



**REVISING**  
EDMONTON'S  
COMMUNITY ENERGY  
TRANSITION STRATEGY

Edmonton

**Draft Content - Key  
Elements of the Energy  
Transition Strategy**

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### **Appendix 1: Strategies**

**DRAFT CONTENT****EXECUTIVE SUMMARY**

The update of Edmonton's Community Energy Transition is an opportunity to re-imagine our city and the energy markets we will lead. The energy transition represents a once in a life-time opportunity to create a new era of economic growth in the region. This will require transformational change at an unprecedented rate. Globally, it is expected that tens of trillions of dollars will be invested in the transition. Edmonton businesses and industry could market, support and sell its energy transition expertise to this growing global demand. This is our next great opportunity.

The transition is unfolding in front of our eyes. Over the last few years, leading companies in our region have invested in innovative projects that have created our global competitive advantage. Suncor has recently announced a new cogeneration facility that will help green Alberta's electrical grid and avoid the equivalent emissions of 550,000 passenger vehicles per year. They have also announced the Forty Mile Wind Project, which will provide the equivalent of 100,000 homes' electricity use per year. The region is now home to the world's largest CO<sub>2</sub> pipeline and a significant carbon capture and storage facility. The region is also home to the first-of-its-kind hydrogen blending project.

There are emerging businesses in bitumen beyond combustion, lithium refinement, smart grid, low carbon hydrogen for heavy transportation and heating, building automation, energy efficiency and green buildings. Edmonton is well-situated to be the place for manufacturing, distribution and construction. This will attract new talent dedicated to technology innovation, create, grow and diversify our economy and contribute to meeting climate and energy goals.

Our province and city have a proud history of being some of the best energy innovators in the world. This expertise has led to growth and economic prosperity. We have responded to and supplied the global markets with our energy products for the last 50 years, and we can respond to and supply the energy products the global markets are demanding for the next 50 years.

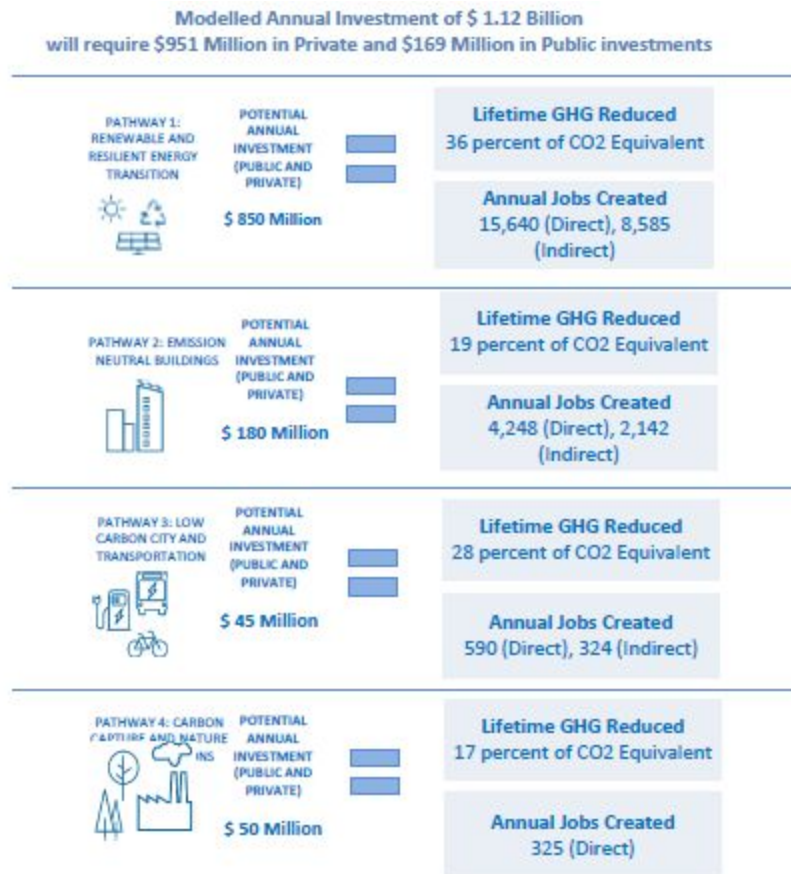
To further catalyze this growth, we propose four interconnected pathways which are built on a foundation of climate solution leadership. The pathways represent bold and brave actions, and are grounded in the principles of prosperity, just and equitable, urgent and dynamic, collaborative and transformative. The interconnected pathways are:

- A **Renewable and Resilient Energy Transition** that attracts the next generation of energy innovators to the region while transitioning Edmonton to 100% decarbonized energy.
- A **Low Carbon City and Transportation** that continues to build on the transformative city building efforts outlined in The City Plan and those that are currently underway such as the Blatchford carbon neutral development.

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- **Emission Neutral Buildings** that are highly energy efficient, powered by renewable energy, and create a thriving energy efficiency industry.
- **Carbon Capture and Nature Based Solutions** that catalyze innovative technology and efforts to make a greener and healthier city.

These pathways will require a smart and agile implementation approach. As with many transitions there are built-in tensions and difficult trade-off decisions. The Energy Transition Strategy and Action Plan will need to use the right levers of change at the right time to achieve prosperity in a just and equitable way and to achieve significant GHG reductions.



Transformational change poses many challenges and opportunities. Edmonton's vision is achievable, but will require significant levels of public and private investment. Investment is required from Federal and Provincial levels of government, the private sector, and the City of Edmonton. The visual above is an illustrative example of the level of local public and private investment that could be catalyzed from the energy transition. This investment opportunity will only be realized with robust public and private participation.

**DRAFT CONTENT****OUR STARTING POINT**

Our starting point has changed. We are entering a new era of economic growth at the same time that a global pandemic has emerged. This new starting point has become our greatest opportunity.

Whether we like it or not, the world around us has changed drastically, and is still changing. The COVID-19 pandemic has presented health, economic, and social challenges that have impacted economies worldwide in an unprecedented way. The global COVID-19 pandemic requires an unprecedented financial response (at the time of this report exceeding \$10 trillion). The public health crisis of COVID-19 has impacted people's quality of life and how we interact with public space and our neighbors, and has also significantly contributed to economic challenges that were already present in Edmonton from low oil prices. Physical distancing measures that were introduced in March 2020 to contain the spread of the virus and the temporary economic shut-in that followed have impacted economic activity for both households and businesses. Edmonton's economy is now expected to contract by 5.7% in 2020, followed by growth of 3.9% as the economy pivots to recovery mode.<sup>1</sup>

This global economic shock is impacting employment and investment across all sectors, including energy. Global energy investment is expected to shrink by an unparalleled 20% in 2020.<sup>2</sup> The International Energy Agency identified governments have a unique opportunity today to boost economic growth, create millions of new jobs and put global greenhouse gas emissions into structural decline through a sustainable recovery for the energy sector.<sup>3</sup> If done correctly, the energy transition can help Edmonton recover from the COVID public health and economic crisis, and put our city in a stronger position into the future. However, this will require a transformational change; one that will be difficult.

The global economy is changing. **We are entering a new era of economic growth.** Moving forward, Edmonton is entering a phase of slow economic recovery and a lower medium-term growth. This will mean that the City will need to explore new economic recovery mechanisms for Edmonton's economic recovery that test the bounds of its existing monetary and fiscal policy. This can be driven by the interaction between rapid technological innovation, sustainable infrastructure investment, and increased resource productivity.<sup>4</sup> The Paris Agreement was adopted by nearly every nation and these commitments and targets have set a clear signal to the market on the inevitability and pace needed for the global energy transition. This will define the global economy of the 21st century.<sup>5</sup> Over the coming decades, **the national plans under the Paris Agreement represent tens of trillions of dollars in investment**<sup>6</sup> and leading companies and investors are creating a new competitive race.

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The businesses who can deliver the innovation and solutions will seize the international markets who are looking for solutions. The demand exists and will only grow. Canada's clean technology developers and adopters are well positioned to compete and win in this global market.<sup>7</sup> In Canada clean technology contributed \$26.7 billion (2016) to GDP, and has an annual growth rate of 3.4% per year since 2007. The Government of Canada has a goal that clean technology is one of Canada's top five exporting industries and that by 2025 clean technology's contribution to GDP will grow to \$80 billion.<sup>8</sup> This is an economic growth opportunity that is recognized by Canada's industry leaders. Nearly fifty of Canada's major business leaders recognize this as the country's competitive advantage and in an open letter encouraged governments to lead a collaborative and bold economic recovery that builds on the strengths of our existing economy and talent to capture the growth markets of the future.<sup>9</sup>

**Edmonton's Economy 2.0 - the story unfolding before our eyes**

Our local economy is changing. The Energy industry will continue to be a critical and fundamental structural platform for our economy. There are transformative, innovative changes taking place in industry that are addressing climate resilience. Edmonton has an opportunity to capitalize and diversify the economy through new investments within emerging industries in the energy and innovation sectors and benefit from well established companies that are transforming their businesses.

Many companies — globally, in Alberta and the Edmonton metro region — are transforming their businesses to capitalize on, respond to and provide leadership to energy transition and climate challenges. Making the transition to a low carbon economy is challenging but many companies in the private sector are finding new ways of responding and leading to achieve positive climate outcomes while creating new economic opportunities.

Right here in the Edmonton Metropolitan Region, Suncor has recently announced a new cogeneration facility that will help green Alberta's electrical grid and avoid the equivalent emissions of 550,000 passenger vehicles per year. They have also announced the Forty Mile Wind Project, which will provide the equivalent of 100,000 homes' electricity use per year. Adding to all that, the completion of Canada's electric highway, with EV charging stations at our Petro-Canada stations from coast to coast. Suncor is embedding sustainability as a value driver in day to day business decisions.

There are emerging businesses in bitumen beyond combustion, including lithium refinement, smart grid, low carbon hydrogen for heavy transportation and heating building automation, energy efficiency and green buildings, which Edmonton is situated to support by way of manufacturing, distribution and construction. This has the potential to attract new talent dedicated to technology innovation, and create, grow and diversify our economy and contribute to meeting climate and energy goals. As well, this presents an opportunity for retraining displaced workers in other industries.

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In recent years key projects in the region have given us a competitive advantage to supply global markets with the energy services and products the world is now demanding. The region is home to the world's largest CO<sub>2</sub> pipeline and a significant carbon capture and storage facility. Also the first-of-its-kind hydrogen blending project is being advanced in the region, with construction commencing in Q1 2021.

