

Penticton Community Climate Action Plan

City of Penticton
October 2021



Prepared by:



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Executive Summary

The City of Penticton Community Climate Action Plan (CCAP) outlines a path towards a low carbon future: A future where City residents experience the benefits of a connected, healthy and economically prosperous community while taking action on climate change and adapting to climate impacts.

The climate is changing in British Columbia (BC) as it is around the world. The average global temperature has already increased by 1 degree Celsius (°C) above pre-industrial levels. The United Nations Intergovernmental Panel on Climate Change (IPCC) is urging a limit of 1.5°C warming, which would require global emissions to be net-zero by 2050.

The City of Penticton CCAP focuses on leveraging municipal powers to help residents, businesses and visitors save energy, emissions, and money. It is residents and businesses in the City of Penticton that have the biggest role: A significant reduction in community greenhouse gas (GHG) emissions depends on individual choices about how to get around, where to live and how to handle food waste and yard material. The Plan lays out actions for transportation, buildings, waste and organizational readiness. Actions fall into three categories:

- **Infrastructure:** Investments into the City of Penticton-owned infrastructure that enable residents to make lower-emissions choices such as active transportation networks and public charging stations
- **Policy:** Changes to City of Penticton policy and regulation that lead to energy and emission reductions in the community such as requirements and incentives for enhanced energy efficiency in new buildings.
- **Engagement:** Outreach, education and incentives that inspire residents and businesses to make choices to reduce energy and emissions and prepare for a low carbon future.

Current City of Penticton Community Greenhouse Gas Reduction Target

5% reduction from 2007 by 2020

10% reduction from 2007 levels by 2030

New Community Greenhouse Gas Reduction Target

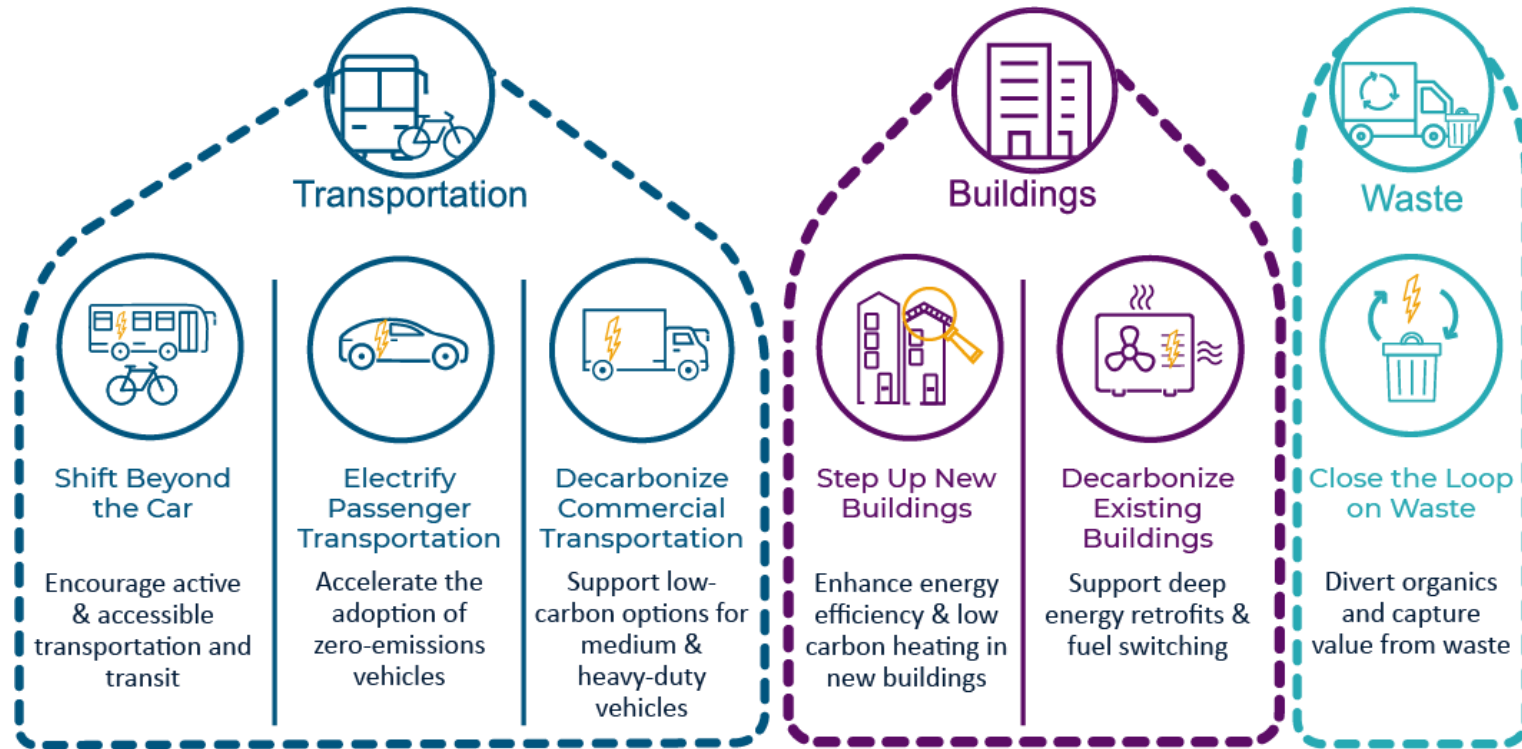
40% reduction from 2007 by 2030

100% reduction from 2007 levels by 2050



The Big Moves

The CCAP is organized into six broad categories of actions that have the biggest impact on reducing emissions in the community. These are called “Big Moves”. The Big Moves focus on the types of emissions that are most in control of the local government and that are measured in the emissions inventory. The CCAP lays out strategies and actions under each of the six Big Moves.



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There is one more important category of actions – Organizational Leadership. This “seventh Big Move” ensures that climate action becomes a part of regular decision-making and operational process within the City of Penticton. Page 43

Our Community's Low Carbon Vision




During the CCAP planning and engagement process, community stakeholders went through a visioning exercise called “backcasting” to imagine what a low carbon future for City of Penticton could look like. We chose 2040 as our visioning year to allow for a slightly longer time horizon than ten years but short enough to imagine the changes happening. The community vision for the City imagined by stakeholders is:

In 2040, emissions in the City of Penticton will be reduced by at least 65%. The water and the air we breathe will be cleaner and natural systems will be thriving. In 2040, you will walk out the front door into a liveable community where concrete has dwindled and natural spaces are abundant. A variety of new mobility services are available to support the needs of all residents and visitors. Congestion is reduced and you arrive at your destination more efficiently. You can also choose to travel by e-bike, scooter or zero-emission public transit.

The air in Penticton is cleaner because there are far fewer cars on the street and most are electric. There is less noise and much more space for parks and pedestrian-only streets as active and alternative transportation has been prioritized.

People are trying out new types of living arrangements with more shared functions and spaces. More houses are built with wood, which makes them more comfortable to live in and much better for the climate than concrete buildings with less embodied carbon.

In addition to this community vision, workshop participants defined success for each major sector of community emissions:

The Future of Transportation	The Future of Buildings	The Future of Waste
<p>A complete zero-emission transportation system connects our community and region.</p> 	<p>Our community's buildings are exceptionally energy efficient, and powered, heated and cooled with 100% renewable energy.</p> 	<p>Our community diverts all of our organic waste, such as food scraps and yard trimmings, from landfills and recovers value from everything that enters the waste stream.</p> 

Where We're Starting From

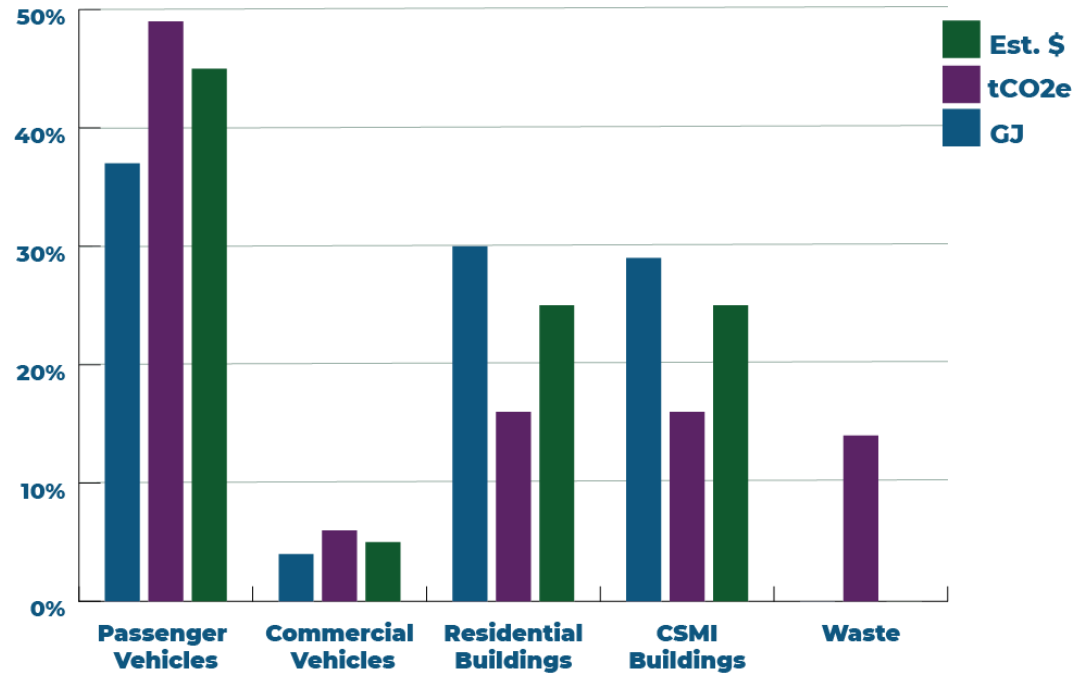
Understanding where we're starting from is just as important as knowing where we want to get to. After visioning, we need to know where we're starting from.

The City of Penticton is a medium-sized hub community in the Okanagan-Similkameen with a population of 37,000 people. The community is growing at a rate of 0.98% per year, with most growth occurring in the built-up area of the City and most new residential units are multifamily. About 50% of existing residential buildings are single-family homes, and 9% are low rise apartment buildings. Most residents get around by car and truck, however Penticton has Phase 1 completed of the Lake-to-Lake multi-use pathway connecting Okanagan Lake to Skaha Lake to improve active transport means. There is one DC fast charger in the community, and 14 locations with public Level 2 stations. There is currently no organic waste pick up service though residential yard waste pickup does exist. The City sells Class A biosolids compost produced through its wastewater recycling program. The Regional District of Okanagan-Similkameen is currently evaluating options for an in-vessel organics management facility for the purpose of collecting and composting food waste from commercial and residential sources.

Current Energy, Emissions and Costs by Sector

The current state of energy end emissions is shown in the graph below for each sector in 2018.

2018 % of Energy, Emissions, and Expenditures By Sector

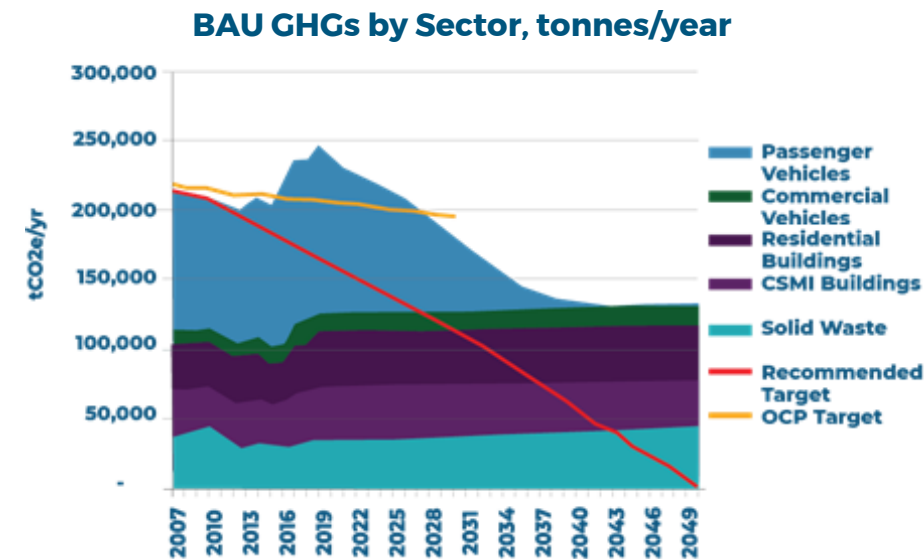


Passenger vehicles account for the greatest proportion of energy, emissions, and energy costs, at 37%, 49%, and 45%, respectively. When combined with commercial vehicles, transportation as a whole accounts for 55% of emissions in Penticton. Residential and commercial and small/medium industrial (CSMI) buildings account for about 15% each, and waste 14%. In 2018, the community spent about \$136 million on energy. Since Penticton operates its own electrical utility though, a significant proportion of the \$52 million of electrical expenditures are circulated back into the community.

Working Toward our Future Vision and Target

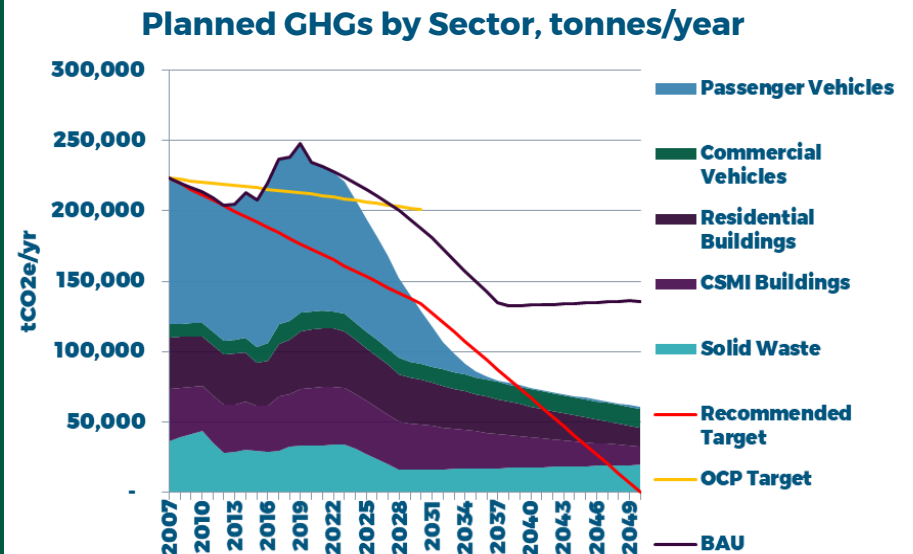
This CCAP outlines a pathway toward Penticton’s low carbon vision and emissions reduction target of 40% below 2007 levels by 2030. The two graphs below compare the business as usual scenario with the fully implemented plan scenario. Note that the target from the previous CCAP (developed in 2011) of 5% by 2020 was not met; in fact emissions have *risen* by 5% since 2007. This was attributed primarily to passenger vehicles, which rose 16% during that period. Similarly, cold years in 2017 and 2018 led to increased natural gas usage for heating. On the other hand, the City’s corporate climate action plan has achieved carbon neutrality since 2016.

Business as Usual



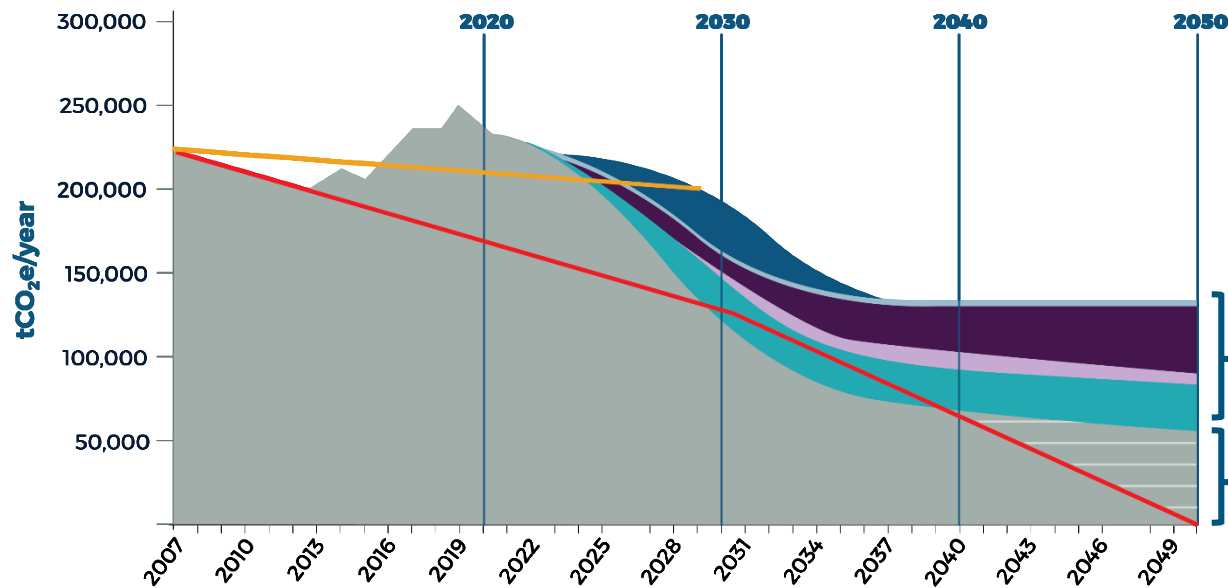
The Business as Usual (BAU) scenario shows anticipated GHG emissions reductions due to policy commitments made by the Government of Canada and Province of BC.

Plan Implementation



By implementing this CCAP, Penticton reduces its emissions by 42% below 2007 levels by 2030, meeting the new target (40% below 2007), and the existing OCP target. In doing so, Penticton places itself as a leader in taking significant action on climate change. See the following page for a description of how each Big Move contributes to the reduction in emissions.

Emissions Reductions by Action From BAU, tonnes/year



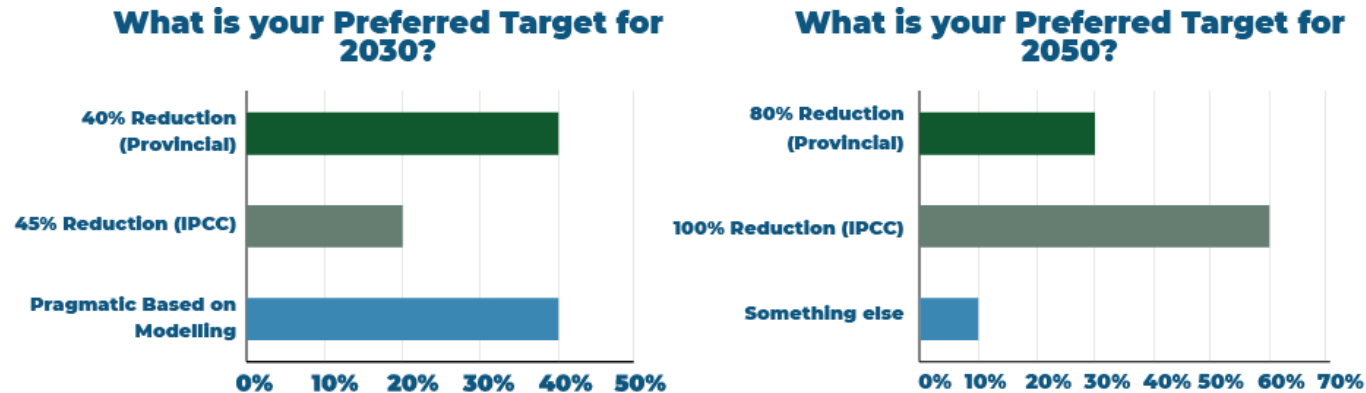
- Electrify Passenger Vehicles
- Better Existing Buildings
- New Buildings Efficiency & Fuel
- Shift Beyond the Car
- Organics & Landfill Gas
- Remaining Emissions
- Penticton's OCP Target
- Emissions Reduction Target

Emissions reductions over time
Eliminating fossil fuels from transportation and heating are key actions moving forward. By 2030, the majority of emissions savings will be from actions to electrify transportation. By 2040 and 2050, actions to reduce emissions from community buildings will have a big impact on reaching targets.

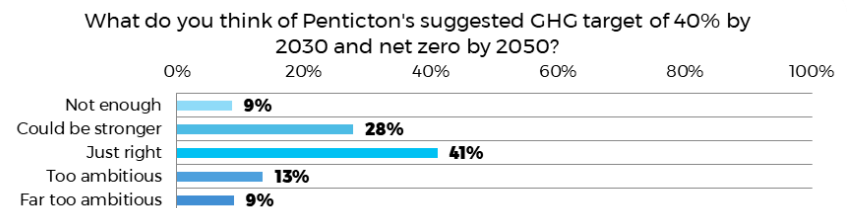
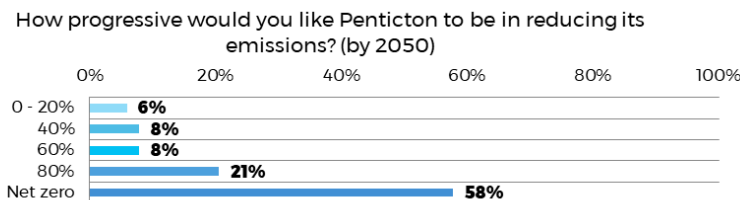
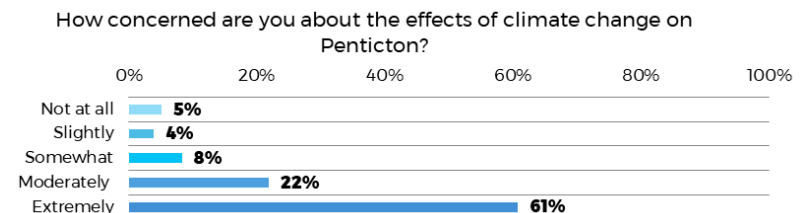
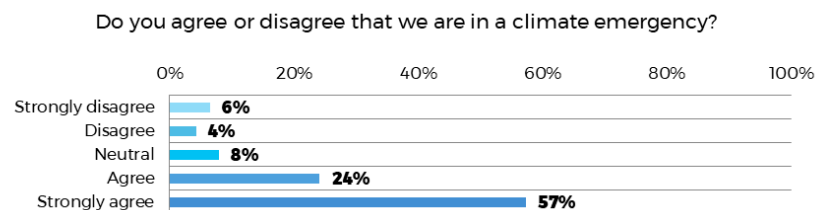
Remaining Emissions
Tackling remaining emissions between 2040 and 2050 will come from added support at a provincial and federal level and technological improvements. The solutions and technology to reduce emissions in our community will grow and become more sophisticated over time. This will include new and innovative nature-based solutions to capture and store carbon and offsetting emissions.
What's important is that we get started now implementing proven solutions like the Big Moves to ensure we are well positioned to take advantage of emerging technology.

Engagement Summary

The CCAP incorporated significant input from the public and stakeholders throughout the process. Two stakeholder workshops shaped the community's vision and informed the ambition level of each Big Move, as illustrated in the following Plan Summary section. Attendees were also surveyed on their preferred GHG reduction targets for 2030 and 2050, for which a majority of people were in favour of a 40% reduction in 2030, and 100% reduction in 2050. Workshops were attended by City councillors and staff, regional district and provincial level government organizations, and community organizations and committees.

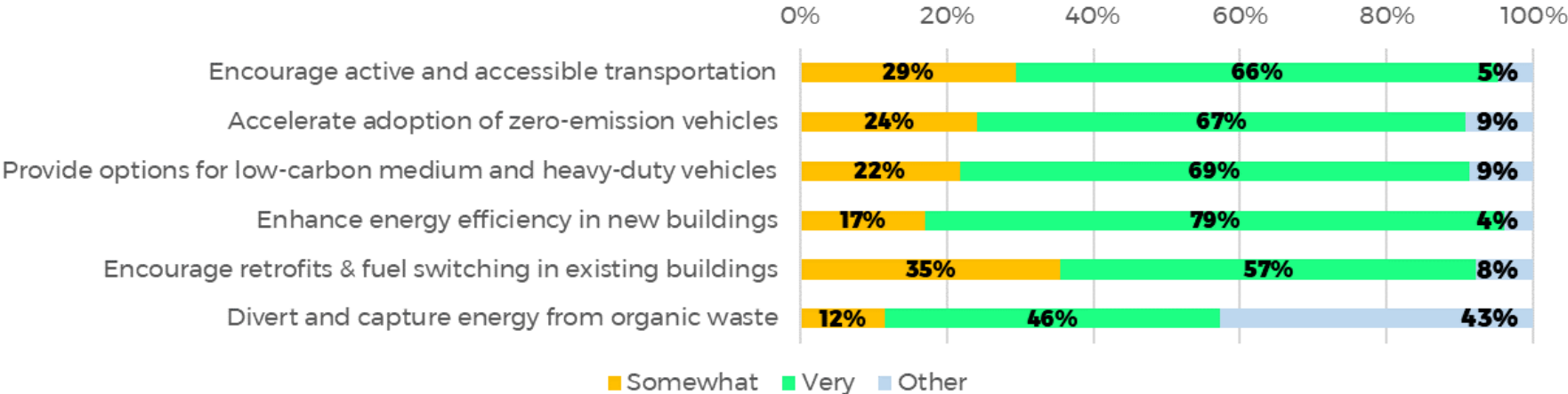


The public surveys were conducted after the stakeholder workshops to confirm the direction articulated by workshop participants. Overall, the public agreed with the GHG reduction targets proposed by the stakeholders, with 78% believing that the targets were either just right (41%), or could be more ambitious (37%). Survey respondents also agreed that we are in a climate emergency, with 81% either agreeing (24%) or strongly agreeing (57%).









Public opinion also supported each of the Big Moves, with at least 90% being either very or somewhat supportive of five of the six Big Moves. The public also supported most of the Big Move actions, with 27 of the 35 actions surveyed garnering support from a majority of respondents.

How Important is it for the City to...



