required to meet current codes, legislation and other City policies, not only those required for C627. In addition, this could increase the schedule by a year.

c) The potential annual operating cost savings from redesigning the Lewis Farms Community Recreation Centre and Library to be emissions neutral is estimated to be \$650,000 annually due to electricity and natural gas savings based off of the energy model completed in January 2021.

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Annual savings for Valley Zoo - Nature's Wild Backyard Phase II cannot be determined at this time due to the lack of an energy model.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-002CB

**Document Page #:** 25

**Asked By:** Councillor Stevenson

**Question:**

How was the carbon impact of induced vehicle travel incorporated into the assessment of enabling emission impacts for projects in the Road Composite?

**Answer:**

**Planning and Environment Services Branch**

Induced vehicle travel was primarily incorporated into the direct emissions assessment when a profile increases or decreases road capacity for projects and was included in the Road Composite when calculated.

Induced travel was estimated considering the tailpipe emissions from additional vehicle kilometer traveled for profiles in road composite, both i) congestion reduction, and ii) induced demand (where added road capacity leads to new vehicle travel) were considered simultaneously as part of the assessment. It is expected that once completed, during the early years of the project induced demand will likely play a role in increasing the vehicle kilometer traveled. The longer-term direct GHG impacts for road composite profiles are unquantified at this time.

For Enabling emission impacts, no quantification assessments were undertaken, only qualitative. Two types of induced impacts were considered: (1) induced impacts on future growth which considers the impacts on future growth targets, and (2) induced impacts on future travel, which considers the potential long-term impacts the profiles may have on travel demand and travel pattern changes.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-003CB

**Document Page #:** 25

**Asked By:** Councillor Stevenson

## **Question:**

Pages 25 and 43 note that the Terwillegar Drive Expressway is included in the Road composite, however page 71 indicates that this project was part of the Transit Composite.

- a) Could you clarify which composite this project was included in when assessing the net GHG impact of each composite?
- b) Recognizing that this project includes both roadway and transit components, could you clarify how the overall emissions impacts were assessed?

## **Answer:**

**Planning and Environment Services Branch**

The Terwillegar Drive Expressway is included in the Road Composite and is correct on Pages 25 and 43. Page 71 is an error and should state "Part of Road Composite 12,800".

a) Although categorized as a "Road Composite" Terwillegar Drive Expressway includes multiple components including the transit specific impacts. To assess the road composite emission impacts, all the components (road widening, interchange upgrade, dedicated bus lanes, the shared use path, and the 142 St. pedestrian/cyclist bridge) of the Terwillegar Drive Expressway profile were considered.

b) The Edmonton Regional Travel Model (RTM) is an analytical platform designed to simulate travel activities occurring within the Edmonton metro region based on the household composition, their socioeconomic and demographic characteristics, amenities and opportunities available across the Edmonton region. The Edmonton RTM was used to assess overall emission impacts in two steps.

In Step 1, the impacts on travel pattern and resultant changes in vehicle kilometers traveled and transit service hours were estimated for:

- Road Congestion: Reduction in congestion (or improve traffic flow) due to an increase in roadway capacity. Resultant Carbon Impacts - Decrease emissions;
- Induced Demand: Development of "Induced Demand" due to an increase in roadway capacity. Resultant Carbon Impacts - Increase emissions;
- Transit Ridership: Increase in transit ridership due to the new transit service (e.g., Bus Rapid Transit (BRT) service on Terwillegar Drive). The increase in ridership considers both transfer of existing transit users to the BRT and the travel mode shift from driving to new transit facility. Resultant Carbon Impacts - Decrease emissions;
- Active Mode Use: Increase in active mode use due to the new shared use path and the new ped/bike bridge over the whitemud drive. Resultant Carbon Impacts - Decrease emissions.

In Step 2, changes in fuel consumption and resultant impacts of tailpipe emissions were estimated based on travel patterns changes estimated in Step 1.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-004CB

**Document Page #:** 100

**Asked By:** Councillor Stevenson

**Question:**

- a) Am I correct in understanding that the Transit Composite did not assume a shift to a carbon neutral fleet?
- b) Have we quantified the carbon savings of switching to an emissions neutral fleet?

**Answer:**

**Planning and Environment Services Branch**

a) The transit composite did not quantify emission impacts of adopting a carbon neutral transit fleet.

b) The carbon savings of switching to an emissions neutral transit fleet were not quantified as part of carbon budgeting due to the lack of budget profiles prepared that include the purchase of carbon neutral transit fleet vehicles. Pilot projects, such as budget profile CM66-3600 were not calculated based on materiality.

The total City of Edmonton vehicle fleet emitted 108,000 tonnes CO<sub>2</sub>e in 2021, 27% of the total corporate 2021 emissions (this includes transit, waste and other City owned/leased vehicles). This is a current state snapshot, and does not account for fleet growth.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-005CB

**Document Page #:** 9

**Asked By:** Councillor Tang

**Question:**

For the 60 actions in the Energy Transition strategy - 90% have commenced. What are the 10% that haven't started? What are the factors preventing them from starting?

**Answer:**

**Planning and Environment Services Branch**

There are 60 actions in the Energy Transition Strategy with an implementation start timeframe of 2021-2022. Approximately 90% of those actions have commenced as they were partially funded in the previous budget cycle 2019-2022. The remaining actions that have not yet started are:

- Action 1.1 Engage in ongoing dialogue with Memorandum of Understanding partners on ownership and participation opportunities of Indigenous Peoples in the energy transition;
- Action 1.2 Advocate for a low cost and low carbon energy supply for Edmontonians and businesses;
- Action 3.6. Apply greenhouse gas emissions mitigations and sustainability and resilient elements to urban renewal projects and urban redevelopment;
- Action 4.5 Establish a nature based solutions framework and program for the City of Edmonton
- Action 5.4 The City updates the Civic Operations GHG Management Plan to align with the updated Energy Transition Strategy outcomes;
- Action 5.6. The City aligns its policies and standards related to planning, development, construction, and procurement/supply chain with the goal of climate resilience; and
- Action 5.7. The City establishes an internal Climate Action Leadership Task Force to support accelerated and focussed climate action.

The reason these initiatives have not started is due to staff resourcing levels, complexity of the initiative and the need to work with multiple implementation partners. Administration has flagged as corrective actions the need to activate climate resilient urban development, as well as develop an advocacy and partnership strategy (which is currently under development, and Administration has been advocating and working with implementation partners as opportunities become available).

There are an additional 40 actions that are set to be implemented in 2023-2026. There are various unfunded capital profiles and operating packages that are required for implementation of these actions.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-006CB

**Document Page #:** 13

**Asked By:** Councillor Tang

**Question:**

How much of remaining 98% in the community emissions is residential vs. Commercial vs. Industrial? How can carbon budgeting be better utilized as a tool if we can't quantify GHG for projects in planning stages?

**Answer:**

**Planning and Environment Services Branch**

Community emissions represent 98% of Edmonton's total emissions. In 2021, the breakdown of those community emissions are: buildings (about 37 per cent of total emissions, with residential buildings being 19 per cent and commercial and institutional buildings being 18 per cent), transportation on and off road (about 33 per cent of total emissions), industry including manufacturing and construction (about 24 per cent of total emissions), other sources including community waste, fugitive emissions, and agriculture, forestry and other land use (about 6 per cent of total emissions).

This was the first iteration of completing a carbon budget alongside financial budgets. The carbon budgeting process will continue to evolve as the organization matures. Similar to financial budgeting of projects, that ability to estimate costs improves as the project moves through the different stages. Administration will need to implement various activities such as implementing carbon checks (so as the initiatives move through different stages, the ability to quantify emissions will improve), assessing decision-making points and developing new quantification methodologies. Carbon implications can also be further integrated into decision making processes, such as including as options in business cases.

As the City develops new policies that require emissions neutrality/net zero, such as C627 that requires newly constructed buildings to be emission neutral, quantification of emissions will be simple at the planning stage.

# Responses to City Council Questions on the Proposed Carbon Budget

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**Document:** Carbon Budget Book

**Question #:** 23-007CB

**Document Page #:** 14

**Asked By:** Councillor Tang

**Question:**

Can you please clarify "The 2023-2026 proposed capital, operating and utility budgets..." bullet - Is 140,000 tonnes CO<sub>2</sub>e overall net? Or are there also projects increasing GHG which create neutral impact?