We are home to a young, well-educated, talented workforce and we have demonstrated innovation and a strong tradition of research and development with respect to cutting edge technologies. In 2016, Edmonton's green energy economy was responsible for generating \$3.59 billion in gross output, \$1.79 billion in gross domestic product (GDP), and employed approximately 14,669 direct jobs, equal to 2.0% of the region's workforce.<sup>10</sup> Our value chain has strengths that span all elements including: design, engineering and technical services, construction and manufacturing, operations, and broader ecosystem supports. Edmonton's economy 2.0 has been unfolding before our eyes.

## **BACKGROUND - GETTING TO 1.5**

In 2015, Edmonton developed its first ever Community Energy Transition Strategy. The strategy was a risk management approach designed to make Edmonton an energy sustainable city and to position Edmonton to participate in what is possibly one of the greatest economic opportunities in history. At that time, the strategy identified the energy transition as the golden opportunity of our age that would be prosperous for those who responded to the challenge with innovative solutions. The strategy took the position that few places are better positioned than Edmonton (in terms of knowledge, experience and financial capacity) to lead and excel in this area.

Since Edmonton's Community Energy Transition Strategy was first developed key events have accelerated the global energy transition.

- **The Paris Agreement was adopted by nearly every nation.** The agreement commits nations to limit the rise of global average temperatures well below 2 degrees Celsius and to pursue efforts to limit the temperature increase even further, to 1.5 degrees Celsius. This **requires an unprecedented reduction in greenhouse gas emissions.**
- An Intergovernmental Panel on Climate Change special report on the impacts of global warming of 1.5 degree Celsius identified that to limit warming to 1.5 degrees, global CO<sub>2</sub> emissions need to decline by about 45% by 2030, reaching net zero around 2050.

In order to build on and update the existing Energy Transition Strategy to reflect ambitious 1.5 degree targets, and to align it with the City's long term vision as outlined in ConnectEdmonton and The City Plan, technical analysis was undertaken. ConnectEdmonton's Goal for Climate Resilience states: Edmonton is a city transitioning to a low-carbon future, has clean air and water and is adapting to a changing climate. To understand what the

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transition to a low-carbon future looks like, a local carbon budget was calculated. Local carbon budgets are “bleeding edge” work, and the thinking and precision around this field of work will continue to be refined based on new knowledge and improved scientific understanding. The carbon budget shows “how far and how fast” we have to move in terms of emission reductions, and the magnitude of change required. Meeting Edmonton's local carbon budget requires rapid reduction of greenhouse gas emissions and carbon neutrality by 2050.

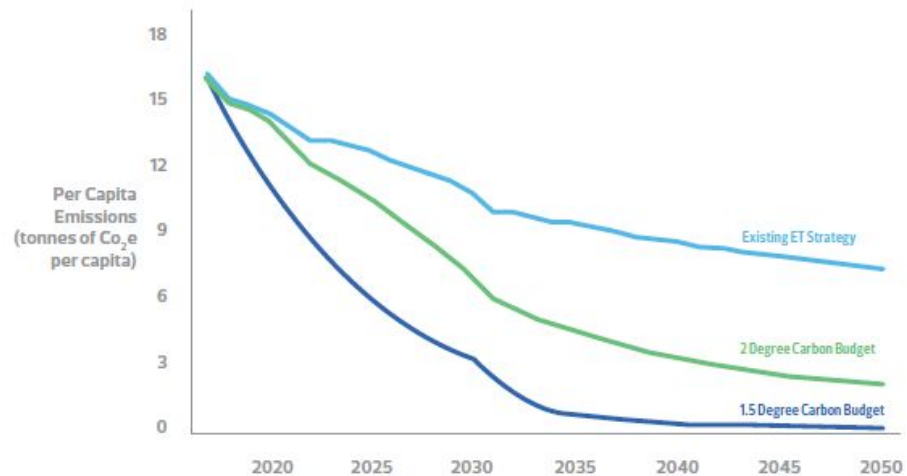


Figure 1 Edmonton's Local Carbon Budget Trajectory

The technical work also identified that there is no single measure (or even a handful of measures) that can reduce emissions to levels to align with Edmonton's local carbon budget. The work identified that a suite of actions across different sectors are required, and the magnitude of emissions reductions in any one measure are relatively small, but collectively can achieve deep reduction targets.

From a greenhouse gas emission perspective, Edmonton is in a challenging starting point. Edmonton's exceptional growth rate over the last decade has meant total GHG emissions have increased, though the average per person emissions have decreased. Despite this progress, Edmonton still has one of the highest per capita greenhouse gas emissions levels in the world (18 tonnes/person). The four major sources of greenhouse gas emissions in Edmonton are:

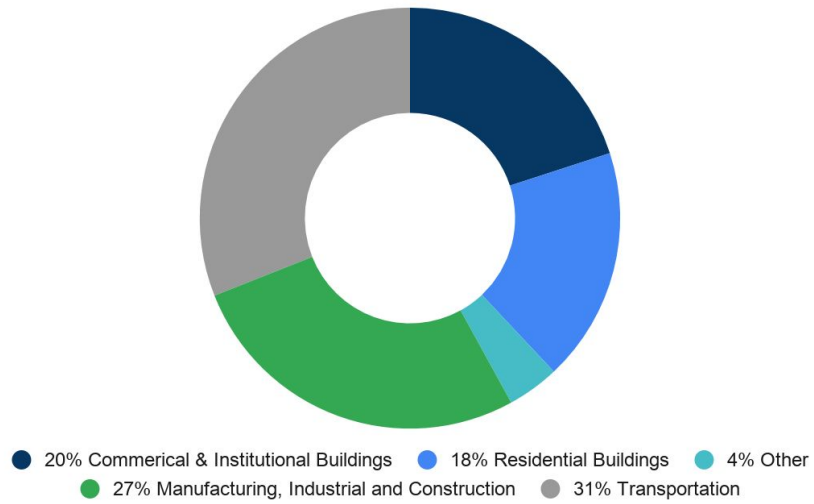
- Transportation - 31% of Edmonton's total emissions;
- Manufacturing, industry and construction - 27%;
- Commercial and institutional buildings - 20%; and
- Residential buildings - 18%.

The remaining emissions come from agriculture, forestry, waste and waste water treatment, and fugitive and non-specified sources. Edmonton's river valley and urban forest capture approximately 1% of the city's emissions.



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Figure 2 Edmonton's GHG Emissions by Sector

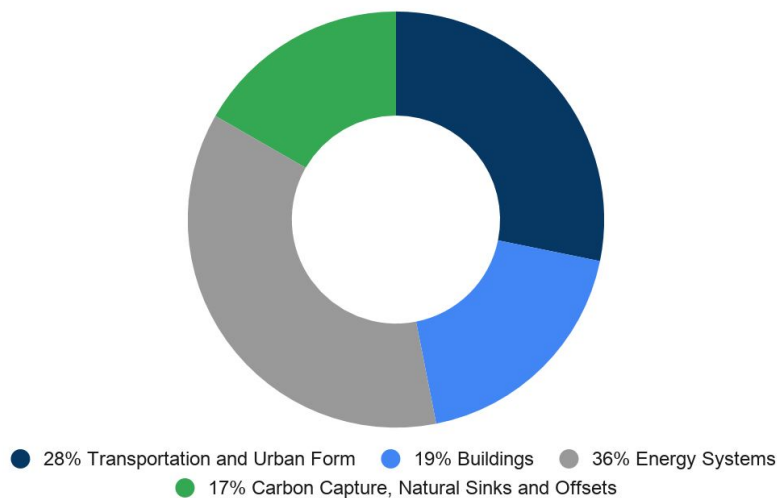


The work to update the strategy identified that with rapid and significant actions, Edmonton's emissions could be reduced by up to 85%. The three major reduction areas are:

- Transportation and Urban Planning - up to 28% of needed reduction;
- Energy Systems - up to 36%; and
- Buildings - up to 19%.

A gap of up to 17% of needed reductions remains, and will need to be addressed by actively removing carbon from the atmosphere through carbon capture technology, nature based solutions or purchasing offsets.

Figure 3: Emission Reduction Profile



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Also, since Edmonton's Community Energy Transition Strategy was first developed,

- The leadership of the **Edmonton Declaration has signaled** that we are **open for business and investment** in the future energy market.
- Numerous City of Edmonton climate actions programs have been launched **demonstrating the City's willingness to act and invest in this area.**
- Climate Resilient Edmonton: Adaptation Strategy and Action Plan, the companion document to this strategy, was developed. The strategy identifies climate change impact projections for Edmonton, if global greenhouse gas emissions reductions are not taken. That strategy also identifies the local impacts of climate change, such as damages and disruption from extreme weather events, adverse health effects, and direct and indirect lost productivity and services. These projected impacts could lower Edmonton's GDP by \$3.2 billion and \$7.4 billion annually by the 2050s and 2080s (respectively), and could increase the number of physical and mental health incidents by 22,000 episodes annually by the 2050s.

Building on and updating the Energy Transition Strategy in a bold, brave, agile and smart manner, is needed to to embrace an incredible economic opportunity and respond to a changing world.

## STRATEGIC ALIGNMENT AND STRATEGY STRUCTURE

The Energy Transition Strategy and 1.5° Climate Action Plan fall under ConnectEdmonton and The City Plan, and provide further details on how goals and outcomes in those strategic documents, related to energy and climate, will be achieved.

**ConnectEdmonton** sets the direction for our future and outlines where we need to change today to realize our vision for Edmonton in 2050. ConnectEdmonton is about transformational change and has four goals: Climate Resilience, Regional Prosperity, Urban Places and Healthy City.

**The City Plan** sets the strategic direction for the way Edmonton grows, its land use, its mobility systems, open spaces, employment and social networks, generally touching on most aspects of life in Edmonton.

The Energy Transition Strategy and 1.5° Climate Action Plan outline how we achieve the transformational change to a low carbon city as outlined in ConnectEdmonton and City Plan.

**DRAFT CONTENT****STRATEGY STRUCTURE**

The Energy Transition Strategy and 1.5 Climate Action Plan have:

Five

**GUIDING PRINCIPLES**

Guide how the Energy Transition Strategy and 1.5 Climate Action Plan will be advanced and implemented. Following ConnectEdmonton's guiding principle of being connected, the energy transition guiding principles ensure that we make strategically consistent choices as we work to achieve our goals.

Four

**PATHWAYS**

Areas of transformative action. Pathways are interconnected and they are all needed to achieve Edmonton's low carbon future. Each Pathway has goals, strategies and actions.

