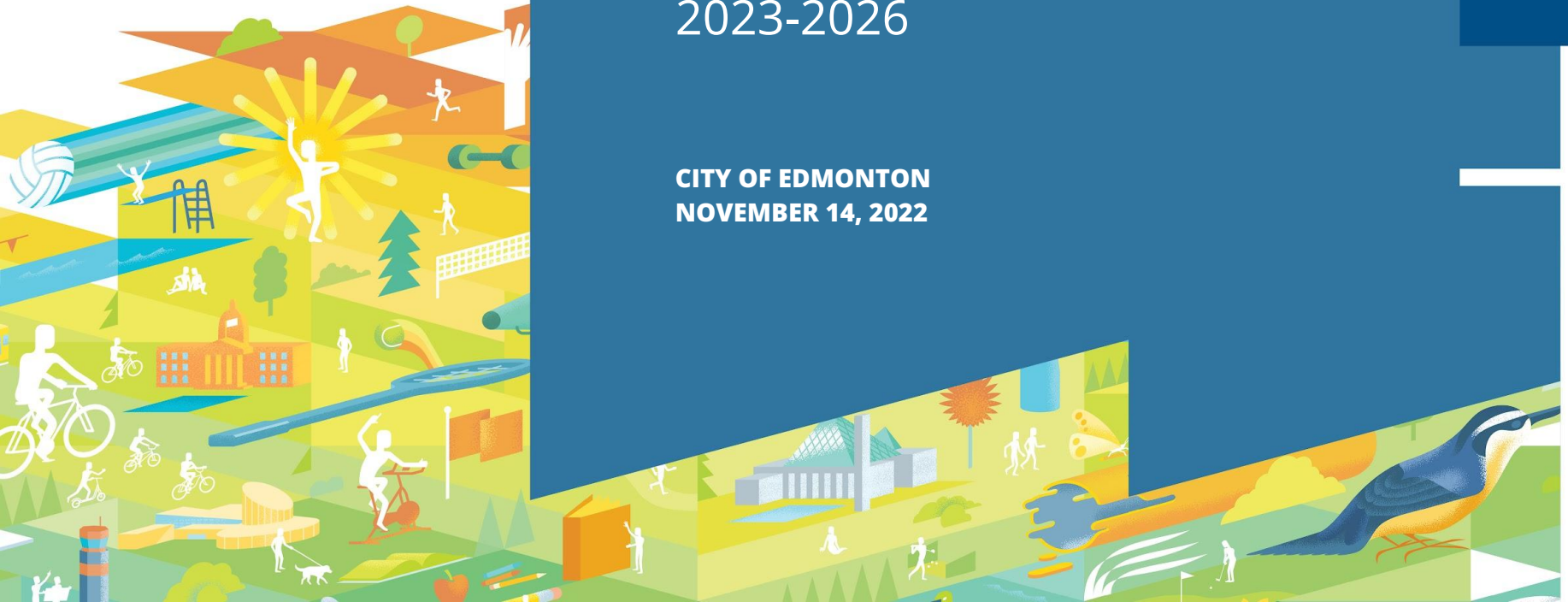
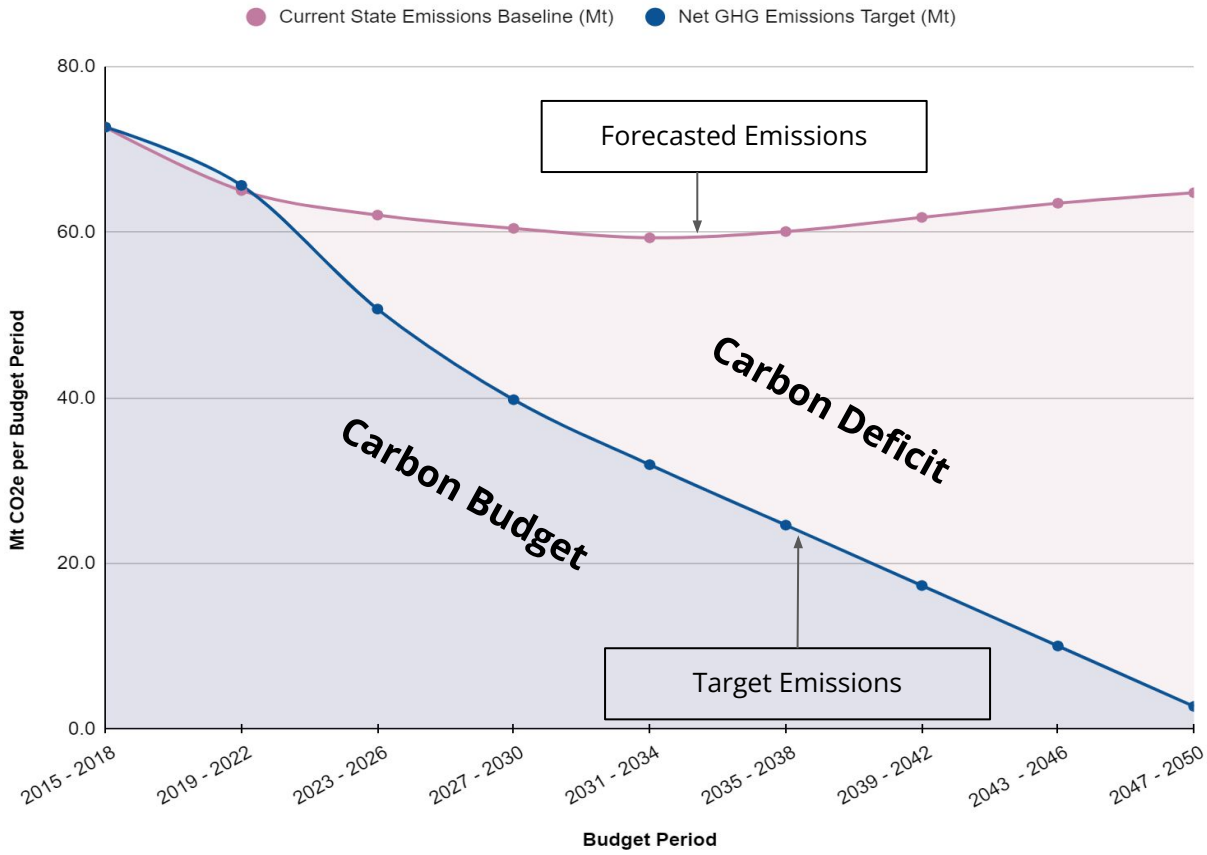
CARBON BUDGET 2023-2026