**Answer:**

**Planning and Environment Services Branch**

140,000 tonnes CO<sub>2</sub>e is the overall net reduction in emissions over 2023-2026 (the sum of total net impact each year for 4 years) based on the quantifiable proposed budget requests recommended for funding across the capital, operating, and utility budgets. Within that, there are some projects that increase emissions and some that decrease. Examples of many of the items included can be found on Table 2, Page 28 of the 2023-2026 Carbon Budget, which outlines proposed budget requests that have significant quantifiable GHG emissions impacts.

# Responses to City Council Questions on the Proposed Carbon Budget

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**Document:** Carbon Budget Book

**Question #:** 23-008CB

**Document Page #:** 20

**Asked By:** Councillor Tang

**Question:**

Step 4 develop strategy to achieve targets: Isn't this strategy the Energy Transition Strategy? Are there additional strategies? Or strategies specific to individual projects?

**Answer:**

**Planning and Environment Services Branch**

Yes, the Energy Transition Strategy (approved by Council in 2021) is the strategy in Step 4 "Develop Strategy to Achieve Carbon Targets." The next step required in Step 4 is to implement the strategy. Dynamic implementation is required. Administration will present Council with "corrective actions" when GHG emission reduction progress is not achieved such as the June 15, 2022 Executive Committee Community Energy Transition Strategy - Annual Report (UPE00604). The Community Energy Transition Strategy and Action Plan is required to be reviewed every five years and updated as needed to stay relevant and to meet City Charter requirements.

# Responses to City Council Questions on the Proposed Carbon Budget

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**Document:** Carbon Budget Book

**Question #:** 23-009CB

**Document Page #:** 23

**Asked By:** Councillor Tang

**Question:**

"Professional judgment and subject matter expertise was used" - are the SMEs internal or external?

**Answer:**

**Planning and Environment Services Branch**

For the qualitative assessments identified on page 23 of the carbon budget, the assessments were completed by internal subject matter experts. In some cases, information from external subject matter experts was used to inform these assessments.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-010CB

**Document Page #:** 24

**Asked By:** Councillor Tang

**Question:**

In the event that we can't have quantifiable data - what about requiring some principles or assumptions embedded with the projects? (I.e., retrofits for renewal projects as a baseline)

**Answer:**

**Planning and Environment Services Branch**

Administration added the qualitative data to provide emissions impacts in the absence of quantifiable data.

In the case of City owned new construction, the City's Climate Resilience Policy C627 requires that all new construction be built to an emissions neutral standard. Therefore no quantification, beyond an assumed emissions impact of zero tonnes was completed for new construction projects designed after the implementation of C627.

Administration will continue to evolve the carbon budgeting process as well as review where policy changes are needed to support the City's climate resilience efforts:

- Administration will need to implement various activities such as implementing carbon checks, assessing decision-making points and developing new quantification methodologies. Carbon implications can also be further integrated into decision making processes, such as including carbon budget requirements into business cases.
- The Energy Transition Strategy identified 5 Levers of Change, one of which is "Policy and Regulation" that can guide, direct, manage or shape how we provide strategic direction for land, infrastructure or service to influence or change the behaviour of residents and markets. Policy changes may be required to embed climate resilience into projects
- Unfunded Operating Service Packages that support climate resilience (energy transition or adaptation) tools, decision making and policy changes include: Energy Transition Strategy Implementation Composite (pg. 239), Supplemental Community Energy Transition Implementation (pg. 241), Supplemental Corporate Energy Transition Implementation (pg. 243), Climate Adaptation Strategy Implementation Composite (pg. 238), and Supplemental Corporate Adaptation Implementation (pg. 242)

# Responses to City Council Questions on the Proposed Carbon Budget

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**Document:** Carbon Budget Book

**Question #:** 23-011CB

**Document Page #:** 25

**Asked By:** Councillor Tang

**Question:**

Can you please incorporate the unfunded Bike Plan into the active mode composite for comparison purpose?

**Answer:**

**Planning and Environment Services Branch**

The current unfunded capital profiles and service packages related to Bike Plan implementation focus on rapid completion of district connector routes within the redeveloping areas and select neighbourhood routes in higher ridership potential areas. The reported emission impacts of the active mode composite included these unfunded packages along with the funded and near term priorities. If left unfunded, the reported GHG emissions impacts (700 tonnes CO<sub>2</sub>e reduction) will be less. At this time, no separate emission impacts estimation are available for the funded and near term priorities.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-012CB

**Document Page #:** 27

**Asked By:** Councillor Tang

**Question:**

Will carbon budgeting be done for ad hoc projects / service packages to council outside of budget? How can we incorporate the practice of carbon budgeting as part of the day-to-day planning at the city?

**Answer:**

**Planning and Environment Services Branch**

Yes, Administration will implement both a carbon budget and a carbon accounting framework. The carbon accounting framework will incorporate carbon impacts into day-to-day planning and decision making throughout City process; continued implementation will occur throughout 2023.

Administration will continue to evolve the carbon budgeting process as well as review where policy changes are needed to support the City's climate resilience efforts:

- Administration will need to implement various activities such as implementing carbon checks, assessing decision-making points and developing new quantification methodologies. Carbon implications can also be further integrated into decision making processes, such as including carbon budget requirements into business cases.
- The Energy Transition Strategy identified 5 Levers of Change, one of which is "Policy and Regulation" that can guide, direct, manage or shape how we provide strategic direction for land, infrastructure or service to influence or change the behaviour of residents and markets. Policy changes may be required to embed climate resilience into projects
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# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-013CB

**Document Page #:** 42

**Asked By:** Councillor Tang

**Question:**

Can you please clarify: "Building Energy Benchmarking program:" -How is uptake or interest in participating in this program? What is the participation rate?

**Answer:**

**Planning and Environment Services Branch**

Edmonton's Building Energy Benchmarking Program improves building energy efficiency, and supports building owners and operators to reduce their energy consumption and greenhouse gases by providing owners with information about their building. The program was established in 2017, and over the past 5 years the program uptake has grown by more than 400% in total number of participating properties and more than 600% in total number of buildings. As of 2022 there are 704 buildings participating representing 5.9 million square meters of floor area. Administration has estimated that about 2% of commercial and institutional buildings are participating in the Benchmarking program, however these participants represent approximately 20% of the total GHG emissions for commercial and institutional buildings in the City.

Program growth over 5 Years (some buildings participate year over year):

- Year 1: 83 Properties representing 99 buildings (of the 21 participating organizations), representing total emissions of 389,000 tonnes CO<sub>2</sub>e and 2.02 million square meters.
- Year 2: 159 properties representing 184 buildings (of the 30 participating organizations), representing total emissions of 540,000 tonnes CO<sub>2</sub>e and 2.76 million square meters.
- Year 3: 184 properties representing 249 buildings (of the 36 participating organizations), representing total emissions of 630,000 tonnes CO<sub>2</sub>e and 3 million square meters.
- Year 4: 328 properties representing 424 buildings (of the 56 participating organizations), representing total emissions of 564,000 tonnes CO<sub>2</sub>e and 4.74 million square meters.
- Year 5: 419 properties representing 704 buildings (of the 73 participating organizations), representing total emissions of 605,000 tonnes CO<sub>2</sub>e and 5.9 million square meters.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-014CB

**Document Page #:** N/A

**Asked By:** Mayor Sohi

**Question:**

The federal government's 2022 Fall Economic Statement proposes a refundable tax credit equal to 30 percent of the capital cost of investments in:

- Electricity Generation Systems
- Stationary Electricity Storage Systems that do not use fossil fuels in their operation
- Low-Carbon Heat Equipment, including active solar heating, air-source heat pumps, and ground-source heat pumps; and,
- Industrial zero-emission vehicles and related charging or refueling equipment, such as hydrogen or electric heavy duty equipment used in mining or construction.

Which specific existing City programs can help amplify this potential incentive?

Which of the unfunded capital and operating energy transition package(s) would be most synergistic and best positioned to leverage this potential incentive to maximize GHG reductions for our community?

**Answer:**

**Planning and Environment Services Branch**

Based on the information that was released in the 2022 Fall Economic Statement, this tax incentive will be targeted towards larger corporations including energy and hydrogen producing companies. Details are expected to be included in the 2023 Federal Budget that has not yet been released.

When developing city community focused programs, Administration considers incentives that other orders of government offer with the intent of strategically amplifying those incentives. Administration ensures local community programs do not duplicate other available incentives and where appropriate are stackable and complimentary to programs offered by others.

In addition to sharing information regarding this opportunity with our Corporate Climate Leaders Program and Energy Transition Leadership Network partners, this incentive is intended to encourage investment in Canada and it could be used to support the City's Economic Action Plan in attracting new businesses to Edmonton. This incentive program is also anticipated to assist consumers down the chain as clean technology becomes more accessible and the unfunded Supplemental Community Energy Transition Implementation (p 241) operating package would have the closest synergy to this potential incentive.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-015CB

**Document Page #:** N/A

**Asked By:** Mayor Sohi

**Question:**

With limited resources, can you provide some context on whether investments in corporate or community energy transition likely yield great GHG reductions and why?