One

**FOUNDATION**

The commitment to "climate solution leadership" is the foundation on which the Energy Transition Strategy and 1.5 Climate Action Plan is built.

Fifteen

**GOALS**

Set out what needs to be achieved in Edmonton. The goals are long term outcomes aligned to Council's vision.

Thirty-Seven

**STRATEGIES**

Approaches needed to achieve the goals. The strategies represent the overall action that is required to achieve emissions reduction goals, even if specific actions are modified during implementation due to changing contexts such as emerging technologies.

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Multiple

**ACTIONS**

Activities that will be taken to reach the Pathway goals. The actions have been developed to reach multiple outcomes: greenhouse gas emissions reduction, economic prosperity and just & equitable transition.

**THE PATH FORWARD**

ConnectEdmonton is about transformational change and the four goals, including Climate Resilience, require action and change to achieve our vision. Transformational change poses many challenges and opportunities. Edmonton's vision is achievable, but it will not be easy. The challenges and opportunities can be grouped into four key areas related to the four key reductions areas: **Energy, Buildings, Urban Living and Transportation**, and **Carbon Capture and Nature Based Solutions**.

**Energy**

**The Opportunity:** This strategy allows us to re-imagine where our energy comes from and the future energy markets we can lead. Edmonton and Alberta are home to the world's best energy innovators and we can use our strengths to lead this transition. This pathway will build on our current strengths and innovation to develop the next generation of energy jobs, small business opportunities and products the global market is beginning to demand. We have competitive advantages, including the ability to produce near zero-emission hydrogen at a lower cost than virtually any other jurisdiction in the world.<sup>11</sup>

**The Challenge:** A part of our economy and identity are tied to the fossil fuel industry. Factors in the global energy market are changing and global energy systems are going through a rapid transition. These changes will cause economic and social challenges in our region and province. As we work to diversify, making ourselves more resilient and attractive, there will not be consensus in the community on this transition. As with many transitions there are built-in tensions. There will be enthusiasm from the next wave of energy entrepreneurs, and there will be others who are experiencing various "stages of grief" (ie. denial, anger, etc.). This transition will be a challenging time in which to govern.

**Buildings**

**The Opportunity:** An emission neutral building is one that is highly energy efficient and uses only renewable energy. Edmonton is home to significant expertise in sustainable building practices and green building technologies. It is home to the highest number of net-zero residential buildings in Canada. Construction and engineering is a key sector of Edmonton's economy. We have the expertise and innovative building technologies the world will need. The homes built in Edmonton today are more energy efficient than homes built a decade ago. The strategy imagines a future where homes in the coming decade will be even more comfortable, energy efficient, and resilient as well as having lower energy costs than the homes we have today. This pathway also imagines an unprecedented energy efficiency retrofit effort

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(over 350,000 residential buildings) that could create a thriving retrofit industry and significant local job opportunities.

**The Challenge:** Edmonton is consistently ranked as one of the most affordable cities in Canada. However, there are roughly 74,000 energy poor households in Edmonton, meaning the household is unable to maintain 'adequate' (ie. a level of energy consumption in the home necessary to meet basic health and well-being needs) access to energy services at a reasonable cost. Inefficient buildings have higher energy costs which can be especially challenging for lower-income homes. Not only are housing conditions and long term affordability a challenge, but the higher upfront costs to building an emission neutral building or the ability to access funding to complete a retrofit will be a challenge. Some members of the development industry have expressed concerns about affordability implications and their capacity to meet increasingly stringent building regulations. Retrofitting efforts will require equity and community needs considerations.

***Urban Living and Transportation***

Observations from 27 major urban centers across North America showed that cities with higher levels of energy efficiency, reduced GHG intensity, higher rates of "green" buildings, greater availability of sustainable transport options tend to have: higher rates of employment; higher GDP per capita; lower rates of violent crimes; higher levels of educational attainment; lower levels of perceived stress among residents (improved mental health); a greater sense of community; and higher levels of investment in new commercial and institutional buildings.

**The Opportunity:** The way a city is designed and built has a direct impact on how people get around, connect and experience their city. Edmonton has a lot of potential to be designed and re-built to connect us to each other, to our communities and to our local businesses. We can have a city that helps each of us save money on the ways we move around, while also reducing the amount of time we spend driving, ultimately helping to create a healthier lifestyle. We can have a city that is attractive to top global employers by providing the lifestyle their employees are looking for. Urban planning practices are changing, and Edmonton has already shown bold transformative leadership in developments such as Blatchford. Continuing to catalyze those bold and transformative urban planning decisions across Edmonton and implementing The City Plan will help to create a vibrant and thriving low carbon city.

**The Challenge:** Many growing cities, particularly in North America, have been designed to prioritize the car. We are currently a city with "big city" commutes, wide and multi-lane roads and big surface parking lots that are missing pedestrian and cycling connections. Transforming to a city with accessible and easy multi-modal transportation choices, where people do not have to travel far to meet their daily needs, and where our increased density will help accommodate a larger population within our existing boundaries will not be simple, easy or cheap.

***Carbon Capture and Nature Based Solutions***

**The Opportunity:** To limit global warming to 1.5°C, actions that actively remove carbon from the atmosphere are needed. These actions include nature based solutions (such as planting more trees and protecting existing carbon sinks) and technological options (such as using carbon capture

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equipment). Nature based solutions help support attractive, healthy urban places and carbon capture technology can grow prosperity in our region. The Edmonton Metro region is home to state of the art CO<sub>2</sub> carbon capture and storage technology and infrastructure, such as the world's largest capacity CO<sub>2</sub> pipeline and large scale CO<sub>2</sub> capture projects. This is our competitive advantage and these strengths position the region to attract and grow carbon capture investment and jobs.

**The Challenge:** Even with decisive and bold climate action, up to 20% of the reductions needed in Edmonton will have to come by removing carbon from the atmosphere or offsetting emissions. There are uncertainties in this pathway including the amount of "negative" emissions needed. This will depend on the amount of reductions that different actions achieve, and the level of action taken by other levels of government, businesses and the community. There are also uncertainties in the feasibility, scalability and impact of carbon capture measures.

**Transformational Pathways**

Four bold and transformative pathways have been developed to reach Edmonton's Climate Resilience goal of a low carbon city:

- Renewable and Resilient Energy Transition
- Low Carbon City and Transportation
- Emission Neutral Buildings
- Nature Based Solutions and Carbon Capture

Pathways are areas of transformative action. The four pathways are interconnected and they are all needed to achieve Edmonton's low carbon future. Each pathway has goals that set out what needs to be achieved for a low carbon, prosperous and just and equitable future. The pathways reflect the four main reduction opportunities for Edmonton.

Each Pathway will require investment, to varying degrees, that will be dependent on the tools, actions or approaches that the City can use to enact change and achieve specific outcomes. These tools are referred to as Levers of Change.

**Milestones** illustrate how a pathway advances until 2050. Milestones represent significant initiatives aligned with meeting the pathway goals. Each pathway will require multiple initiatives, some small and some large. Milestones illustrate the transition to 2050, however the Climate Action Plan (to be developed) focuses on actions for the coming decade. The pathways require targets to achieve the strategy's goals and the transition's milestones.

**PATHWAY #1: RENEWABLE AND RESILIENT ENERGY TRANSITION**

This pathway allows us to re-imagine where our energy comes from and the future energy markets we can lead. This pathway will see Edmonton supplied with **100% emission neutral electricity and heating by 2050** and a complete build out of **a city-wide decarbonized district energy network by 2050**. This pathway will build on our current strengths and innovation to develop the next generation of energy jobs, small business opportunities and

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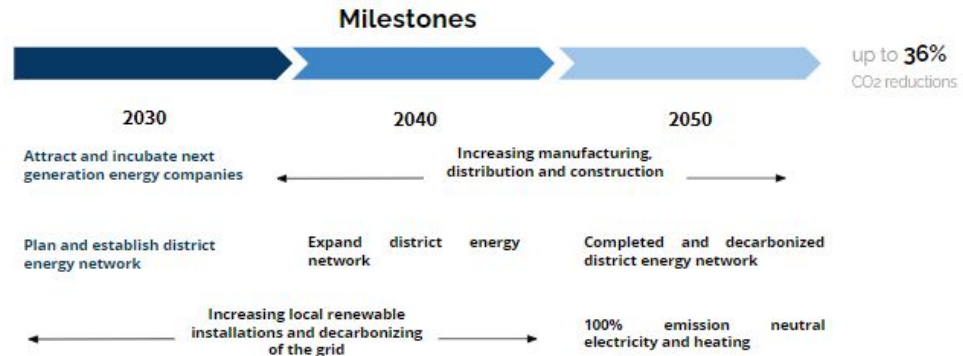
**PATHWAYS** are areas of transformative action. Pathways are interconnected and they are all needed to achieve Edmonton's low carbon future. Each Pathway has goals, strategies and actions

**GOALS** set out what needs to be achieved in Edmonton. The goals are long term outcomes aligned to Council's vision.

products the global market is beginning to demand. This pathway will see the Edmonton Metropolitan Region **attract and incubate 50 next generation energy companies by 2030 with diverse ownership (ie. women, Indigenous, minority owned)**. This pathway could achieve up to 36% of the needed emission reductions and would require approximately \$857 million in annual public and private investment. The level of public investment required will depend on the Levers of Change that are applied to achieve this pathway.

**Goals**

- **Edmonton is a thriving city powered by low carbon energy**
- **Edmonton is a hub for low carbon energy innovation and investment**
- **Edmonton uses waste as a resource**



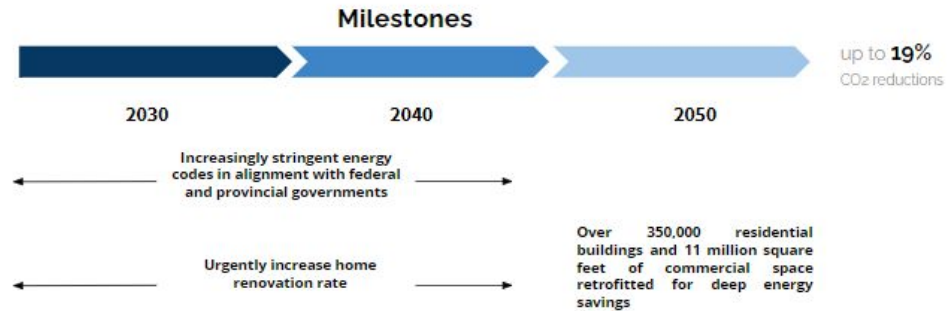
The pathway strategies can be found in Appendix 1.