Plan Summary

Big Move	Strategy	Timeframe		
		Short	Med	Long
Shift Beyond the Car 	SHIFT 1: Optimize land use planning tools to enable compact community growth			
	SHIFT 1.1 – Optimize policies and bylaws for compact growth			
	SHIFT 2: Enable walking, cycling and other forms of zero emission mobility			
	SHIFT 2.1 – Enable active transportation through plans and policies			
	SHIFT 2.2 – Build safe routes for walking, cycling and other forms of zero emission mobility			
	SHIFT 2.3 – Develop and deliver an active transportation outreach strategy			
	SHIFT 2.4 – Normalize car-free and zero-emission zones			
	SHIFT 2.5 – Promote micro e-mobility and on-demand mobility services			
	SHIFT 3: Promote transit ridership and support a zero emissions transit network			
	SHIFT 3.1 – Collaborate with transit providers to promote transit ridership			
	SHIFT 3.2 – Transition to a zero emissions transit network			
Total GHG emissions reductions for this Big Move in 2030		2,300 tCO_{2e}		
Electrify Passenger Transport 	ELECTRIFY 1: Enable charging on-the-go			
	ELECTRIFY 1.1 – Design, fund and build a public EV charging network			
	ELECTRIFY 2: Enable charging at home and work			
	ELECTRIFY 2.1 – Adopt EV-ready building requirements			
	ELECTRIFY 2.2 – Enable EV charging in existing residential and commercial buildings			
	ELECTRIFY 3: Encourage EVs through outreach and supportive policies			
	ELECTRIFY 3.1 – Develop and deliver an EV outreach strategy			
	ELECTRIFY 3.2 – Accelerate EV adoption through supportive policies and incentives			
Total GHG emissions reductions for this Big Move in 2030		18,900 tCO_{2e}		
Decarbonize Commercial Transport 	COMMERCIAL 1: Accelerate the adoption of ZEVs for commercial fleets			
	COMMERCIAL 1.1 – Develop a Community Vision and Strategy			
	COMMERCIAL 1.2 – Engage Commercial and Industrial Stakeholders			
	COMMERCIAL 2: Lead by example by transitioning municipal fleet			
	COMMERCIAL 2.1 – Update corporate policies to prioritize low carbon options			
Total GHG emissions reductions for this Big Move in 2030		0 tCO_{2e}		

Big Move	Strategy	Timeframe		
		Short	Med	Long
Step Up New Buildings 	NEW BUILDINGS 1: Adopt Higher Steps of the Energy Step Code & Low Carbon Approach			
	NEW BUILDINGS 1.1 – Adopt the Energy Step Code			
	NEW BUILDINGS 1.2 – Prioritize a low-carbon approach			
	NEW BUILDINGS 2: Build Industry Capacity			
	NEW BUILDINGS 2.1 – Provide outreach and incentives			
	NEW BUILDINGS 2.2 – Build industry capacity through training and coordination			
	Total GHG emissions reductions for this Big Move in 2030	2,700 tCO_{2e}		
Retrofit Existing Buildings 	EXISTING BUILDINGS 1: Improve Energy Efficiency and Enable Fuel Switching			
	EXISTING BUILDINGS 1.1 – Encourage and enable deep energy retrofits			
	EXISTING BUILDINGS 1.2 – Encourage and enable building electrification or renewable gas			
	EXISTING BUILDINGS 2: Build Industry Capacity and Increase Demand			
	EXISTING BUILDINGS 2.1 – Establish a long-term marketing campaign			
	EXISTING BUILDINGS 2.2 – Build industry capacity through training and coordination			
Total GHG emissions reductions for this Big Move in 2030	14,300 tCO_{2e}			
Close the Loop on Waste 	WASTE 1: Divert Organics from Landfill			
	WASTE 1.1 – Adopt policies that increase organics diversion			
	WASTE 1.2 – Implement (or enhance) organics collection and processing			
	WASTE 1.3 – Divert construction, demolition, agricultural, and industrial wood waste			
	WASTE 1.4 – Develop and deliver a comprehensive zero-waste outreach program			
Total GHG emissions reductions for this Big Move in 2030	20,600 tCO_{2e}			
Total Plan Reductions in 2030 (vs. 2030 BAU)		58,800 tCO_{2e}		
Total Plan Reductions in 2030 (vs. 2007 baseline)		94,400 tCO_{2e}		

Introduction

Municipal Commitment

The City of Penticton, like most communities across British Columbia, is responding to climate change. City of Penticton signed on to the *BC Climate Action Charter*, which is a voluntary agreement between the Province of British Columbia, the Union of B.C. Municipalities, and individual local government signatories. Local governments commit to:

- Carbon neutrality in corporate operations;
- Measure and report their corporate greenhouse gas emissions; and
- Create complete, compact, and more energy-efficient communities.

Provincial legislation – *the Local Government (Green Communities) Statutes Amendment Act (Bill 27, 2008)* – also requires that each local government establish targets, plans, and strategies to do their part to mitigate climate change. Having an up-to-date plan such as this Community Climate Action Plan (CCAP) helps with this, and also makes City of Penticton ready to apply for funding from the Federal or Provincial governments and other funders to implement strategies in the plan.

Implementing the plan will result in numerous social, economic and environmental benefits to the community, as outlined in Figure 1.

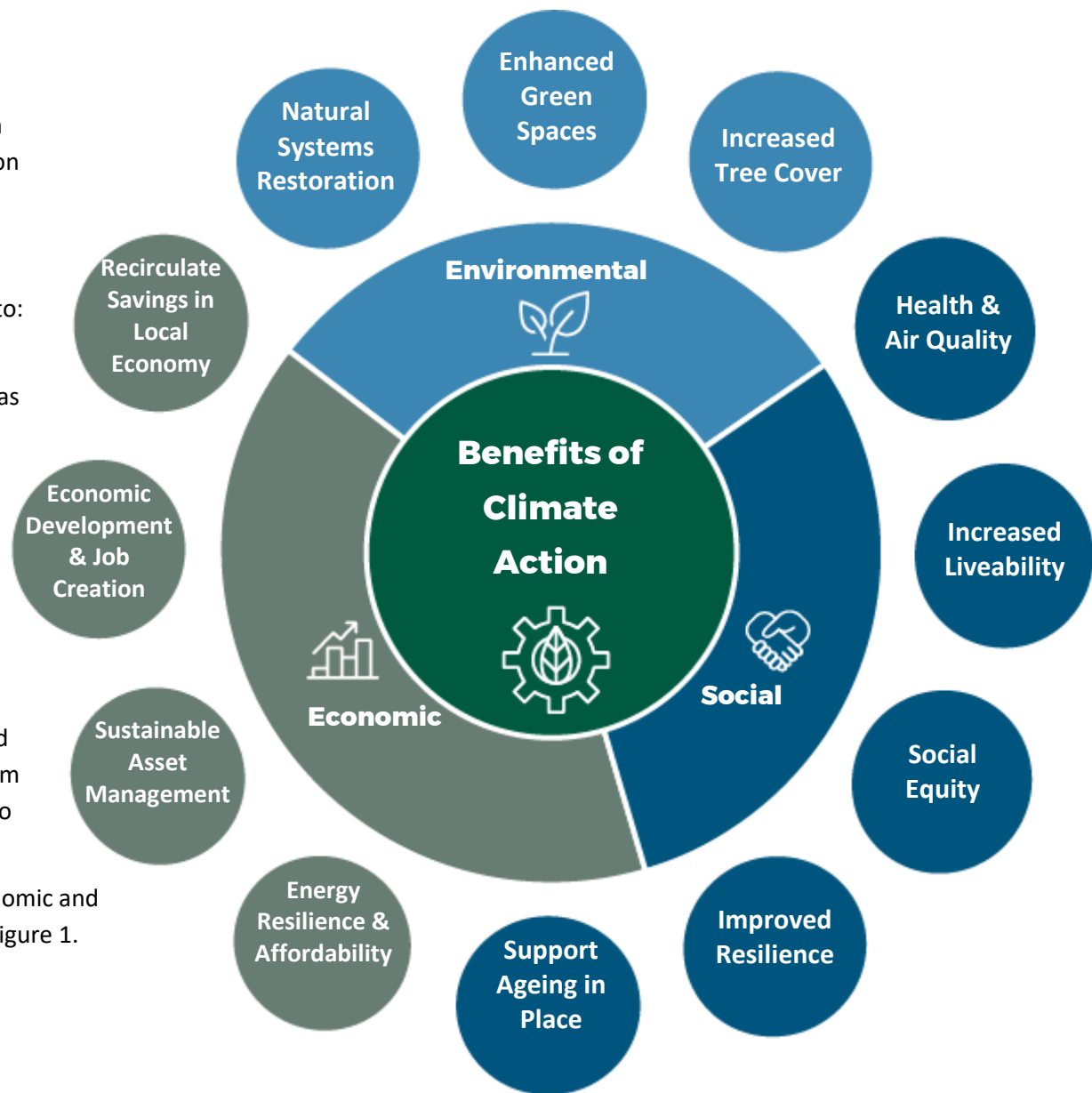


Figure 1 – Climate Action Co-Benefits

Local Governments Take Climate Action By:

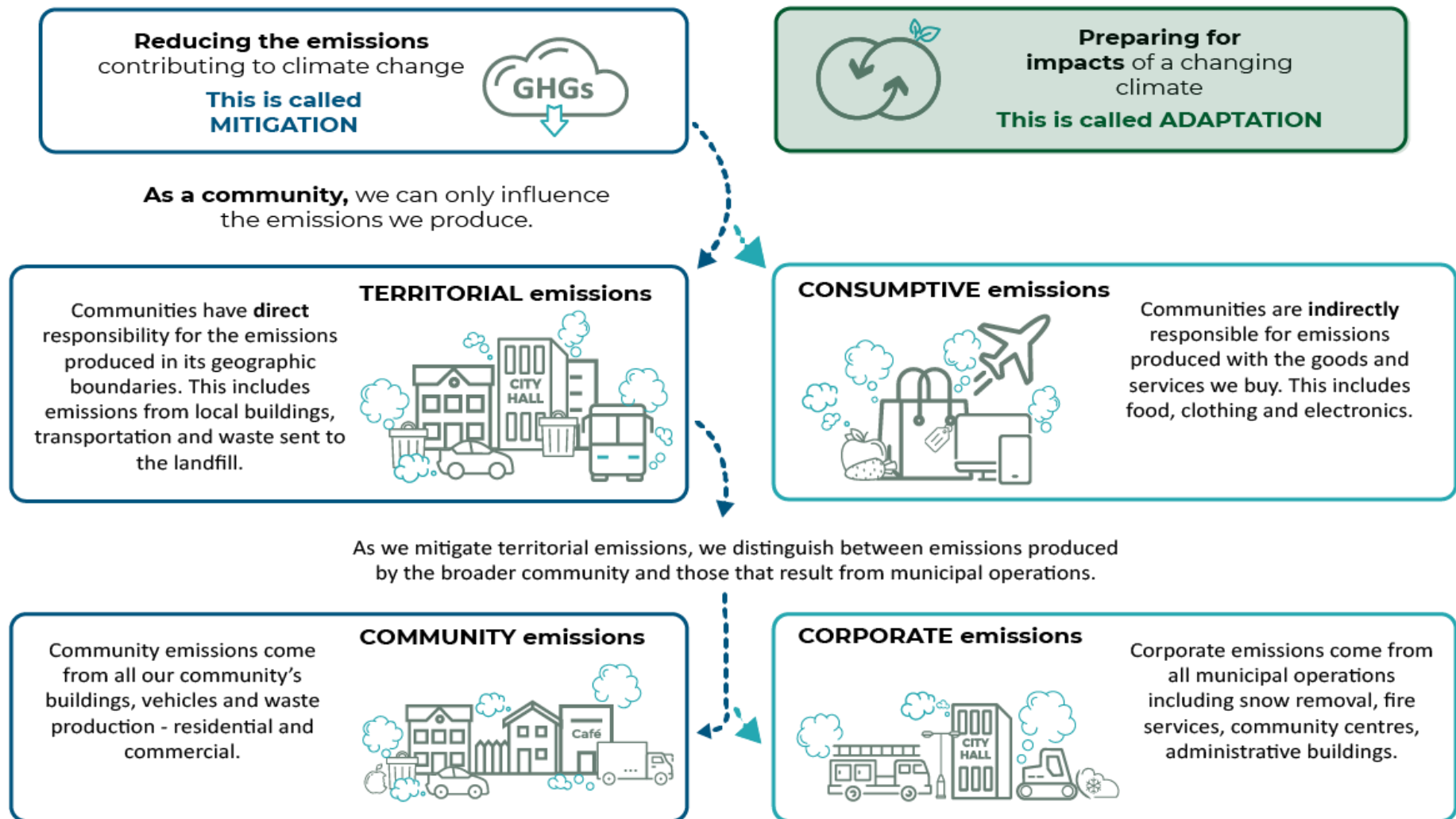


Figure 2 – Local Government Climate Action*

*The scope of this plan includes the elements on the left: mitigation, territorial emissions, and community emissions.

What is the Community Climate Action Plan?

Climate action consists of both reducing emissions, or *mitigation*, and preparing for the impacts of a changing climate, or *adaptation*. A Community Climate Action Plan (CCAP) is an important component of any local government's overall climate action strategy, which should also include a plan to address emissions from the local government's own operations and a climate adaptation plan.

The City of Penticton CCAP focuses on leveraging municipal powers to help residents and businesses save energy, emissions, and money. While municipal actions are necessary to achieve our climate goals, they are insufficient on their own. Significantly reducing our community greenhouse gas (GHG) emissions requires everyone to take action and make individual choices about how to get around, where to live, and how to handle food waste and yard material.




As a local government, there are numerous ways we can help residents and businesses sort through low carbon choices and show how those choices contribute to our collective success. There are also many ways the City can lead by example. This CCAP is our plan forward to reach our emissions reduction goal while building benefits for our community along the way.

This plan lays out key actions across seven Big Moves for transportation, buildings, waste, and organizational readiness:



This icon identifies actions and targets that were influenced directly from community feedback during the engagement process. Look for it throughout the report. Also see Appendix F for detailed engagement results.

The actions in the plan fall into three categories of municipal powers:

Infrastructure	Policy & Regulation	Engagement & Outreach
 <p>Investments into infrastructure owned by the City of Penticton that enable residents to make lower-emissions choices, such as active transportation networks and public charging stations.</p>	 <p>Changes to City of Penticton policy and regulation that lead to energy and emission reductions in the community, such as requirements and incentives for enhanced energy efficiency in new buildings.</p>	 <p>Outreach, education and incentives that inspire residents and businesses to make choices to reduce energy and emissions and prepare for a low carbon future.</p>

Adaptation Considerations

Although this CCAP is focused primarily on mitigating greenhouse gas emissions that cause climate change, it is equally critical to properly prepare for climate impacts that are already happening. As highlighted in the next section, the climate is changing and will continue to change in the future, and Penticton will experience a variety of local impacts. Fortunately, many actions can accomplish both of these, as shown in Figure 3.

Climate Change Risks in Penticton

Penticton, like communities across the planet, is expected to see changes in its climate. These changes will be experienced by residents as extreme, wild weather and shifting seasons. Temperatures are expected to rise in each season and precipitation levels are expected to decline in summer and increase in other seasons. Thus, more extreme temperatures, wildfires, and droughts could occur in summer months. Flooding, landslides and storms may also happen more frequently, and with greater severity.

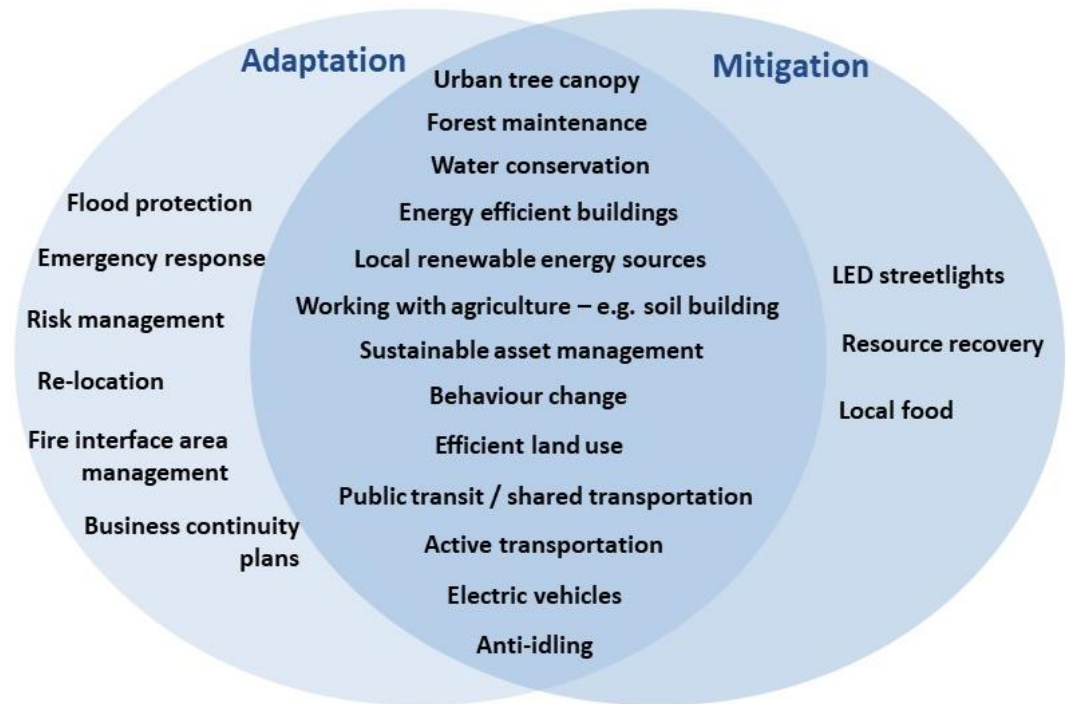


Figure 3 – Intersection Between Climate Change Mitigation and Adaptation Actions

The Regional District of Okanagan-Similkameen (RDOS) and Interior Health have also reviewed how the region has recently been affected by climate change, particularly extreme weather events.

The RDOS documented the large number of wildfires, floods and landslides in 2017 and 2018 ¹:

- 93 wildfires and 40,185 hectares burned
- About 6 wildfires required the RDOS' Emergency Operations Centre to issue alerts and evacuation orders
- RDOS wildfire related costs totalled \$318,723
- More than 9 lakes flooded and over 21 creeks and rivers caused flooding
- Over 10 incidents of landslide or debris flow occurred
- RDOS flood related costs to the Province of BC totalled \$7.5 million

During the 2017 wildfire season, Interior Health reported the following statistics for July and August²:

- More than 48,000 people were evacuated in the BC Interior and 880 Interior Health patients/clients were evacuated
- Over 80 alerts or evacuation orders were issued
- 52.37 air quality health index was reached (the highest on record)
- \$2.7 million in costs for Interior Health and 32,013 staff hours on wildfire response

The recent and anticipated climate changes will impact community buildings and infrastructure, human safety and health, natural resource sectors (e.g. agriculture), and the water supply in Penticton. Evaluating adaptation strategies now and, where possible, complementary low emissions strategies, will help advance the City's overall resiliency and ability to respond and thrive over the short and long-term. A wide range of strategies can be instituted by local governments and their partners to enhance resiliency and adapt to potential impacts, such as:



Figure 4 – Okanagan Wildfires Summer 2021, Source: Interior Health

¹ [Regional District of Okanagan-Similkameen Presentation at Making the Links Symposium 2018](#)

² @Interior Health – September 2017, <https://www.interiorhealth.ca/AboutUs/MediaCentre/PublicationsNewsletters/Documents/Edition%20179%20-%20September%202017.pdf>

- Defining land-uses and bylaws to better protect buildings from lake and river flooding, hard stabilization structures (e.g. walls), soft measures (e.g. wetland restoration), vertical or lateral setbacks, and flood-proofing of buildings can be adopted. Higher building standards and maintenance also safeguard against extreme weather and weathering processes
- More buffer zones and the reduction of wood fuel in the urban-wildland interface can help to minimize risks from wildfires.
- Diversification or upgrading community infrastructure like drinking water, storm water and wastewater systems helps to withstand heavy precipitation and extreme weather events. Natural assets like wetland restoration can also minimize storm water run off. Storing excess water during heavy precipitation and instituting water conservation or water efficient technologies can address increased water stress
- Encouraging the use of sustainable agricultural practices such as planting climate tolerant species and increasing the carbon content of soil (e.g. by promoting compost produced through organics diversion) could improve production levels considering changes in temperature and precipitation levels
- The addition of more natural vegetation can help to cool communities.
- Early warning systems and emergency response plans alert residents to extreme heat, poor air quality, wildfires, and floods in advance in order to move them to safer locations. This also helps to minimize stress and anxiety and possible injuries or illnesses.

A National Roundtable on the Environment and the Economy report* explains that the climate change costs for Canada could rise from \$5 billion/year in 2020 to \$21-43 billion/year by the 2050s, or higher. Finding ways to adapt to climate change will help to reduce these costs.

**Paying the Price: The Economic Impacts of Climate Change for Canada*, <http://nrt-trn.ca/climate/climate-prosperity/the-economic-impacts-of-climate-change-for-canada/paying-the-price>

Targets for Reducing Our Emissions

Community targets show the urgency of the challenge we are facing and the call to action to reduce our GHG emissions. Penticton's long-term community target is aligned with the Province of BC's targets.

Our new community targets are:



40% reduction in emissions below 2007 levels by 2030

100% reduction in emissions below 2007 levels by 2050



These were the targets chosen by workshop participants and confirmed in the public survey.

To meet the 2030 target, Penticton needs to produce at least 89,300 fewer tonnes of greenhouse gasses in 2030 (relative to 2007 levels). The actions in this plan are projected to achieve annual emission reductions of 94,400 tonnes CO₂e relative to 2007 (58,800 tonnes CO₂e relative to 2030).

Inventories: What is measured in this plan?

Local governments have varying degrees of influence over different sources of emissions within their boundaries. Our emissions come from both 'local' sources (emissions that are created here) and 'global' sources from local consumption (emissions that include everything from the extraction of raw materials through to processing and transport as well as emissions that may be counted elsewhere but are still ultimately our emissions).

Penticton's GHG reduction target references only local (territorial) emissions. These emissions are measured in the Energy and Emissions Inventory using the BC Methodological Guidance for Quantifying GHG Emissions. The major categories of emissions included in this inventory are: buildings (residential and commercial), transportation (passenger and commercial) and waste.

This plan does not comprehensively address large industrial operations (e.g. mining, sawmill), embodied carbon (the emissions associated with creating something), or life cycle emissions (how many GHGs are emitted over the lifetime of an energy source or object). This is outside of the scope of what municipalities can meaningfully address currently, but is an important thing for everyone to think about when they are buying goods or services. How was your item created, how far did it travel, how is it packaged? These are all important questions to consider when buying consumer goods.

Current Energy, Emissions and Costs by Sector and Fuel Type

Figure 5 shows how much energy was used (measured in gigajoules or “GJ”), the GHG emissions produced (measured in tonnes of carbon dioxide or “tCO₂e”) and how much that energy cost (estimated dollar amount) for each key sector in 2018.

The sectors are:

- Passenger vehicles
- Commercial vehicles
- Residential buildings
- Commercial and small-medium industrial buildings (CSMI)
- Waste

In 2018, for the whole community of Penticton:

- Total energy consumption was 4,650,000 GJ
- Total GHG emission were 236,000 tonnes of CO₂e
- Total energy expenditure was \$136,000,000

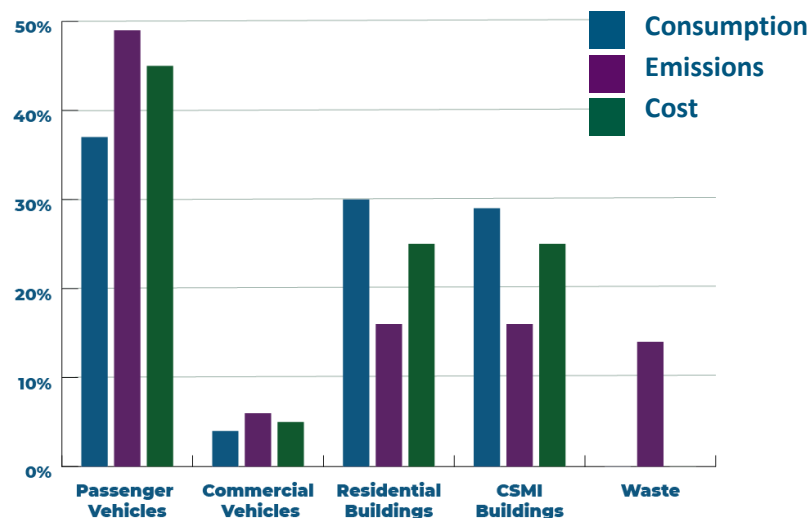


Figure 5 – Consumption (GJ), Emissions (tonnes CO₂e) and Energy Expenditure (\$) in 2018

Passenger vehicles account for 49% of Penticton’s GHG emissions and commercial vehicles account for 6%. The discrepancy in passenger vs. commercial vehicle emissions is due to the use of Kent Group retail gas station data to evaluate transportation fuel consumption, which is current to 2020, vs. the Provincial CEEI database, which was last updated in 2010. Though the Kent Group data does not include commercial cardlock stations, which would result in under-representation of commercial vehicle fuel consumption, the vast majority of transportation emissions are from passenger vehicles (80%). Therefore, given the two options, it was decided that the Kent Group data would be utilized. Residential and CSMI buildings each account for about 15% of GHG emissions, while waste accounts for 14%.

Passenger vehicles are also responsible for 45% of energy expenditure in Penticton. This is the money spent by Penticton residents at the pump filling the tank of their personal vehicles, and almost all of this money leaves the community. A lot of money is also spent on heating and operating residential and CSMI buildings, at 25% each. The majority of a residential energy bill is due to heating, and this can be quite a financial burden for many people.

It is interesting to note that waste has no energy consumption or expenditure associated with it in this inventory. Buildings and vehicles use various fuel sources such as natural gas, electricity, gasoline and diesel which cost money to purchase and contain a certain amount of energy. Waste does not use any fuel sources, but its decomposition in landfill does result in GHG emissions.

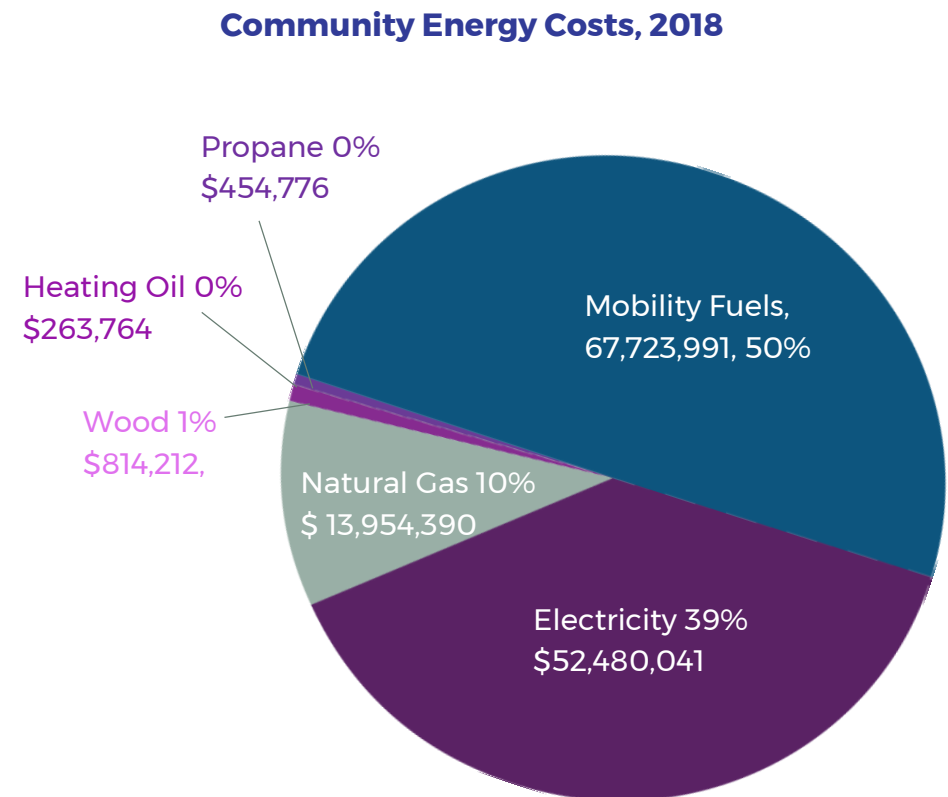
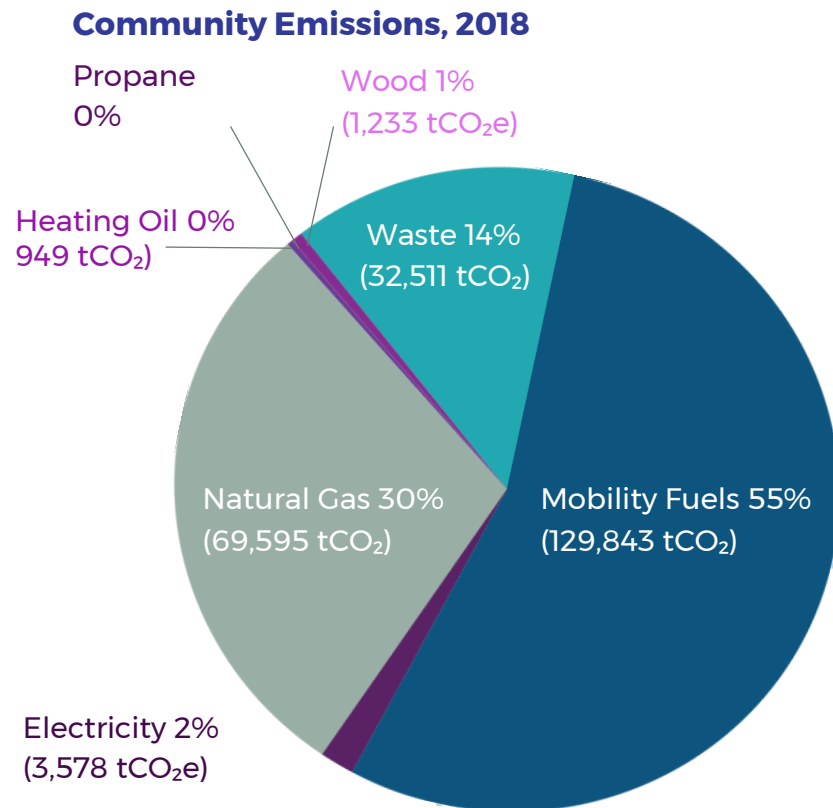


Figure 6 – Emissions (tonnes CO₂e) and Energy Expenditure (\$) by Fuel Source

Figure 6 shows Penticton’s emissions and energy expenditure in terms of fuel source rather than sector. Looking at emissions and expenditure in this way can reveal some interesting trends.