**Answer:**

**Planning and Environment Services Branch**

Greenhouse gas emissions from City of Edmonton corporate operations make up approximately 2% of all Edmonton emissions, with the remaining 98% of emissions generated in the community. Community emissions are the greatest challenge and the most impactful GHG reductions in the community can often come from City of Edmonton policy changes. The policy, standards and infrastructure established through City of Edmonton decisions help shape the behaviour and future actions of the community.

There are different levers of change municipalities can use to take climate change actions. Some are more impactful than others. For example:

- Funding for the City of Edmonton to allow for changes in urban planning and development policy are critically important to reducing community emissions and to avoid locking in additional emissions (Energy Transition Strategy Implementation package pg 239)
- Funding for the City of Edmonton to allow for the development of a district energy bylaw to ensure buildings are ready to connect to district energy systems, and for developing policies and advocating for regulation to ensure regulation supports privately owned district energy systems in Alberta (Energy Transition Strategy Implementation package pg 239)
- Funding for infrastructure, such as the active transportation network and low carbon district energy systems are critical to support the broader community's transition to low carbon choices.

Policy changes are the final and most impactful step in market transformation. Policy allows for larger impacts for a relatively lower investment, when compared to individual incentives that require higher investment dollars.

To achieve the goals in the Energy Transition Strategy, all actions are necessary. Examples of the types of deliverables that are expected to be within the scope of the Energy Transition Integrated Composite Packages, including the Supplemental Corporate and Supplemental Community, are outlined in the Attachment.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-015CB

**Document Page #:** N/A

**Asked By:** Mayor Sohi

## **Scope of Energy Transition Strategy and Climate Adaptation Strategy Implementation Operating Service Packages**

### **Background**

An investment analysis for the community energy transition strategy identified public and private investments totalling \$41.7 billion over the next 30 years, because of the urgency to act to mitigate the effects of climate change, some of the investments have a higher front-end investment required for accelerated climate actions to reach economies of scale and support local market transformation. The City cannot tackle this challenge alone and private investment and other orders of government must also contribute. Edmonton's targeted share for implementation of the Energy Transition Strategy and Adaptation Strategy over the next four years was identified to be \$640 million for urgent, scaled up climate action. The combination of the unfunded capital and operating services packages for energy transition and climate adaptation represent approximately 90% of the City's targeted funding share for Energy Transition and 70% of the City's targeted funding share for adaptation and approval of all unfunded capital and operating services packages for climate would provide the best alignment to the timelines outlined in the strategies.

The climate file is changing rapidly and often as there are continuously emerging issues, information, and opportunities. The intent of composites is to have flexible climate action funds that will enable the City of Edmonton to be nimble and respond to changes, such as new funding opportunities announced by higher orders of government. Funds would also allow Council to direct funding to priority projects that need further climate action, that may not have funds fully allocated or dedicated.

Prioritization is crucial in order to make meaningful change with limited resources. Administration will develop a prioritization process to allocate funds in a transparent manner that supports the best acceleration opportunities, and includes check-ins with Council to ensure alignment with Council's priorities. This process will reflect best practices in the corporation such as the Business Technology Investments and governance approach (please refer to page 83 of the 2023-2026 Proposed Capital Budget), which has established governance, framework, guiding principles and processes to guide the delivery of business technology investments across the corporation

Work that will be delivered through these service packages will align with the actions in the respective climate strategies. Examples of the types of projects that are expected to be within the scope of each of the climate service packages are listed below.

### **Energy Transition Strategy Implementation (pg 239)**

This package would support new advocacy approaches to collaborate with and leverage relationships to activate energy transition strategy and development of a change management plan to reach the City's goal of becoming a carbon neutral corporation. It will advance at least one "Big Win" action from each of the strategy's four energy transition pathways. Examples of these initiatives are provided below.

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**Document Page #:** N/A

**Asked By:** Mayor Sohi

- Implementation of District Energy Strategy which represents a real time opportunity to support the delivery of a City-wide decarbonized district energy network in Edmonton. Implementation of this strategy with the funding in this composite includes ensuring buildings are ready to connect through the development of a district energy bylaw, completing feasibility studies and establishing procurement pathways to enable external partnership investment, developing policies and advocating for regulation to ensure regulation supports privately owned district energy system in Alberta and building a district energy database.
- Establishment of a Planning and Development Framework that includes tools, resources, guidelines and standards to catalyze energy transition practices through the city's urban development process. This includes identifying energy transition requirements throughout the entire planning and development continuum in order for Edmonton to transition to a low carbon community. This could include an electric vehicle charging network plan instrumental in the transformative shift to reduce greenhouse gas emissions associated with transportation, and to ready Edmontonians for the shift to electric vehicles.
- Scale up of Clean Energy Improvement Program (CEIP) from the existing pilot program supports emission neutral buildings through energy retrofits in the community. The majority of funding needed for the scale up of the CEIP is expected to be supported by a borrowing bylaw. This unfunded service package would support funding that would not be covered under the borrowing bylaw.
- Development of a nature based solutions framework that fosters investment in natural carbon storage and strengthens our connection to nature. This could include private property tree incentives and a conservation off-set program, as well as tools, resources and policies needed to advance these critical carbon sequestration projects.

## **Supplemental Community Energy Transition Implementation (p 241)**

This package would support going “further and faster” on actions to enable energy transition in the community. This could include accelerating work in the Energy Transition Strategy Implementation service package or the development and implementation of the initiatives such as the following:

- programs to address energy poverty (e.g., incentives for Just and Equitable Transition, energy efficient affordable housing and associated monitoring and forecasting tools)
- policy, standards and programs to enable increase in renewable energy including incentives for battery storage for green power systems, a program to activate aggregate purchasing of renewable energy for Edmonton organizations and policy or regulatory changes to support adoption of renewable energy
- programs and/or policy/regulation to support low carbon and emission neutral buildings including pilot program for hydrogen heating at neighbourhood scale, performance based incentive for emission neutral buildings, and benchmarking and voluntary disclosure of embodied carbon in new construction
- strategy to transition to a circular economy that addresses recovery and reuse of resources to reduce consumption based carbon emissions

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-015CB

**Document Page #:** N/A

**Asked By:** Mayor Sohi

- transportation marketing program to encourage Edmontonians to adopt low emission transportation plans
- policy and programs supporting urban agriculture and the use of City owned land and public spaces to advance resilient food systems
- community level energy transition planning that creates social connections through climate action
- Collaboration with the Climate Innovation Fund on initiatives to develop green economy solutions for Edmonton's carbon emission challenges.

### **Supplemental Corporate Energy Transition Implementation (p 241)**

This package would support going "further and faster" to advance energy transition in the City's own civic operations and make progress towards becoming a carbon neutral corporation. This package will improve science and evidence based decision making processes such as carbon accounting, emissions monitoring, modeling and forecasting, and enhanced disclosure of energy performance. In addition, this packages could support accelerating work in the Energy Transition Strategy Implementation service package or development and implementation of the initiatives such as the following:

- policy and program reviews and updates to support improved climate resilience outcomes related to City services (e.g., urban planning, procurement, and design/construction/operation of City infrastructure) and to establish new funding approaches that reinvest energy savings into into new energy efficiency projects
- internal Carbon Reduction Cost Saving program that focuses on reducing emissions across all business areas through operational changes
- "First buyer" program that uses the City's purchasing power to support creation and access to low carbon and carbon capture products
- potential procurement of renewable heating energy/fuels/offsets
- Just and equitable framework for decision making in support of climate goals
- research and studies on emerging technologies and solutions that can accelerate or enhance actions to mitigate and respond to climate change.