**PATHWAY #2: EMISSION NEUTRAL BUILDINGS**

This pathway imagines a future with highly energy efficient, healthy homes and buildings, powered by renewable energy. This pathway will see Edmonton administrating **increasingly stringent energy codes in alignment with federal and provincial governments**. This pathway will see Edmonton undertake an unprecedented energy efficiency retrofit effort (**over 350,000 residential buildings and over 11 million square feet of commercial space retrofitted for deep energy savings by 2050**). This effort could create a thriving retrofit industry and significant local job opportunities. This pathway could achieve up to 19% of the needed emission reductions and would require approximately \$180 million in annual public and private investment. The level of public investment required will depend on the Levers of Change that are applied to achieve this pathway.

**Goals**

- **The buildings that Edmontonians live, work and play in are emission neutral and improve personal wellness**
- **Eliminate energy poverty**
- **Catalyze the local green building and energy efficiency industry**

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The pathway strategies can be found in Appendix 1.

### **PATHWAY #3: LOW CARBON CITY AND TRANSPORTATION**

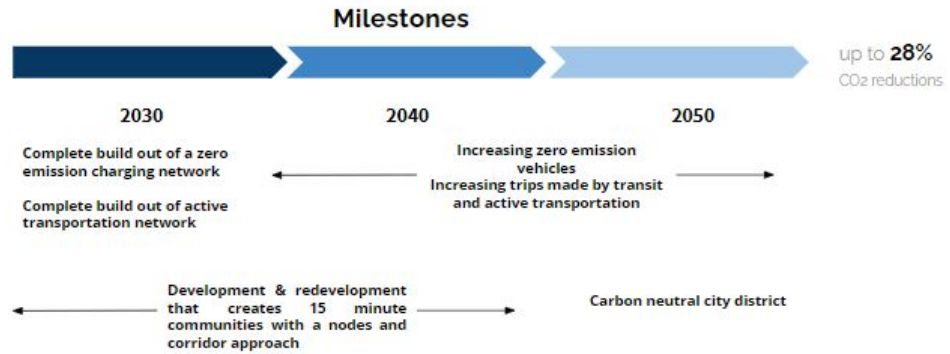
This pathway continues to build on the transformative city building efforts outlined in The City Plan and those that are currently underway such as the Blatchford carbon neutral development. This pathway will see Edmonton with **city districts that are carbon neutral by 2050, 50% of growth occurring as infill development, and the complete build out of the active transportation network by 2030**. This pathway helps create the city that is attractive to top global employers by providing the lifestyle their employees are looking for. This pathway will see **50% of trips made by transit and active transportation by 2040, development and redevelopment that creates 15 minute communities with a nodes and corridor approach, and a city with a completed zero emission vehicle charging network by 2030**. This pathway could achieve up to 28% of the needed emission reductions and would require approximately \$45 million in annual public and private investment. The level of public investment required will depend on the Levers of Change that are applied to achieve this pathway.

#### **Goals**

- **Edmonton is planned, designed and built to be a vibrant carbon neutral city**
- **Safe and accessible zero emission mobility**
- **Edmontonians reduce consumption based emissions by supporting local businesses**



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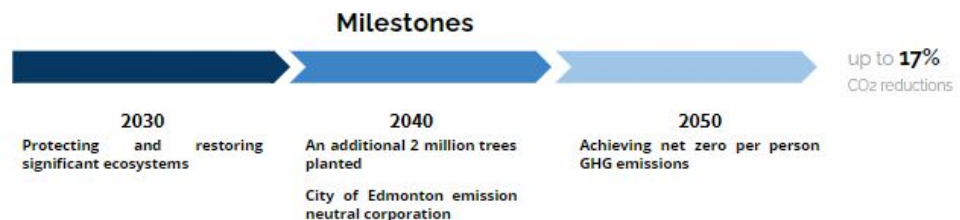
The pathway strategies can be found in Appendix 1.

**PATHWAY #4: CARBON CAPTURE AND NATURE BASED SOLUTIONS**

This pathway imagines a future where we cost effectively remove carbon from the atmosphere using innovative technology and nature based solutions that cultivate a healthier city. This pathway sees Edmonton **protecting and restoring significant ecosystems by 2030 and planting an additional 2 million trees by 2040**. This pathway helps support attractive, healthy urban places and carbon sequestration. The technology solutions under this pathway can grow prosperity in the region by using our carbon capture technology and infrastructure competitive advantage to attract and grow investment and jobs. This pathway will see the **City of Edmonton is an emission neutral corporation by 2040**. This pathway sees Edmonton **achieving net zero per person GHG emissions by 2050**. This pathway addresses the gap of up to 17% of the needed emission reductions and would require approximately \$50 million in annual public and private investment. The level of public investment required will depend on the Levers of Change that are applied to achieve this pathway.

**Goals**

- **Edmonton is full of nature, to support healthy people, emissions reductions, communities and carbon sequestration**
- **Expand carbon technology investment/opportunities and business in the Edmonton Metropolitan region**
- **Edmonton cares for future generations by offsetting remaining emissions**



The pathway strategies can be found in Appendix 1.

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The commitment to climate solution leadership is the FOUNDATION on which the Energy Transition Strategy and 1.5 Climate Action Plan are built.

## FOUNDATION: CLIMATE SOLUTION LEADERSHIP

The energy transition is a complex community effort that will require leadership. The strategy needs to stand on a foundation where the City of Edmonton demonstrates climate solution leadership in our own decision making, actions and advocacy.

### Goals

- The City of Edmonton aligns decision making with the international target of limiting global warming to 1.5°C
- The City of Edmonton partners with and mobilizes communities and governments to meet carbon budget goals
- The City of Edmonton establishes innovative and participatory financing tools

The pathway strategies can be found in Appendix 1.

## THE APPROACH

In order to activate the changes identified in the Energy Transition Strategy, two complementary approaches are needed. The first is an approach to accelerate efforts. The second is a smart and agile implementation approach. These approaches, and the development of the strategy are guided by a series of principles.

The **Guiding Principles** ground how the Energy Transition Strategy and Climate Action Plan will be advanced and implemented.

The **Acceleration Approach** reflects the level of ambition and action needed over the next 30 years.

The **Implementation Approach** reflects how that ambition will be realized.

## GUIDING PRINCIPLES

The update and implementation of the Energy Transition Strategy is guided by the following principles:

### Just and Equitable

- We will lead Edmonton through a just and equitable energy transition, fostering a good quality of life for all Edmontonians, leaving no one behind.

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**GUIDING PRINCIPLES**  
ground how the Energy Transition Strategy and Climate Action Plan will be advanced and implemented. Reflecting and following ConnectEdmonton's guiding principle of being connected, our principles ensure that we make strategically consistent choices as we work to achieve our goals.

- We are not only serving those today, but we are serving those who come after us by taking action and not deferring action to future generations.
- Environmental protection and sustainability will be integral to the energy transition.

**Prosperous**

- This energy transition will be an economic development and job diversification transition, equipping Edmontonians to be resilient to changing economies.

**Urgent and Dynamic**

- We work towards achieving increasingly urgent and ambitious climate action and find ways to accelerate our energy transition efforts.
- We will learn from others to accelerate and prioritize our own actions and we will use a dynamic steering and flexible approach to respond to evolving knowledge and technologies, allowing us to leverage and accelerate efforts.

**Transformative**

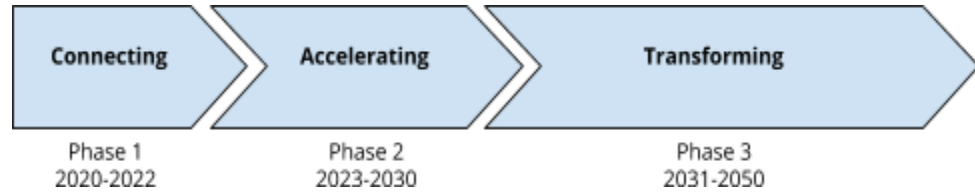
- Edmonton's energy transition will be a re-imagining of our city; departing from a business-as-usual approach to transform into a low carbon community.
- We will lead by example in our decisions, services, projects, procurement, infrastructure and actions. Every decision is a climate change decision.

**Collaborative**

- Transitioning to a low carbon city is a collective effort, and we will connect and collaborate with other governments, regional partners, institutions, communities, businesses, academia, and global partners for accelerated action.
- We will approach this challenge in a holistic and integrated way. The Pathways are integrated with each other, with other climate actions and with City processes.

**ACCELERATION APPROACH**

Irreversible climate change is already happening, and impacts are being felt around the world. This means that the window to act in order to avoid the most damaging effects is quickly closing, requiring accelerated efforts to reduce greenhouse gas emissions. The acceleration approach has three phases:

**DRAFT CONTENT****Phase 1: Connecting (2020-2022)**

The first phase of accelerated action is **Connecting**. This phase connects our level of ambition with a plan, by updating the current Energy Transition Strategy. This phase connects the need for more urgent action to current initiatives, by adjusting initiatives (where possible), and launching new budgeted initiatives. This phase connects the network of businesses, institutions, academia, community groups and residents who will collectively make this energy transition happen. Finally, this phase connects our ambition to the financial resources needed for Phase 2 of acceleration.

**Phase 2: Accelerating (2023-2030)**

The second phase of accelerated action is **Accelerating**. This phase requires rapid and significant scaling up of existing programs, as well as the launch of several new initiatives, actions, programs and services. This will need to be done quickly, yet strategically, in order to create a large emissions reduction impact and economic prosperity in a just and equitable way.

**Phase 3: Transforming (2031-2050)**

The third phase of accelerated action is **Transforming**. This phase builds off the rapid and significant scaling up during Phase 2. This phase sees transformation of our energy systems, our city and the way we move around it, and the buildings we live, work and play in. In this phase, Edmonton will need to take transformational action to achieve carbon neutrality or net zero emissions.

**IMPLEMENTATION APPROACH**

The Energy Transition Strategy and 1.5 Climate Action Plan require an agile and smart implementation approach. This means knowing if, and what type of, an initiative is needed and knowing when government action is no longer required, or at least not required in the same way.

While the approach to achieving our greenhouse gas emissions targets requires multiple actions, not every action is required immediately or forever, and the solutions must respond to the challenge of new fiscal constraints. Though the majority of climate actions have a positive return on investment, they do impose an upfront cost, and it may not be feasible or realistic for those costs to be borne all at once.