CITY OF EDMONTON
NOVEMBER 14, 2022



What is a Carbon Budget?



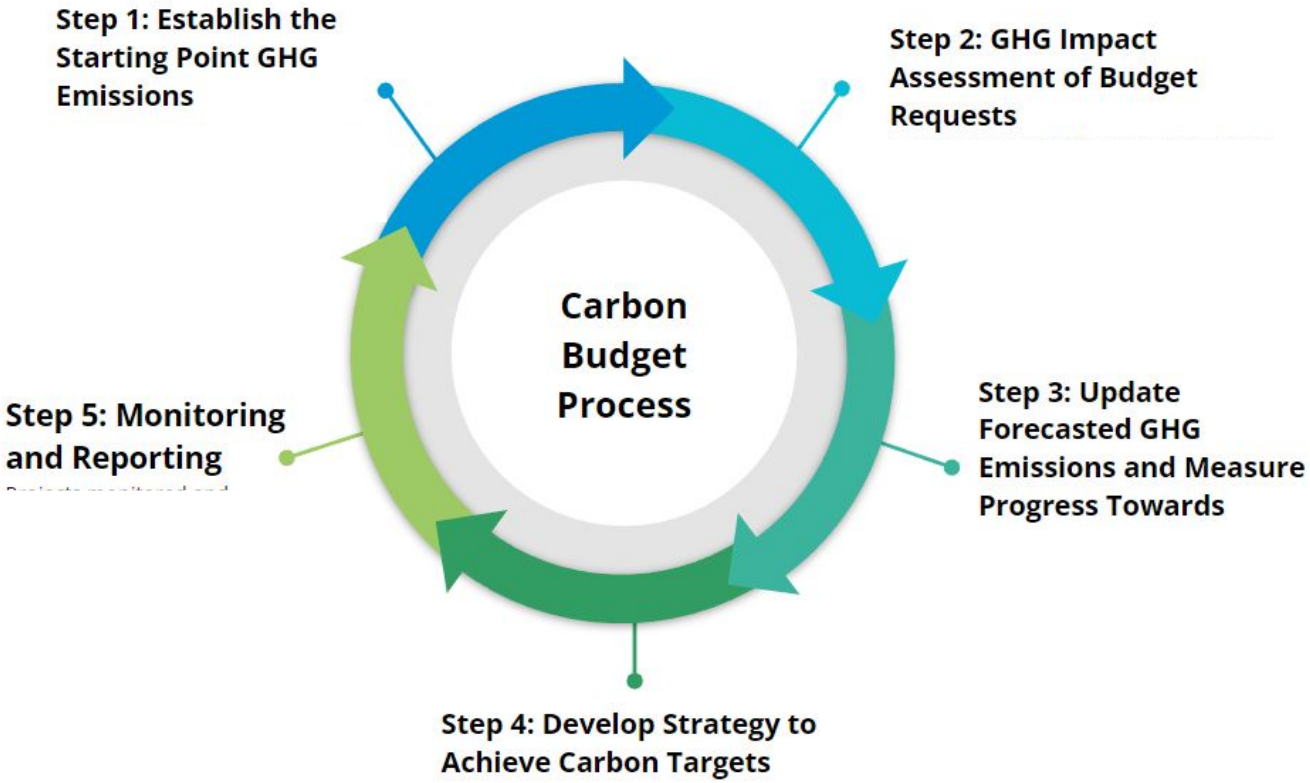
How should the Carbon Budget be used?