Mobility fuels are comprised of gasoline and diesel emissions from passenger and commercial vehicles. They make up a large majority of community emissions and energy costs, at 55% and 50%, respectively. With respect to buildings, natural gas heating is a significant emission source in Penticton at 30% of all community emissions, however it only contributes 10% of costs. Electricity on the other hand, contributes 39% of community costs, yet less than 1% of emissions. This is because electricity used in Penticton has very low emissions associated with it, but it is more expensive per unit of energy than natural gas. Electricity is primarily used in buildings, but small amounts may be used in other sectors, such as passenger vehicles (electricity for EVs). Heating oil, propane and wood account for less than 2% of emissions and expenditure combined because they are not the main source of energy in most buildings. The decomposition of waste in landfill contributes 14% of total emissions in Penticton. There is no energy cost associated with waste.

Process

The CCAP process consists of four steps: Modelling & Analysis, Engagement, Recommending Actions and Draft Plan, and the Final Plan. See Figure 7 below for more details.

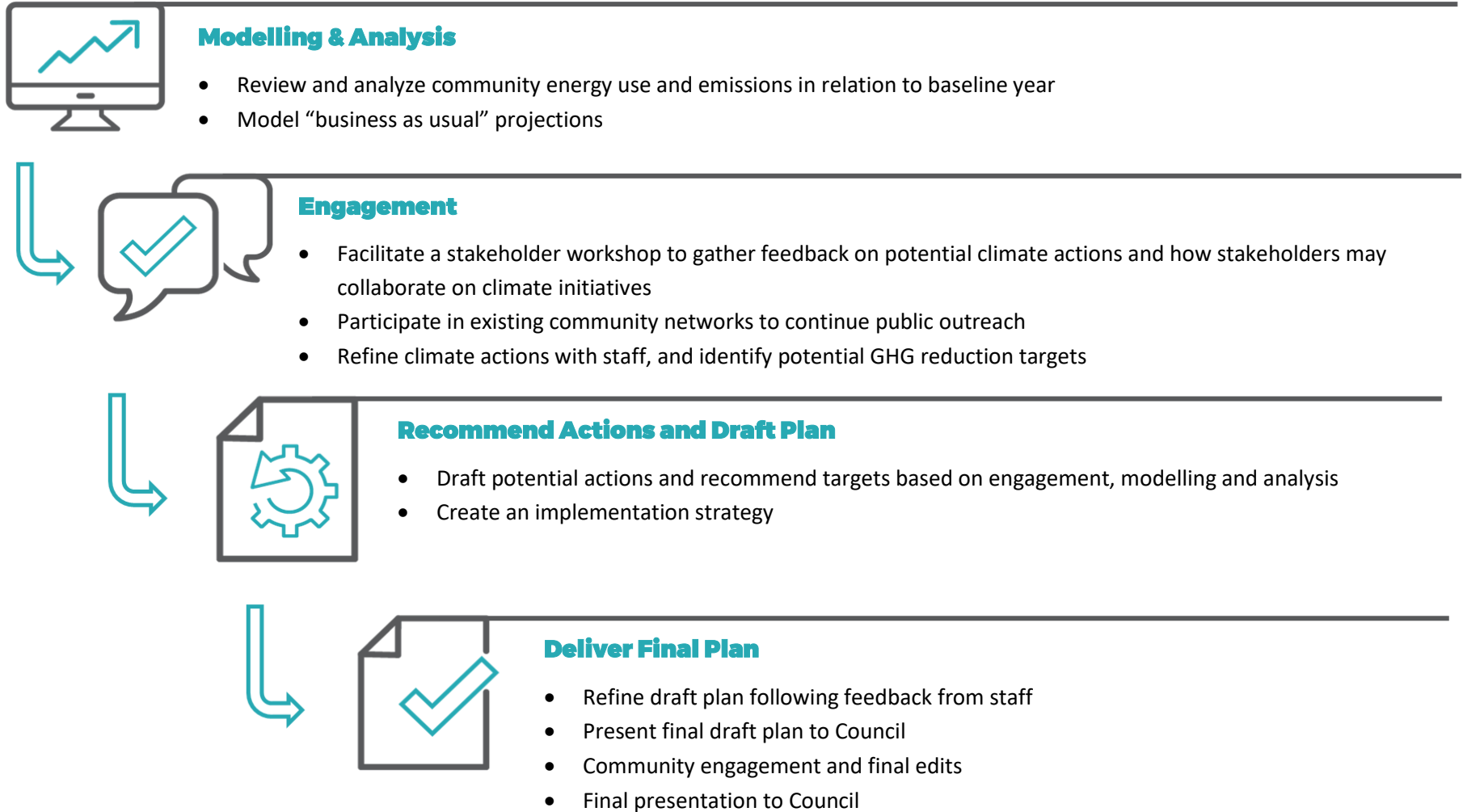


Figure 7 – CCAP Process

Forecasting and Backcasting

There were two different approaches used in the development of the Penticton CCAP: Forecasting and Backcasting. Forecasting is a common approach used to create estimates of future emissions using current inventory data and projections. Backcasting, on the other hand, starts by imagining the desired future scenario that is not limited by current projections or past experience. Used in combination, these two approaches provide us with a clear positive vision of the future and a measurable plan to start us on the pathway to our destination.

Forecasting Approach: BAU Projections

What does 'Business As Usual' mean?

Business As Usual, or BAU, is a way of describing what is estimated to happen to Penticton's emissions if the City takes no further action to decrease emissions beyond what they are already doing and plan to do. A number of factors are taken into account to develop BAU emissions scenarios, population growth being one of the most important considerations. As the number of people increase in a community, more buildings are needed/used and more vehicles are driven on roads.

Other considerations that were taken into account to develop City of Penticton's BAU emissions scenario for this report include the following:

- Changing climate patterns— as warmer winters and hotter summers occur, they are and will continue to change the way that energy is consumed in buildings
- Likely future impacts of policies already adopted by other orders of government, such as:
 - Renewable and low carbon fuel standards
 - Vehicle tailpipe emissions standards
 - Provincial and Federal Zero-Emission Vehicle (ZEV) mandates requiring 10% of new passenger vehicle purchases by 2025 as ZEVs, 30% by 2030, and 100% by 2035 as ZEVs
 - The greening of the BC Building Code by 2032 (progressive steps towards net zero energy).

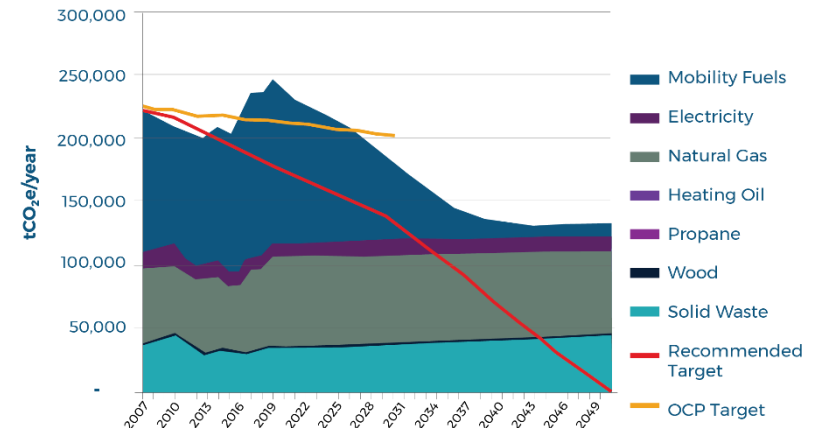


Figure 8 – Business as Usual GHG Emissions by Fuel Type

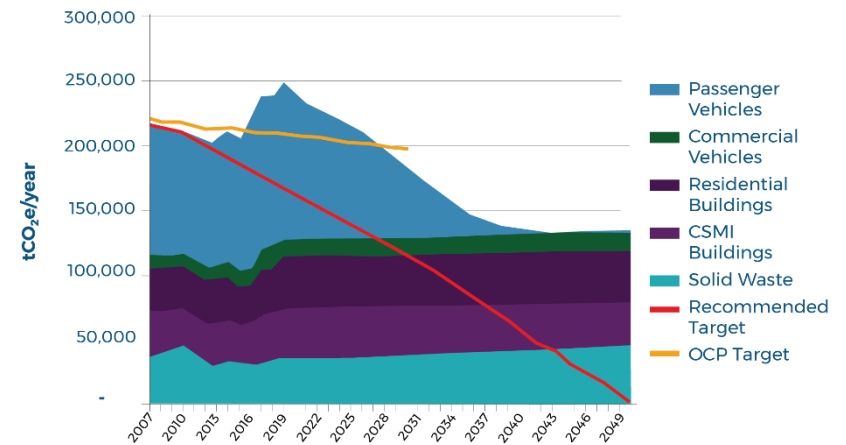


Figure 9 – Business as Usual GHG Emissions by Sector

Figure 8 and Figure 9 show Penticton’s GHG emissions inventory from 2007 to 2018 and its business-as-usual forecast from 2019 to 2050. Figure 8 shows emissions by fuel type (note that propane and heating oil are not visible on the graph due to low emissions contribution). Figure 9 shows emissions from the five sectors stacked on top of one another to show total emissions. Between 2007 and 2018 there was an increase in emissions of 6.8%, with some annual fluctuations in between. Emissions are expected to decline from 2021 onwards. It is anticipated that the biggest reductions will come from passenger vehicles/mobility fuels. This is due to Provincial climate policy such as the *Zero Emission Vehicles Act* in British Columbia.

The yellow and red lines indicate Penticton’s OCP and new reduction targets, respectively. In a business-as-usual scenario, Penticton will meet its OCP target in 2030, but fall well short of the new targets for both 2030 and 2050.

Backcasting Approach: Envisioning our Future

Backcasting is a planning approach that starts by defining the future vision, examining the current state, and identifying a path to achieve the vision. The concept of “backcasting” as used in this planning processes was developed by the Natural Step, as seen in Figure 10.

Over the course of two workshops, City of Penticton staff and stakeholders:

- Developed a vision of their desired low carbon future, focusing on three sectors: transportation, buildings, and waste
- Identified the current state of the sectors
- Brainstormed creative solutions to compliment the Big Moves, and
- Prioritized the solutions

See Appendix A for action details and lead departments to carry out implementation, and Appendix F for a summary of the workshop content, and post-workshop survey results.

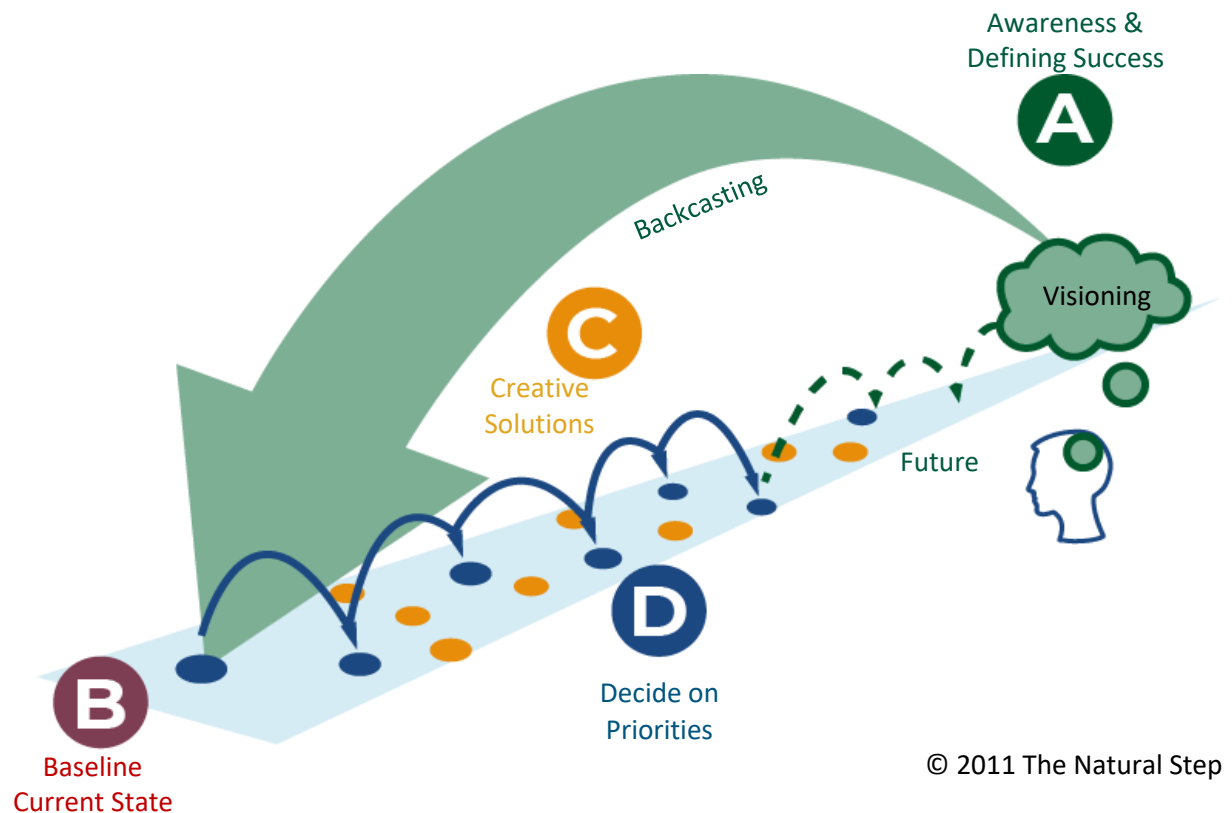


Figure 10 – Backcasting Approach. Source: The Natural Step

Engagement - Informing the Plan

Vision & Current State

To ensure a lasting plan with a foundation for commitment and energy for implementation the planning process for the Community Climate Action Plan deployed the following engagement approaches:

- Two virtual workshops with key staff, Council, and community stakeholders on June 10th and 14th, 2021
- Internal staff team providing insights and consideration on solutions
- General Public climate survey
- Public in-depth surveys on electric vehicles and home energy retrofits
- Youth climate survey

The stakeholder workshops in June focused on three major sectors: Buildings, Transportation, and Waste & Other, and followed the backcasting steps identified in Figure 10. Attendees included City of Penticton Councillors and staff, the City’s Electric Utility and FortisBC, community organizations such as the Community Sustainability Advisory Committee, First Things First Okanagan, Downtown Penticton Association, Interior Health and the Thompson Okanagan Tourism Association.

The first workshop developed a vision for 2040, and then established the current state for the three sectors. They are summarized below:

	Buildings	Transportation	Waste & Other
Vision	Deep energy reductions in all new and existing buildings, with a focus on existing homes and low carbon energy sources. Buildings will be healthy and resilient.	Connected, accessible, and equitable networks with all electric bike and ride shares. Land use policies minimize vehicle need.	Circular economy where all waste generated is re-used: Food and yard waste converted to compost for local farms and gardens, metal smelted locally, power generation for all other fuels. Urban forest canopy for resilience and community well-being.
Current State	Most homes are connected to gas, regulatory disincentives to fuel switching, lack of policies on EV charging for buildings, trades and realtors are not educated or supportive. No current mandatory EnerGuide labelling.	Car and truck culture is dominant. Local EV supply is minimal, and so is on-street EV charging. Some connectivity is available for active modes of transportation (e.g. Lake to Lake Network), but not enough safe bike storage.	Limited food waste composting in the Okanagan, though RDOS wants to ban residential organics from the landfill, and is making commercial food waste a priority. Anaerobic digestion is possible to make biogas. Residential recycling program is excellent, but not yet for commercial.

Creative Solutions and Action Prioritization

In the second workshop, attendees were asked to examine the actions identified in the Big Moves and balance that against the vision and current state developed in the first workshop, in order to inform the customized actions which will enable Penticton to meet their climate objectives. They were then asked to prioritize actions based on level of impact, ease of implementation, and availability of technology and resources (see photo below for an example from the online whiteboard). Lastly, high priority actions were analyzed further through Deep Dives, looking at aspects such as funding requirements, co-benefits, barriers, and equity concerns. The results are summarized in the Action Plan section. Raw engagement input for all activities (Vision, Current State, Action Prioritization, Deep Dives, and public engagement surveys) are given in Appendix F; an example is below in Figure 11.

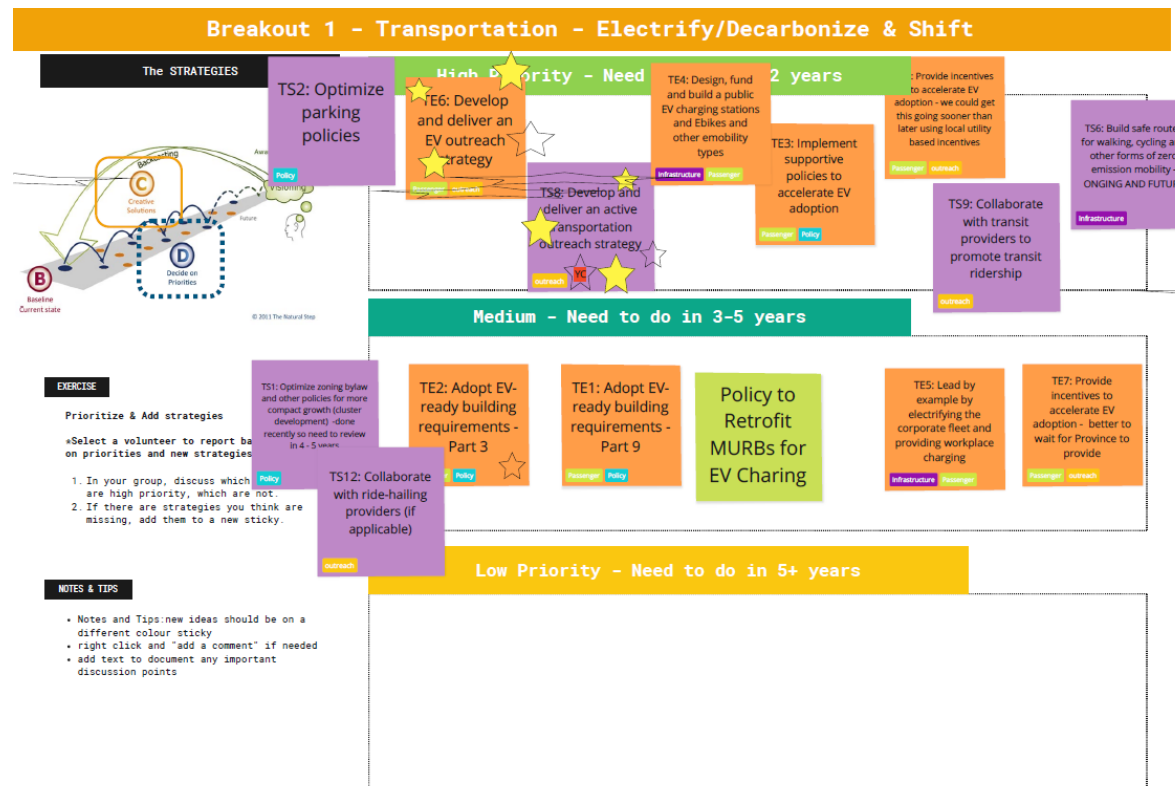
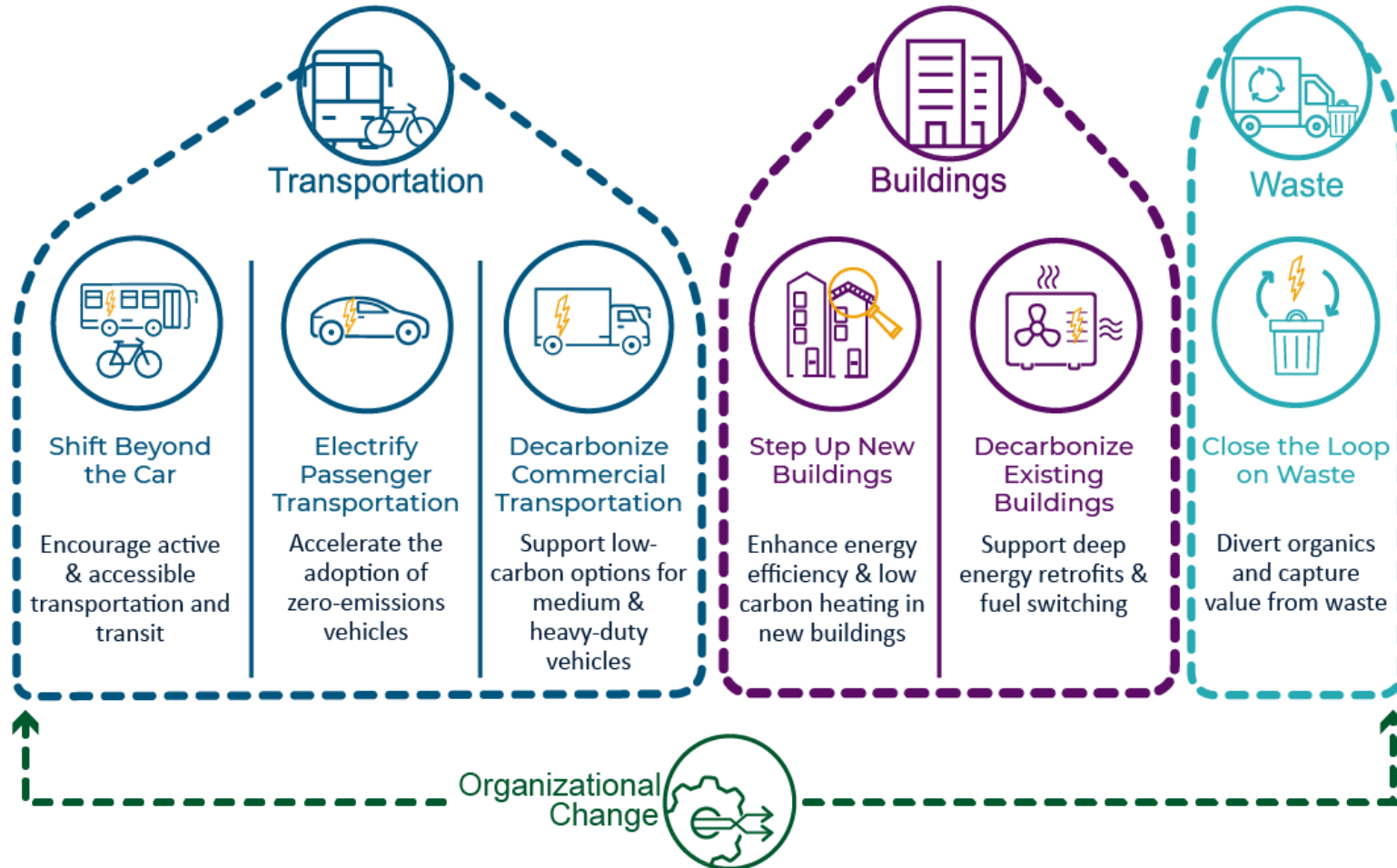


Figure 11 – Sample Stakeholder Engagement Board

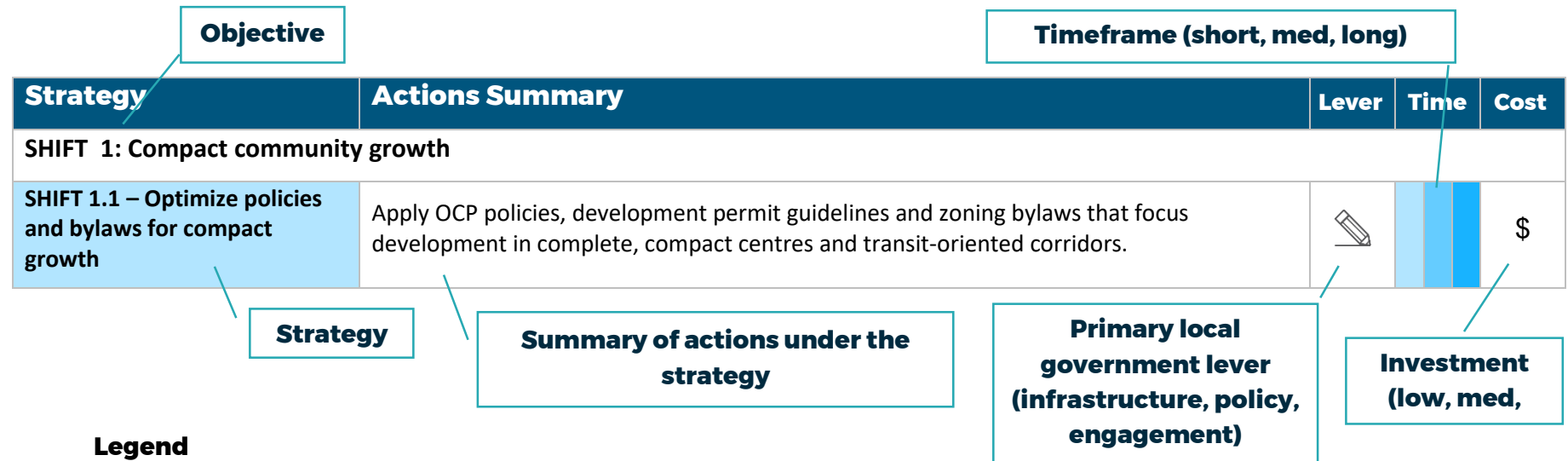
Action Plan

The CCAP is organized into six Big Moves to address the way we move, where we live and work, and what we do with waste. These are considered “big moves” because they tackle the biggest sources of community emissions. Importantly for this plan, they are also most in control of local governments. Each big move has a vision and objectives as well as specific actions the City can take to lay the foundation for individuals and businesses to make cleaner choices.



Action Plan Guide

The following pages outline each of the six Big Moves – and their associated objectives, strategies and actions – organized by sector (transportation, buildings, and waste). Below is an example of a strategy from Shift Beyond the Car, showing the types of information displayed.



Legend

Lever		Timeframe			Cost	Definition	
Infrastructure		Short (1-2 years)	■		Low	<\$25,000	\$
Policy & Regulation		Medium (3-5 years)		■	Med	\$25,000 - \$100,000	\$\$
Engagement & Outreach		Long (5+ years)		■	High	>\$100,000	\$\$\$

Notes:

- Lever: Many strategies utilize more than one local government lever. The following tables show only the primary lever, however Appendix A indicate all levers involved.
- Timeframe: Many strategies span more than one timeframe, with some actions starting in the short term and full deployment of the strategy occurring in the longer term.

The Way We Move



Vision:

A complete zero-emission transportation system connects our community and region.

Current State:

Vehicles are responsible for 55% of the greenhouse gas emissions generated from residents and businesses in Penticton. Transportation fuels such as gasoline and diesel are the largest expenditure on energy in the community at \$68 million per year.

Big Moves for Transportation

Shift Beyond the Car



Encourage active and accessible transportation and transit.

Electrify Passenger Transportation



Accelerate the adoption of zero-emission vehicles.

Decarbonize Commercial Transportation



Support low carbon options for medium and heavy-duty vehicles.