### **Climate Adaptation Strategy Implementation (pg. 238)**

This package focuses on preparing the community for a changing climate through proactive risk management and includes a focus on developments, as well as supporting critical operational changes in the corporation necessary to reduce vulnerabilities to most significant climate risks. Deliverables in this package may include the following:

- risk management initiatives to understand and prepare for changing climate including a long term water security assessment and policy changes to minimize changing wildfire risk and urban heat island impacts, among others
- incentive programs to support climate risk assessments and improvements in land developments
- improved climate analytics including new tools, data and resources such as climate change modeling to support decision making and climate risk mapping

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-015CB

**Document Page #:** N/A

**Asked By:** Mayor Sohi

- creation of a climate risk and resilience lens and process to provide decision makers information on climate risks and impacts, analogous to GHG impacts from carbon budgeting
- climate change planning and development framework that includes tools, resources, and standards to improve integration of climate adaptation and resilience in urban development

#### **Supplemental Community Adaptation Implementation (p 240)**

This package represents going “further and faster” to reduce the community risk to climate change impacts and focuses on increasing social resilience capacity for the impacts of climate change. This could include accelerating work in the Climate Adaptation Strategy Implementation or deliverables such as the following:

- climate change resilience hubs action plan and program to build capacity in the community to respond to climate change impacts
- community level resilience programs that creates social connections through development of local climate action planning and implementation

#### **Supplemental Corporate Climate Adaptation Implementation (p 242)**

This package represents going “further and faster” to advance climate resilience in the City's own civic operations. This could include accelerating work in the Climate Adaptation Strategy Implementation or deliverables such as the following:

- development of a climate resilient infrastructure and facilities renewal strategy
- updating and aligning design and construction standards to incorporate climate change modeling data
- operational changes to City services and programs to minimize vulnerabilities to changing climate risks.

# Responses to City Council Questions on the Proposed Carbon Budget

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**Document:** Carbon Budget Book

**Question #:** 23-016CB

**Document Page #:** 45

**Asked By:** Councillor Tang

**Question:**

What about our watershed management, River Valley, and Ribbon of Green work? Are they considered as part of the natural asset protection?

**Answer:**

**Planning and Environment Services Branch**

The Natural Asset Protection item funds acquisition of natural areas outside of the River Valley and Ravine System. As such, the Natural Asset Protection profile does not include watershed management (i.e., integrated land and water planning), River Valley or Ribbon of Green work.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-017CB

**Document Page #:** 49

**Asked By:** Councillor Tang

**Question:**

Would emissions reduction through procurement also take into account the distance with which the material would take to get here? (I.e., local source vs. Procured abroad)

**Answer:**

**Planning and Environment Services Branch**

The City's method for measuring emissions does not currently account for emissions embedded in the transportation of materials beyond our municipal city limit. This is true both with the current accounting of our annual corporate GHG emissions and also the work that was done to prepare the carbon budget. Improving understanding of GHG emissions requires new tools and approaches. Unfunded Operating Package: Supplemental Corporate Energy Transition Implementation (pg. 243) would support these improvements.

There is a mandate for administration to consider the emissions embedded in the transport of procured items through the sustainable procurement policy (C556B approved July 4, 2022). Corporate Procurement and Supply Services Branch is working to activate this policy by supporting purchasers with an evolving number of tools and processes that build environmental considerations into the procurement process. As well, as the City moves forward with implementing further embodied carbon disclosure, availability of this data will be assessed to help inform future embodied carbon policy. Unfunded Operating Package: Supplemental Corporate Energy Transition Implementation (pg. 243) would support embodied carbon efforts.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-018CB

**Document Page #:** 51

**Asked By:** Councillor Tang

**Question:**

The building code is regulated at the provincial level? What tools in this area can the city use? What is the status, if at all, of a regional climate resilience strategic work with EMRB?

**Answer:**

**Planning and Environment Services Branch**

Yes, the Building Code is regulated at the provincial level. The National Building Code of Canada is published and periodically updated by the National Research Council of Canada (NRC). In turn, provincial governments adopt the national model codes, with or without amendments. The City of Edmonton is provincially accredited by the Safety Codes Council to enforce these codes and their standards through permit issue and inspection processes enabled by the Safety Codes Act.

Administration sent a memo to Council on November 14, 2022 on Implementing and Enforcing More Stringent Energy Requirements (see Attachment 1).

Through land sale agreements, the City requires buyers to develop properties above and beyond typical building code. For greenfield residential development land, the City has worked with BuiltGreen Canada to promote and inform buyers on the benefits of building net-zero, sustainable building practices and various available incentive programs. Homes built on land developed by the City are required to be constructed in accordance with the NRCanEnerGuide Rating System achieving an EnerGuide rating of at least 15% lower than "a typical new home". In the Laurel development project, 91% of homes (138 out of 151 total) were built to an EnerGuide rating greater than 15%.

In addition to this, the majority of sale agreements for vacant multi-family/commercial land require that they be developed in accordance with LEED certification to ensure energy efficiency.

Administration intends to bring forward a Council report in 2023 that shares preliminary opportunities, challenges and options arising from release of the next edition of the Building Code.

The Edmonton Metropolitan Regional Board completed work in 2022 to identify the steps needed to complete: 1) Regional carbon budget; 2) Regional Climate Risk and Vulnerability Assessment; and 3) Coordinate regional standards for climate resilient communities and building energy efficiency. The Board voted to initiate work on the Regional Climate Risk and Vulnerability Assessment in August 2022 with the approval of a project charter. This piece of work is underway and scheduled to be completed in February 2024. Initiation of the other two pieces of work is expected in Q1-Q2 of 2023.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-018CB

**Document Page #:** 51

**Asked By:** Councillor Tang

11/22/22, 6:18 PM

City of Edmonton Mail - Memo to Council - Implementing and Enforcing More Stringent Energy Requirements - November 14, 2022



Stephanie McCabe <stephanie.mccabe@edmonton.ca>

## Memo to Council - Implementing and Enforcing More Stringent Energy Requirements - November 14, 2022

Stephanie McCabe <stephanie.mccabe@edmonton.ca>

Mon, Nov 14, 2022 at 4:14 PM

To: Councillors Office\* <councilloroffice@edmonton.ca>

Cc: Executive Leadership Team <elt@edmonton.ca>, Executive Leadership Team Assistants <elta@edmonton.ca>, Aileen Giesbrecht <aileen.giesbrecht@edmonton.ca>, Mayors Office\* <mayorsoffice@edmonton.ca>, Kent Snyder <kent.snyder@edmonton.ca>

Good Afternoon,

Please see attached memo.

Thank you.

--



**Stephanie McCabe** MAsc, PEng, ICD.D

DEPUTY CITY MANAGER  
URBAN PLANNING AND ECONOMY  
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**Memo to Council - Implementing and Enforcing More Stringent Energy Requirements - November 14, 2022.pdf**  
129K

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# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-018CB

**Document Page #:** 51

**Asked By:** Councillor Tang

Office of the Deputy City Manager  
URBAN PLANNING AND ECONOMY

*Memorandum*



November 14, 2022

Reference No.: 438777258-001

To: City Council  
From: Stephanie McCabe, Deputy City Manager, Urban Planning & Economy  
Subject: **Implementing and Enforcing More Stringent Energy Requirements**

This Memo is in response to the June 15, 2022 Council Motion at Executive Committee "That Administration provide a memo that outlines opportunities, challenges and options to implement and enforce higher levels of energy savings than the federal energy code as adopted by the province."

Building codes are rules that provide the minimum requirement for building construction. The national building code is created and periodically updated by the National Research Council of Canada (NRC). In turn, provincial governments adopt the National codes, with or without changes. Once these codes come into effect, each municipality must then implement and enforce them through application review and inspections.

The most recent code (released in March 2022) includes predefined "Energy Tiers", or series of steps to reach net zero construction. These tiers, ranked one through five, gradually decrease the amount of energy a building will consume. The provincial government has the authority to decide which tier of the code they will adopt and when to progress to the next tier that will gradually move towards net zero construction.

Administration will bring forward a Council report in the second quarter of 2023 that shares preliminary opportunities, challenges and options for implementing and enforcing higher levels of energy savings than the federal energy code as adopted by the province. Administration will continue seeking feedback from the City's Emission Neutral Building Industry Advisory Group.

Initial feedback has identified opportunities for more stringent energy code requirements including;

- Driving economic growth by signaling to manufacturers that the region and province will require windows, prefab walls, insulation, energy consultants, etc.
- Opportunities to explore higher energy savings specifically for City of Edmonton land developments.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-018CB

**Document Page #:** 51

**Asked By:** Councillor Tang

Challenges identified by the building industry with more stringent energy code requirements include;

- Higher energy standards will impact housing affordability, which could bring on cost disparities within the region.
- A current lack of knowledge and skills related to updated code.

Administration has also heard that there is a benefit to having a provincial-wide launch of energy codes, even if this means a slower roll out, as it would provide consistency for builders, yield manufacturer and supply chain benefits, and is supported by industry.

Administration will continue its engagement with stakeholders and will provide options and recommendations for implementing and enforcing higher levels of the energy savings to Council in the second quarter of 2023.