- To help inform funding decisions within the operating and capital budget

- Each budget request (funded or unfunded) within the operating and capital budget includes a GHG assessment
  - Appendix A of the 2023-2026 Carbon Budget

- The Carbon Budget does not require Council approval

How was the Carbon Budget Developed?



Qualitative Assessment

All budget requests have been evaluated for a qualitative assessment of carbon impacts, including *direct* impact to the four pathways in the Energy Transition Strategy:

Pathway #1: Renewable and Resilient Energy Transition

Pathway #2: Emission Neutral Buildings

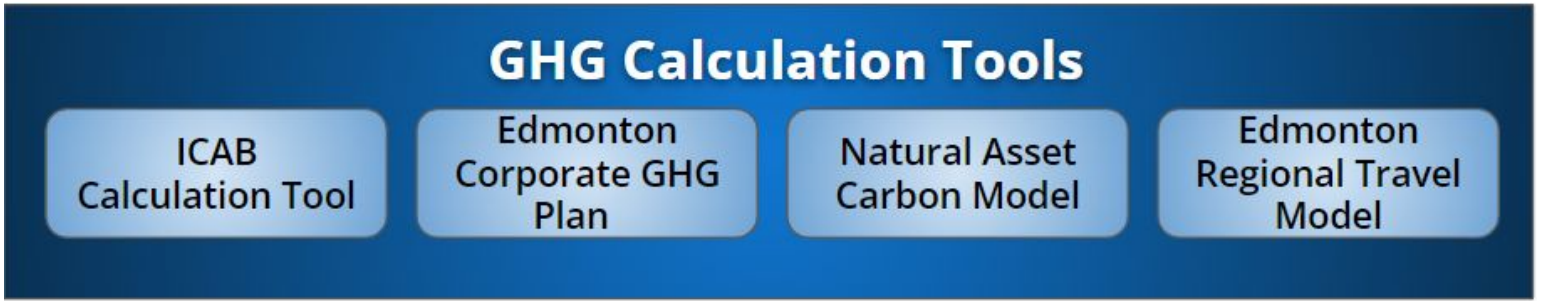
Pathway #3: Low Carbon City and Transportation

Pathway #4: Nature Based Solutions and Carbon Capture

- The budget requests have also been assessed to determine if they *indirectly* enable emissions reductions or increases (enabling)

Quantification Approach

- Changes in operational emissions of proposed budget requests were quantified where possible, through various methods, including manual calculations, existing data (such as energy models), or by using one or more of the City's 4 tools



GHG Assessment - Example

Service Package Name	CETS Action	Pathway				2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request ($000s)
		1	2	3	4				
Three-stream Communal Collection	☑	-	-	↑	-	300	↓	Both	10,390

Description of GHG Impacts

This profile increases Pathway #3 emissions due to new collection routes but is expected to enable emission reduction through waste reduction and increased diversion. No impacts for Pathway 1, 2 or 4 emissions.

Direct Emissions Impact - Low: associated with the energy use of new recycling and organics collection vehicles.

Enabling Emissions Impact - Medium: associated with waste reduction and increased diversion.