Not only do we need to know when to enter into an action, we also need to know when to exit, stop, or change an action. Market transformation may

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reach a point when government intervention would no longer be required. Monitoring and review, as well as regular check-ins with City Council, will be required in order to implement effectively and in an accelerated manner.

The proposed implementation approach:

- aligns with the City of Edmonton's Capital Project Development and Delivery approach, but includes an additional "monitoring" element that is not typical for infrastructure projects,
- provides a flexible overall framework to guide the management of the broad range of energy transition initiatives (ie. policy, infrastructure, etc.),
- ensures effective and efficient use of public funds,
- includes formal checkpoint reviews during different phases of the approach, and
- includes exceptions to allow for accelerated action to meet energy transition goals and targets where opportunities emerge.

**KEY ELEMENTS OF THE IMPLEMENTATION APPROACH**

The proposed implementation approach has four key elements:

**Levers of Change** - are tools, actions or approaches that the City can use to enact change and achieve specific outcomes. The different outcomes of the strategy will require different actions, and the action might change at different times.

**Implementation Gates** - provide communication, check-in and approval opportunities as initiatives move through a development to delivery process. The gates are aligned with decision points (ie. What lever of change? Should the initiative be altered, proceed or be delayed? etc.).

**Prioritization** - part of the implementation gate process will include prioritization. Once it has been determined actions need to be taken, and how those actions should be delivered, prioritization will be conducted based on the carbon accounting framework and budget processes.

**Thresholds and Monitoring** - are the signals to be monitored to determine when to implement an action, when to change or modify our approach, or when to stop doing an action.

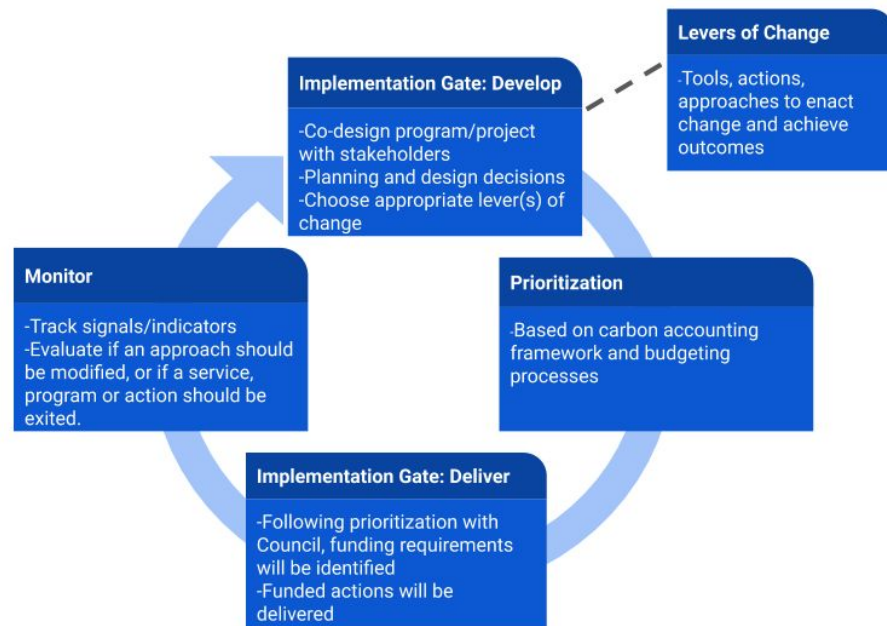
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Figure 4 Energy Transition Implementation Approach

## LEVERS OF CHANGE

**LEVERS OF CHANGE** are tools, actions or approaches that the City can use to enact change and achieve specific outcomes. The different outcomes of the strategy will require different actions, and the action might change at different times.

The City Plan identifies levers of change that are tools, actions or approaches that the City can use to enact change and achieve specific outcomes. These levers are how the City can bring about a market transition and can be applied to the energy transition.

The City Plan identifies four levers of change: Partnership and Advocacy; Incentives, Pricing and Subsidies; Infrastructure Investment; and Policy and Regulation; . Levers of change may need to be applied to varying degrees to achieve an Energy Transition outcome. In some cases, multiple levers will need to be used at the same time.

**Partnerships and Advocacy** require fostering relationships with private, community, institutional and not for profit entities to activate strategies, initiatives and actions to advance common goals, recognizing shared interests and aspirations.

**Incentives, Pricing and Subsidies** include applying a premium to cost or a reduction in cost to support a shared outcome or influence behaviour. This can include off-setting the costs of services and amenities for certain user groups or types of activities, or applying charges and fees for users through available financial mechanisms.

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**Infrastructure Investment** is about providing capital or operational investment in physical infrastructure, City assets, services and planning activities to activate and encourage specific energy transition outcomes.

**Policy and Regulation** is a municipal planning instrument that can guide, direct, manage or shape how we provide strategic direction for land, infrastructure or services to influence or change the behaviour of residents and markets or market groups.

The four levers of change the City Plan identifies, are expanded to include a fifth lever in the Energy Transition context:

**DRAFT Activation** is about providing awareness, filling knowledge gaps, and building capacity to encourage and support energy transition outcomes.

**IMPLEMENTATION GATES**

Implementation gates are a structured check-in and approval process that allows decision makers to set initial direction on priorities, and refine the initiative (if needed) prior to delivery. The implementation gate framework can be applied to a broad range of initiatives (ie. policy, infrastructure, etc.) and has an "exceptions process" for certain initiatives.

Implementation gates help to phase in distinct pieces of work related to the life-cycle of an initiative. Many initiatives or decisions will have a design life (ie. the period of time the initiative or service is needed and is relevant). At each gate there is a formal checkpoint review on whether or not to proceed to the next gate, or if adjustments are needed. This gated approach helps ensure that the right lever(s) of change is being implemented at the right time.

The gated implementation approach consists of three phases:

**Develop** - During this phase actions will be co-designed with stakeholders. The initiatives that will enter the "Develop" phase will be based on Council identified priorities through the City's long-term capital investment plan and Priority Based Budgeting (PBB) process. During this phase, planning and design decisions will be made, and the specific **Levers of Change** will be selected. A composite fund will support the work during this phase.

**Deliver** - During this phase, the developed actions and initiatives will be presented to Council for **Prioritization** through the carbon accounting framework and budgeting processes. During this phase operating and/or Capital funding requirements will be identified. Those initiatives that are funded by Council will be delivered (ie. the infrastructure would be constructed, services launched for residents or businesses, policy enacted, etc.).

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**Monitor** - A monitoring and evaluation framework will be developed to track the signals that will determine when to modify an initiative approach, or when to exit the service, program or action.

**EXCEPTIONS**

Similar to the City of Edmonton's Capital Project Development and Delivery approach, the following exceptions to the gated implementation approach are proposed: i) low risk initiatives; and ii) initiatives that meet criteria for acceleration.

**Low risk initiatives**, in the Energy Transition Strategy context, are those that maintain a composite budget profile or can be integrated into existing City programs and services with minimum re-alignment or without additional resources.

**Acceleration criteria** are the basis for when an initiative will not need to follow the gated approach. This acceleration criteria include:

- Opportunities to leverage external funding;
- Opportunities for delivery at significantly reduced costs; or
- Council directed priority projects.

**PRIORITIZATION**

Once actions have been vetted through the implementation gates process, prioritization of the actions based on the carbon accounting framework. The carbon accounting framework may be integrated into the City's new Priority Based Budgeting (PBB) process to provide a combined corporate approach for the City's overall capital and operating budget.

Similar to a financial budget, a **Carbon Budget** includes revenues (annual emission limit), expenses (emissions) and deficits/surpluses (annual emission limit minus emissions). The Carbon Budget aligns with decision-making frameworks used by local governments for capital and operating budgets, frameworks in which investments, costs and benefits are assessed over multiple years and often involve trade-offs between early action and deferred spending. When combined with effective monitoring of emissions, the Carbon Budget also provides a framework for reporting progress on a consistent basis from year-to-year.

Central to the success of Carbon Budgeting is a **Carbon Accounting Framework** to support the quantitative tracking and management of greenhouse gas emissions throughout the community. The accounting framework must contain the periodic emission inventories that provide the



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most accurate reading of overall progress toward achieving the level of emissions specified in the Carbon Budget. It must also support the quantification of the expected and actual emission impacts of the City's policies, practices and spending decisions, as well as the community emission impacts of initiatives of households, firms, utilities and other levels of government.

Figure 5 illustrates the concepts addressed in the Carbon Accounting Framework. Annual GHG inventories track GHG emissions from both the municipality and the community. The gap between the Carbon Budget and the inventory is identified either as a surplus or a deficit. The Carbon Budget report also includes a carbon forecast and the impact of planned actions relative to the Carbon Budget.

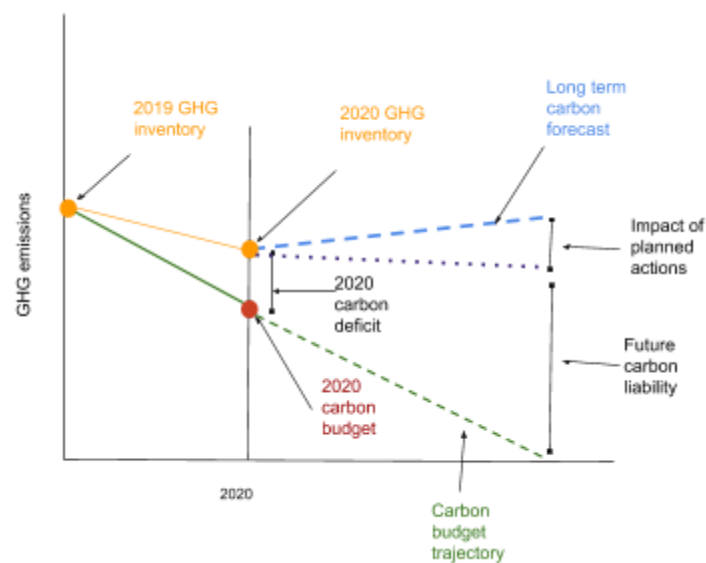


Figure 5. Conceptual illustration of Carbon Budgeting Terms

### Carbon Accounting Framework Objectives

Six objectives have been identified to guide the development and implementation of the Carbon Accounting Framework:

1. Implement a framework to manage the City's Carbon Budget.
2. Align Edmonton's carbon budget with City's existing operating and capital budget plans/processes including the City's capital investment outlook and Priority Based Budgeting (PBB) process. .
3. Highlight trade-offs and synergies for financial and GHG decisions.
4. Track civic and corporate actions and policies in the context of the Carbon Budget.
5. Enable transparent reporting of the Carbon Budget.
6. Build carbon literacy in the organisation and within the community.