SM/lk

c: Executive Leadership Team - [elt@edmonton.ca](mailto:elt@edmonton.ca)  
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# Responses to City Council Questions on the Proposed Carbon Budget

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**Document:** Carbon Budget Book

**Question #:** 23-019CB

**Document Page #:** 53

**Asked By:** Councillor Tang

**Question:**

How does EPCOR contribution factor into this carbon budget? As their work closely intertwines with the City's.

**Answer:**

**Planning and Environment Services Branch**

EPCOR is included in the overall community emissions, as it is not part of the corporate emissions. The current 2023-2026 Carbon Budget focused on budget requests specifically related to the 2023-2026 Proposed Capital Budget, 2023-2026 Proposed Operating Budget, 2023-2026 Proposed Waste Services Utility Budget, and 2023-2026 Proposed Blatchford Renewable Energy Utility Budget; emissions impacts of specific projects related to EPCOR were not included.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-020CB

**Document Page #:** 54

**Asked By:** Councillor Tang

**Question:**

Has this total amount (176 megatonnes) changed at all from the initial target when the carbon target was first announced?

**Answer:**

**Planning and Environment Services Branch**

Two carbon budgets are used: 1) A "fair share" carbon budget (approved in City Plan of 135 megatonnes CO<sub>2</sub>e as of 2019) and 2) A "target" carbon budget that aligns with the targets in the Energy Transition Strategy (176 megatonnes CO<sub>2</sub>e as of 2022). Both trajectories have the same end point of achieving net zero per person greenhouse emissions by 2050. However, the cumulative emissions released under each trajectory are different.

**Fair Share Carbon Budget:** This methodology is based on the theory that the big cities in the C40 network should do their "fair share" and do more to reduce their emissions in order to be equitable to other countries with lower per capita emissions and GDP. Based on the historical emissions and in accordance with the "fair share" carbon budget, at the start of 2022 Edmonton can only emit another 107 megatonnes CO<sub>2</sub>e in total by the end of 2050. This was previously 135 megatonnes CO<sub>2</sub>e as of 2019.

**Target Carbon Budget:** The targets set in the Energy Transition Strategy (50% reduction by 2030 and carbon neutrality by 2050) are aligned with the global targets required to achieve the Paris Agreement's ambition to limit the increase of global temperature to 1.5 degrees Celsius. The budget associated with these targets is 176 megatonnes CO<sub>2</sub>e as of 2022.

The "target" and "fair share" carbon budgets were decoupled to allow Edmonton to better understand the need for fair share actions within the national context, and to better understand if municipal funding is required for fair share actions.

# Responses to City Council Questions on the Proposed Carbon Budget

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**Document:** Carbon Budget Book

**Question #:** 23-021CB

**Document Page #:** 58

**Asked By:** Councillor Tang

**Question:**

Is it 2026 (for the indicator 2026 GHG Emissions Impacts) because the project would be operational by then? Since embodied emission is not included.

**Answer:**

**Planning and Environment Services Branch**

2026 was chosen as the year as it is the final year in the budget cycle, and it is assumed that most projects would be operational or nearly completed.

# Responses to City Council Questions on the Proposed Carbon Budget

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**Document:** Carbon Budget Book

**Question #:** 23-022CB

**Document Page #:** 64

**Asked By:** Councillor Tang

**Question:**

Lewis farm is not connected with transit - how does this support or not support GHG emissions?

**Answer:**

**Planning and Environment Services Branch**

Lewis Farms is not directly connected with transit, however the emissions impact associated with more vehicle travel is adjacently considered in the new parking lot that will increase personal vehicle use capacity and increase Pathway 3 emissions as a result.

Appendix B includes Assumptions used in the 2023-2026 Carbon Budget; page 106 outlines assumptions for new and renewed parking lots and bike racks.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-023CB

**Document Page #:** 71

**Asked By:** Councillor Tang

**Question:**

For road widening projects GHG estimates: how do you compare emissions from vehicles idling from congestion as a result of growth vs. A widened road that ends up letting more traffic through faster? Assuming limited transit options in the area. Can the latter potentially have enabling emissions impacts?

**Answer:**

**Planning and Environment Services Branch**

Emission impacts for all transportation related profiles were measured against “no development” scenarios. For road widening projects for example, emissions were first estimated for the “no development” scenario (What if projects don't get built or leave the facilities with their “current state”?). In this case, emissions were primarily driven by vehicles idling from congestion resulting from higher travel demand and growth in the future. Under the “development” scenario, emissions were estimated assuming that projects will be built as per the plan. In this case, emissions were estimated based on changes in vehicle kilometer traveled driven by:

- Road Congestion: Reduction in congestion (or improved traffic flow) due to an increase in roadway capacity. Resultant Carbon Impacts - Decrease emissions;
- Induced Demand: Development of “Induced Demand” due to an increase in roadway capacity (road widening). Resultant Carbon Impacts - Increase emissions;

The difference in estimated emissions between the “development” and “no development” scenarios were reported as the emission impacts for transportation infrastructure projects by composite types (e.g., road, transit, and active).

Induced vehicle travel was primarily incorporated into the direct emissions assessment when a profile increases or decreases road capacity for projects and was included in the Road Composite when calculated. For Enabling emission impacts, two types of induced impacts were considered: (1) induced impacts on future growth which considers the impacts on future growth targets, and (2) induced impacts on future travel, which considers the potential long-term impacts the profiles may have on travel demand and travel pattern changes.

# Responses to City Council Questions on the Proposed Carbon Budget

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**Document:** Carbon Budget Book

**Question #:** 23-024CB

**Document Page #:** 75

**Asked By:** Councillor Tang

**Question:**

CM-20-2020, CM-99-9000 - Why is active transportation work not part of CETS action?

**Answer:**

**Planning and Environment Services Branch**

This is an error, and should have been labelled a CETS action. Improving sidewalk connections contributes to walkability, which is part of the CETS included in Pathway 3 (Low Carbon City and Transportation) under Goal: Safe and accessible zero emission mobility, Strategy 17: Ensure a safe, accessible, and comfortable active transportation system that enhances walking and cycling.

# Responses to City Council Questions on the Proposed Carbon Budget

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**Document:** Carbon Budget Book

**Question #:** 23-025CB

**Document Page #:** 41

**Asked By:** Councillor Salvador

**Question:**

Please list all "new build" capital projects included in the proposed capital budget that do not meet the standards set out in C627.

**Answer:**

**Planning and Environment Services Branch**

There are three "new build" capital projects that are included in the proposed capital budget that were approved before Policy C627 and therefore meet C532 policy requirements but not C627 requirements. However, it should be noted that these are in various stages of construction or late design.

Lewis Farms Community Recreation Centre and Library - Late design.

Valley Zoo - Nature's Wild Backyard Phase II - Late design.

Coronation Park Sports and Recreation Centre - Under construction.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-027CB

**Document Page #:** 45

**Asked By:** Councillor Salvador

**Question:**

The City has a goal to plant 2 million trees. One of the assumptions for the carbon capture for this report is that all of these trees will be on city property. What measures are in place to ensure new plantings are able to mature? Is the current mature canopy included in these carbon calculations? Would the Urban Primary Vegetation and Land Inventory include this information?

**Answer:**

**Planning and Environment Services Branch**

To ensure new plantings are able to mature, capital and developer projects that involve new tree planting incorporate an establishment period for new trees that includes watering, health and condition inspection/monitoring, and tree stake removal for maintained park and boulevard trees. The establishment period for park and boulevard trees is three years, during which time the trees are watered. Trees planted through capital or developer projects are inspected through a construction completion certificate (CCC) and final acceptance certificate (FAC) process before being accepted into the operations inventory to continue to maintain the trees. Operational activities to care for the urban forest include continued condition inspections including monitoring for invasive species/disease/tree damage, tree pruning, removing hazardous branches and dead trees as needed, and inspection of natural areas. The City also measures overall success of the City's planting programs in meeting City goals (the Urban Forest Management Plan goal for 20% forest canopy coverage and the City Plan of 2 million trees planted) through use of a GIS inventory to keep track number of trees and growth in boulevard and park trees, as well as naturalized and natural areas. The City has also used LiDAR technology to measure canopy growth and loss during the 2019-2022 budget cycle, and has submitted an operating service package (titled Implementation of the Urban Forest Management Plan) to request funding to complete this canopy coverage measurement again during the 2023-2026 budget cycle.

The current mature canopy is included in the total carbon budget. The current mature canopy removes greenhouse gases from the atmosphere and reduces the total amount of greenhouse gas emissions in the carbon budget.