The Way We Move

Shift Beyond the Car

Encourage active and accessible transportation and transit.

Overview

Walking and cycling are not just weekend recreational activities – they are viable, beneficial, economical and environmentally-friendly modes of transportation. Penticton can design and build well-connected, accessible, safe and enjoyable routes, and are already being considered as part of the Downtown Revitalization Plan. This will encourage residents and visitors to choose an active mode of travel such as walking and cycling. Good sidewalks, bike lanes, and trails make active transportation a viable choice when traveling through neighbourhoods, communities, and town centers. The same infrastructure also affords access for those who use mobility aids, such as scooters and wheelchairs.

Planning for a zero-carbon transportation system requires a paradigm shift. Rather than solve traffic and infrastructure problems by expanding roads or building more of them, communities can support all transportation options and facilitate alternative travel choices that reduce the need for more, or bigger roads. Not only does this reduce transportation-related emissions, but this shift can also result in reduced infrastructure and maintenance costs down the road.

Looking Forward to 2030 – An Aspirational Target

- 30 commutes per person-year removed through more accessible active transportation, transit, and shifts in land use, (equivalent to 7.3 million vehicle kilometres travelled (VKTs) each year), building to 270 commutes per person by 2030.
- Streets have been reimagined to prioritize active, public and low carbon transportation options.
- New neighbourhoods are designed to maximize car-free options, and are fully connected via bike paths and transit options. See Appendix H for active transportation recommendations.
- Appropriate facilities for bike storage and e-bike charging are located in strategic hubs to support emission-free commuting.

Objectives

1. Optimize land use planning tools to enable compact community growth
2. Enable walking, cycling and other forms of zero emission mobility
3. Promote transit ridership and support a zero emissions transit network

Provincial Action


















As part of the Province of British Columbia's commitment through [CleanBC](#) to embrace clean and renewable energy across the board, the government developed [Move Commute Connect – B.C.'s Active Transportation Strategy](#). The strategy established a new target for active and assisted transportation:

By 2030, double the percentage of trips taken with active transportation

Federal Action

The Government of Canada's [Pan Canadian Framework on Clean Growth and Climate Change](#) commits to supporting a shift from higher- to lower-emitting modes of transportation as well as investing in infrastructure.

Strategies for Shifting Beyond the Car

Strategy	Actions Summary	Lever	Time	Cost
SHIFT 1: Optimize land-use planning for compact community growth				
SHIFT 1.1 – Optimize policies and bylaws	Apply OCP policies, development permit guidelines and zoning bylaws that continues to focus development in the built up area.			\$
SHIFT 2: Increase walking, cycling and other forms of zero emission mobility				
SHIFT 2.1 – Enable active transportation through plans and policies	Develop an Active Transportation Strategy that identifies gaps in the network. Implement supportive policies such as a Complete Streets Policy and updated Sub Division Servicing Bylaw and others to increase AAA infrastructure.			\$\$
SHIFT 2.2 – Build safe routes for walking, cycling and other forms of zero emission mobility	Continuously improve active transportation infrastructure including reconfiguring existing streets and building safe and convenient active transportation paths to connect all neighborhoods. 			\$\$\$
SHIFT 2.3 – Deliver an active transportation outreach strategy	Connect with community members to learn about their active transportation needs. Dedicate staff time for promotion and education around active transportation.			\$
SHIFT 2.4 – Normalize car-free and zero-emission zones	Beginning with the car free zone established through the Penticton Farmers Market, progress to more frequent car free days on a variety of streets. This may lead to a permanent establishment of a car free zone.			\$
SHIFT 2.5 – Promote micro e-mobility and on-demand mobility services	Understand when and where on-demand services are most useful and remove policy barriers and update bylaws. Host awareness events for e-bikes (and other forms of micro mobility) and work with vendors. BC Transit is already exploring on-demand mobility services			\$
SHIFT 3: Increase transit ridership and a support a transition to a zero emissions transit network				
SHIFT 3.1 – Collaborate with transit providers to promote transit ridership	Promote transit ridership by offering free transit days and celebrating new routes. Ultimately explore universal free transit with transit providers.			\$\$
SHIFT 3.2 – Transition to a zero emissions transit network	Work with BC Transit and neighbouring communities to ensure that transit progressively transitions to zero emissions vehicles (e.g. electric)			\$
Total GHG emissions reductions for this Big Move: 2,300 tCO_{2e} by 2030				



Safety was the highest ranked action to encourage use of non-vehicle transportation



The Way We Move

Electrify Passenger Transportation

Accelerate the adoption of zero-emission vehicles

Overview

Zero-emission vehicles (ZEVs) are clean, efficient, and cost-effective. In British Columbia, where at least 94% of all electricity is renewable and non-emitting, electric vehicles (EVs) are already a viable near zero-emission option.

Local governments can make zero-emission vehicles an easier choice for residents and businesses by investing in infrastructure, enacting supportive policies, and by engaging with companies and organizations that operate large fleets, such as car-sharing and ride-hailing providers. Local governments also deliver community outreach and education on zero-emission transportation choices.

If every British Columbia local government implemented this Big Move, by 2030 they would collectively reduce the province's total greenhouse gas emission inventory by 1.5 to 2 million tonnes because it would be equivalent to removing half a million internal combustion engine (ICE) vehicles from our roads. At the Penticton level, this move could remove 21% of emissions by 2030, or 8,700 ICEs from the road.

Looking Forward to 2030 – An Aspirational Target

- 970 passenger vehicles each year are switched to zero-emission, 8,700 by 2030.
- New buildings are required to provide an electrified, dedicated service for EV charging.
- A robust and strategically designed charging network ensures infrastructure is available at workplaces and public parking spaces.
- City of Penticton continues to demonstrate leadership by prioritizing electric for their fleet replacement policy and all service contracts require low emission vehicles as part of municipal contracts. See Appendix H for recommendations on electric mobility.

Objectives

1. Enable charging on-the-go
2. Enable charging at home and work
3. Encourage EVs through outreach and supportive policies

Provincial Action






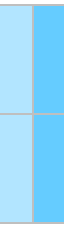




In May 2019 the Province enacted the [Zero Emissions Vehicle Act](#) to follow through on the transportation commitments in its [CleanBC](#) climate plan. The legislation requires all new light-duty cars and trucks sold or leased in British Columbia will be zero-emission vehicles, leading up to 100% by 2040, though this was superseded in June 2021 by a new Federal mandate as detailed below.

The Province established its [Clean Energy Vehicle Program](#) to support the transition. The program provides incentives to reduce the price of new zero-emissions vehicles and charging stations, and works to raise awareness of the benefits of such vehicles. businesses.

Federal Action

In June 2021, the Government of Canada mandated 100% of passenger car and trucks to be zero-emission by 2035. This supersedes the CleanBC mandate of 100% by 2040.

Strategies for Electrifying Passenger Transportation

Strategy	Actions Summary	Lever	Time	Cost
ELECTRIFY 1: Enable charging on-the-go				
ELECTRIFY 1.1 – Design, fund and build a public EV charging network	Leverage grant opportunities to install an annually increasing number of EV charging stations at key locations throughout the community. Collaborate with other local governments on a regional charging network strategy.			\$\$\$
ELECTRIFY 2: Enable charging at home and work				
ELECTRIFY 2.1 – Adopt EV-ready building requirements	We will closely follow the Province’s building requirements for EV-readiness, but we do not expect this to be in place in the near term. The City will explore establishing its own requirements in advance, for Part 9 and Part 3 buildings.			\$
ELECTRIFY 2.2 – Enable EV charging in existing residential and commercial buildings	Work with stratas and property management companies on navigating the process to retrofit existing parking stalls with EV charging equipment.			\$
ELECTRIFY 3: Encourage EVs through outreach and supportive policies				
ELECTRIFY 3.1 – Develop and deliver an EV outreach strategy	Work with third-party organizations to educate builders and developers on EV charging requirements, strategies, and funding opportunities through open houses and workshops. Partner with other organizations to host engagement events such as ride-alongs.			\$
ELECTRIFY 3.2 – Accelerate EV adoption through supportive policies and incentives	Adjust speed limits to enable low-speed EVs on select streets. Provide perks to EV drivers such as priority parking. Incent ride hailing, taxi operators and other fleet operators to switch to EV’s.			\$
Total GHG emissions reductions for this Big Move: 18,900 tCO_{2e} by 2030				



Convenience of charging at home and free parking were the top two factors in determining how often an EV driver charges



The Way We Move

Decarbonize Commercial Transportation

Accelerate the transition to zero emission medium and heavy-duty vehicles

Overview

Local government impact on this sector is currently limited due to lack of availability of commercial-sized electric vehicles, and commercial fleets being owned and operated either privately or from other orders of government.

Looking Forward to 2030 – An Aspirational Target

- Commercial fleets have leveraged their investment in charging infrastructure to establish high-powered charging hubs.
- Transit buses and school buses are electric, providing clean, emission-free travel options for the young and old.

Strategies for Decarbonizing Commercial Transportation

Strategy	Actions Summary	Lever	Time	Cost
COMMERCIAL 1: Accelerate the adoption of ZEVs for commercial fleets				
COMMERCIAL 1.1 – Develop a Community Vision and Strategy	Carry out a needs assessment through to 2040 and design a commercial/institutional charging network strategy.			\$
COMMERCIAL 1.2 – Engage Commercial and Industrial fleets	Support a pilot fleet electrification program with a commercial/institutional partner.			\$\$
COMMERCIAL 2: Lead by example by transitioning municipal fleet				
COMMERCIAL 2.1 – Update corporate policies to prioritize low carbon options	Review and integrate contractual requirements for municipal services to require lower emissions vehicles, increasing over time; These will be done as required by provincial legislation when it is introduced.			\$\$\$
Total GHG emissions reductions for this Big Move: 0 tCO_{2e} by 2030				



Electrification of the municipal fleet was selected by 76% of the public.

Objective

- Accelerate the adoption of zero-emission vehicles for commercial fleets
- Lead by example by transitioning municipal fleet

Provincial Action

10% of heavy-duty vehicles electric by 2030

94% of buses electric by 2030

16% of heavy-duty vehicles run on LNG

Provincial low carbon fuel standard

Federal Action

Tailpipe reduction standards – 40% reduction in tailpipe emission intensity by 2025 from 2015 levels

Where We Live and Work



Vision:

Our community's buildings are exceptionally energy efficient, and powered, heated and cooled with 100% renewable energy.

Current State:

Our homes and commercial buildings are responsible for 32% of the greenhouse gas emissions generated in City of Penticton. The main source of emissions is natural gas used for space and water heating, at over 90% of building emissions.

Big Moves for Buildings

Step Up New Buildings



Enhance energy efficiency and low carbon heating in new buildings

Decarbonize Existing Buildings



Support deep energy retrofits and fuel switching



Where We Live and Work

Step Up New Buildings

Enhance energy efficiency and low carbon heating in new buildings

Overview

While existing buildings generate the majority of building-related greenhouse gas emissions, local governments have greater authority to influence new construction. They can do so via the *BC Energy Step Code*, a section of the *BC Building Code* that local governments may use to require or incentivize better-than-code energy performance in new construction. While the Step Code is a great tool for improving overall building energy performance, it does not explicitly address emissions from new buildings. Local governments can address influence emissions by implementing the regulation in tandem with incentives that target zero-emission heating and cooling systems.

City of Penticton's population is growing at a rate of 0.98%. Every new building built to minimum code standards is a lost opportunity for improved energy efficiency and reduced carbon emissions and is one more building that will have to be retrofitted down the road.

Looking Forward to 2030 – An Aspirational Target

- All new buildings (~180/year, 1,600 by 2030) will be built to Step 4 of the Energy Step Code (40% more efficient), and 75% of our community's new buildings (135/year, 1,200 by 2030) will use only zero carbon energy sources for space and water heating.
- The building industry is now focused on whole building performance, as opposed to prescriptive code requirements.
- Energy performance is quantified and verified, so homeowners and buyers now have a better understanding on the long-term operations cost of the home.
- Homes are quiet, comfortable and durable. Energy costs are minimized through efficient design that reduces demand.

Objectives

1. Enhance Energy Step Code adoption to include a low carbon approach
2. Build industry capacity

Provincial Action

The province's CleanBC climate plan outlines the dates when the base *BC Building Code* will adopt BC Energy Step Code performance targets:





- In 2022, all new buildings will be 20% more energy efficient than those built to meet today's minimum code requirements.
- By 2027, all new buildings will be 40% more energy efficient
- By 2032, all new buildings will be "net zero energy ready".

CleanBC [Better Homes](#) links homeowners and residential builders to rebates and resources, and CleanBC [Better Buildings](#) provides funding and capital incentives to encourage energy efficient design, construction and renovation in larger buildings.

Federal Action

Natural Resources Canada's [Build Smart: Canada's Buildings Strategy](#) establishes the goal that all provinces and territories will adopt a net-zero energy-ready model building code by 2030.

Strategies for Stepping Up New Buildings

Strategy	Actions Summary	Lever	Time	Cost
NEW BUILDINGS 1: Adopt upper levels of the Energy Step Code with a low carbon approach				
NEW BUILDINGS 1.1 – Adopt the Energy Step Code	Penticton already requires Step 3 for Part 9 buildings, and will explore Step 4 in advance of the Provincial deadline of 2027 (and Step 5 in 2032). For Part 3 buildings, the City will require Step 1 effective from January 1 st , 2022.			\$
NEW BUILDINGS 1.2 – Prioritize a low-carbon approach	Opt-in to Provincial carbon metrics for new buildings if/when they become available or adopt a tiered approach (e.g. Step 3 or Step 2 with a low carbon energy system). Also consider the impacts of embodied emissions in new construction.			\$
NEW BUILDINGS 2: Build Industry Capacity				
NEW BUILDINGS 2.1 – Provide outreach and incentives	Promote existing Clean BC and FortisBC new construction incentives to subsidize costs of low-carbon technologies, improved insulation, working with an Energy Advisor, and/or mid-construction testing.			\$
NEW BUILDINGS 2.2 – Provide training and coordination	Collaborate across the region to provide relevant training to the building industry and realtors. Assemble a list of local or regional Energy Advisors and develop a plan to train more Energy Advisors in the area.			\$
Total GHG emissions reductions for this Big Move: 2,700 tCO₂e by 2030				



Adoption of the BC Energy Step Code was the most endorsed action, selected by 84% of the public.



Where We Live and Work

Decarbonize Existing Buildings

Support deep energy retrofits and fuel switching

Overview

In 2030, 90% of the all buildings in City of Penticton will be ones that are already standing today. Many buildings use more energy than is necessary. Owners of 20-year-old gas-heated homes can lower their energy bills by as much as 30% through energy efficiency retrofits and reduce about 1.8 tonnes of greenhouse gas emissions per year. Homeowners can pursue various degrees of building energy retrofits—from replacing individual pieces of equipment to comprehensive overhauls of the whole building, known as deep energy retrofits.

Deep energy retrofits involve changes to the entire building, including insulation, windows and doors, and air barrier, as well as ventilation and space and water heating equipment. To ensure emissions reductions as well as energy reductions, the energy retrofit must include fuel switching, from fossil fuel sources to zero-carbon sources such as electricity or 100% renewable gas. Such projects usually rely on the expertise of an energy advisor, who conducts energy modelling and airtightness testing.

City of Penticton has limited jurisdiction over requirements for existing building retrofits but has an opportunity to influence and enable building owners to make investments in the energy efficiency of their buildings.

Looking Forward to 2030 - An Aspirational Target

- 460 homes (2.7%) each year will undergo deep retrofits (4,100 homes by 2030).
- 206 fossil fuel-heated homes (2%) each year will convert their fossil-fuel heating and hot water systems to zero emissions, powered by either electricity or renewable gas (1,850 homes by 2030).

Objectives

1. Improve energy efficiency
2. Encourage and enable fuel switching
3. Build industry capacity and increase demand


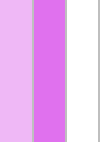

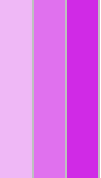

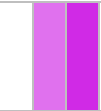

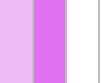
Provincial Action

CleanBC [Better Homes](#) links homeowners and renovators to rebates and resources, and CleanBC [Better Buildings](#) provides funding and capital incentives to encourage energy efficient renovation in larger buildings. The Province is currently working on an Existing Buildings Renewal Strategy, which will enable increased energy efficiency retrofits in the existing building stock.

Federal Action

The [Canada Greener Homes Grant](#) provides grants for energy efficiency upgrades and up to \$600 for pre- and post-retrofit EnerGuide assessments. The program also supports training Energy Advisors across Canada to meet increasing demand.

Strategies for Decarbonizing Existing Buildings

Strategy	Actions Summary	Lever	Time	Cost
EXISTING BUILDINGS 1: Improve Energy Efficiency and Enable Fuel Switching				
EXISTING BUILDINGS 1.1 – Encourage and enable deep energy retrofits	The City will promote Provincial and Federal incentives / programs, and look at options such as requiring EnerGuide assessments at the point of renovation. The City will also monitor the upcoming “Retrofit Code” expected to be released in 2024, and continue retrofits on corporate buildings.			\$
EXISTING BUILDINGS 1.2 – Encourage and enable building electrification or renewable gas	As part of 1.1, the utility-led energy efficiency retrofit campaign could have an emphasis on building electrification particularly heat pumps, as an excellent way to reduce GHGs. The City could also identify and remove barriers to heat pump installation, including streamlining permitting processes, optimizing noise regulations, and restructuring permit fees. Renewable natural gas opportunities could also be explored.			\$
EXISTING BUILDINGS 2: Build Industry Capacity and Increase Demand				
EXISTING BUILDINGS 2.1 – Establish a long-term marketing campaign	The City will explore a large-scale expansion of its utility-led community-wide energy efficiency retrofit campaign, for building envelope improvements, and electrification. This should be multi-year. In conjunction with all the other actions in this Big Move.			\$
EXISTING BUILDINGS 2.2 – Build industry capacity	Educate renovators and realtors on energy efficiency and low carbon choices for space and water heating. In conjunction with all the other actions in this Big Move.			\$
Total GHG emissions reductions for this Big Move: 14,300 tCO_{2e} by 2030				



65% of youth said home energy efficiency is the top action for the City to take to reduce GHGs in Penticton.

How We Manage 'Waste'



Vision:
Our community diverts all of our organic waste, such as food scraps and yard trimmings, from landfills and recovers value from everything that enters the waste stream.

Current State:
Organic landfill waste accounts for 14% of our communities GHG emissions. There is currently no organic waste pick up service though residential yard waste pickup does exist. The City also sells compost through its wastewater recycling program. The Regional District is currently evaluating options for an organics management facility.

Big Move for Waste

Close the Loop on Waste



Divert organics and capture value from waste



How We Manage Waste

Close the Loop on Waste

Divert organics and capture value from waste

Overview

Emissions from waste occur when organic waste mixed in with garbage decomposes in the landfill and produces methane, a potent greenhouse gas that is released into the atmosphere. Organic waste makes up about 30-40% of landfill waste, and includes food waste from homes and businesses, yard and garden waste, wood waste, and paper that cannot be recycled, such as food-soiled paper. Organic material decomposes over approximately 10 years in the local landfill. Organics diversion reduces or eliminates the new waste added every year but the waste that is already in place at the landfill continues its decomposition process. Because of this, it takes a number of years for the emissions reductions from organics diversion to scale up. Of course, how much waste is diverted (the diversion rate) is key to emissions savings.

By diverting organic waste from the landfill, it can be turned into compost that can be sold. There are other technologies that can capture value from the waste stream, such as landfill gas capture, biogas digesters, gasification plants, and waste heat recovery systems. Part of this Big Move is investigating opportunities for these technologies regionally.

Looking Forward to 2030 - An Aspirational Target

- 2.1 kg of organics per person-week (56%) of our community's residential food and yard waste will be converted to usable compost at a regional processing facility.
- All the compost created is repurposed into high quality soil for use in local farms and gardens.

Objectives

1. Divert organics from the landfill
2. Explore other resource recovery technologies






Provincial Action

The Province of British Columbia has committed to ensuring that, by 2030, 95% of organic waste will be diverted from landfills, and 75% of landfill gas will be captured. The province has also committed to fund workforce training.

Federal Action

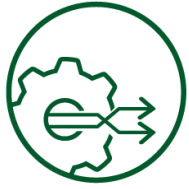
The Government of Canada, through its Investing in Canada Infrastructure Program (ICIP) provides funding for infrastructure that enables resource recovery, such as generating renewable fuel from waste.

Strategies for Closing the Loop on Waste

Strategy	Actions Summary	Lever	Time	Cost
WASTE 1: Divert Organics from Landfill				
WASTE 1.1 – Adopt policies that increase organics diversion	Initiate staff consultation on organics, processes and targets. Adopt organics diversion targets for the community.			\$
WASTE 1.2 – Implement (or enhance) organics collection and processing	Evaluate local opportunities for organic handling and diversion. Implement curbside kitchen waste collection for single-family homes. Install central collection points that are regularly picked up for multi-family units, work camps, etc. Consider partnering with Regional District or neighboring communities for collection of commercial organics.	 		\$\$\$
WASTE 1.3 – Divert construction, demolition, agricultural, and industrial wood waste	Identify wood waste landfills in the community, develop inventory (if any), and attempt to evaluate opportunity from those. Identify and pursue options to support and grow the market for salvaged forest clearing and deconstruction materials.			\$
WASTE 1.4 – Develop and deliver a comprehensive zero-waste outreach program	A zero-waste outreach program may include community-led composting projects, school programs, participation in Provincial “Love Food Hate Waste” campaign and education around source-separation requirements.			\$\$
Total GHG emissions reductions for this Big Move: 20,600 tCO_{2e} by 2030				



Implementing organics collection was the second most endorsed action, selected by 84% of the public, and 62% of youth.



Organizational Leadership Implementation for Success

Several key factors are important for the successful implementation of community energy and emission reduction plans based on research conducted by CEA, QUEST, and Smart Prosperity.³ Among others, they include establishing broad support for implementation, building staff and financial capacity for implementation, and institutionalizing the plan in order to withstand political and staff turnover.

With regards to institutionalization, ideas on how this can be done are shown in the table below. Specific details on the Big Move actions, and the lead departments to carry out implementation are given in Appendix A. Detailed strategies for an urban tree canopy and home energy retrofits are also provided in Appendix G and Appendix I, respectively.

Incorporate	Embed climate action into other planning documents such as the OCP, bylaws and policies, departmental/master plans, as well as development proposals. A Corporate Climate Action Plan is an effective way for the City to demonstrate leadership by taking action on its own assets; the City of Penticton is renewing its Corporate Plan concurrently with this CCAP, and has been carbon neutral since 2016. Climate action could also be incorporated into City staff job descriptions. Some communities report on climate action or sustainability implications in reports to Council.
Budget	Embed climate action into the budgeting process.
Monitor	Monitor indicators as outlined in the Monitoring and Evaluation section.
Convene	Host regular meetings to discuss implementation, innovative technology and methods, new legislation, and necessary pivots with internal and/or external stakeholders.
Report	Report regularly to Council on progress and accomplishments. Annual reporting is recommended. It can be integrated with CARIP reporting.
Renew	Prepare for plan renewal approximately every five years.

Table 1 – Institutionalizing Climate Change at the Local Level

³ Community Energy Implementation Framework, <https://questcanada.org/project/getting-to-implementation-in-canada/?dc=framework>

Monitoring and Evaluation

Monitoring and evaluating the implementation of the Climate Action Plan is critical for its success. Key Performance Indicators (KPIs) enable communities to measure the outcomes of a plan’s implementation. When KPIs are monitored regularly, communities can determine how to best allocate resources to support implementation, and what success different actions are having.

Suggested indicators are shown in Appendix C.

Funding

Funding sources that communities have used for climate action are shown in the table below. Specific internal funding mechanisms that Penticton can employ to assist with implementation can be found in Appendix J.

Internal Funding Sources	External Funding Sources
<ol style="list-style-type: none"> 1. Allocation from operating budget 2. Revolving energy efficiency fund (from corporate projects) 3. Forgone revenue (charge less for a municipal service to use the difference to fund a climate initiative) 4. General revenue (e.g. property taxes) 5. Recycling and solid waste user fees 6. Building permit fees and other service fees charged by Development Services 7. Electrical utility and water user fees 8. Potential funding from CARIP replacement 	<ol style="list-style-type: none"> 1. UBCM Gas Tax Agreement Funds 2. FCM’s Green Municipal Fund supports plans, studies, capital projects and pilot projects for environmental initiatives in a number of focus areas 3. FCM Community Efficiency Financing Program for financing community-scale retrofit infrastructure 4. Federal government programs such as the Greener Homes Grant, Low Carbon Economy Challenge, and Clean Energy Innovation Program 5. Provincial government programs such as the Clean Energy Vehicle Program, BikeBC Program, and CleanBC Communities Fund 6. Emotive grants for EV educational events to foster greater EV adoption 7. CleanBC and FortisBC energy efficiency incentives for new home construction and for increasing energy efficiency in existing buildings 8. BC Housing and FortisBC for education or demonstration projects to encourage the building industry to construct low energy and GHG emission homes. 9. FortisBC free energy grants for municipal buildings, and subsequent rebates for retrofits

Forecasting: Action Plan Projections

Figure 12 shows the modelled emissions reduction by Big Move for the year 2030, relative to BAU projections.

If all Big Moves are implemented in Penticton to the degree outlined in this Plan, GHG emissions in 2030 could be reduced by 58,800 tonnes of CO₂e below 2030 BAU, or 94,400 tonnes below 2007 levels, a total reduction of 42%, which meets the new 40% reduction target. Diverting organic waste from landfill produces the largest reductions at 20,600 CO₂e. Whilst the BAU scenario assumes a certain level of passenger vehicle electrification, this Big Move still presents major emission reductions, at 18,900 tonnes CO₂e of mobility fuels, primarily gasoline, while the collective actions from Shift Beyond the Car reduce an additional 2,300 tonnes CO₂e. Retrofitting the existing building stock by fuel switching and improving energy efficiency presents savings of 8,300 and 6,000 tonnes CO₂e respectively, or 14,300 tonnes CO₂e in total. The vast majority of these reductions are from natural gas, at 13,600 tonnes CO₂e.

Figure 13 shows the emissions reduction by Big Move to 2050 relative to the BAU. By 2050, the Big Moves are expected to reduce emissions by 75,800 tonnes CO₂e vs. the 2050 BAU, for a net reduction from 2007 levels of 163,300 tonnes CO₂e, resulting in a 73% reduction vs. 2007 baseline. Note that although the 2050 emission reduction target is not met, it is anticipated that new technologies and levers will become available in the future which will enable Penticton to achieve the target.

The modelling methodology is described in detail in Appendix E.