**DRAFT CONTENT****Carbon Accounting Framework Implementation Approach and Next Step**

The implementation of the Carbon Accounting Framework requires a corporate, integrated approach that supports a phased roll-out of the framework. The phases include:

- Phase 1, Research & Analysis: The phase includes an evaluation of the existing GHG inventories and processes for Edmonton; and jurisdictional scans of other cities that have successfully enabled a local carbon accounting framework.
- Phase 2, Approach & Development: The phase includes a tailored, staggered approach for Edmonton to implement its own carbon accounting framework. The framework includes an implementation approach, carbon accounting tool, carbon calculation manual, and reporting and validation mechanism.
- Phase 3: Capacity building: The phase builds capacity within the organization and the community to develop a foundational carbon budgeting, monitoring and reporting system. Capacity building will also include staff training/education, integration with existing corporate financial processes internal resource realignment, and process finalization.
- Phase 4: Roll-out: In Fall 2022, a pilot Carbon Budget may be introduced through Edmonton's four year (2023-2026) capital and operating budget cycle. Based on the outcome of the pilot, a fully integrated Carbon Budget implementation may occur through the subsequent Supplemental Operating and Capital Budget cycles.

Figure 6 outlines the timelines for the phased implementation of the Carbon Accounting Framework:



Figure 6. Timeline for the Phased Implementation of Carbon Accounting Framework

**THRESHOLDS AND MONITORING**

Many initiatives or decisions will have a design life (ie. the period of time the initiative or service is needed and is relevant). To understand when an initiative or service has reached the end of its design life, various indicators will need to be tracked. This will require thresholds and signals to be defined.

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**Signals** can be thought of as indicators. The signals will need to be reliable, comparable, and understandable. Signals can be economic, social, and/or energy market related. There may be signals that are specific to certain initiatives and there may be signals that apply to a suite of initiatives.

**Thresholds** are the point at which the effects of the initiative are observed. Reaching a threshold does not mean we have achieved the overall target, but it is the point where progress towards or deviation from the outcome is becoming evident. Once a defined threshold is reached, a decision point will be triggered. This decision point can be to plan an exit for the service/initiative or direction to re-enter into the Design and Deliver implementation gate process to identify the next approach to take (ie. Does the initiative need to be modified? Is a different lever of change required? Is the initiative still required?).

## THE INVESTMENT APPROACH

An innovative approach is needed to catalyze the investment needed for this transition and to *Re-imagine* our place in the global energy markets. A quick and responsive investment approach is needed to *Recover* from the current economic and COVID-19 health crisis. The roll-out of these two distinct approaches are designed to align with the City of Edmonton's four year budget cycle and the Strategy's Acceleration Approach.

- Recovery investment - focusses on "shovel ready" initiatives with high job multipliers that create local jobs quickly. Recovery investment is aligned with: i) Phase 1 of the Acceleration Approach and connects local workers with jobs, and ii) recommendations from an independent task force to the federal government for stimulus funding.
- Re-imagine investment - focuses on investing in the transformational initiatives that will reshape our city and our place in the world. Re-imagine investment is aligned with Phase 2 of the Acceleration Approach and requires rapid and significant scaling up of existing programs, as well as the launch of new initiatives, actions, programs and services.

### Recovery Investment

Investment in the transition is particularly important as it relates to any potential COVID-19 stimulus efforts. To date, the federal government has announced \$10 billion in new major infrastructure initiatives to create jobs and economic growth in areas of: clean power, broadband, building retrofits, agricultural irrigation, as well as zero emission buses and charging infrastructure. Five Levers of Change are needed to transition the market. Of those five, three levers in particular are best suited to deliver stimulus

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measures: 1) Infrastructure Investment; 2) Policy and Regulation and 3) Incentives, Pricing and Subsidies. To achieve the greatest benefit, a combination of levers are required.

The City of Edmonton can further the transition and support economic recovery through a suite of expanded and accelerated actions (Table 1 below). Recognizing these actions require additional investments, they will require support from multiple levels of government. If stimulus funding does become available it would be utilized to catalyze additional private investment while creating local investment and jobs. Current thinking among many of the experts representing G20 economies has identified that for a COVID-19 economic recovery, "green-stimulus" fiscal policies would create more jobs and economic growth than traditional fiscal stimulus.<sup>15</sup> Their findings identified that green construction projects can deliver high job multipliers and that renewable energy generates more jobs in the short run (when jobs are scarce) and free up labour as the economy returns to capacity. Therefore, it's critical for Edmonton not to lose its competitive advantage that it has managed to build by being a first mover on local energy transition programming, research and partnerships.

These accelerated actions do not replace or stop the work that is underway in the current Energy Transition Strategy. Existing and ongoing programs and projects will continue in the near term.

Table 1: Accelerated Actions

Initiative	Description	Current Funding (\$000)	Potential Additional Funding (\$000)
Accelerate actions identified in the 2018 Civic Operations GHG Management Plan (City Leadership)	A composite fund to allow for acceleration of renewable energy installations, energy retrofits, energy system infrastructure and fleet improvements.	16,500 composite fund for solar PV and approx 30,000 for energy retrofits through renewal funding	up to 10,000 (Capital 2021-22)
Increase the incentive amount and expand the existing Solar Rebate Program to commercial buildings	Program currently provides a rebate of \$0.40 per installed watt of solar for residential rooftop installations to a maximum of \$4,000 per install.	350/year for 4 years for a total of 1,400 (launched July 2019, ends June 2023)	up to 350 annually (Operating 2021-22)
Pilot the Clean Energy Improvement Program to provide an alternative financing option	Program provides a financing tool for home and commercial building owners to undertake energy efficiency and renewable energy projects	2 year pilot 900	up to 11,250 (dependent upon FCM funding to be announced early Oct)

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	with repayment of loans through property taxes.		
Accelerate and expand existing building retrofit programs	Commercial: provides rebates for commercial retrofits with greater incentives for deeper green investment.  Residential: provides rebates for residential retrofits with greater incentives for deeper green investment	Commercial 1,000/year for 3 years for a total of 3,000  Residential 600/year for 3 years for a total of 1,800	Commercial up to 2,000 annually (Operating 2021-22)  Residential up to 2,000 annually (Operating 2021-22)
Further grow and improve Edmonton's bike lane infrastructure	Deploy a combination of expanding improving existing bike routes; upgrading, improving or relocating substandard routes; constructing planned routes & missing links; walking and wayfinding infrastructure	Updated Bike Plan is not currently funded	up to 10,000-20,000 (Capital 2021-22)
Accelerate Edmonton's EV-Readiness by supporting the installation of EV charging infrastructure	Introduce a new rebate program that incentivizes electrification of the transportation system as well as reduces the use of single occupancy vehicles. provides rebates for new (\$300) and existing (\$600) residential EV Chargers, existing for Commercial (\$2000) (max 50% rebate).  Accelerate Curbside and Public Access Charging Stations in partnership	EV charger rebates 150/year for 3 years for a total of 450  Public infrastructure 0	up to 200 annually ( Operating 2021-22 to increase to commercial rebates)
Accelerate tree planting and ecological restoration	Additional tree planting; protect existing natural carbon sinks; acquire intact and ecologically significant natural areas to protect existing carbon sinks; encourage and incentivize naturalization of private property	4,500	up to 10,000 (Capital 2021-22)
Attract investment and technology start-ups that build on the region's energy resources and innovation strengths	Funding for newly established Climate Innovation Fund	0	up to 2,000 (Operating - one time)
<b>Total</b>			47,050 (2021)

**DRAFT CONTENT****Re-Imagine Investment**

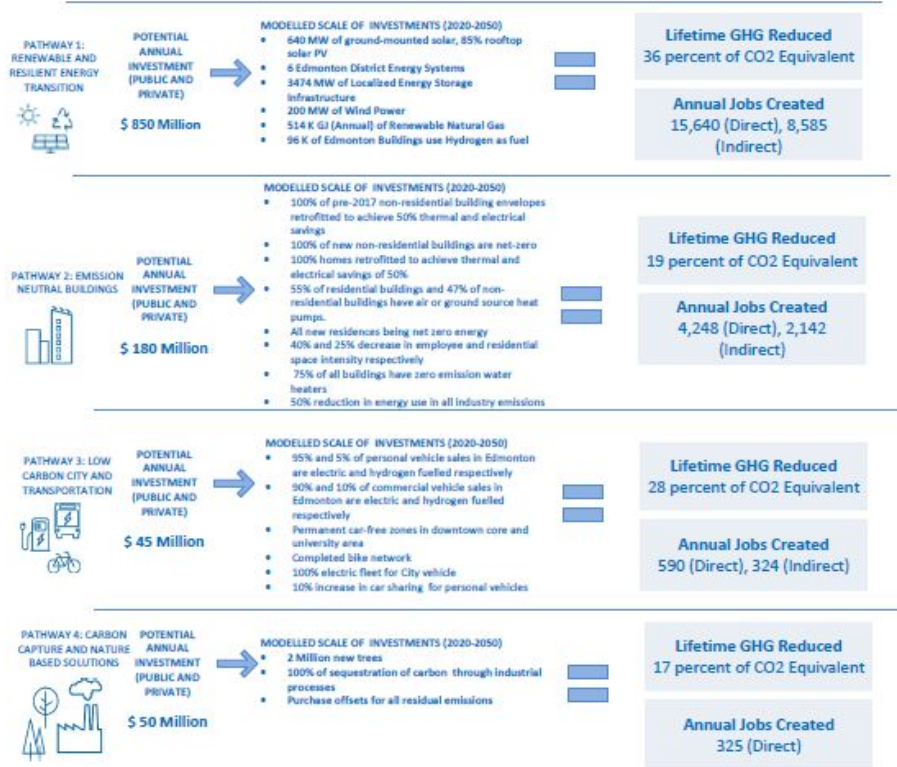
The successful implementation of Edmonton's Community Energy Transition Strategy will signify the city's transition to a new energy economy reliant on clean and renewable energy. The funding for such an energy transition within the next 30 years would require bold, future-focused and ambitious risk-taking to build capacity through transformative and accelerated actions. Innovative financing approaches will be needed.

Edmonton's current economic downturn has added a strain to its already limited financial resources that may limit the realization of its environmental and economic priorities. Implementation of energy transition actions require a pragmatic, time-sensitive and methodological approach that sets the stage for Edmonton's long-term energy shift and economic resilience.