Projects Not Quantified

The following budget requests were not quantified:

- Projects in initial planning phases
  - Specific project details not known
  - Quantifications requiring significant assumptions
  - Planning and design profiles
  - Composite profiles
  - Land development profiles
- Data and quantification limitations
  - Maturity of the organization - would be able to quantify in the future
- Projects with no quantifiable emissions impact
  - Strategy implementation related projects

Quantification - Key Assumptions

Renewal

- Renewal is considered modern equivalent replacement.
- Renewal capital profiles will reflect to impact to current GHG emissions
- As the GHG emissions targets decrease every year, renewal will make up a larger portion of the GHG inventory

GHG Assessment - Example - Renewal Project

Service Package Name	CETS Action	Pathway				2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request ($000s)
		1	2	3	4				
Facilities - Minor Renewal Program	☐	-	-	-	-	Not Quantified	-	Corporate	30,000

Description of GHG Impacts

This profile is used to support minor renewal projects to address asset failures within City owned facilities. The scope of work may include replacement of energy using components with modern equivalent replacements which will not have material emissions reductions. No direct emissions impacts and no enabling emissions impacts.

Quantification - Key Assumptions (cont ...)

Transportation System

- Transportation impacts are best represented at an aggregate level, taking into consideration the entire network, as projects are all interconnected.
- Emissions for transportation projects will not be quantified on an individual basis.
- The transportation components will be presented at the Community level for the following:
  - Road component
  - Transit component
  - Bike network component
  - Overall transportation system

GHG Assessment - Example - Transportation Project

Service Package Name	CETS Action	Pathway				2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request ($000s)
		1	2	3	4				
Yellowhead Trail - Fort Road Widening	☐	-	-	↑	-	Part of Road Composite 12,800	↓	Community	54,597

Description of GHG Impacts

This profile includes the expansion of roadway capacity leading to increased Pathway 3 emissions. Tree removal will adhere to City Tree Management Policy resulting in no impact to Pathway 4 emissions. Project is expected to reduce congestion and resultant emissions when considering City population growth, enabling decreases in emissions.

Direct Emissions Impact - Medium: Due to the importance and high usage of the transportation route currently.

Enabling Emissions Impact - Medium: Due to the importance of the route and uncertainty related to adoption of electric vehicles (EVs) within the community and induced increased use of the route.

GHG Assessment - Example - Transportation Project

Service Package Name	CETS Action	Pathway				2026 GHG Emissions Impacts (tonnes CO2e)	Enabling	Community /Corporate /Both	2023-2026 Budget Request ($000s)
		1	2	3	4				
Valley Line LRT: Downtown to Lewis Farms	☑	-	↑	↓	↓	Part of Transit Composite (23,700)	↓	Both	1,398,324

Description of GHG Impacts

This profile is expected to increase the overall number of trees along the line decreasing Pathway 4 emissions. Development of LRT will enable transit to be used more broadly and plans include incorporation of active travel modes supporting decreases in Pathway 3 emissions from fewer personal vehicle trips. Buildings and facilities related to station operation would lead to Pathway 2 emissions increases. New LRT can enable emissions decreases by shifting towards more dense urban form.