GHG Savings By Action in 2030, tonnes/yr

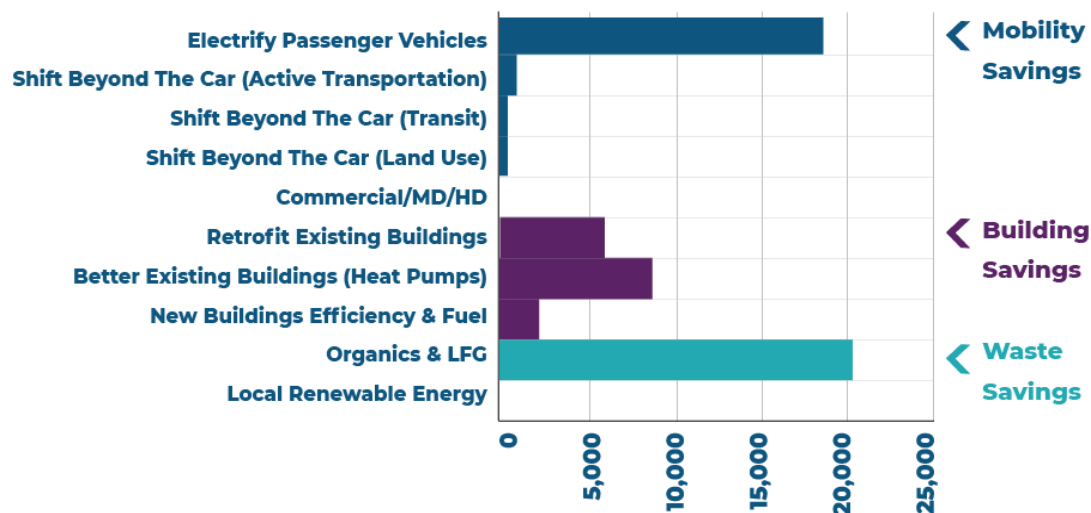


Figure 12 – GHG Savings By Action, tonnes/yr

Emissions Reductions by Action From BAU, tonnes/year

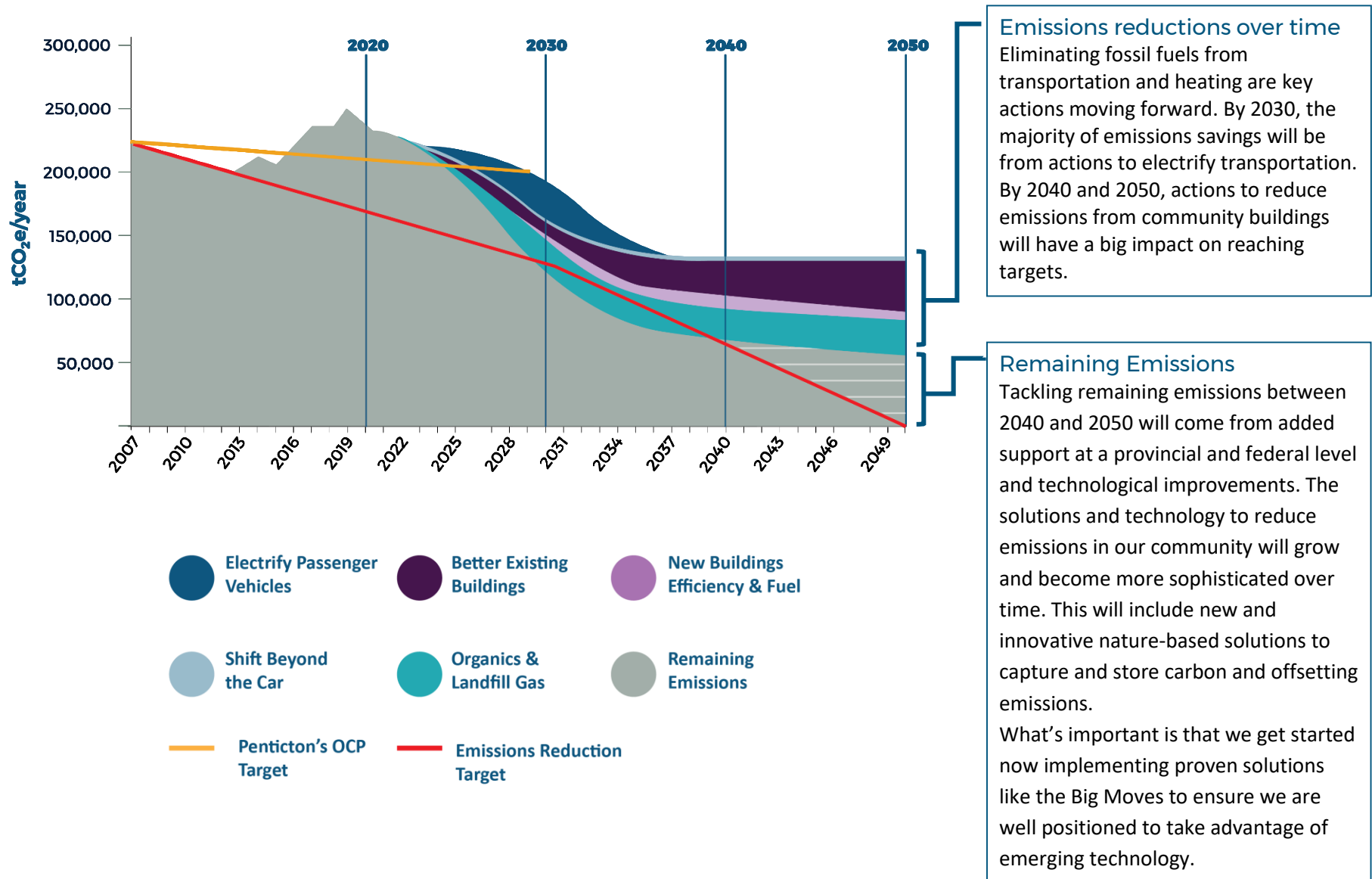


Figure 13 – Emission Reductions by Big Move to 2050




Appendix A. Implementation Details

The following pages include *template* detailed actions for each of the Big Move strategies. The actions are presented in four tiers: Tier 1 represents foundational actions that any community can begin with and Tier 4 represents full deployment of the strategy. The Big Move will be considered fully deployed when all four tiers are complete. Highlighted columns indicate the level of implementation modelled in the City of Penticton CCAP. Note that although some actions may not be specifically applicable to Penticton, they are standard for representative communities in BC.

At the bottom of each column is the relative cost, uncertainty, difficulty, and impact of each tier of the Big Move.



Cost			
Uncertainty			
Difficulty			
Impact			





Municipal levers are noted for each strategy:



Infrastructure	Policy & Regulation	Engagement & Outreach
 <p>Investments into the City of Penticton owned infrastructure that enable residents to make lower-emissions choices, such as active transportation networks and public charging stations</p>	 <p>Changes to City of Penticton policy and regulation that lead to energy and emission reductions in the community, such as requirements and incentives for enhanced energy efficiency in new buildings.</p>	 <p>Outreach, education and incentives that inspire residents and businesses to make choices to reduce energy and emissions and prepare for a low carbon future.</p>

Transportation - Shift Beyond the Car

The combination of land use (being near where you need to go daily) and infrastructure (active and accessible paths & prioritization, transit) and policy (parking pricing) combine to shift from fossil vehicles to active accessible and transit. Land use policy effects are long term rather than short term partly due to the long time-scale of development.



Strategy	Tier 1	Tier 2	Tier 3	Tier 4
SHIFT 1.1 Optimize policies and bylaws for compact growth  Lead: Dev. Services & Planning as needed	<input checked="" type="checkbox"/> Review OCP and planned development to identify opportunities to further incent or require infill development <input type="checkbox"/> Review employment locations and link location/land use to local Economic Development Strategic Plan <input type="checkbox"/> Add mixed-use neighborhood commercial as a permitted use in zoning bylaw for specified locations such as corner lots and centrally located larger properties	<input type="checkbox"/> Leverage CLIC (Community Lifecycle Infrastructure Costing) tool to assess financial impacts of development proposals <input type="checkbox"/> Increase density along core Transit Network	<input type="checkbox"/> Create a density bonus structure for development within short walking distance of the core transit network <input type="checkbox"/> Increase Density for neighbourhood node viability	<input type="checkbox"/> Require all new developments to have walk-scores greater than the community average and expected transportation emissions below the community average
SHIFT 2.1 Enable active transportation through plans and policies  Lead: Dev. Services & Planning	<input checked="" type="checkbox"/> Refresh/develop Active Transportation Plan <input checked="" type="checkbox"/> Survey the community on travel habits and what services / opportunities are needed within the community to reduce out-of-community travel <input type="checkbox"/> Link to local Economic Development Strategic Plan	<input checked="" type="checkbox"/> (In progress) Develop a Complete Streets Policy to including formalizing hierarchy (pedestrian - bike - transit - truck - car) <input type="checkbox"/> Apply trip-end facility requirements to all commercial and industrial buildings regardless of gross floor area	<input type="checkbox"/> Update Subdivision Servicing bylaw to require any new subdivisions to include active transportation infrastructure <input type="checkbox"/> Strategically price parking to incent active transportation	

<p>SHIFT 2.2 Build safe routes for walking, cycling and other forms of zero emission mobility</p>  <p>Lead: Dev. Services</p>	<p>✓ Continuously improve active transportation infrastructure per existing plans</p>	<p>✓ (In progress) Implement Complete Streets Policy to reconfigure streets to be 'complete streets' as streets are regularly scheduled for resurfacing / reconstruction for pavement maintenance or installation of utilities. If new streets are required, design to support connectivity</p>	<p><input type="checkbox"/> Prioritize budgeting for key AAA transportation infrastructure that will connect major destinations (schools, shopping) to main residential areas</p> <p><input type="checkbox"/> Invest in enhanced transit</p>	<p><input type="checkbox"/> Initiate a 10-year program to connect all neighborhoods to safe and convenient active transportation paths</p>
<p>SHIFT 2.3 Develop and deliver an active transportation outreach strategy</p>  <p>Lead: Communications</p>	<p>✓ Promote new routes and end of trip facilities</p> <p>✓ Promote events such as Bike to Work Week</p>	<p><input type="checkbox"/> Expand active transportation promotion. E.g. education events for new 'all ages and abilities' routes (e.g. priority for disabled users, etiquette when passing others</p>	<p><input type="checkbox"/> Contract dedicated, permanent, part-time outreach capacity to engage the community on active transportation and transit</p>	<p><input type="checkbox"/> Collaborate with communities in the region on shared outreach capacity</p>
<p>SHIFT 2.4 Normalize car-free and zero-emission zones</p>  <p>Lead: Dev. Services</p>	<p>✓ Establish car free days on a key street - 1 day a year</p> <p>✓ Combine with a special event and create a festival experience</p>	<p>✓ Expand car free days on a key street to more days of the year / more streets</p> <p>✓ Consider car free days once a week during warmer seasons (e.g. combined with weekly farmers market)</p>	<p><input type="checkbox"/> Establish high-profile car-free areas within the community</p>	
<p>SHIFT 2.5 Promote micro e-mobility and on-demand mobility services</p>  <p>Lead: Dev. Services</p>	<p>✓ Host awareness events for e-bikes, e-scooters and EV golf carts, including demonstrations</p>	<p><input type="checkbox"/> Conduct an analysis to understand when and where on-demand service will be most useful</p>	<p><input type="checkbox"/> Collaborate with a technology vendor to bring e-mobility on demand solutions to the community, such as electric kick-scooters or e-bikes available for rent through an app</p>	

<p>SHIFT 3.1 Collaborate with transit providers to promote transit ridership</p>  <p>Lead: Engineering?</p>	<input type="checkbox"/> Promote transit ridership by celebrating new routes and offering free transit days	<input type="checkbox"/> Collaborate with transit providers to enable free transit programs for children/seniors, and during bad air quality or very cold weather		<input type="checkbox"/> Explore universal free transit with transit providers
<p>SHIFT 3.2 Transition to a zero emission transit network</p>  <p>Lead: Engineering?</p>		<input checked="" type="checkbox"/> Collaborate with neighboring communities on safe and convenient inter-community transit that is safe and responsive to the needs of the communities	<input type="checkbox"/> Start working with transit providers and neighbouring communities to ensure that transit shifts to zero emissions vehicles (e.g. electric)	<input type="checkbox"/> Initiate a 10-year transit investment program to connect all neighborhoods and connect to other communities with zero emissions transit
	Tier 1	Tier 2	Tier 3	Tier 4
Cost	Green	Yellow	Red	Red
Uncertainty	Green	Green	Yellow	Yellow
Difficulty	Green	Yellow	Yellow	Red
Impact	Red	Red	Yellow	Yellow

Transportation - Electrify Passenger Vehicles



New vehicle sales are approximately 10% of total vehicle stock annually. Switching to an EV from a fossil vehicle eliminates almost 100% of the emissions in BC. The more that people can walk, cycle and take transit in the community and between communities may reduce the % of EV's required for the first target year. In 2019, 10% of car sales (not including trucks and SUVs) were EV's, though this is not even across BC. Provincial ZEV mandates do not require even portions of sales regionally so City of Penticton can help influence local EV adoption.


Strategy	Tier 1	Tier 2	Tier 3	Tier 4
<p>ELECTRIFY 1.1 Design, fund and build a public EV charging network</p>  <p>Lead: Dev. Services</p>	<p>✓ Install public Level 2 charging at one municipally owned parking lot to demonstrate leadership. Consider up to 4 Level 2s as a demonstration at that location</p>	<p>✓ (In progress) Develop a community EV charging infrastructure strategy (current/future demand for L2 and DCFC, garage orphans)</p> <p>✓ (In progress) Through engagement and network design, consider opportunities to leverage public institution (or other Part 3) charging infrastructure to address garage orphans</p>	<p>☐ Collaborate with other local and regional governments on a regional charging network strategy</p>	<p>✓ Leverage grants to implement community EV charging infrastructure strategy</p> <p>☐ Consider implementation to focus on supporting other actions, such as integrated transportation hubs (connectivity of charging infrastructure to e-bike shares, transit options, etc.)</p>
<p>ELECTRIFY 2.1 Adopt EV-ready building requirements</p>  <p>Lead: Buildings</p>	<p>☐ Initiate consultation on Part 9 and Part 3 new construction charging infrastructure requirements</p>	<p>☐ Draft building bylaw amendment to integrate Part 9 EV readiness requirement for 100% of all new non-street parking</p> <p>☐ For Part 3, consider requiring smart chargers, to facilitate load management in the future</p>	<p>☐ Implement Part 3 EV charger readiness policy (I.e.. 100% electrified, EV-ready stalls for new MURBs (energized outlet capable of supporting Level 2 charger - integrate load management); 25% of stalls at new, non-residential Part 3 buildings)</p>	<p>☐ Require EV readiness reflective of new Part 3 construction for rezoning or development permits for major redevelopment / renovation</p>
<p>ELECTRIFY 2.2 Enable EV charging in existing residential and commercial buildings</p>	<p>☐ Provide information to homeowners about Provincial EV charging incentives</p>	<p>☐ Work with stratas and property management companies on navigating the process to retrofit existing</p>	<p>☐ Top up provincial residential/MURB and workplace L2 retrofit incentives</p>	<p>☐ Provide or advocate for Tier 2 exemptions or kWh allowances to protect EV</p>

 Lead: Buildings		parking stalls with EV charging equipment		owners against increased electricity prices
ELECTRIFY 3.1 Develop and deliver an EV outreach strategy  Lead: Communications, Dev. Services	<input type="checkbox"/> Advise local groups of EV outreach incentives from Emotive <input type="checkbox"/> Create a communications plan to support engagement <input type="checkbox"/> Deliver builder/developer education on EV charging requirement for part 9 and part 3 such as an Open House for electrical trades to engage on EV charging readiness requirement	<input type="checkbox"/> Continue outreach to builders, public, auto dealers in including workshops and stakeholder engagement <input type="checkbox"/> Partner with other organizations to host engagement events such as test-drives and ride-alongs	<input type="checkbox"/> Facilitate a regional workshop to identify opportunities to leverage community EV charging network implementation to support regional travel <input type="checkbox"/> Partner with neighboring communities on ongoing active outreach to public and car dealers, implementing the communications plan (Tier 1) to support community identity around EVs	<input type="checkbox"/> Create a community or regional brand around electric vehicle adoption, reflective of the local priorities and context to encourage adoption
ELECTRIFY 3.2 Accelerate EV adoption through supportive policies and incentives  Lead: Dev. Services, Economic Dev.		<input checked="" type="checkbox"/> Adjust speed limit for more streets to 30km/h when possible to allow for low speed EV's	<input type="checkbox"/> Leverage Provincial decal program (EV-OK) to provide a suite of EV priority parking (may include free parking or just priority)	<input type="checkbox"/> Incent taxi operators and other fleet operators to switch to EV's (e.g. priority parking for EV taxis, business permit reduction for electrified fleets) <input type="checkbox"/> Create EV-only zones in core downtown areas
	Tier 1	Tier 2	Tier 3	Tier 4
Cost				
Uncertainty				
Difficulty				
Impact				

Transportation - Decarbonize Commercial Transportation



Commercial transportation is one of the most difficult segments of community emissions to address, since communities have minimal control over private and provincial commercial fleets. Additionally, commercial-sized electric vehicles are limited in availability, although there has been considerable progress in the past 2-3 years, with trucks from Ford, Tesla, Bollinger, and Rivian expected to be on the market by 2022. Communities however, can convert their own corporate fleets as products become available.



Strategy	Tier 1	Tier 2	Tier 3	Tier 4
<p>COMMERCIAL 1.1 Develop a community vision and strategy for commercial ZEV infrastructure</p>  <p>Lead: Electric Utility, Dev. Services?</p>	<input type="checkbox"/> Conduct a needs assessment for fleet charging requirements, through to 2040	<input type="checkbox"/> Design a non-municipal commercial/institutional EV charging network strategy, with emphasis on hub-style charging to leverage fleet needs and electrification of delivery bays	<input type="checkbox"/> Support a pilot fleet electrification initiative with one commercial/institutional partner. (e.g. land use/zoning change to allow for transit charging hub, or electric school bus parking zone, etc.) OR: <input type="checkbox"/> (Renewable) Natural gas vehicle collaboration for heavy duty vehicles. (Collaborating with other local return-to-base fleets such as BC Transit, school board, waste haulers, and industry / commercial operators)	<input type="checkbox"/> Facilitate joint procurement/joint funding in coordination with commercial fleet operators for the implementation of the commercial/institutional EV charging network strategy
<p>COMMERCIAL 1.2 Engage commercial and industrial stakeholders</p>  <p>Lead: Communications, Engineering, Electric Utility</p>	<input type="checkbox"/> Develop communications strategy to support outreach/engagement with commercial sector <input type="checkbox"/> Advocate to provincial government for commercial decarbonization legislation, leveraging collaborations with commercial sector and regional districts	<input type="checkbox"/> Convene a Commercial & Industrial fleet operators workshop to discuss current and future opportunities around low emissions/electrification of fleets <input type="checkbox"/> Engage with BC Transit and School District to identify early adoption opportunities of	<input type="checkbox"/> Engage with stakeholders on design of the commercial EV charging network. Integrate as much as possible with public and municipal charging strategies)	<input type="checkbox"/> Host an emerging and future technology workshop for MD/HD fleet operators, and facilitation of driver training courses on emission-reducing techniques

		electric bus and transit options (recognizing 100% electric transit target for BC Transit, and currently available school bus funding for School Districts)		
<p>COMMERCIAL 2.1</p> <p>Update corporate policies to prioritize low carbon options</p>  <p>Lead: Procurement & Public Works</p>	<p>✓ (In progress) Review and integrate contractual requirements for municipal services to require low emission vehicles, increasing over time with 100% requirement by 2040. (applies to commercial entities that are contracted for municipal services)</p>		<p><input type="checkbox"/> Require Corporate fleet electrification policy to buy used vehicles at time of replacement if no low-carbon options are available</p>	<p><input type="checkbox"/> Corporate fleet electrification policy fully implemented (to extent that available technology allows) for 100% EV</p>
	Tier 1	Tier 2	Tier 3	Tier 4
Cost				
Uncertainty				
Difficulty				
Impact				

Buildings – Step Up New Buildings




Step Code is an efficiency code, not a GHG code. Efficiency is a good first step, but to get deep emissions reductions the heating fuel must be low/no emissions. Electricity is nearly emissions free in BC and heat pumps use 1/2 to 1/4 the energy of a home heated by baseboard heaters, saving energy and money over the long run. Each new building that is inefficient and has a fossil heating system is one more building that will need to be retrofitted at some point.


Strategy	Tier 1	Tier 2	Tier 3	Tier 4
<p>NEW BUILD 1.1 Adopt the Energy Step Code</p>  <p>Lead: Buildings</p>	<p>✓ Designate departments and individuals to attend the local government Step Code Peer Network and start working on an implementation strategy</p>	<p>✓ Adopt the Energy Step Code with a community-wide requirement for one of the lower steps for Part 9</p> <p>✓ (Jan 2022) Adopt the Energy Step Code with a community-wide requirement for one of the lower steps for Part 3</p> <p>✓ Adopt policies and programs to incentivize adoption of higher steps</p>	<p>✓ Determine timelines for adopting upper steps</p> <p><input type="checkbox"/> Adopt a rezoning policy to require upper steps for new developments that add significant density</p>	<p><input type="checkbox"/> Adopt upper steps of the Energy Step Code community-wide at the earliest opportunity, and signal intent require top step in advance of 2032</p>
<p>NEW BUILD 1.2 Adopt a low-carbon approach to the Energy Step Code</p>  <p>Lead: Buildings</p>	<p><input type="checkbox"/> Conduct consultation with the local building industry about low carbon approaches to the Energy Step Code</p>	<p><input type="checkbox"/> Adopt a tiered approach encouraging low carbon energy systems (e.g. Step 3 community wide, Step 2 if they connect their project to a district energy system or implement a low carbon energy system</p>	<p><input type="checkbox"/> Adopt the Provincial GHG metrics when they become available</p>	<p><input type="checkbox"/> Investigate opportunities to address embodied carbon in the construction sector</p>
<p>NEW BUILD 2.1 Provide outreach and incentives</p>	<p>✓ Promote existing incentives for building more efficient new homes via Better Homes BC</p>	<p>✓ Leverage Fortis BC funding to provide subsidies to builders that offset the additional cost of Energy Advisors and/or provide incentives for mid-</p>	<p><input type="checkbox"/> Top up provincial incentives (betterhomesbc.ca) for heat pumps to replace fossil heating systems in new buildings</p>	

 <p>Lead: Communications, Buildings</p>		<p>construction air tightness testing</p> <p><input type="checkbox"/> Fee rebates could also be considered for new homes that install solar or electric vehicle charging stations</p>		
<p>NEW BUILD 2.2 Build industry capacity through training and coordination</p>  <p>Lead: Buildings</p>	<p>✓ (In progress) Collaborate across the region to provide relevant training to building industry and realtors</p> <p>✓ Assemble and promote list of local or regional Energy Advisors</p>	<p><input type="checkbox"/> Continue providing locally relevant training</p> <p><input type="checkbox"/> Work with building industry partners to accelerate Energy Advisor training</p> <p><input type="checkbox"/> Develop quota for minimum number of local Energy Advisors by 2022</p>	<p><input type="checkbox"/> Continue partnering to provide training to building industry, focusing on meeting Upper Steps</p>	
	Tier 1	Tier 2	Tier 3	Tier 4
Cost				
Uncertainty				
Difficulty				
Impact				




Buildings - Retrofit Existing Buildings


Building envelope improvements reduce energy needed to heat the building. An average retrofit can save 10% to 20% of energy while a deep retrofit (\$80,000-\$100,000) can save 50% to 60%. Heat pumps use 1/2 to 1/4 of the energy of a home heated by baseboard heaters. Electricity has >80% less emissions than natural gas. Perpetual locked in renewable gas contracts (buying the environmental benefits of renewable gas produced somewhere) may be an option in the future.

Strategy	Tier 1	Tier 2	Tier 3	Tier 4
<p>EXISTING BUILD 1.1 Encourage and enable deep energy retrofits.</p>  <p>Lead: Buildings</p>	<input type="checkbox"/> Promote <i>Better Buildings</i> , <i>Better Homes BC</i> , and <i>Greener Homes Grant</i> at front counter and in property tax mailings as well as business license renewal mailings		<input type="checkbox"/> Require EnerGuide assessments (Part 9 buildings) and building energy benchmarking (Part 3 buildings) as a condition of a renovation permit over a value threshold	<input type="checkbox"/> Require minimum energy performance standards aligning with the Province's upcoming retrofit code (*as more information becomes available)
<p>EXISTING BUILD 1.2 Encourage and enable building electrification or renewable gas</p>  <p>Lead: Buildings, Electric Utility</p>	<input type="checkbox"/> Provide information about heat pumps to renovators and homeowners at time of permit	<input type="checkbox"/> Identify and remove barriers to heat pump installation, including streamlining permitting process, optimizing noise regulations, restructuring permitting fees, and others	<input type="checkbox"/> Top up Provincial (<i>Better Buildings</i> and <i>Better Homes BC</i>) heat pump incentives	<input type="checkbox"/> Use the City owned utility to finance heat pumps to replace fossil fuel heating. Also assure quality and manage installers
<p>EXISTING BUILD 2.1 Establish a long-term marketing campaign</p>  <p>Lead: Communications, Buildings</p>		<input type="checkbox"/> Establish a 10-year program for a community-wide marketing campaign (based on 'energy diets') to encourage building envelope improvements, electrification or other low carbon fuel sources	<input type="checkbox"/> Collaborate with Penticton Indian Band and local governments in the region on a coordinated 10-year campaign to market deep energy retrofits and fuel-switching from heating oil, propane, and natural gas to heat pumps	

<p>EXISTING BUILD 2.2 Build industry capacity</p>  <p>Lead: Buildings, Communications</p>	<input type="checkbox"/> Educate renovators and realtors on energy efficiency and low carbon choices for space and water heating	<input type="checkbox"/> Provide a building energy benchmarking workshop to large portfolio operators	<input type="checkbox"/> As part of the 10-year marketing campaign, collaborate with others to provide extensive training and development for heat pump system designers and installers	<input type="checkbox"/> Signal intention to adopt 'retrofit code' when it becomes available (outreach to public, retailers, realtors, trades)
	Tier 1	Tier 2	Tier 3	Tier 4
Cost	Green	Yellow	Yellow	Yellow
Uncertainty	Green	Green	Yellow	Red
Difficulty	Green	Green	Yellow	Red
Impact	Red	Yellow	Green	Green

Waste - Close the Loop on Waste

Strategy	Tier 1	Tier 2	Tier 3	Tier 4
<p>WASTE 1.1</p> <p>Adopt policies that increase organics diversion</p>  <p>Lead: Public Works</p>	<p>✓ (In progress) Collaborate with the Regional District to initiate consultation on organics, processes & targets</p>	<p><input type="checkbox"/> Adopt organics diversion targets for community and corporate</p>	<p><input type="checkbox"/> Collaborate with RDOS to facilitate diversion (away from landfill) for construction and demolition waste</p> <p><input type="checkbox"/> Require organics diversion for event permitting</p>	<p><input type="checkbox"/> Ban all city (residential, commercial, institutional) organics (food waste, yard waste, etc.) from going to garbage stream</p>
<p>WASTE 1.2</p> <p>Implement (or enhance) organics collection and processing</p>  <p>Lead: Public Works</p>	<p>✓ (In progress) Work with RDOS to complete assessment (inventory) of community organic waste volumes and feasibility of landfill diversion</p>	<p>✓ Collaborate with RDOS to evaluate local opportunities for organic handling and composting</p> <p>✓ Consider partnering with Regional District and neighboring communities</p> <p><input type="checkbox"/> Implement curbside kitchen waste collection for single-family homes</p>	<p><input type="checkbox"/> Install central collection points that are regularly picked up for multi-family units</p>	<p><input type="checkbox"/> Establish public program for compost pick-up from all buildings</p> <p><input type="checkbox"/> Integrate organics collection in streetscapes, where appropriate</p>
<p>WASTE 1.3</p> <p>Divert construction, demolition, agricultural and industrial wood waste</p>  <p>Lead: Public Works</p>			<p><input type="checkbox"/> Support RDOS in identifying and pursuing options to support and grow the market for salvaged deconstruction materials</p>	<p><input type="checkbox"/> Support RDOS in identifying opportunities to salvage surplus and used construction materials, and promote reuse, donation, repair, and sharing opportunities</p>

<p>WASTE 1.4 Develop and deliver a comprehensive zero-waste outreach program</p>  <p>Lead: Communications, Public Works</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Support (funding or land donation) community-led composting projects <input type="checkbox"/> Support existing and new capacity for reusable resources, including Free Swaps, Share Sheds, free-store for unwanted goods, and building materials depot <input type="checkbox"/> Provide funding to School District to implement programs on educating about waste reduction/diversion 	<ul style="list-style-type: none"> <input type="checkbox"/> Fund/Support a part or full-time position dedicated to organic diversion (and waste reduction) to support implementation <input type="checkbox"/> Conduct annual community zero-waste drives to enhance awareness, streamline with school and business programs 	<ul style="list-style-type: none"> <input type="checkbox"/> Educate and communicate the source-separation requirements 	<ul style="list-style-type: none"> <input type="checkbox"/> Establish a waste reduction working group consisting of key staff across the organizational structure that institutionalizes support for organic diversion and zero waste initiatives, include external organizations where possible
	Tier 1	Tier 2	Tier 3	Tier 4
Cost				
Uncertainty				
Difficulty				
Impact				

Appendix B. Other Opportunities

We explored other opportunities for the City of Penticton beyond the prescribed Big Moves. These included local renewable energy actions, primarily on rooftop solar and micro hydro, and carbon sequestration actions including preservation of local wetlands, wood-framed buildings for new buildings, and carbon capture technologies. The action summaries and timelines for implementation are shown below.