For the purpose of developing funding scenarios, a model was used that considered 23 different actions for carbon reductions. The model is useful for identifying the general scale of investment required, but is limited in that it assumes a technical maximum is achievable (ie. the model does not reflect implementation barriers). Though only 23 actions were modelled, thereby selecting "technology winners," it is expected in actuality that a range of technologies will complete and be deployed in the market to varying degrees. The model is useful to help inform the high level areas of action. However, the approach for developing the strategy is to not pick "winners and losers" and to instead allow market forces to select the solutions through innovation and competition. The model also assumed that those actions would be incented by various "Levers of Change". The model identified approximately **\$1.1 billion of new and incremental of private and public investment is required every year**. Early estimates suggest that the City of Edmonton would likely contribute approximately \$65 million annually of the total public investment required to catalyze the \$1.1 billion investment, during the Re-imagine investment phase. City Council has already funded a relatively small portion of this through the current Energy Transition Strategy. This estimate will be refined once plans and funding from other orders of government are articulated, and as the Climate Action Plan is developed.

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Modelled Annual Investment of \$ 1.12 Billion will require \$951 Million in Private and \$169 Million in Public investments



To catalyze the investment needed, 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. The level of government investment required would depend on the lever of change that is used, and could be as high as \$200 million every year in early stages to catalyze the investment and “kick-start” the market transition.

**NEXT STEPS**

The energy transition is a key part of Edmonton’s and Alberta’s future. This work will position us to respond to changing global markets, while creating prosperity, economic diversity, and supporting Edmontonians in a just and equitable way. This work is transformative in nature. There is a lot of work to do but, if we begin now, Edmonton’s long term goals are achievable.

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Work will continue towards meeting an aggressive, though adjusted, timeline with a full strategy and action plan being advanced to Council in the fourth quarter of 2020. Next steps will include:

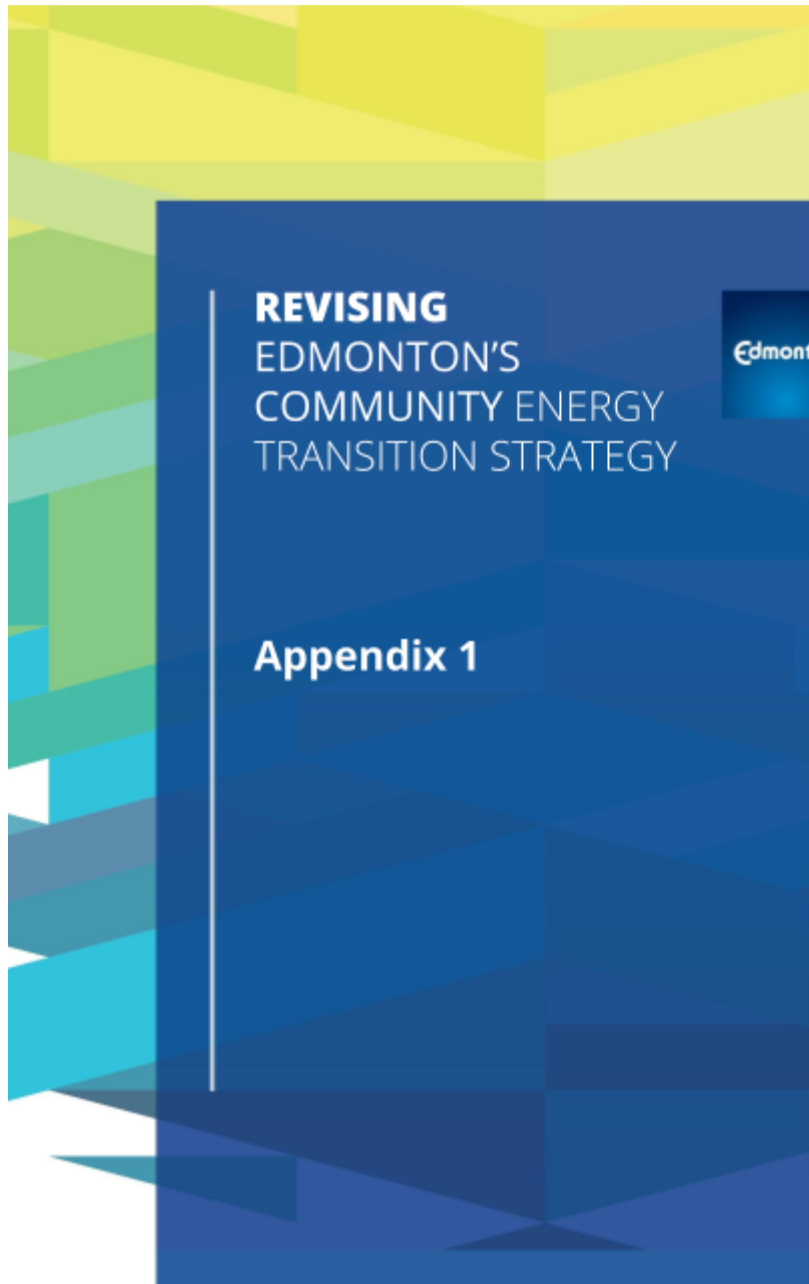
- Continuing to monitor and identify potential stimulus funding to support the acceleration of actions;
- Refining the strategy;
- Developing an action plan that stages out the first 10 years of actions/ initiatives and identifies City of Edmonton budget implications;
- Quantifying the impact of initiatives, and advancing a dynamic monitoring, reporting and adjustment approach for Edmonton's Carbon Budget through an internal phased, integrated and evolving Carbon Accounting Framework;
- Preparing a funding strategy to support the work, that will be advanced to Council in 2021. The funding strategy will need to Re-imagine how this work can be financed, and will look for an innovative approach that prioritizes the implementation of energy transition actions through realistic yet ambitious partnerships, tools and levers.



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**APPENDIX 1 - DRAFT CONTENT**

**STRATEGIES**









Strategies are approaches needed to achieve the goals. The strategies represent the overall action that is required to achieve emissions reduction goals, while specific actions under each strategy may be adjusted to changing circumstances and emerging opportunities, the overall strategies are the directions needed to meet energy transition goals.

Legend:

-  High Impact (replaces carbon intensive energy and is scalable; creates local employment)
-  Moderate Impact (reduces emissions; supports economic diversification or local businesses opportunities/cost savings)
-  Enabling Impact (does not directly reduce GHG emissions or create economic activity, but enables low carbon city outcomes)









**PATHWAY #1: RENEWABLE AND RESILIENT ENERGY TRANSITION**

**Goal A: Edmonton is a thriving city powered by low carbon energy**



Strategy	Potential Actions	GHG Reduction	Economic Activity
A1. Support regional employment through local renewable energy and storage systems	<ul style="list-style-type: none"> <li>• provide solar and battery incentives</li> <li>• pilot financing approaches such as the Clean Energy Improvement Program</li> <li>• zoning bylaw changes</li> </ul>		
A2. Plan for and enable the development of community renewable energy projects and the expansion of a renewable district energy network.	<ul style="list-style-type: none"> <li>• support community, cooperative and Indigenous owned renewable energy projects</li> <li>• establish, expand and decarbonize a city wide district energy network</li> </ul>		
A3. Advocate for and support the supply and purchasing of low carbon energy.	<ul style="list-style-type: none"> <li>• aggregate/group purchase renewable energy</li> <li>• advocate for a low carbon energy supply for Edmontonians, businesses and industry</li> </ul>		
A4. Develop opportunities for all Edmontonians to participate in Edmonton's energy transition.	<ul style="list-style-type: none"> <li>• increase participation of Indigenous Peoples in the energy transition</li> <li>• provide training and skills development for under-represented groups to benefit from energy transition jobs and small business opportunities</li> </ul>		

**APPENDIX 1 - DRAFT CONTENT**

**Goal B: Edmonton is a hub for low carbon energy innovation and investment**

Strategy	Potential Actions	GHG Reduction	Economic Activity
B1. Form new collaborations with utilities, alternative energy suppliers, post-secondary institutions, businesses and regional partners to advance the low carbon energy market and industries.	<ul style="list-style-type: none"> <li>support regional initiatives for future energy systems, supply chains and infrastructure including the scale up/expansion of the hydrogen production and distribution network</li> <li>conduct a neighbourhood scale hydrogen heating pilot</li> <li>connect local businesses to opportunities in the low carbon economy</li> <li>partner with utility providers to understand and prepare for the growth of electrification/new demand profiles</li> </ul>		
B2. Attract investment and technology start-ups that build on the region's energy resources and innovation strengths.	<ul style="list-style-type: none"> <li>support regional initiatives to locate lithium refinement and manufacturing and bitumen-beyond-combustion, industries and innovation within the region</li> <li>support regional initiatives such as a centre of innovation for artificial intelligence in smart grid and building automation</li> <li>establish a "start-up in residence" program to incubate green energy sector technologies</li> </ul>		
B3. Develop strategies to market regional clean technology products and services.	<ul style="list-style-type: none"> <li>market and promote local clean tech products, projects and services</li> </ul>		
B4. Continue to expand Edmonton's partnership ecosystem to build and support green economy employment.	<ul style="list-style-type: none"> <li>support the development of a green job access program to provide experience via internships/on-the-job training</li> <li>promote green apprentice programs through post-secondary institutions</li> </ul>		







**Goal C: Edmonton uses waste as a resource**

Strategy	Potential Actions	GHG Reduction	Economic Activity
C1. Minimize emissions and maximize the production of zero emissions energy and resources from waste.	<ul style="list-style-type: none"> <li>advance regional initiatives to pilot low carbon waste to energy</li> <li>develop a waste reduction and materials recovery roadmap to support markets and business opportunities</li> <li>expand alternate processing methods for non-organic feedstock to avoid landfill transfer</li> <li>maximize the production of renewable energy from waste</li> </ul>		