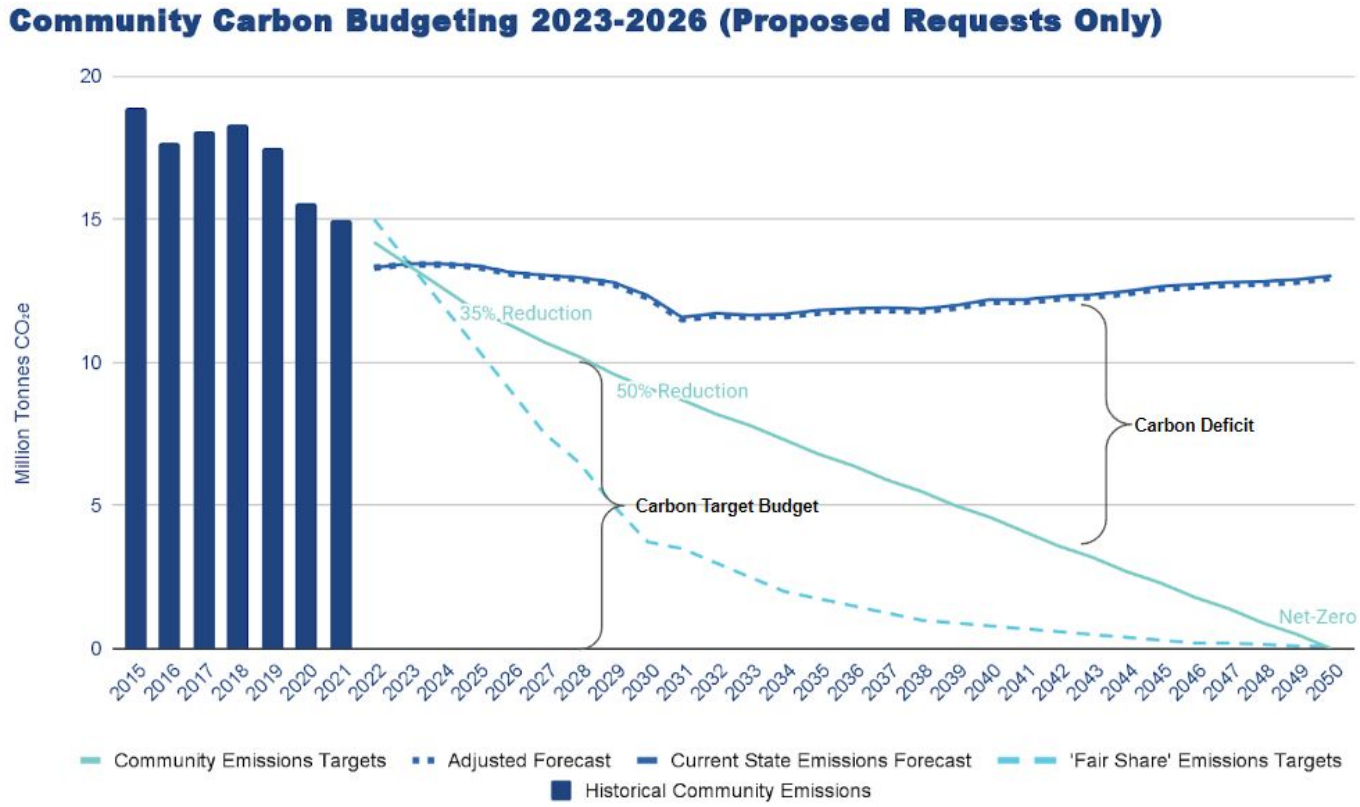
Direct Emissions impact - Medium: associated with the increase use of transit and active travel, expected increase to total trees offset by increased emissions from the energy use of the station.

Enabling Emissions Impacts - High: associated with shifting urban form to increase density.