Local Renewable Energy and Sequestration

Strategy	Actions Summary	2022	2023	2024	2025	Later
LOCAL RENEWABLE ENERGY						
RENEWABLE 1.1 Pursue community-scale renewable energy systems.	Conduct a renewable energy scan to determine financially and technically feasible renewable energy options. These may include biomass district heat, solar, wind and renewable gas.	Done				
RENEWABLE 1.2 Support building-level renewable energy projects.	Provide Municipal incentives for renewable energy installations in buildings.	X				
SEQUESTRATION						
SEQUESTER 2.1 Preserve ecologically sensitive areas within the municipal boundary	Identify and then use policy measures to reduce / prevent clearing of ecologically sensitive areas e.g. trees, e.g. density bonus for developments.	X				
SEQUESTER 2.2 Encourage low embodied carbon buildings	Consider ways to support or encourage building materials that have low embodied carbon or even have a net negative carbon balance, e.g. by relaxing Step Code requirements for wood-frame Part 3 buildings and encouraging larger wood-frame Part 3 buildings.				X	
SEQUESTER 2.3 Collaborate with other governments, organizations and industry to pursue low-carbon and carbon capture technologies	Keep abreast of ways that local governments can be involved in, and support carbon capture & sequestration, e.g. through Province of BC, CEA, and Pacific Institute for Climate Solutions.					X

Appendix C. Recommended Key Performance Indicators

Two types of indicators are recommended. Primary indicators measure community energy consumption and GHG emissions, while secondary indicators can quantify the indirect success of various actions. The following table provides a description of these indicators, the measures of success, data sources for each indicator, and frequency of reporting. Annual progress reporting should be planned by the City of Penticton.

	Indicators	Measures of Success	Data Sources
Primary	1. Community GHG emissions	40% reduction in emissions from 2007 levels by 2030 100% reduction in emissions from 2007 levels by 2050	Provincial energy & emissions data at the community level, and Kent Marketing Group fuel sales data for area gas stations converted into emissions using latest factors from the Province
	2. Per capita energy usage	Average household and commercial energy use declines over time to 2050 Annual fuel sales (gas & diesel) decreases over time to 2050	Provincial energy & emissions data at the community level, Kent Group fuel sales data for area gas stations, Penticton electrical utility usage data
Transportation	3. Gas station fuel sales data	Decrease in sales of fossil fuels	Kent Marketing Group fuel sales data for the area gas stations
	4. kWh/year used recharging EVs at public charging stations	Increase in kWh/year delivered by EV stations	Usage data already available to the City (other charging station providers may also be able to provide data)
	5. # of public EV charging stations	Increase in number of EV stations, L2's and L3's	Websites e.g. https://www.plugshare.com/
	6. # and % of EVs registered in the community	Increase in # and %	ICBC data
	7. Infrastructure to promote active transportation	Progress towards outcomes of the following plans: <ul style="list-style-type: none"> • Transportation Master Plan • Parks & Recreation Master Plan • Official Community Plan 	Public Works & Recreation

	Indicators	Measures of Success	Data Sources
	8. Commuting / personal travel mode split	Increase in travel around Penticton and between Penticton and Osoyoos / Kelowna by ride share, public transit, walking or cycling	BC Transit ridership data, and Census
Existing buildings	9. # of energy efficiency incentives distributed for building efficiency upgrades	Average increase in incentive use	Summary data from FortisBC (and other entities as applicable, e.g. Province), NRCan EnerGuide D and E evaluations
New buildings	10. # of buildings at each level of the BC Energy Step Code	Increase in number or percentage of new buildings constructed to various levels of the Step Code	Permit applications <i>(Notes: suggest setting this up in advance for GIS; Some builders may currently be building to Step Code and getting FortisBC rebates without the District knowing, by following the prescriptive pathway. Advising local builders and front counter staff of the Step Code compliance pathway in the building code should solve this.)</i>
Renewable Energy	11. # of renewable energy buildings installations	Increase in percentage of buildings adding solar and other renewable energy sources	Distributed Generation Program applications <i>(Note: this only covers renewable energy systems that generate electricity. Others will not be possible to track.)</i>
Waste	12. Amount of organics diverted from landfill	Increase in organics at composting facility	Regional District of Okanagan-Similkameen
	13. Recycling rates	Increase in recycling rates	Regional District of Okanagan-Similkameen
	14. Tonnes of waste per capita to landfill	Decrease in waste per capita sent to landfill	Regional District of Okanagan-Similkameen
Other	15. Urban tree canopy cover	Increase in canopy	GIS estimates of tree canopy cover from Parks; Development applications; Public Works tree planting data <i>Note: due to complications with GIS, this indicator may only be possible to track in the medium-term, if at all.</i>
	16. Per capita water consumption	Decline in water use	Usage data on water utility bills / metering system

	Indicators	Measures of Success	Data Sources
	17. # of participants at building community & citizen educational events / workshops	High participation levels at events	Registration/Attendee lists for events

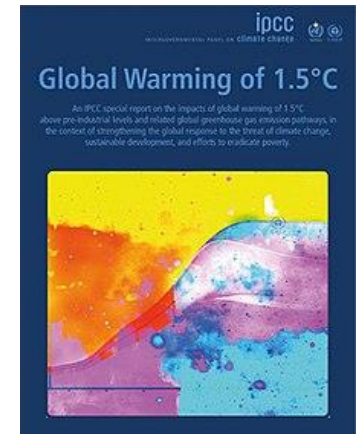
Appendix D. Climate Action at All Levels

Global Action

When Canada signed the Paris Agreement in 2015, we joined a global commitment to keep global warming below 2°C, and as close to 1.5°C as possible. In October 2018, the United Nations Intergovernmental Panel on Climate Change (IPCC) released a major report that emphasized the dramatic difference in consequences between a 1.5°C and 2°C world. Every degree of warming beyond this threshold will lead to increased impacts of extreme weather, more wildfires and floods, increases in sea-level rise, and severe threats to human health and well-being.

By limiting these impacts, we can ensure a healthy environment, economy and society for ourselves and future generations. While it is not too late, time is of the essence.

The key finding of the IPCC report is that limiting warming to 1.5°C is possible, but requires deep emissions reductions across all areas of society – reducing global emissions by 45% from 2010 levels by 2030 and reaching net zero emissions by 2050.



PAN-CANADIAN FRAMEWORK



on Clean Growth and Climate Change

Canada's Plan to Address Climate
Change and Grow the Economy

National Action

In 2016, the Government of Canada released its Pan-Canadian Framework on Clean Growth and Climate Change. The framework sets out the federal government's strategy to meet its commitment under the Paris Agreement to reduce national greenhouse gas (GHG) emissions 30% below 2005 levels by the year 2030. In 2017, the most recent emissions inventory year, Canada's emissions were 716 megatonnes of CO₂ equivalent (Mt CO₂e), which is a 2% decrease from 2005 levels. This means that in order for Canada to meet its emissions reduction target, we need a decrease of 28% from 2005 levels in just ten years. More recently, the Government of Canada has established a target of net-zero emissions by 2050, requiring an acceleration of action by all levels of government.

Actions available to the federal government include vehicle fuel-efficiency standards, model national building codes, energy ratings, and carbon pricing.

Provincial Action

In December 2018, the Province of British Columbia released its CleanBC climate plan. The plan reaffirmed the province’s previous target to reduce emissions 80 per cent below 2007 levels by the year 2050, and established a new interim target to reduce emissions 40 per cent by 2030. In 2017, BC’s provincial emissions were 0.5% below 2007 levels, which means that in order for BC to meet its emissions reduction target, we need a decrease of 40% from 2007 levels in just ten years.

CleanBC outlines a path to meeting the 2030 targets, outlining a range of actions to meet 75% of the target. These actions include sourcing clean and renewable



electricity, incremental increases in building-energy performance in the BC Building Code, tailpipe emissions standards, and measures to reduce emissions from industry. The Province is currently identifying the actions to achieve the remaining 25% of emissions

reductions.

CleanBC builds on a history of provincial climate action: The provincial government has enacted laws and regulations to reduce emissions and transition to a low-carbon economy. These include the Climate Change Accountability Act, Carbon Tax Act, Greenhouse Gas Industrial Reporting and Control Act, and Clean Energy Act.

As shown in Figure 14, senior levels of government have recognized the need for strong climate action (particularly on mitigation), and provide support to local governments.

The federal government uses national standards and funding in climate action because provinces have constitutional jurisdiction over both energy and local governments.

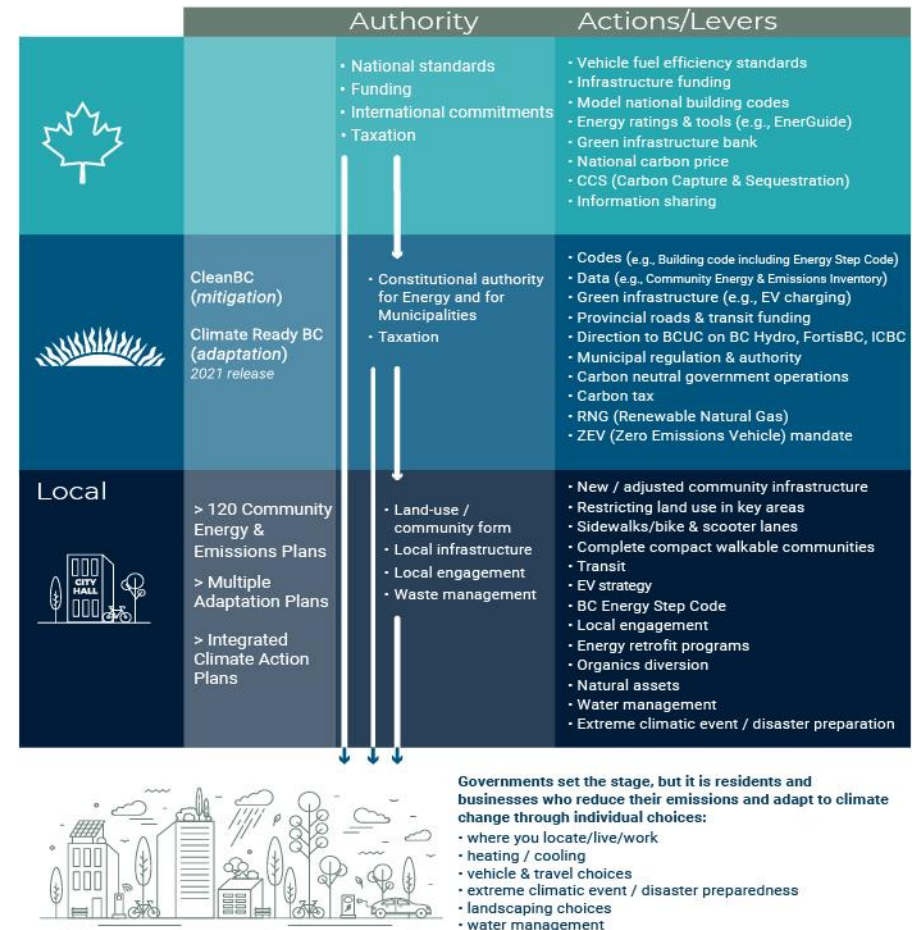


Figure 14 – Climate Action at All Orders of Government

Local Action

More than 120 British Columbia local governments have to date enacted community climate action plans or Community Climate Action Plans (CCAPs), which outline actions they can take, or are taking, to reduce greenhouse gas emissions. Local governments have varying degrees of influence over different sources of emissions within their boundaries, as shown below.

Local Government Relative Influence over GHG Emissions

High ←—————→ Low

Municipal infrastructure, buildings and fleet.	Transportation network Land use patterns Solid waste Building efficiency standards	Transportation mode share Residential and business energy efficiency Food security	Air travel Industrial energy efficiency Vehicle standards Energy utilities
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If local governments are to succeed, they will need leadership and/or support from other orders of government, as well as commitments from residents and businesses. Further, the outputs of this Plan and the targets/actions prioritized for implementation will need to be embedded into relevant policy, operational, budgetary and asset management plans or strategies. Communities and regional districts play an important role in climate mitigation and adaptation. Almost every British Columbia local government has committed to some degree of action under the B.C. Climate Action Charter. Across Canada, local and regional governments directly and indirectly influence approximately 60 per cent of the nation's overall energy use and 50 per cent of its GHG emissions.

Residents and Businesses

Residents and businesses also have an important role in climate action, such as individual choices on where to live, how to heat or cool, how to travel, how to handle household waste, preparing for extreme events such as extreme heat, making landscaping choices that affect the urban tree canopy and are wildfire smart, and being careful with water use. Meanwhile, businesses' decisions regarding their current operations and future plans as well as factors such as leadership and innovation also impact community-based emissions and affect a community's resilience to a changing climate. Residential and business decisions are shaped by other levels of government, including local government, creating an opportunity for governments to influence those choices in a way that addresses environmental issues and climate action.

Appendix E. Inventory and Modelling Methodology

This appendix contains details on the community energy & emissions inventory and projections for the City of Penticton.

Inventory

Penticton's inventories were created using data for buildings, transportation and waste obtained from the Province of BC. Full inventory years for buildings and waste are: 2007, 2010, 2012, 2013, 2014, 2015, 2016, 2017 and 2018. Full inventory years for transportation are 2007 and 2010.

Emissions factors for inventory years are shown in the following table, and are sourced from the Province of BC.

Table 2 – Emissions factors used for inventory years

GHG/GJ, by Year	2007	2010	2012	2013	2014	2015	2016	2017	2018
Passenger Vehicles	0.068	0.065	0.069	0.069	0.069	0.069	0.070	0.068	0.068
Commercial Vehicles	0.070	0.067	0.070	0.070	0.070	0.070	0.071	0.070	0.070
Electricity	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Natural Gas	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050
Wood	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019
Heating oil	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068
Propane	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061

As can be seen, some of the emission factors have changed over time. The emission factors for gasoline have decreased as a result of the Renewable and Low Carbon Fuel Requirements Regulation. The emissions factor for electricity has decreased as a result of ongoing efforts to decarbonise the electricity grid. However, please read the textbox below regarding future changes in emissions factors for electricity.

Transportation data was sourced from a previous release of the Province of BC's Community Energy & Emissions Inventory (CEEI) data,⁴ and building energy and landfill waste data was sourced from the latest CEEI data and the Province's release of Provincial Inventory data at the community level.⁵

⁴ <https://www2.gov.bc.ca/gov/content/environment/climate-change/data/ceei>

⁵ <https://www2.gov.bc.ca/gov/content/environment/climate-change/data/provincial-inventory>

Electricity emissions factor subject to change

Information received from the Province of BC in December 2020 and January 2021 states that the electricity emissions factor used for electricity consumption across BC will change, effective for reporting for the 2021 year. But because of the lag in reporting cycles it will not appear in reports until June 1st 2022, and the Province will not officially change the electricity emission factors in the forthcoming *2019 BC Methodological Guidance for Quantifying Greenhouse Gas Emissions*.

Despite this it is official that there is an intention to change, which will take effect in 2022, and the change will be backdated as well for previous years.

Previously, emissions from electricity use was calculated using a three-year rolling average of emissions from BC utility owned and operated facilities, and did not include emissions associated with importing electricity from outside of BC. Those emissions will now be included. (Note that no credit will be made for clean electricity generated in BC used to displace electricity generated in other jurisdictions.)

Under the old methodology the Province calculated City of Penticton's electricity emissions factor to be 2.587 tCO₂e/GWh for 2018. Based on the limited information currently available, under the new methodology the Province has calculated the figure for the 2019 year to be 29.9 tCO₂e/GWh. *If* the 2018 and 2019 years are comparable (and it is probable that they are at least approximately comparable), this would be an increase of 11.6 times.

Despite the increase, emissions from electricity would still be far lower than for natural gas on a per unit of energy basis, and electricity used in Penticton would still have among the lowest GHG emissions in the world (e.g. still about 30 times lower than Australia's, 8 times lower than New York's, or 40% lower than Ontario's).

Assumptions made with respect to the inventories are as follows:

- The Province of BC made a series of standard assumptions in the creation of the CEEI data, which are outlined on the CEEI webpage: <https://www2.gov.bc.ca/gov/content/environment/climate-change/data/ceei>. The CEEI inventory years in the preceding charts are 2007, 2010, and 2012.
- The Province of BC made assumptions for buildings and landfill waste emissions information, which are outlined in the community level spreadsheets on the Provincial Inventory webpage: <https://www2.gov.bc.ca/gov/content/environment/climate-change/data/provincial-inventory>
- In creating the inventories, CEA made other assumptions in addition to these:
 - Because the Province removed transportation data from its most recent release of the 2007 and 2010 CEEI data, and has not provided this data for any other year, CEA has used population data to extrapolate transportation data for any year post-2010.

The following are not included in the inventory:

- Emissions from Agriculture, Forestry and Other Land Use (AFOLU)
- Emissions from large industry
- Consumptive emissions (e.g. food, services, consumer goods)

Business As Usual Projection

CEA's QuickStart model was used both to calculate the BAU trajectory, and to estimate the potential GHG reductions that could be achieved. Developed in 2010 on behalf of BC Hydro and used by approximately 70 communities to date, the model builds on information including population and community energy and emissions inventory data.

The model uses formulas both to calculate the BAU trajectory, and to estimate the impacts of implementing each Big Move.

The BAU trajectory was calculated by using available inventory data, and then projecting forwards using a population forecast provided based on census data.

There are full or partial inventory years that describe the community's emissions profile from 2007-2018. From 2019 onwards, all of the data is an estimate as a BAU projection.

For the BAU projection modelling, the assumption is that energy consumption and emissions will increase proportionally with increases to population, although the impact of policies from higher levels of government are also incorporated, and other assumptions. Only policies that have already been adopted and that will have quantifiable impacts are incorporated. Assumptions are:

- The Province's incremental steps to net zero energy ready buildings by 2032.
- Federal Tailpipe emissions standards.
- Provincial Renewable & low carbon transportation fuel standards.
- BC Zero-Emissions Vehicle Act and new Federal mandate, requiring every new LDV sold in B.C. to be a zero-emission vehicle by 2035 (with a ramp up in advance of that date).
- Reductions in public sector commercial building emissions as per Provincial CleanBC mandate of 80% reduction in emissions by 2050
- An annual decrease in natural gas consumption per residential connection is included, as per Fortis BC 2017 Long Term Gas Resource Plan: https://fbc.comprod.blob.core.windows.net/libraries/docs/default-source/about-us-documents/regulatory-affairs-documents/gas-utility/171214_fei_2017_ltgrp_ff.pdf
- How the impacts of a changing climate will affect building energy consumption, as outlined below:

The final assumption had the following methodology:

- Climate change data for the region obtained from ClimateData.ca.
- Projected global emissions to 2030 currently places the world in the range for the IPCC's Fifth Assessment Report's Representative Concentration Pathway (RCP) 6.0 scenario.
- RCP 6.0 scenario not available on ClimateData.ca, therefore RCP 4.5 (median impact scenario) used as a (conservative) proxy.
- Decreases in residential heating oil and propane consumption assumed to be proportional to projected decreases in Heating Degree Days (HDDs).
- Decreases in residential and commercial natural gas consumption assumed to be proportional to decreases in HDDs and the proportions of natural gas consumed for space heating for each sector, and that proportion obtained from the Navigant 2017 Conservation Potential Review for FortisBC Gas.
- Decreases in residential and commercial electricity consumption assumed to be proportional to decreases in HDDs and the proportions of electricity consumed for space heating for each sector. However, proportions of electricity consumed for space cooling for each sector and how this will increase proportional to projected increases to Cooling Degree Days (CDDs) also included. These proportions obtained from the Navigant 2016 Conservation Potential Review for FortisBC Electric.

Although CEA's model assumes that projections will be linear, there will be annual variability due to factors such as economic conditions (on mobility fuels and building energy consumption) and climatic variations (particularly on building energy consumption). These variations mean that it may often be necessary to collect several years of data before one can see the success or lack of it in implementation of an action, in the primary indicators.

Modelling the Big Moves

The QuickStart model estimates the impacts of the Big Moves compared to the BAU trajectory. The impacts of the Big Moves can vary greatly between communities, and depend on the assumptions made. The assumptions made for each Big Move are based on research that CEA has conducted and can be tailored for individual communities.

GHG emission reductions by Big Move are described in the main body of this report in Figure 13.

The QuickStart model allows Big Move implementation at five levels; 0%, 25%, 50%, 75% and 100%. This allows for varying levels of ambition within each Big Move. The model also requires an implementation start year.

The QuickStart model makes the following assumptions based on full implementation (100% ambition level).

Big Move	Modelling Assumptions – Full Implementation	
Step Up New Buildings	90%	New homes with zero-carbon heating
Decarbonize Existing Buildings	3%	Homes retrofit per year
	33%	Energy reduction per retrofit
	2%	Homes replacing fossil fuel heating with heat pumps
Shift Beyond the Car	1 year	Lag time from implementation for initial impact
	20 years	Full implementation takes 20 years
	17%	Maximum VKT reduction after 20 years from Active Transportation, Transit and Land Use
	40%	Attribution of VKT reduction to Active Transportation
	40%	Attribution of VKT reduction to Transit
	20%	Attribution of VKT reduction to Land Use
Electrify Passenger Vehicles	9%	Current % of vehicle sales as EV
	20%	Compound Annual Growth Rate of new car purchases as EV in year 1
	40%	Compound Annual Growth Rate of new car purchases as EV in year 5
Decarbonize Commercial Transportation	1%	Percentage GHG reduction per year
	10%	Maximum GHG reduction after 10 years
	5	Lag time from implementation for initial impact
Waste	75%	Percentage GHG reduction from organics diversion or landfill gas capture
	5	5 years until full implementation

If a lower level of ambition is selected, then that would be applied in the model. For example, if a community selects a 50% ambition level for Waste, then the GHG reduction would be 50% of 75% (or 37.5%) but would still take 5 years to ramp up to that diversion level.

Penticton’s ambition levels for each Big Move and the modelled assumptions therein are illustrated in the table below.

Big Move	Implementation Year	Ambition Level	Modelling Assumptions - Penticton	
Step Up New Buildings	2023	3	67.5%	New homes with zero-carbon heating
Decarbonize Existing Buildings	2022	3 (retrofits) 4 (heat pumps)	2.25%	Homes retrofit per year
			33%	Energy reduction per retrofit
			2%	Homes replacing fossil fuel heating with heat pumps
Shift Beyond the Car	--	--	1 year	Lag time from implementation for initial impact
			20 years	Full implementation takes 20 years
			13%	Maximum VKT reduction after 20 years from Active Transportation, Transit and Land Use
	2025	3	44%	Attribution of VKT reduction to Active Transportation
	2025	2	28%	Attribution of VKT reduction to Transit
	2022	4	28%	Attribution of VKT reduction to Land Use
Electrify Passenger Vehicles	--	--	9%	Current % of vehicle sales as EV
	2024	4	40%	Compound Annual Growth Rate of new car purchases as EV in year 1
			40%	Compound Annual Growth Rate of new car purchases as EV in year 5
Decarbonize Commercial Transportation	2025	1	0.25%	Percentage GHG reduction per year
			2.5%	Maximum GHG reduction after 10 years
	--	--	5	Lag time from implementation for initial impact
Waste	2024	3	75%	Percentage GHG reduction from organics diversion or landfill gas capture
	--	--	5	Implementation takes 5 years

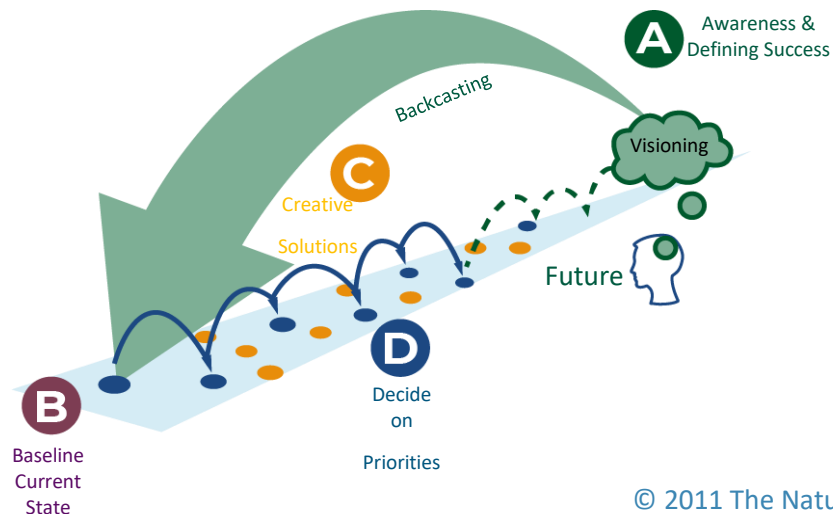
Appendix F. Engagement Summary

Engagement in the development of the Community Climate Action Plan was conducted in two phases. The first involved workshops with community stakeholders to inform the creation of a draft plan. The second involved consultation with the community to confirm the direction of the plan. The following summary highlights the activities conducted in each phase and the outcomes that influenced the creation of the plan.

Phase 1: Stakeholder Engagement

On June 10th and 14th, Penticton community stakeholders gathered via Zoom to discuss Penticton’s Community Climate Action Plan. The workshops were facilitated by Community Energy Association (CEA) staff. The workshops featured in-depth discussion on the current community emissions on Penticton as well as the envisioning of a low carbon future and review of the opportunities and actions to reduce community Greenhouse Gas Emissions (GHGs). The workshop group spent two afternoons examining community energy emissions and expenditure data and developing an action plan. Workshop participants and community stakeholders represented the following groups:

- City of Penticton Councillors and staff
- City of Penticton Electric Utility
- Downtown Penticton Association
- First Things First Okanagan
- FortisBC
- Interior Health
- Landform Architecture
- Okanagan College
- Penticton Sustainability Advisory Committee
- Regional District of Okanagan-Similkameen
- Residents of Penticton
- South Okanagan Immigrant and Community Services
- Thompson Okanagan Tourism Association



The workshops followed the “backcasting” approach, which first envisions a low carbon future and defines success, then identifies the current state before brainstorming creative solutions and prioritizing actions. Workshop 1 focused on A and B of the backcasting approach. Workshop 2 focused on C and D of the backcasting approach.

Workshop participants were divided into three breakout groups and remained in the same group throughout. The breakout groups were;

- Transportation

- Buildings
- Waste & Other

Workshop One

Activity A – A Vision of the Future

In the first breakout session, participants were asked to describe their vision of the future for Penticton for Buildings, Transportation and Waste. The year 2040 was used in this exercise as it bridges the gap between 2030 which is the short-term target year and 2050 which is the long-term target year. Participants were told that their vision could be unimpeded by traditional constraints such as cost. Participants were encouraged to be bold with their ideas. The Miro boards can be seen in Figure 15, Figure 16, and Figure 17.