**APPENDIX 1 - DRAFT CONTENT**

**PATHWAY #2: EMISSION NEUTRAL BUILDINGS**

**Goal D: The buildings that Edmontonians live, work and play in are emission neutral and improve personal wellness**



Strategy	Potential Actions	GHG Reduction	Economic Activity
D1. Support the acceleration of emission neutral buildings	<ul style="list-style-type: none"> <li>establish an industry advisory group for ongoing advice and recommendations</li> <li>develop emission neutral building best practice guidance</li> <li>support programs and services such as incentives</li> <li>evaluate the regulatory framework in 2025, based on the effectiveness of emission neutral building incentives/programs and advocate for emission neutral buildings standards to other orders of government as required</li> <li>lead by example by setting an emission neutral building standard for new City buildings</li> </ul>		
D2. Support residential, commercial and institutional property owners to reduce overall energy use and utility costs through retrofits and energy efficiency improvements.	<ul style="list-style-type: none"> <li>implement financing tools to support efficiency renovations</li> <li>deliver energy efficiency programs and incentives</li> <li>expand energy benchmarking, disclosure and labelling</li> <li>provide tools, education and information programs</li> </ul>		
D3. Support low embodied carbon buildings and infrastructure	<ul style="list-style-type: none"> <li>encourage voluntary reporting of embodied carbon emissions in new construction</li> <li>lead by example by implementing embodied carbon disclosure and labeling requirements into City procurement processes</li> </ul>		

**Goal E: Eliminate energy poverty**

Strategy	Potential Actions	GHG Reduction	Economic Activity
E1. Develop programs to alleviate energy poverty and increase energy efficiency in affordable buildings	<ul style="list-style-type: none"> <li>implement income based programs to help residents make their homes more energy efficient;</li> <li>continue to apply energy efficiency criteria as part of the affordable housing grant program</li> <li>provide incentives for energy efficient/emission neutral affordable housing</li> <li>provide learning opportunities and encourage diverse groups to take climate action, alleviate their energy burden and adapt to climate change</li> </ul>		







**APPENDIX 1 - DRAFT CONTENT**

**Goal F: Catalyze the local green building and energy efficiency industry**

Strategy	Potential Actions	GHG Reduction	Economic Activity
F1. Attract and expand opportunities for green building technology, products and services.	<ul style="list-style-type: none"> <li>attracting green building and industry efficiency technology manufacturing businesses and supply chains</li> <li>marketing and promoting local green building expertise</li> <li>build local capacity to deliver energy outcomes</li> </ul>		









**PATHWAY #3: LOW CARBON CITY AND TRANSPORTATION**

**Goal G: Edmonton is planned, designed and built to be a vibrant carbon neutral city**





Strategy	Potential Actions	GHG Reduction	Economic Activity
G1. Advance sustainable urban planning practices to become a carbon neutral city.	<ul style="list-style-type: none"> <li>update zoning bylaw</li> <li>update the Design and Construction Standards</li> <li>accelerate infill development</li> <li>expand, protect and restore the Green and Blue Network</li> </ul>		
G2. Advance low carbon districts with complete and compact communities.	<ul style="list-style-type: none"> <li>develop geographic plans that support emissions targets</li> <li>accelerate mixed use development</li> </ul>		
G3. Advance initiatives that allow all Edmontonians to have access to the benefits and opportunities of a vibrant low carbon city.	<ul style="list-style-type: none"> <li>establish a just and equitable transition initiative</li> <li>support social connections in neighborhoods and communities through climate action</li> </ul>		

**APPENDIX 1 - DRAFT CONTENT**

**Goal H: Safe and accessible zero emission mobility**

Strategy	Potential Actions	GHG Reduction	Economic Activity
H1. Accelerate a safe, accessible, and comfortable active transportation system that enhances walking and cycling.	<ul style="list-style-type: none"> <li>integrate mobility options with surrounding land uses</li> <li>identify potential car free or low emissions zones</li> <li>allocate public space to prioritize cycling and walking</li> <li>accelerate and increase cycling and walking infrastructure</li> </ul>		
H2. Establish and expand a zero emissions public transit system that is safe, convenient, reliable and connected across the Edmonton region.	<ul style="list-style-type: none"> <li>expand public transportation infrastructure</li> <li>transition to a zero emission bus fleet</li> <li>increase dedicated transit lanes and direct transit connections</li> <li>advance the establishment of a Regional Transit Services Commission</li> </ul>		
H3. Support the transition to electric and other zero emission vehicles.	<ul style="list-style-type: none"> <li>dedicate driving lanes or priority parking for zero emission vehicles</li> <li>expand public and private electric vehicle charging infrastructure</li> <li>partner on opportunities for utilization of hydrogen in the heavy duty transportation sector</li> </ul>		
H4. Prepare for changing transportation system needs of a low carbon city.	<ul style="list-style-type: none"> <li>implement work strategies that minimize commuting</li> <li>investigate and pilot road pricing mechanisms</li> <li>support car, ride, bike and other micro-mobility sharing programs</li> </ul>		





**Goal I: Edmontonians reduce consumption based emissions by supporting local businesses**

Strategy	Potential Actions	GHG Reduction	Economic Activity
I1. Advance a circular economy strategy that reduces consumption based carbon emissions.	<ul style="list-style-type: none"> <li>develop a circular economy strategy</li> <li>connect businesses and industries for resource/waste sharing</li> <li>support a local goods production, repair and re-use ecosystem</li> <li>promote the benefit of buying low carbon and local</li> </ul>		
I2. Support a low carbon resilient food system.	<ul style="list-style-type: none"> <li>support local growers to identify "waste heat" locations</li> <li>partner with the region to protect agricultural lands</li> <li>expand local farmers markets</li> <li>lead by example by incorporating food production on City property and public space</li> <li>encourage homeowners to use lawn and balcony space for food production</li> </ul>		



APPENDIX 1 - DRAFT CONTENT

PATHWAY #4: CARBON CAPTURE AND NATURE BASED SOLUTIONS



Goal J: Edmonton is full of nature, to support healthy people, emissions reductions, communities and carbon sequestration

Strategy	Potential Actions	GHG Reduction	Economic Activity
J1. Invest in natural carbon storage and sinks such as tree planting, ecosystem conservation and restoration.	<ul style="list-style-type: none"> <li>Invest in additional tree planting and green infrastructure</li> <li>conserve and restore key carbon sequestration ecosystems and natural assets</li> <li>develop a conservation offset program</li> </ul>		
J2. Accelerate nature based solutions to achieve climate resilience goals.	<ul style="list-style-type: none"> <li>expand and scale up green infrastructure, low impact development, naturalized areas, and green space, in existing and new developments</li> <li>research, assess and value natural asset and infrastructure</li> </ul>		

Goal K: Expand carbon technology investment/opportunities and business in the Edmonton Metropolitan region

Strategy	Potential Actions	GHG Reduction	Economic Activity
K1. Support the acceleration of the development and deployment of carbon capture and storage and utilization technologies.	<ul style="list-style-type: none"> <li>advance and promote regional CO<sub>2</sub> infrastructure;</li> <li>partner with municipalities in the region on significant projects</li> </ul>		

Goal L: Edmonton cares for future generations by offsetting remaining emissions







Strategy	Potential Actions	GHG Reduction	Economic Activity
L1. Develop programs to support and track community, institutional and business offset purchases.	<ul style="list-style-type: none"> <li>lead by example by offsetting residual emissions from municipal operations</li> <li>develop an approach to track voluntary offsets in the community</li> <li>monitor offset efforts by other orders of government</li> </ul>		







**APPENDIX 1 - DRAFT CONTENT**

**FOUNDATION: CLIMATE SOLUTION LEADERSHIP**

**Goal M: The City of Edmonton aligns its decision making with the international target of limiting global warming to 1.5°C**

Strategy	Potential Actions	GHG Reduction	Economic Activity
M1. The City uses a local carbon budget and carbon accounting system to inform its decisions and monitor progress towards its goals.	<ul style="list-style-type: none"> <li>use a carbon budget and carbon accounting framework</li> <li>transitions Climate Related Financial Disclosures into annual reports</li> <li>continue to monitor, and improve where applicable, corporate and community greenhouse gas emissions and implementation of actions</li> </ul>		
M2. The City embeds low carbon goals into its plans, policies and standards to align with the goal of climate resilience.	<ul style="list-style-type: none"> <li>integrate low carbon goals into policies and standards related to planning, development, construction, procurement/supply chain, and employees</li> </ul>		
M3. The City creates an internal task force and continues working with the external Council advisory committee to lead Edmonton to be a carbon neutral city.	<ul style="list-style-type: none"> <li>establish an internal Climate Action Leadership Task Force to guide and support accelerated and focused climate action</li> <li>continue to work with the external Energy Transition and Climate Resilience Advisory Council</li> </ul>		

**Goal N: The City of Edmonton partners with and mobilizes communities and governments to meet carbon budget goals**

Strategy	Potential Actions	GHG Reduction	Economic Activity
N1. The City advances a climate action framework for government collaboration.	<ul style="list-style-type: none"> <li>advocate to other levels of government to remove barriers that impact Edmonton's energy transition</li> <li>develop and advance a climate action framework for government cooperation</li> </ul>		
N2. The City works with other municipalities and regional associations to advance a collaborative	<ul style="list-style-type: none"> <li>advance initiatives of regional collaboration</li> </ul>		

**APPENDIX 1 - DRAFT CONTENT**

approach for climate action in the Edmonton Metropolitan Region.

N3. The City continues to work with international partners to support the Edmonton Declaration and the IPCC Cities and Climate Change Science research agenda.

- continue to advance the Edmonton Declaration
- continue to implement the CitiesIPCC Legacy Research Grant Program
- partner with private sector companies and other cities to develop green economy solutions



N4. The City continues to educate, work with and mobilize the community to take action on climate change via Change for Climate and Corporate Climate Leaders programs, among others.

- expand implementation of programs that work with businesses, communities and residents to collectively reduce Edmonton's greenhouse gas emissions
- continue and expand ongoing education, social marketing and outreach initiatives



**Goal O: The City of Edmonton establishes innovative and participatory financing tools**

**Strategy**

**Potential Actions**

**GHG Reduction**

**Economic Activity**

O1. The City aligns its investment decisions with its low carbon goals

- modernize the City's investment policy
- develop and introduce an internal Carbon Reduction Cost Savings Program in which business areas are required to reduce their carbon emissions by a certain amount annually
- continue the internal Energy Efficiency Revolving Fund
- work with financial institutions to issue Green Municipal Bonds to raise capital for green infrastructure projects



O2. The City accesses and creates innovative and participatory funding mechanisms to support private green investments

- develop a Clean Energy Improvement Program (CEIP)
- leverage opportunities to finance municipal green projects through federal institutions
- partner with local businesses to develop industrial incentive programs
- support the incubation of the green energy sector technologies through a "start-up in residence" program
- work with financial institutions and investment agencies to support green economy innovation



O3. The City develops a just and equitable working group and framework for energy transition programs.

- convene a working group to support a just and equitable transition