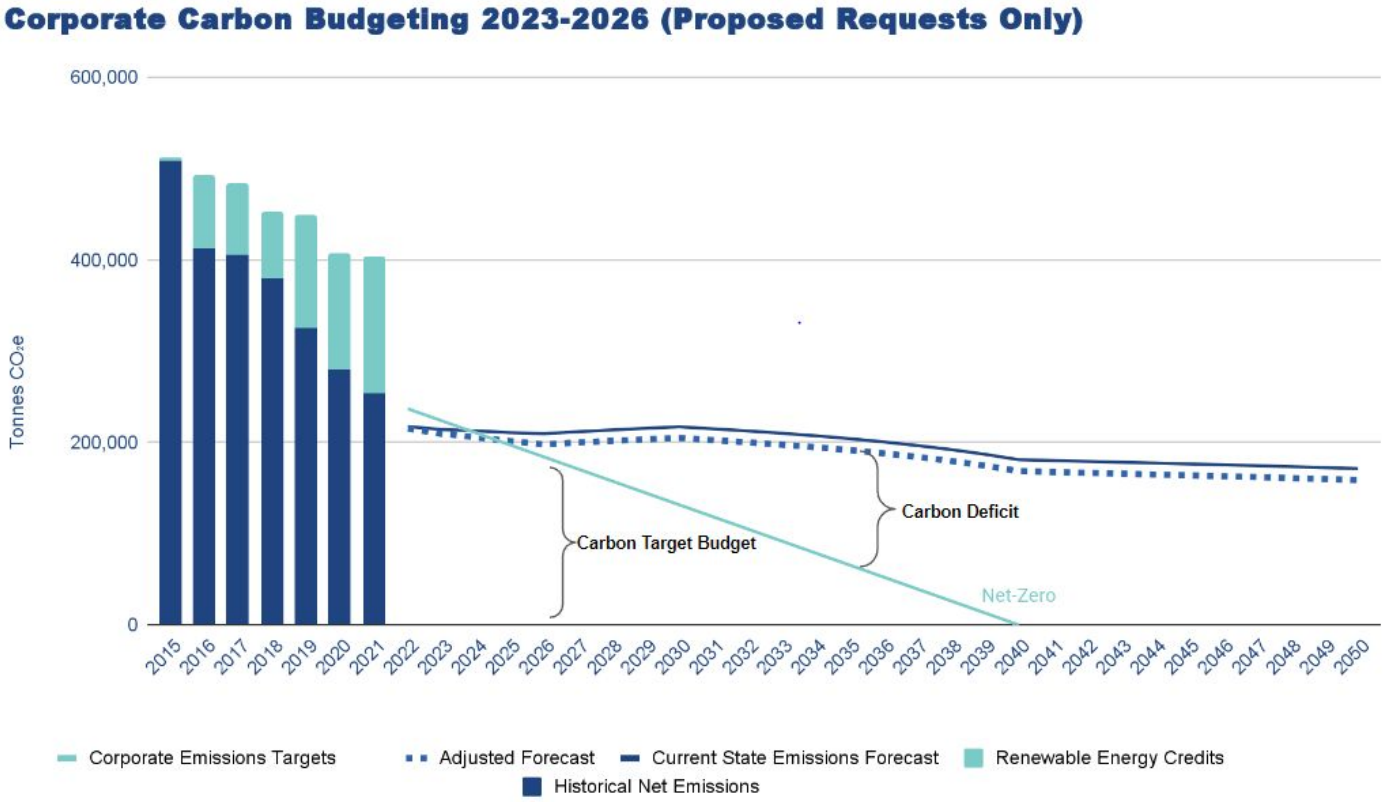
Target Emissions

Target	Community	Corporate
Reducing net GHG emissions by 35%	By 2025	N/A
Reducing net GHG emissions by 50%	By 2030	N/A
Emissions neutral	By 2050	By 2040
Carbon Budget (allowable emissions)	176 million tonnes CO2e	2.25 million tonnes C02e

Community Carbon Budget



Corporate Carbon Budget



Proposed Projects with Quantifiable GHG Impacts

Name of Capital Project	GHG Impacts (Tonnes) 2026	Community/Corporate /Both
Transit Composite - *Capital Line LRT Extension, Metro Line LRT Extension, Valley Line West, Windemere North (Ambleside) Transit Centre and Park and Ride, Mass Transit Network*	23,700 reduction	Community
Landfill Gas to Renewable Natural Gas	22,000 reduction	Both
Edmonton EXPO Centre Rehabilitation	3,000 reduction	Corporate
Lewis Farms Community Recreation Centre and Library (Capital profile)	1,400 increase	Both
Road Composite - *Terwillegar Drive Expressway, Yellowhead Trail Freeway, 50 St. CPR Grade Separation*	12,800 increase	Community

Unfunded Projects Supporting GHG Reductions

Name of Capital Project	Cost ($ millions)
District Energy Network Strategy and District Energy Nodes	$34.5
Active Transportation - multiple options	Varies based on option
Mass Transit Route B1and B2 BRT Route Planning, Design and Construction, Concept, Design & Delivery & E-Bus Infrastructure Expansion	Additional $7.38 $34.65
Nature Based Climate Solutions	$50

6 unfunded climate focussed Service Packages

Key Actions Already Taken

ENERGY TRANSITION

- Rebates - energy and solar
- Client Energy Improvement Program - 2 year pilot
- Blatchford
- District Energy
- LRT Extension
- Electric Buses and Hydrogen Bus
- Protected Bike Lanes
- Curbside EV charging
- City facilities - retrofits and solar

ADAPTATION

- Assessing and mapping climate vulnerabilities for 280 Edmonton neighbourhoods
- Integrating climate resilience into the City's asset management plans
- ECPOR's Flood Mitigation program

Process Improvements

- First iteration of the carbon budget
  - Will improve process based on learnings
- Maturity of the organization
- Emissions quantification
- Embodied carbon
- Corporate interim carbon target

Strategies to Achieve Targets

IMPLEMENT THE ENERGY TRANSITION STRATEGY AND ACTION PLAN

TAKE A BOLDER, STRATEGIC APPROACH TO PARTNERSHIP AND ADVOCACY

INCREASE THE CITY OF EDMONTON'S CLIMATE SOLUTION LEADERSHIP

ACTIVATE CLIMATE RESILIENT URBAN DEVELOPMENT

Looking Forward

- There is much more work to be done
- Municipal investments and funding levels are not sufficient to achieve targets
- Policy development, collaboration and support from other levels of government, and partners

CLIMATE CHANGE IS A COLLECTIVE PROBLEM THAT REQUIRES COLLECTIVE ACTION