The Urban Primary Land and Vegetation Inventory (uPLVI) is a spatial database that maps land cover types across the City. It can be used to derive estimates of canopy cover based on remote sensing data, but is less accurate than direct counts of planted trees provided by City Operations. In addition to bi-annual assessment of boulevard and open space trees, as pruning cycles are completed, the diameter of trees are collected and input into a database that enables an understanding of not only the mortality and condition of trees over time, but also the growth rate of individual trees. The uPLVI functions at a landscape scale, and is not sensitive enough to accurately describe maturation and survival rates of individual trees. LiDAR is also a source for tree counts which, with sufficient detail, individual tree counts can be determined.

The uPLVI can also be used to estimate approximate carbon capture rates over time. Bi-annual maintenance of uPLVI data will allow the City to estimate carbon sequestration potential of the City's vegetation over time. Work to build and finalize the appropriate models for those estimates is ongoing.

# Responses to City Council Questions on the Proposed Carbon Budget

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**Document:** Carbon Budget Book

**Question #:** 23-028CB

**Document Page #:** 45

**Asked By:** Councillor Salvador

**Question:**

Root for Trees gives trees away to private property owners. Were these trees, which will end up on private property, included in this calculation?

**Answer:**

**Planning and Environment Services Branch**

Nature based climate solutions, like planting trees, are necessary actions to reach net zero goals, as they provide potential for carbon sequestration and storage. Root for Trees, including the trees that end up on private property, were included in the carbon budget calculation. The 400 CO<sub>2</sub>e reduction related to trees is the estimated carbon sequestration associated with the urban tree canopy expansion, which includes the Root for Trees and Building Great Neighbourhoods programs. It is included under CM-35-1000 Greener As We Grow Tree Planting Program.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-029CB

**Document Page #:** 9

**Asked By:** Councillor Salvador

## **Question:**

Phase 2 of implementing the Energy Transition Strategy requires rapid and significant scaling up of climate action, which "will need to be done strategically, to create a large emissions reduction impact and economic prosperity by catalyzing and creating a new era of economic growth and job creation." Will the proposed capital and operating budgets have a meaningful impact on the growth and creation of green jobs? Green buildings, energy retrofits, solar PV, district energy, and our fleet transition have a high propensity to create green jobs and are all currently unfunded.

## **Answer:**

**Planning and Environment Services Branch**

The Energy Transition is an economic opportunity and will create green jobs. An investment analysis at the strategy level (ie. of the broad community wide transition), identified public and private investments totalling \$41.7 billion over the next 30 years, averaging \$1.4 billion annually. However, because of the urgency to act to mitigate the effects of climate change, some of the investments have a higher front-end investment required for accelerated climate actions, to reach economies of scale and support local market transformation. Looking specifically over the next ten years, approximately \$24 billion is required to finance the transition, an average of \$2.4 billion per year.

This level of investment has significant job creation opportunities within the private sector. While there are no Edmonton-specific estimates available, research by leading global economists found that green construction projects (such as retrofits and energy infrastructure) can deliver high job multipliers. Their analysis suggests that for every \$1M in spending, 7.49 full-time jobs are created in renewable infrastructure and 7.72 jobs are created in the energy efficiency sector. These job multipliers are higher than job multipliers in fossil fuel sectors. Similarly Canada's Green Municipal Fund uses total job multipliers (including direct, indirect and induced jobs) for \$1 million in capital spending of between 5.8 -11.7 full-time jobs nationally, depending on the type of capital project. The investment associated with the Energy Transition Strategy (using an average 7 full-time jobs for every \$1M in spending), could create as many as 16,000 private sector jobs over the next 10 years. Administration cautions that these estimates are based on national multipliers and are variable given the lack of localised data. The estimated jobs impact may not necessarily reflect the jobs impact within Edmonton or the Edmonton region. Applying this high-level analysis to the unfunded capital projects:

Specific to the following unfunded capital projects:

- Climate Resilient City Facility Upgrades (Linked to City's Renewal Program) - up to 370 jobs
- Climate Resilient City Facility Upgrades - Canada Infrastructure Bank Partnership - up to 940 jobs
- Climate Resilient City Infrastructure Upgrades - up to 160 jobs
- Climate Resilience Investment Accelerator Fund - up to 350 jobs
- Solar PV and Energy Storage Installations at City Sites - up to 250 jobs
- Emissions Neutral City Fleet and Equipment - up to 70 jobs
- District Energy Network Strategy and District Energy Nodes - up to 240 jobs
- River Flooding Defence - up to 175 jobs
- Nature Based Climate Solutions - up to 350 jobs

The capital and operating packages put forward to partially implement the Energy Transition Strategy and Climate Adaptation Strategy will work towards both job creation and avoidance of climate change impact costs.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-030CB

**Document Page #:** n/a

**Asked By:** Councillor Salvador

**Question:**

ESG performance is growing in importance for global investment. Will the proposed capital and operating budgets enhance our ability to market Edmonton to that investment community?

**Answer:**

**Planning and Environment Services Branch**

Yes, we know fresh air, clean water, public safety and welcoming communities all help create a better quality of life for residents. This, in turn, not only helps to attract more people to move or settle in a city but also helps to attract increased investment. So as investors around the world continue to consider ESG factors in their investment decisions, the City of Edmonton has the opportunity to profile and highlight many of the environmental, social and governance initiatives taking place across the corporation.

If funded, some of these include:

- Increased investments and collaborative approach to affordable and supportive housing
- Community Safety and Wellbeing Strategy
- Advancement of the Energy Transition Strategy and Climate Adaptation Strategy
- Inaugural Carbon Budget
- Public Engagement Policy and Framework
- Indigenous Framework
- Anti-racism Strategy
- RECOVER Urban Well-being

This work continues to be profiled through comprehensive communications and marketing strategies using a variety of tools and tactics including social media, digital and traditional media, branding initiatives and partner amplifications. We also continue to work with our major investment partners like Edmonton Global, Alberta's Industrial Heartland and Explore Edmonton to support their investment attraction work.

# Responses to City Council Questions on the Proposed Carbon Budget

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**Document:** Carbon Budget Book

**Question #:** 23-031CB

**Document Page #:** 9

**Asked By:** Councillor Salvador

**Question:**

Between 2021-2022, 60 actions in the Energy Transition Strategy were supposed to begin. 90% of them were commenced. With little to no funding for climate initiatives in the 2023-2026 budget, what will happen to the status of these commenced, but not completed actions?

**Answer:**

**Planning and Environment Services Branch**

These actions were able to begin as they were partially funded in the previous budget cycle 2019-2022. There is a base operating budget for climate change action, funded through service packages from the previous two budget cycles. For example, this has funded the green electricity procurement for the City of Edmonton corporate operations and various programming that supports the community transition such as rebates and education and capacity building programs. This base operating budget can be allocated to continue work on some of these actions. However, scaling up of actions is not achievable without additional funding. As well, actions that require capital investment or the implementation of the additional 40 actions that are set to be implemented in 2023-2026, will be paused/not begin until funding becomes available. There are various unfunded capital profiles and operating packages that are required for implementation of these actions.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-032CB

**Document Page #:** 9

**Asked By:** Councillor Salvador

**Question:**

How many actions in the Energy Transition Strategy are supposed to commence in 2023-2026? Under the proposed budget, how many of those actions will have the funding to begin implementation? What percentage of those will we be able to commence under the proposed budget?

**Answer:**

**Planning and Environment Services Branch**

Approximately 40 actions for the Energy Transition Strategy are scheduled to commence in 2023-2026 budget cycle, the majority of which are currently unfunded. There are 22 Capital, 2 Operating and 5 Utility profiles recommended for funding that were qualitatively assessed to have a material impact (> 100 tonnes of CO<sub>2</sub>e) on reducing GHG emissions. Page 28 of the Carbon Budget highlights the proposed budget requests that were quantified to have the most significant GHG reductions. These include transit profiles, natural areas acquisition, landfill gas to renewable natural gas, and City facility retrofits.

While the energy transition strategy action plan may have scheduled actions to begin in 2021-2022 or 2023-2026, it is important to note that several of these actions will require implementation timeframes beyond these budget cycles and may require ongoing funding.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-033CB

**Document Page #:** 48

**Asked By:** Councillor Salvador

**Question:**

Please share how the Energy Transition Climate Resilience Committee of Council (ETCRC) was involved in the process of creating the carbon budget, how their feedback was incorporated, and how their feedback will be incorporated going forward.

**Answer:**

**Planning and Environment Services Branch**

Administration gathered feedback and input throughout the development of the Carbon Budget and Accounting Framework through discussions with the Energy Transition Climate Resilience Committee (ETCRC) in November of 2021, and the Spring and Fall in 2022. Overall the committee supported the City's direction with the development of the framework and provided valuable insight into further developing the process.