Breakout 2 - Buildings

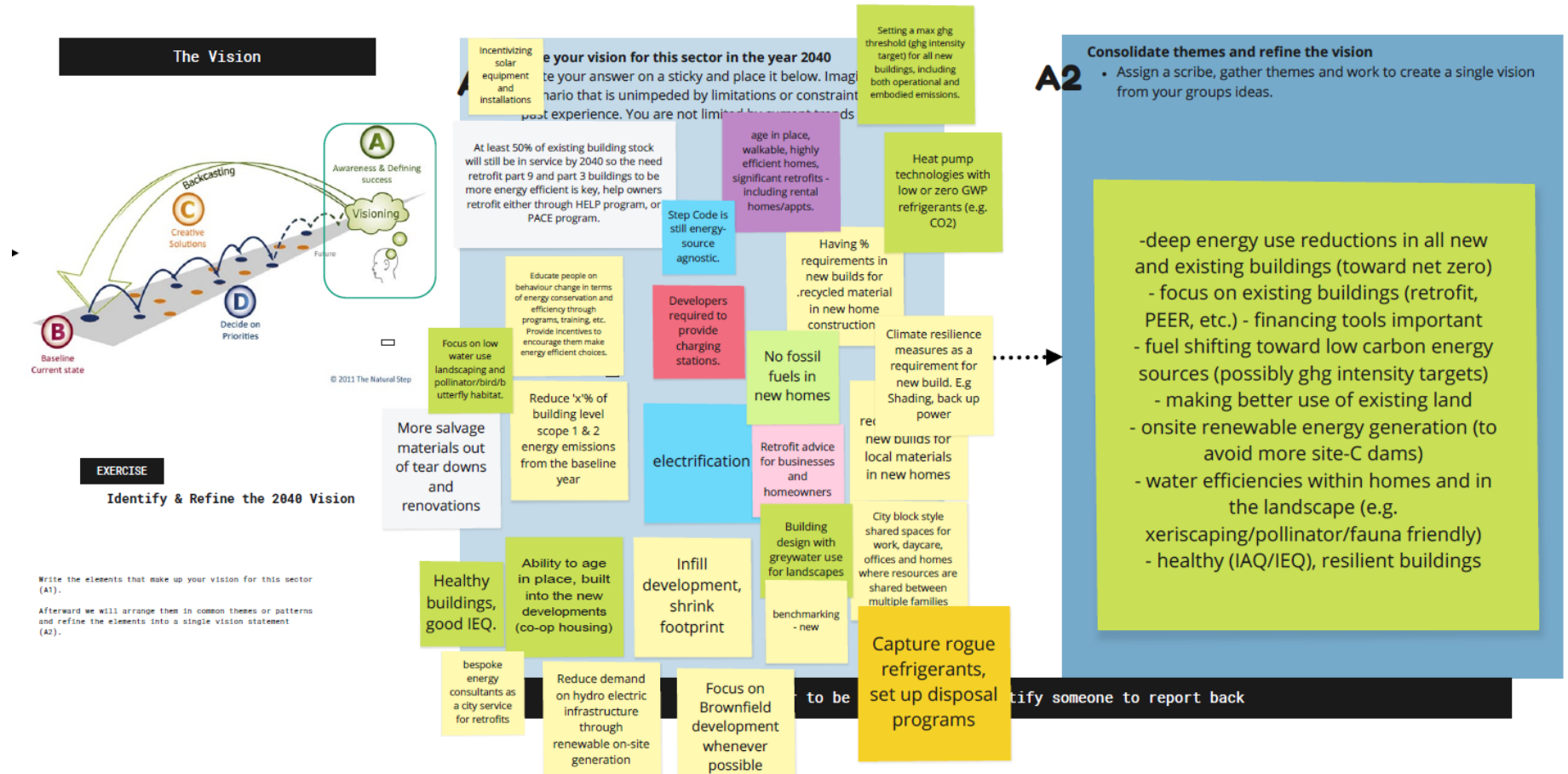


Figure 15 – A Vision of the Future for Buildings

Breakout 2 Waste & Other

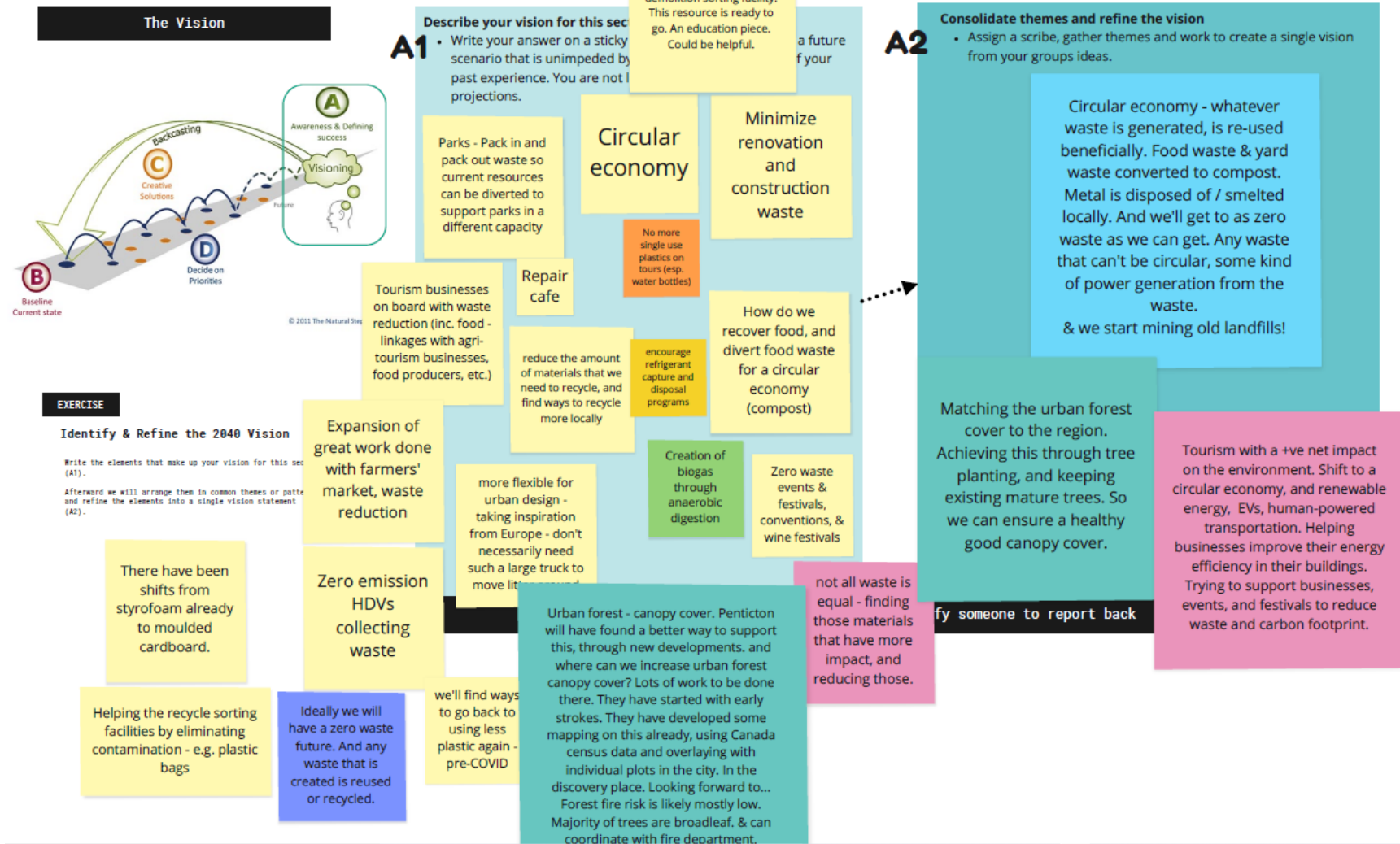


Figure 17 – A Vision of the Future for Waste and Other Sectors

Activity B - The Current State

In the second breakout session, participants were asked to describe the current state of Buildings, Transportation, and Waste & Other for Penticton. The Miro boards can be seen in Figure 18, Figure 19, and Figure 20.

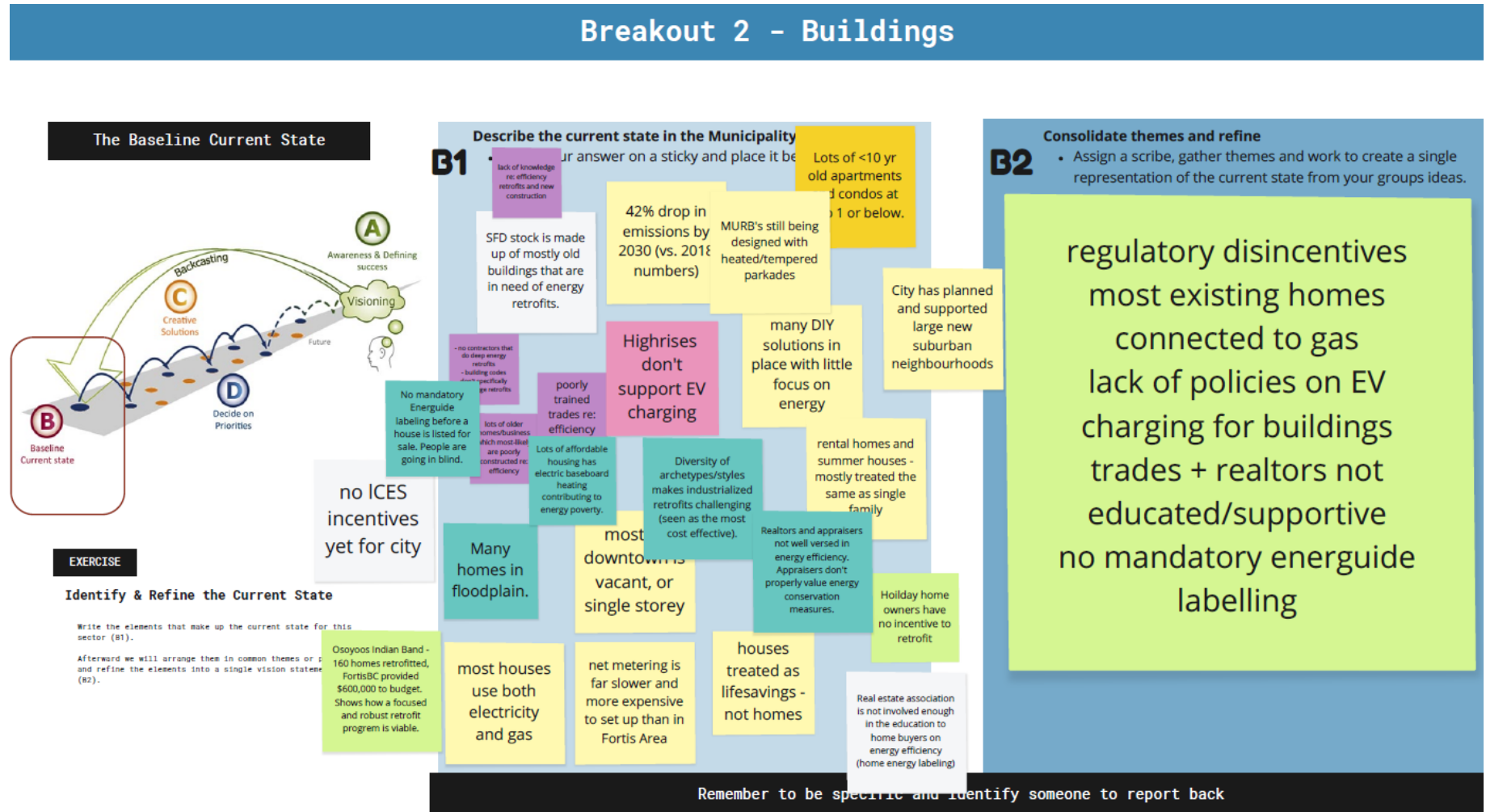


Figure 18 – The Current State of Buildings

Breakout 1 - Transportation - Electric public charging & Shift Beyond TRAILS

The Baseline Current State

EXERCISE

Identify & Refine the Current State

Write the elements that make up the current state for this sector (B1).

Afterward we will arrange them in common themes or patterns and refine the elements into a single vision statement (B2).

B1 Describe the current state for the Main Street

- Write your answer

TRANSIT

poor transit, not going enough places, poor times, connect reg and ride

BC Trans in Pentiction = 0 E-busses

City Fleet
100% EV = 0 vehicles
1 Hybrid
1 EV Van on-order

public charging

Increased sales of SUVs and Trucks

No H2

Several EV charging stations

Minimal on-street EV charging

local EV supply is non-existent

some connectivity for active modes of transportation

lake to lake cycl network

not enough safe bike storage

TRAILS

more recreation trails than connectors

no regional trails to the South

no public end of trip facilities

some trails but could be more

CAR CULTURE

We should ban loud motorcycles from Main St. & Lakeshore

Electric Utility has lots of capacity today - future forecasts on EV demand is driving capital expenditures

too many people parking on residential streets

Strong & entrenched "car culture"

lots of cars and car usage

lots of parking downtown

lack of information about rebates for SFH and MURBS

lack of info on home charging requirements and process

Barriers to home electrical system upgrading

expensive to put in charging station in private homes

CoP Electric Utility offers Payment Plan terms for:

Figure 19 – The Current State of Transportation

Breakout 3 - Waste & Other

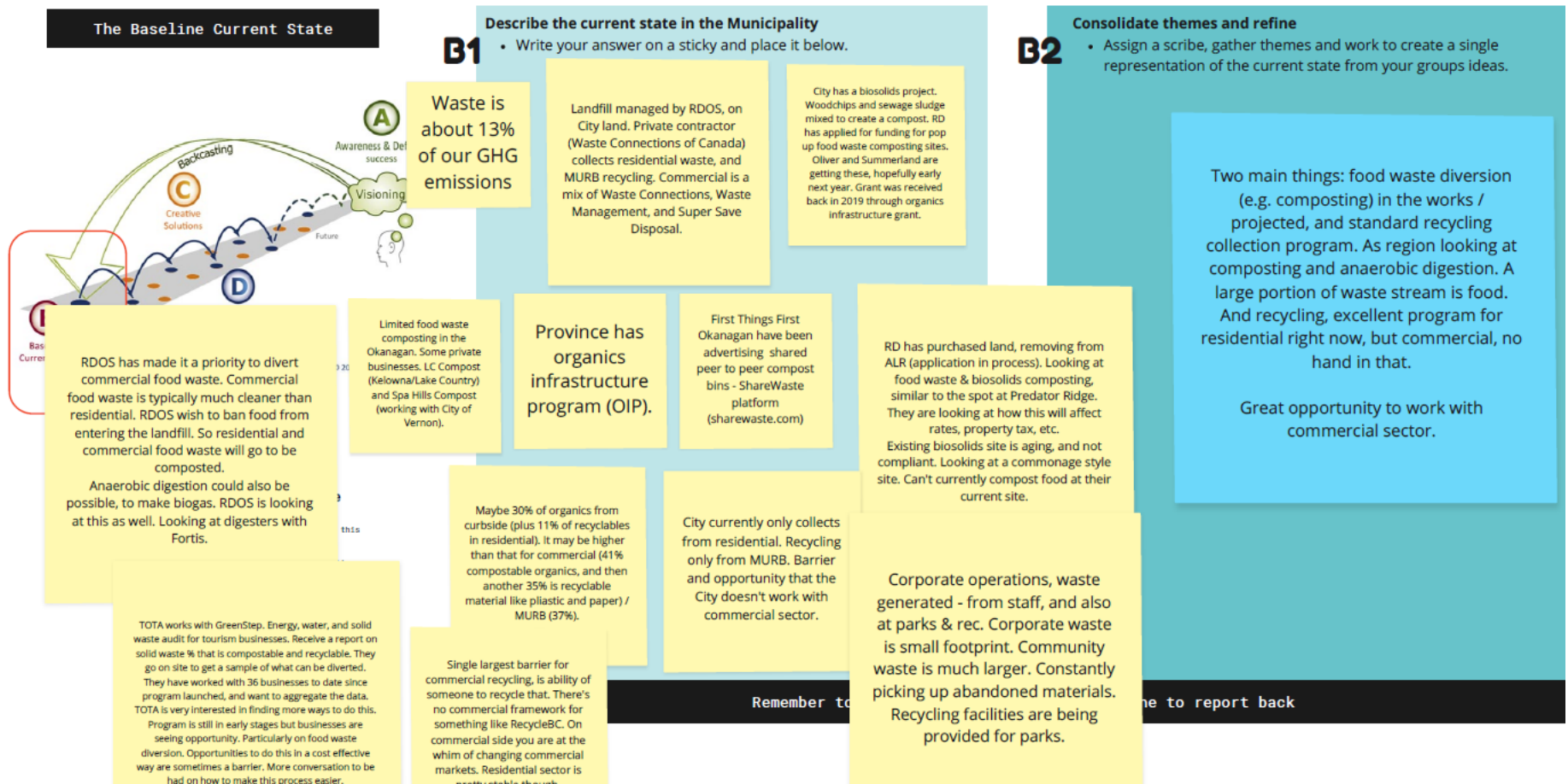


Figure 20 – The Current State of Waste & Other Sectors

Workshop Two

Activities C and D – Identifying and Prioritizing Creative Solutions

In the third breakout session, participants were asked to consider a number of creative solutions provided by CEA and identify additional ones. These creative solutions, or strategies, were then prioritized according to possible implementation timelines. Strategies were prioritized in the following way;

- Short-term implementation (1 - 2 years)
- Medium-term implementation (3 – 5 years)
- Long-term implementation (5+ years)

Figure 21, Figure 22, and Figure 23 show the prioritization of the Buildings, Transportation, and Waste & Other strategies respectively.

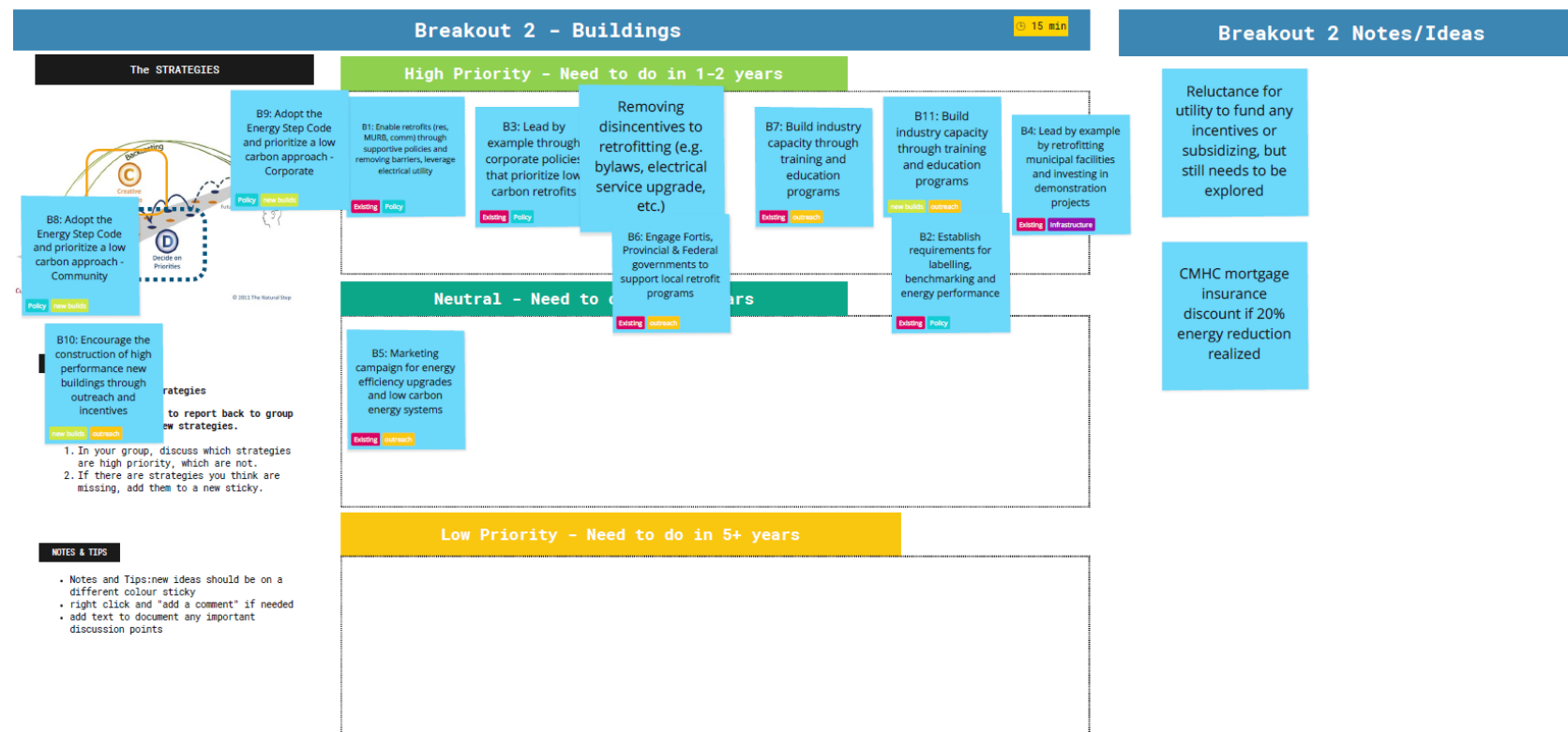


Figure 21 – Prioritization of Buildings Strategies

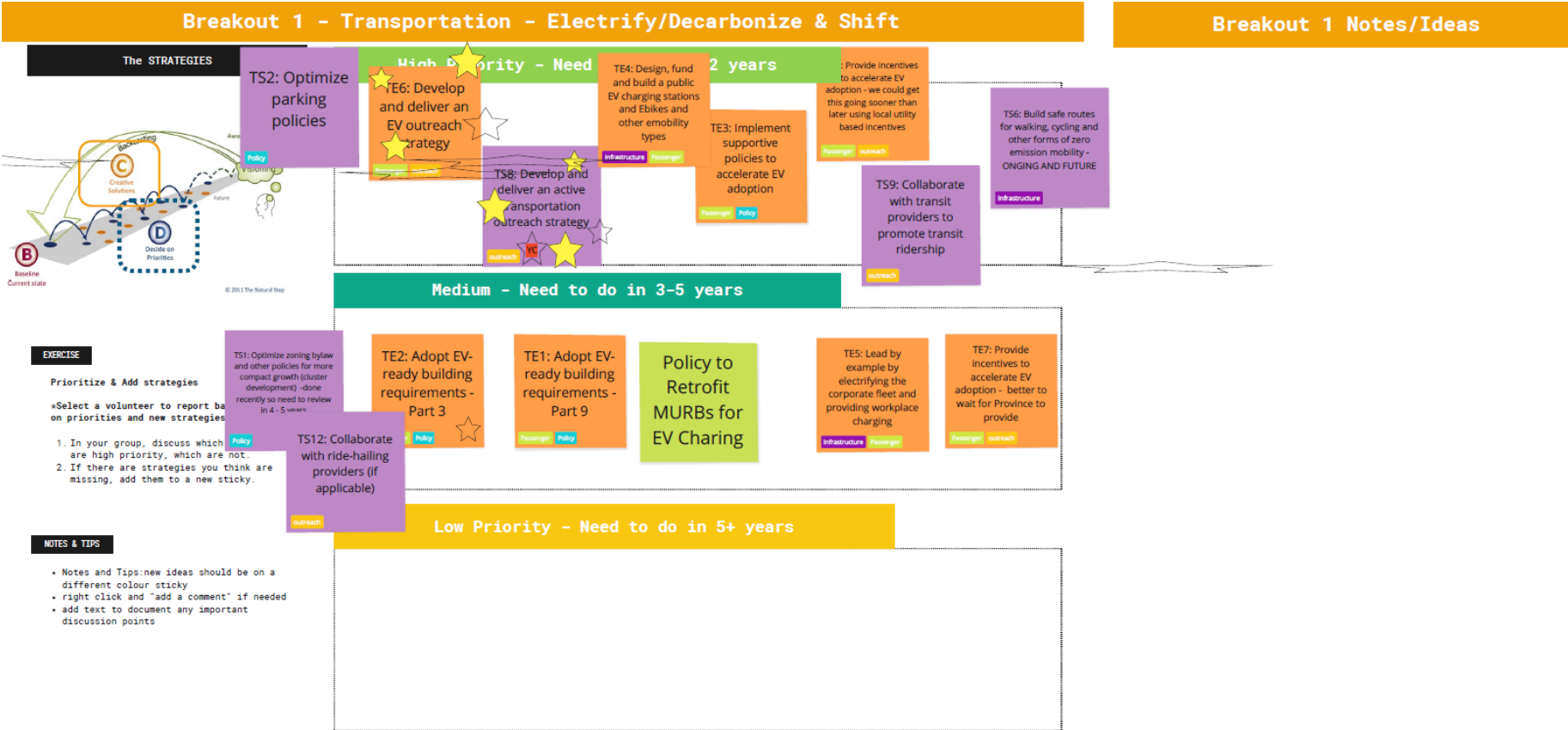


Figure 22 – Prioritization of Transportation Strategies

STEP 3 WORKSPACES

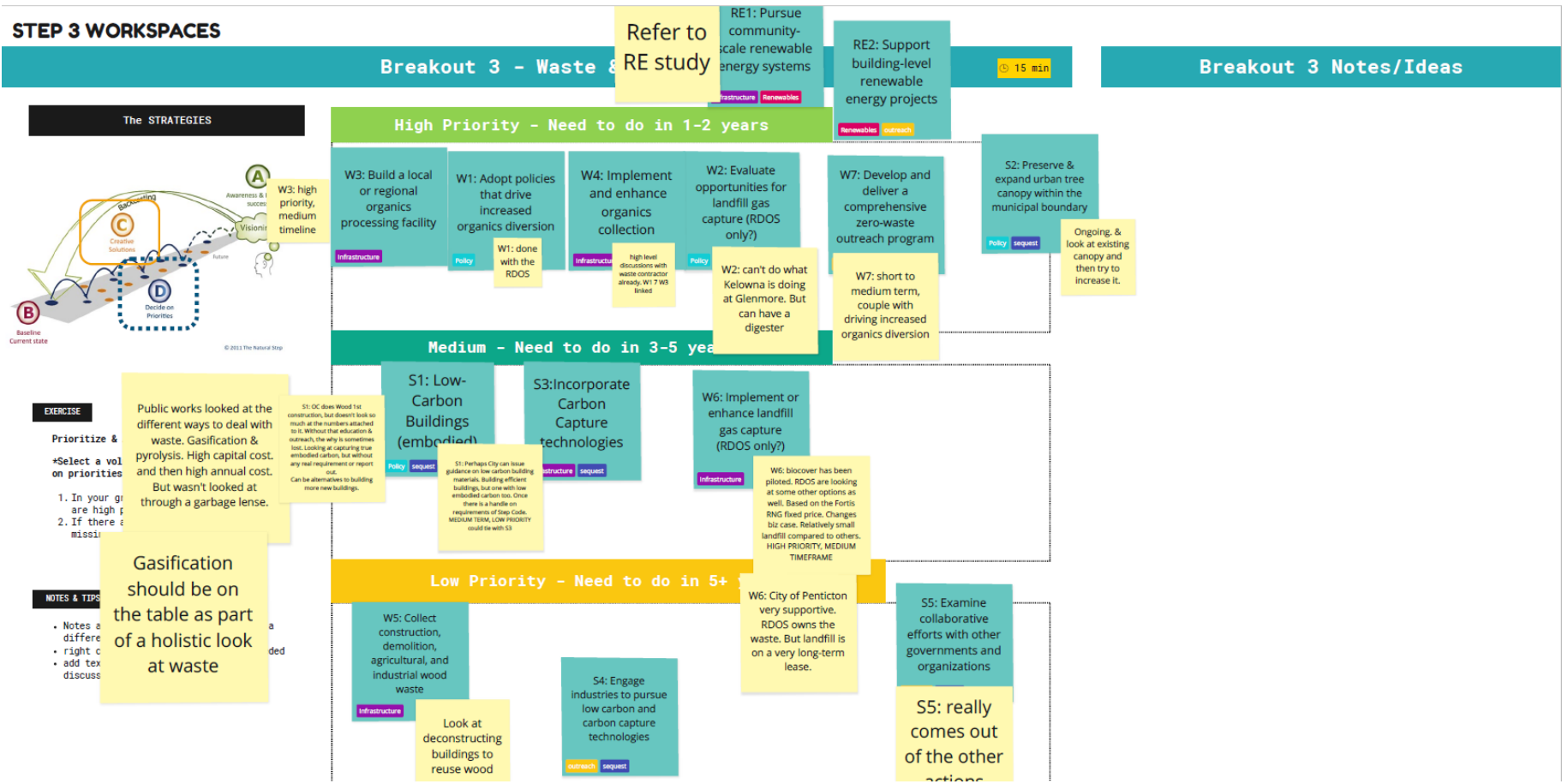


Figure 23 – Prioritization of Waste & Other Strategies

Deep Dive on Priority Strategies

In the final breakout session of workshop 2, participants were asked to select one or two of the priority strategies and do a deep dive in terms of co-benefits, local leverage points, barriers/challenges, catalysts/potential for collaboration, equity and next steps. The Miro boards for this exercise can be seen in Figure 24, Figure 25, and Figure 26.