ETCRC provided valuable feedback which was incorporated into the 2023-2026 Carbon Budget where possible, such as the importance of key messaging to Council around the urgency of the climate emergency. The committee also provided insights for future iterations of the carbon budget and the carbon accounting framework that will be addressed as the process is matured, including capturing impacts of embodied emissions at a qualitative level if not quantitative, and considerations for implications of projects that exceed their allotted carbon budgets. Other areas that were discussed between the ETCRC and Administration included developing policy on the role of offsets in City of Edmonton's Carbon Accounting as well as the treatment of surplus or deficits in annual inventories. These items, along with others suggested by ETCRC, will all be considered for incorporation in the future.

Throughout Q1 2023, Administration will focus on developing a work and resource plan for continued expansion of the Carbon Accounting Framework. There will be another check in with ETCRC to provide an update and gather additional feedback.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-034CB

**Document Page #:** 51

**Asked By:** Councillor Salvador

## **Question:**

Page 51 describes some of the actions underway as part of the Community Energy Transition Strategy, including the complete build out of a city-wide active transportation network, as well as the District Energy Strategy, and the Clean Energy Improvement Program (CEIP), but those are unfunded in the proposed capital and operating budgets. If these capital profiles and service packages remain unfunded in this budget, can they realistically be considered underway in a significant and meaningful way?

## **Answer:**

**Planning and Environment Services Branch**

### Clean Energy Improvement Program

- The majority of funding needed for the scale up of the Clean Energy Improvement Program is expected to be supported by a borrowing bylaw. The unfunded Energy Transition Strategy Implementation Composite service package (pg. 239) would support funding that may not be covered under the borrowing bylaw. To scale up the CEIP program 2 FTEs are required. If the package remains unfunded, Administration would not be able to scale up this program without impacting other climate initiatives such as rebates to fund any gaps that the borrowing bylaw financing can not cover.

### District Energy

- If the capital and service packages for District Energy remain unfunded, a real time opportunity to grow systems in some of the identified immediate nodes in the District Energy Strategy (River Crossing, Exhibition Lands, Bonnie Doon, Heritage Valley) will be lost, or will be significantly delayed into the next budget cycle. This includes the opportunity for facilitation work for enhanced regulations, bylaws, and the opportunity to engage industry partners for joint funding of District Energy implementation.

- The implementation of the new District Energy Strategy would come to a halt.

- Only existing district energy project developments in Blatchford and the Downtown, which have existing capital and operating profiles, could proceed.

### Active Transportation Network

- The current unfunded capital profiles and service packages related to the active transportation network is specific to the bike network and focuses mainly on district connector routes within the redeveloping areas and select neighbourhood routes in higher ridership potential areas. However, complete build out of the bike network will still require developer involvement in building district connector routes in the developing areas and buildout of the remaining neighbourhood routes through neighbourhood renewal.

- If these capital profiles and service packages are left unfunded for this budget cycle, implementation of the bike network can continue but will rely solely on neighbourhood renewal opportunities and available funding through the arterial renewal program. This will result in gradual implementation of the bike plan however it would not be in alignment with the timelines outlined in the Energy Transition Strategy.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-035CB

**Document Page #:** 81

**Asked By:** Councillor Salvador

**Question:**

How were the emissions reductions associated with the Active Mode Composite estimated and validated?

**Answer:**

**Planning and Environment Services Branch**

There are municipal examples with results that show the development of active transportation infrastructure have significant impact on increasing ridership and reducing greenhouse gas emissions. Multiple studies have been conducted that demonstrate if even only a portion of people replace car trips with bike trips, transportation emissions are significantly reduced. Forecasting the GHG reduction impact of active transportation networks is an area that will continue to improve.

The Active Mode Composite adopts the system approach to calculating GHG emissions impacts, including profiles related to the Bike Plan: complete district connector bike network and bike facilities within listed neighborhood profiles.

Similar to other transportation composite profiles, emission impacts for the active mode composite were also assessed against a "no development" scenario. Emissions were first estimated for the "no development" scenario (no further bike network extension or leave existing bike network as-is). Under the "development" scenario, emissions were estimated with the assumption that the complete district connector bike network (near term priorities and future district connector network) will be implemented by 2032. In this case, the emissions impacts were mostly influenced by travel mode shifts from other modes to bike. The shift was primarily from automobile users. The resultant impacts were a decrease in emissions due to less vehicle kilometers traveled and thus less fuel consumption. The difference in estimated emissions between the "development" and "no development" scenarios were reported as the active mode composite emission impacts. Recreational and leisure trips (by bike) were not considered for the active mode composite emission impacts assessments.

Similar to other transportation composite profiles, active mode composite profile was assessed using the Edmonton Regional Travel Model (RTM). The Edmonton RTM is an analytical platform designed to simulate travel activities occurring within the Edmonton metro region based on the household composition, their socioeconomic and demographic characteristics, amenities and opportunities available across the Edmonton region.

In the RTM, walk and bicycle networks include most roadway links, bike lanes, and special pedestrian / bicycle only links such as pedestrian overpasses and trails in the river valley.

The bike user behaviour in the RTM has been validated against the 2015 Edmonton Household Travel Survey (HTS). Several validation metrics were considered, including: Bike Mode Share; Bike Trip Length (e.g., How far do people travel by bike?); Bike Trip Duration (e.g., How long do people travel by bike?); and Bike Trip Purpose (e.g., for what kind of purposes do people travel by bike?).

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-036CB

**Document Page #:** n/a

**Asked By:** Councillor Salvador

## Question:

Please provide survey data or research on Edmontonians opinions concerning climate change, the role of the City of Edmonton in addressing climate change, and attitudes towards maintaining or increasing climate action.

## Answer:

### Planning and Environment Services Branch

Administration conducts an annual survey on Edmontonians' perceptions and attitudes toward climate change. The 2022 survey (with a sample of 1,008 Edmontonians) found that Edmontonians agree that climate change is a concern (75%), that climate change is caused mostly by human activities (71%) and that we need to act now (75%). More highlights include:

- 72% agree that investing in energy efficiency provides job opportunities for Edmonton.
- 69% agree that transitioning to renewable sources of energy provides job opportunities for Edmonton.
- 68% say they are already taking action on climate change.
- 70% wish for the City to either increase or maintain its efforts to address climate change.
- 70% agree that climate change is affecting Edmonton's weather (up from 66% in 2021)
- There is agreement that weather events are risks arising from a changing climate, most notably heat/heatwave (76%); increased drought (74%); increased flooding (73%); increased wildfire smoke (72%)
- One-half of Edmonton residents (52%, up from 46% in 2021) are currently adapting their property to better suit the changing climate.

For the sixth consecutive year, the survey shows that people's attitudes towards climate change are unwavering, despite the many challenges we've encountered during the pandemic and amidst the ongoing environmental, social and economic challenges we face. Visit [changeformclimate.ca/story/survey2022](https://changeformclimate.ca/story/survey2022) for a longer summary. Full survey results are posted at <https://d2m76iq051c4jh.cloudfront.net/story/ClimateChangeAndEnergyPerceptionsReport2022.pdf> and have also been included as a separate attachment to this main report in "Attachment 1 - Climate Change and Energy Perceptions Report".

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 that emerged from this engagement is 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.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-037CB

**Document Page #:** 14

**Asked By:** Councillor Salvador

## **Question:**

Which of the following programs are funded (including amounts) to continue in the proposed budget: Voluntary Home Energy Labeling Program, Home Energy Retrofit Accelerator, Building Energy Retrofit Accelerator, Building Energy Benchmarking Program, Change Homes for Climate: Residential Solar Program, CEIP? Please also include data on program uptake.

## **Answer:**

### **Planning and Environment Services Branch**

Administration is reviewing existing programming as we move into the 2023-2026 budget cycle to understand where programming is still needed and where it needs to be adjusted from a GBA+ or impact lens. The funding for the programs below is included in the proposed budget based on the current design of the programs; modifications to these programs would result in changes in funding. Dollar amounts include rebates and administrative costs. The base budget includes:

- The Voluntary Home Energy Labeling Program has a budget requirement of \$2,000/annually, as well as staff time, which is funded in the base budget. The program has mapped 6,040 properties to date (4,273 existing homes, 1,767 new homes).
- The Building Energy Benchmarking program has a budget requirement of \$70,000 annually, plus staff time, which is funded in the base budget. There are currently 419 properties representing 704 buildings participating in the program.
- The Corporate Climate Leaders Program has a budget of \$115,000 annually, plus staff time, which is funded in the base budget. There are 69 members from Edmonton's business community with 46 submitting baseline GHG inventory and 28 submitting reduction plans and targets to date.
- The Home Energy Retrofit Accelerator program is designed to run until 2024 and has a budget requirement of \$745,000 in 2023-2024, as well as staff time, which is funded in the base budget. The program had 2,382 registered participants and the program is currently 96% subscribed.
- The Building Energy Retrofit Accelerator program is designed to run until 2024 and has a budget requirement of \$1.1Million in 2023-2024, plus staff time, which is funded in the base budget. The program has 176 participants and the program is currently 94% subscribed.
- The Solar Rebate Program was designed to run until 2023 and has a budget requirement of \$246,000 in 2023, plus staff time, which is funded in the base budget. The program has 1,214 participants to date and is currently 100% subscribed.
- The Clean Energy Improvement Program is currently running as a pilot and is funded until mid 2024 or when all CEIP retrofits are complete (The total budget of \$12.3M includes \$9.69M from FCM for financing and \$2.6M in Administration costs and Rebates.). The scale up of the program requires a borrowing bylaw (for the majority of the funding needs), a funded one time package Clean Energy Improvement Program (pg.133), as well as an unfunded package Energy Transition Strategy Implementation Composite (pg. 239) to cover costs that might not be eligible under the borrowing bylaw (amount is not known at this time). The pilot program has 80 residential applications (the residential stream is 100% subscribed) and 2 commercial prequalifications (the commercial stream is 17% subscribed)

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-038CB

**Document Page #:** 8

**Asked By:** Councillor Rice

**Question:**

Capacity to Implement Two Strategies: In the proposed 2023-2026 carbon budget, page 8 states "Edmonton is committed to climate action and protection, through the implementation of two climate strategies" including the Community Energy Transition Strategy and the Climate Resilient Edmonton Adaptation Strategy and Action Plan. What is the city's financial strategy to implement these two strategies? What is the estimated cost for achieving the goals of these strategies and what is the impact on property taxes?

**Answer:**

**Planning and Environment Services Branch**

Edmonton's targeted share for implementation of the Energy Transition Strategy and Adaptation Strategy over the next four years was identified to be \$640 million for urgent, scaled up climate action.

The total private and public cost of implementing the Community Energy Transition Strategy is \$41.7 billion over the next 30 years. Looking specifically over the next ten years, approximately \$24 billion (public and private) is required to finance the transition, an average of \$2.4 billion per year. Mitigating climate change is a collective problem that requires collective action from all levels of government, private sector investments, and all Edmontonians. Of the annual investment requirement of \$2.4 billion, the level of public investment required to catalyze private investment and for local infrastructure is estimated to be approximately \$300 million. A targeted City funding share is one-third or \$100 million annually, shared with Provincial and Federal governments. These costs only reflect energy transition funding needs.

Implementing the Climate Adaptation Strategy is estimated to require \$60 million per year for the next four years. Other assessments conducted have suggested that adapting for changing climate impacts in Edmonton is estimated to require an additional \$185 million per year for the next 10 years, based on high level cost estimations. Estimating climate adaptation costs is more challenging than energy transition costs. Energy transition is a more established program, with standard methods for calculating estimated financial needs. Climate adaptation is a newer field, and is variable based on local contexts, therefore cost estimations, and the sectoral breakdown of investment needed for climate adaptation are not as established and certain as with energy transition.

The City's financial strategy to implement these two strategies relies on numerous funding tools, advocacy and a partnership approach is critical to achieving the goals outlined in both strategies. The impact on property taxes will depend on the mix of tools used. Please refer to the Attachment 5 "Funding Approach" from the April 12, 2021 Council Report UFCSD00209 Revised Community Energy Transition Strategy, which outlines the funding approach to the Community Energy Transition Strategy. The same approach and tools can also be applied to the Climate Resilient Edmonton Adaptation Strategy and Action Plan.

# Responses to City Council Questions on the Proposed Carbon Budget

**Document:** Carbon Budget Book

**Question #:** 23-038CB

**Document Page #:** 8

**Asked By:** Councillor Rice

## Attachment #5

### Funding Approach

Transformational change poses many challenges and opportunities. Edmonton's vision is aspirational but is achievable with significant levels of public and private investment in transformational initiatives that will reshape our city and our place in the world. Investment is required from the private sector, Federal and Provincial levels of government, and the City of Edmonton. The overall funding approach must be one of partnership.

An investment analysis at the strategy level (ie. of the broad community wide transition), identified public and private investments totalling \$41.7 billion over the next 30 years, averaging \$1.4 billion annually. However, because of the urgency to act to mitigate the effects of climate change, some of the investments have a higher front-end investment required for accelerated climate actions, to reach economies of scale and support local market transformation. Looking specifically over the next ten years, approximately \$24 billion is required to finance the transition, an average of \$2.4 billion per year. To put this in context, the GDP of the Edmonton Census Metropolitan Area (CMA) is about \$90 billion per year.<sup>1</sup>

### Private Investment

To catalyze the investment in private assets and energy transition actions throughout the region, a range of barriers will need to be overcome. Investors using business discount rates not only consider the weighted average cost of capital, but also include a premium based on the perceived risk of the investment. Higher risk premiums are applied to investments in the demonstration or early commercialization phase. Industry and household discount rates can be as high as 15% which means that to catalyze around 85% of private investment, government investment could be upwards of 15% of the total investment required. This 15% of investment would need to be supported by all orders of government to "de-risk" the necessary private investment. Administration will monitor future potential Federal carbon tax changes which may impact this assessment.

### Public Investment

Of the annual investment requirement of \$2.4 billion, the level of public investment required to catalyze private investment and for local infrastructure is

<sup>1</sup> <https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=3610046801>

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## Attachment #5

estimated to be approximately \$300 million. This level of investment is significantly higher than the City of Edmonton can realistically manage alone. A targeted City funding share is one-third or \$100 million annually, shared with Provincial and Federal governments. The City share can be further aggregated into two categories:

- \$75 million annually for capital infrastructure investment
- \$25 million annually for catalyst investment

The City-owned capital infrastructure investment relates primarily to the full electrification of the bus fleet, deep facility retrofits, district energy systems and expansion of the active transportation network. These investments will enable future ongoing operational savings, and build infrastructure fundamental towards transition. The remaining operating portion focuses on new or increased rebates and incentives to local homeowners and businesses for energy transition actions, such as to increase the uptake towards solar installations and building retrofits.

These are 'net new' incremental investments, over and above what is included in current capital plans and budgets - very few of these actions are currently funded.

### Funding the Action Plan

Within the energy transition actions, there may need to be further prioritization as there may not be sufficient funding or capacity to immediately advance them all. A listing of potential funding tools available to the City is provided in the following tables, categorized from 'conventional' to 'emerging'.

Conventional funding tools are readily available to the City and can be actioned in a relatively short period of time. Emerging funding tools will require further investigation and analysis in order to assess feasibility. A combination of these tools will likely be required to effectively advance these investments.

Next steps include continued engagement with private and public partners and further exploration of non-conventional funding strategies. These climate actions will roll into upcoming capital and operating long term plans. Budget prioritization tools will be reviewed and/or updated to ensure energy transition is properly represented.

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## Attachment #5

### Conventional Funding Tools

FUNDING TOOL	DESCRIPTION / OBSERVATIONS
Debt financing	Bridge financing tool available to manage the timing between investments and future funding sources. Trade-offs against competing initiatives will be required.
New 'Green' Levy	Similar in approach to previous levies (e.g. Neighbourhood / Alley Renewal, LRT, etc.)
Re-prioritize Approved Capital / Operating Budgets	Priority Based Budgeting can assist with budget reprioritization. Trade-offs against competing initiatives will be required.
Public / Private Partnerships (e.g. Canadian Infrastructure Bank, Climate Innovation Fund)	Examples include Canadian Infrastructure Bank and Climate Innovation Fund. Many emerging arrangements are similar to loan arrangements. Continuous scanning of emerging programs that may assist with the generation of investment capital and the sharing of project and financial risks.
Grants	An overview of the federal and provincial grant funding landscape is addressed in Attachment 6.

### Emerging Funding Tools

FUNDING TOOL	DESCRIPTION / OBSERVATIONS
Property tax uplift deferral incentives	There are financial risks associated with locking in assessment growth to specific areas / initiatives. Trade-offs against competing initiatives will be required.
Carbon adjusted utility franchise fee	Develop a new franchise fee that reflects the carbon intensity of the energy provided by the utility.
Creation of a 'Municipal Energy Corporation'	An arms-length entity with the ability to operate and raise capital independent of the City of Edmonton.