Breakout 2 - Buildings						
Action	Co-Benefits	Local Leverage Points	Barriers/Challenges	Catalysts/Potential for Collaboration	How will everyone benefit/be included? (Equity)	Next Steps
Removing disincentives to retrofitting (e.g. bylaws, electrical service upgrade, etc.)	Process sped up Greater adoption	Electrical utility - net metering, service upgrade Zoning bylaw revisions o FSR allowances o Thick wall exemptions o Rezoning policies	Utility side, recognizing the benefit of allocating funds Staff resources Procedural & policy changes	PACE financing	Need to reform how costs are shared across system	Formation of internal Climate Committee to coalesce implementation
B4: Lead by example by retrofitting municipal facilities and investing in demonstration projects <small>Existing Infrastructure</small>	Demonstration to catalyze community retrofit action Provides a lens on cost to community	Allows City to absorb "spee bumps" in implementation process How to get trades people to participate?	unding	Fortis, FCM (for funding)	Identifies potential barriers, can provide guidance to community level Impetus for community action	Get more energy audits done! More granular discussion within City as to what's needed department-by-department
B7: Build industry capacity through training and education programs <small>Existing Outreach</small>	Improved uptake of low-carbon retrofit technologies New business opportunity/ industry resilience	Okanagan College would be a great partner Putting together workshops for Part 3 buildings, Step 4 compliance		Okanagan College Builders Breakfasts	Creates a (more) sustainable business model, mitigates policies that can impact particular businesses	

Figure 24 – Deep Dive on Strategies for Buildings



Figure 25 – Deep Dive on Strategies for Transportation

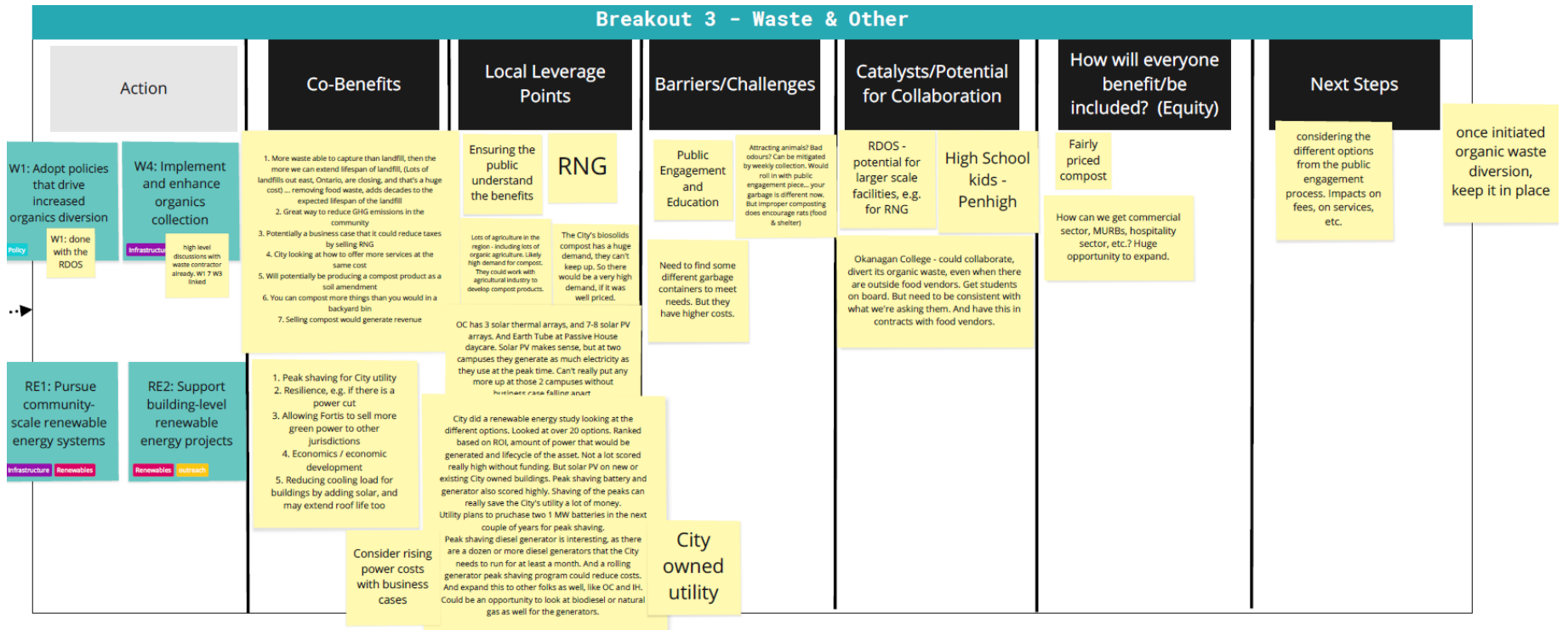


Figure 26 – Deep Dive on Strategies for Waste & Other

Workshop Survey Results on GHG Target Setting

As part of the workshops, participants were offered the opportunity to provide their preferred targets for GHG reductions for 2030 and 2050. These can be seen in Figure 27.

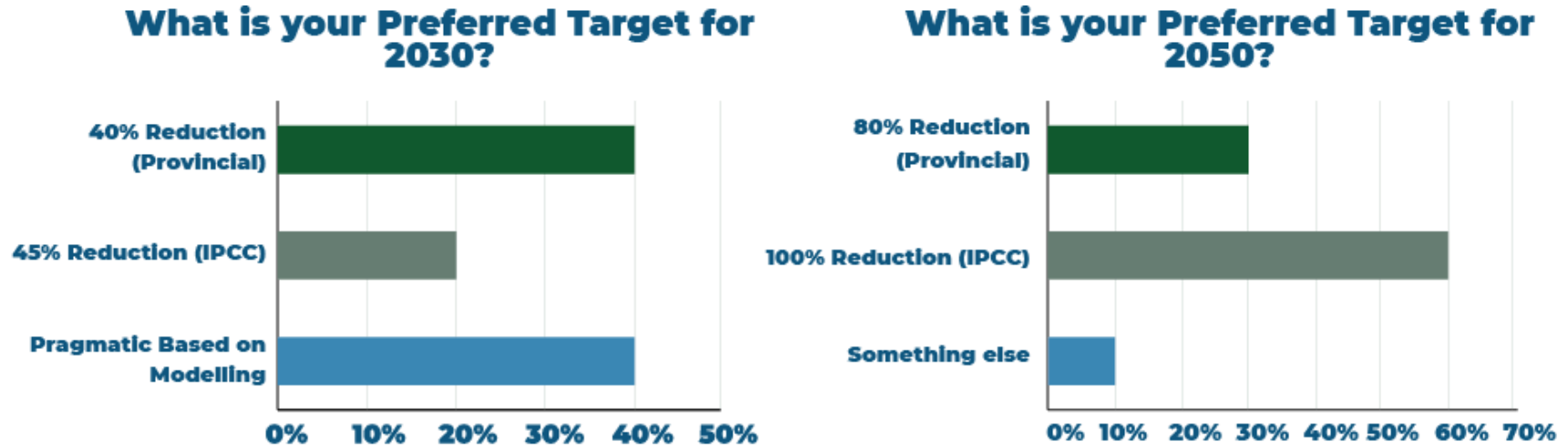


Figure 27 – Workshop Survey Results for 2030 and 2050 GHG Reduction Targets

Phase 2: Community Consultation

With the input gathered through the stakeholder workshops, CEA prepared a draft of the Community Climate Action Plan for review with the community. From August 7 to September 29, 2021, the City conducted an engagement program to confirm the direction of the plan with residents that included a series of pop-up events, youth activities and surveys. The initiatives were promoted using the “blue skies” campaign and leveraging the City’s shapeyourcitypenticton.ca engagement platform. The following is a summary of the activities conducted and the key findings.

Public Surveys

A series of surveys were conducted using the shapeyourcitypenticton.ca engagement platform to assess the public’s views on climate change, confirm the direction of the plan, and where action should be focused. There were three surveys conducted:

- A general high level survey focused on assessing the overall sentiment towards climate change in the community, while touching on actions within each major sector (transportation, buildings, waste) that were being considered for the draft plan
- A detailed survey on home energy retrofits, including demographics on type and age of home, retrofits completed, associated costs, barriers to completing previous or future retrofits, and awareness of the City’s Home Energy Loan Program
- A detailed survey on electric vehicles and accessibility of transportation, with questions on preferred modes of transportation, motivations to purchase electric vehicles, and accessibility barriers with respect to using available transportation (financial, physical, etc.)

The general survey was delivered to two groups, a citizen panel, and a random sample. Results for the general survey combined both groups. All survey takers (with the exception of the youth survey) were first directed to the general survey. After completion, they had the option to do either or both of the more detailed surveys. **Overall, there were 357 submissions for the general survey, 90 for home energy retrofits, 91 for electric vehicles and transportation modes.** In order to involve local youth in the creation of the plan, the City also created an activity for schools that encouraged discussion in the classroom and generated feedback from students on one questions about climate change for the plan. Twenty-five classes participated in the activity and the City received 502 responses from local youth from elementary to high school. The response from the youth survey in particular shows how aware they are of climate change, and its potential impacts.

The following pages summarize each of the surveys as follows:

General survey: pg. 90

Home energy retrofit survey: pg. 93

Electric vehicle survey: pg. 97

Youth activity: pg. 102

General Survey

Sentiments on Climate Change

Out of all survey respondents, the vast majority of them felt strongly about climate change, and how that impacts Penticton’s necessary GHG targets, with 81% either ‘strongly agreeing’ or ‘agreeing’ that we are in a Climate Emergency. 61% are also ‘extremely’ concerned about the effects of climate change, with 22% being ‘moderately’ concerned. As a result, 58% of respondents want Penticton to be net-zero in emissions by 2050 (in line with the Federal Government), while 21% want to reduce emissions by 80% by 2050 (in line with the Provincial Government). Respondents generally felt that Penticton’s suggested GHG target of 40% by 2030 and net-zero by 2050 were appropriate (41%), with some push for more ambition (28%).

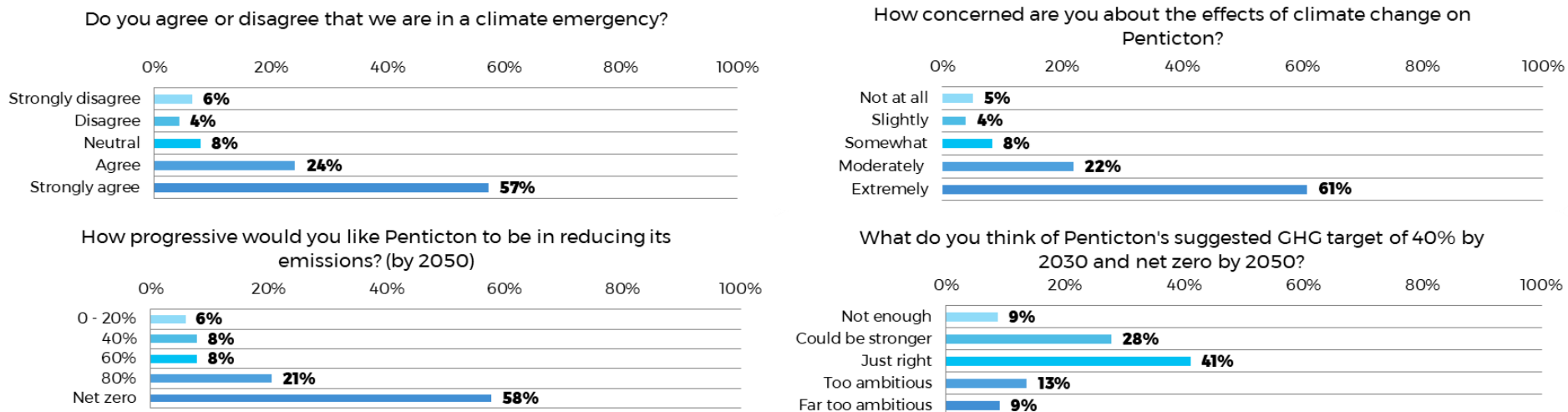


Figure 28 – Survey Results on Climate Change Sentiments

Support for Actions

There was broad community support for action, with a majority of respondents being ‘very’ or ‘somewhat’ supportive of the City taking a proactive role across all sectors, as denoted in Figure 29:

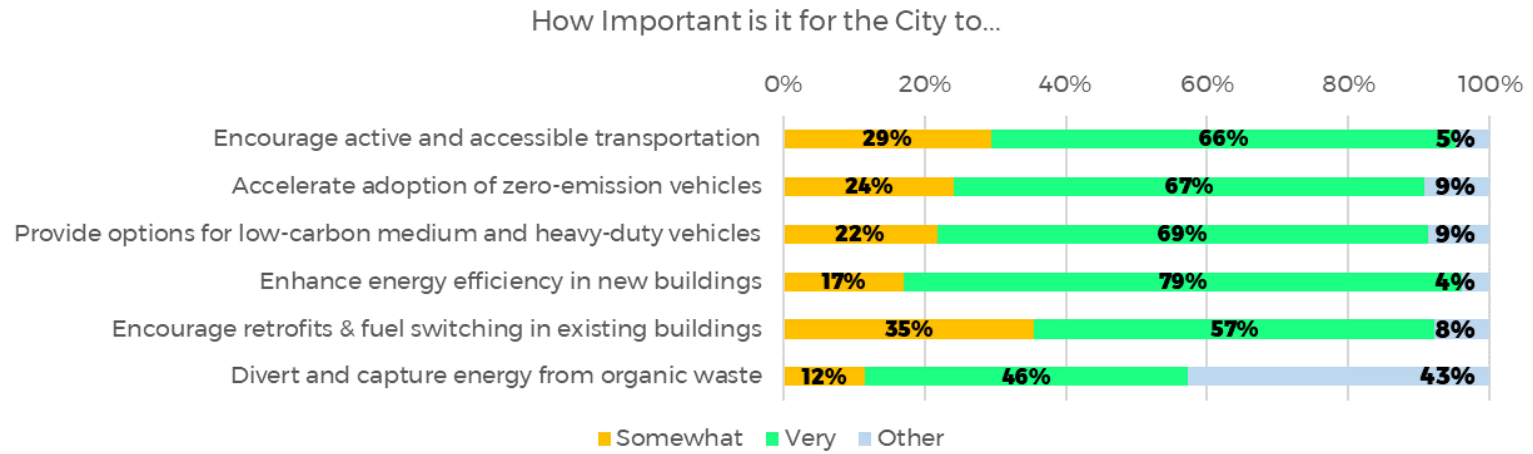


Figure 29 – Importance of Broad Climate Actions

As for specific actions, 27 of the 35 actions them garnered support from a majority of respondents. The top 5 actions, as shown below in Figure 30, were spread across different sectors, with adoption of the BC Energy Step Code for new buildings at 84%, followed by enhancing organic waste collection at 82%, and transitioning the municipal fleet to low-carbon vehicles at 76%.

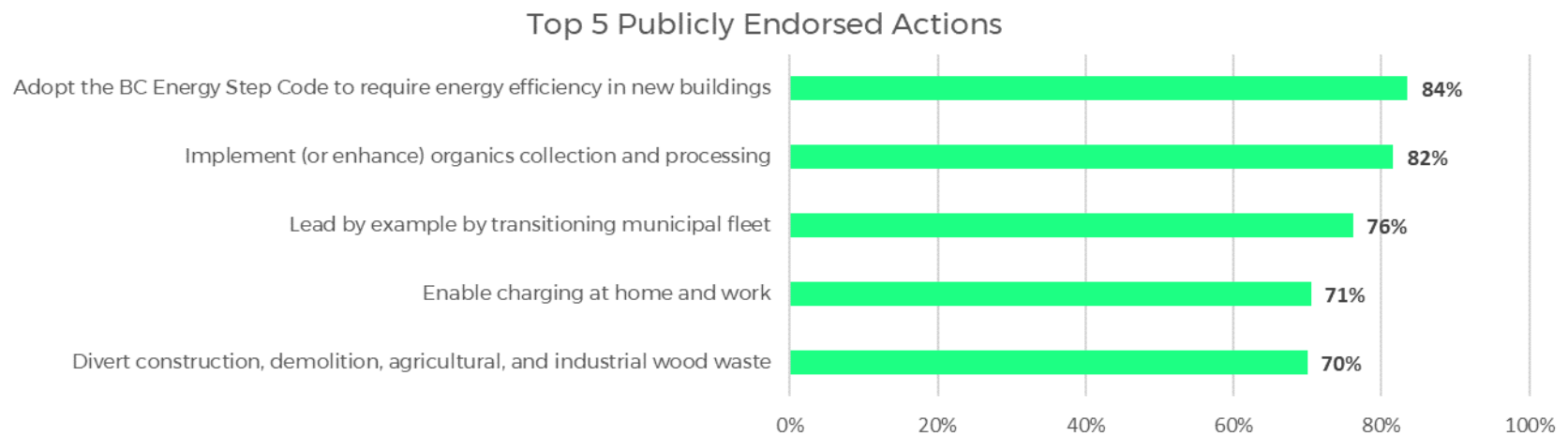


Figure 30 – Top 5 Publicly Endorsed Actions

Personal Responsibility on Climate Change

With respect to preferences and habits, Figure 31 shows that although the top endorsed action was to adopt Step Code, 75% of respondents are ‘not likely’ to purchase a new, higher energy standard home in the next 5 years. On the other hand, 43% of respondents are either ‘likely’ or ‘very likely’ to do home energy retrofits within the next 5 years. On transportation, 67% of respondents said that they’d be likely to walk or cycle regularly once a week in the next year, but 65% are also ‘not likely’ to use public transit at least once a week in the next year. 44% are ‘not likely’ to purchase an e-bike, e-scooter, or other micro e-mobility device in the next year. Lastly, there was a roughly equal split on whether the respondent would purchase an electric vehicle in the next 5 years.

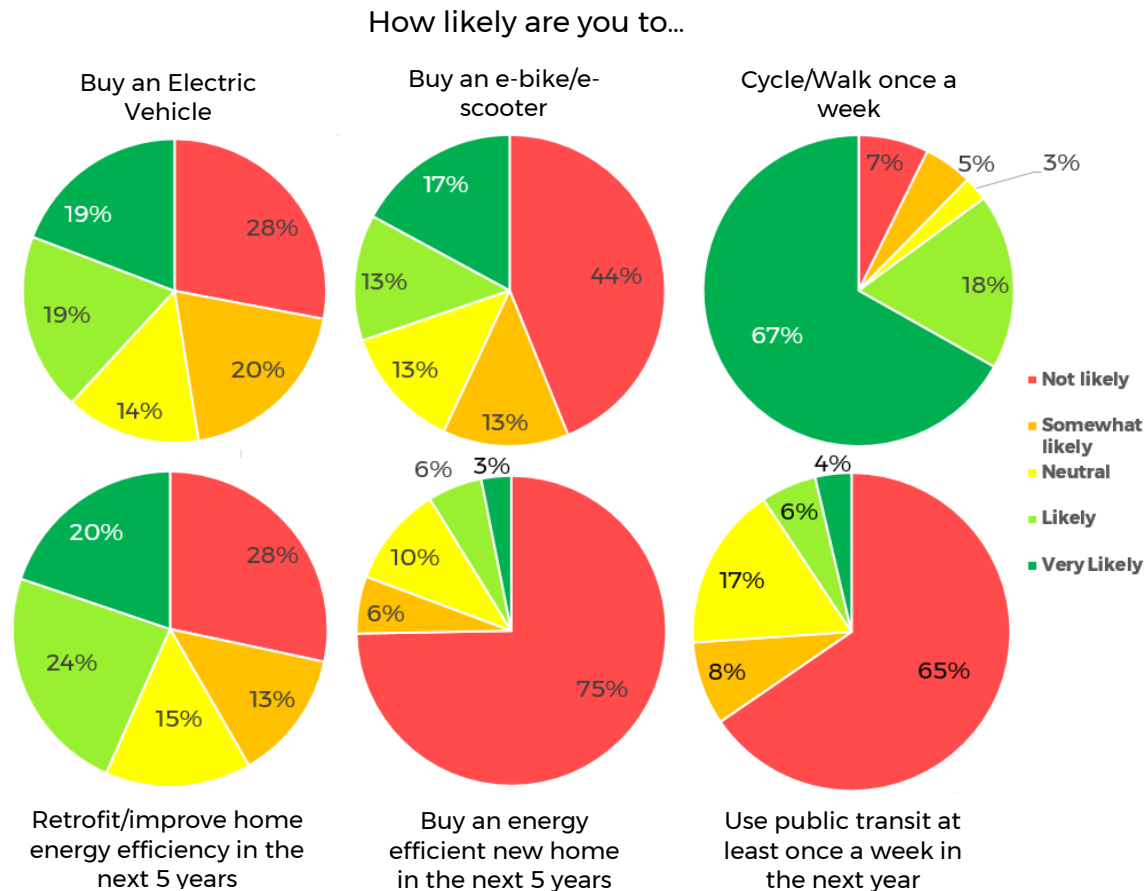


Figure 31 – Personal Responsibility on Climate Change

Demographic Quick Statistics

% of respondents that:

Live in Penticton: 86%

Age 40-64: 40%

Age 65+: 43%

Lived in Penticton for 16+ years: 48%

Lived in Penticton for 8-15 years: 19%

Lived in Penticton for 3-7 years: 21%

Lived in Penticton for <3 years: 12%

Home Energy Retrofit Survey

Completed Retrofit Specifics

As shown in Figure 32, in the past 10 years, 40% of respondents (36 of 90) have undergone major renovations to their home. Among the most common energy efficiency-related renovations there was a roughly equal split amongst appliances (28%), lighting (27%), heating and cooling (26%), and windows (24%). Insulation was less common at 16%.

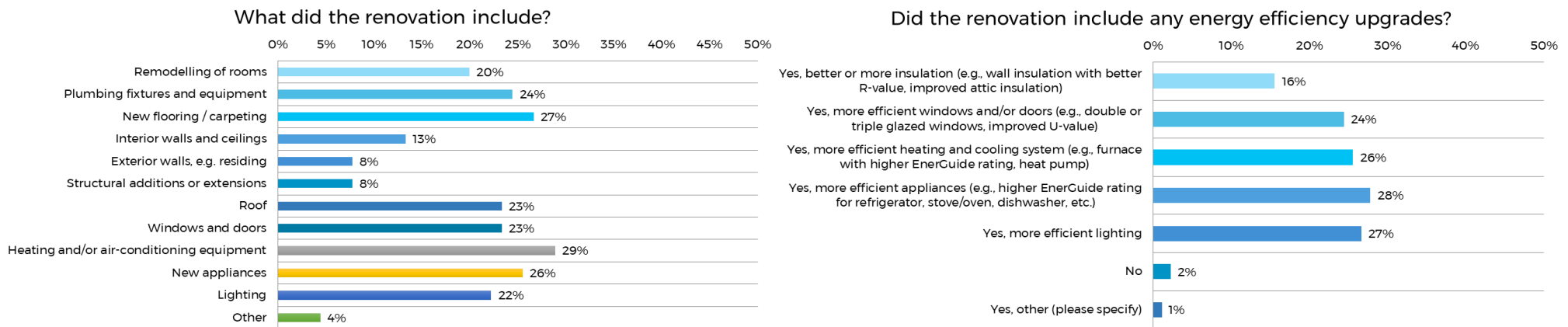


Figure 32 – Specifics for Completed Retrofits

Figure 33 shows the funding mechanisms and grants that homeowners used for their retrofits. Of the 36 retrofitters, the majority of them (23) used their own savings pay for renovations. This was more prevalent as the cost of retrofits increased. Disposable income was used by 8 retrofitters. Financing through mortgage was used by 5 respondents, most of which were in the case where retrofits exceeded \$100,000. As for grants used, FortisBC was a popular source, with the appliance rebate used by a third of retrofitters (12), while the Home Renovation Program was used by 8. On the other hand, 10 of the 36 retrofitters did not use any grant funding.

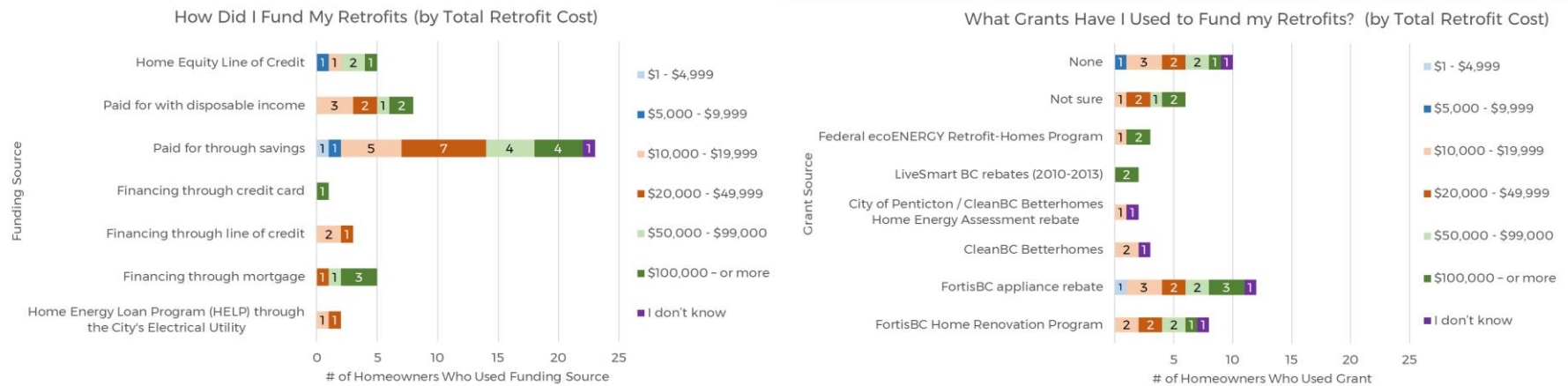


Figure 33 – Funding Mechanisms for Home Retrofits

Drivers and Barriers

Four questions were then asked on drivers and barriers to doing retrofits, each with 5 levels of importance from ‘Not important’/‘Not a motivator’ (1) to ‘Extremely important’/‘My main motivator’ (5). Weighted averages were calculated for each driver and plotted on the diagrams below. The further away from the center a driver is, the more important people perceived the driver to be. Results are shown in Figure 34.

The most important driver identified was to proactively make the home more energy efficient at an average score of 4, or ‘Very important’, which is an encouraging sign moving forward. Retrofits out of necessity either from maintenance (3.6) or repairs (3.4) also scored high. The lowest priority driver was in preparation for a sale (1.2). Co-benefits that were the most important to respondents were environmental footprint (3.9) and cost savings (3.8), although most co-benefits scored relatively high. Similarly, there was broad support for the options that could help include energy efficiency into the next home renovation, with a rebate to reduce upfront costs rated the highest (4.5). This was also reflected in the barrier analysis, where high cost scored considerably higher than any other encumbrance to energy efficiency retrofits. (3.5)

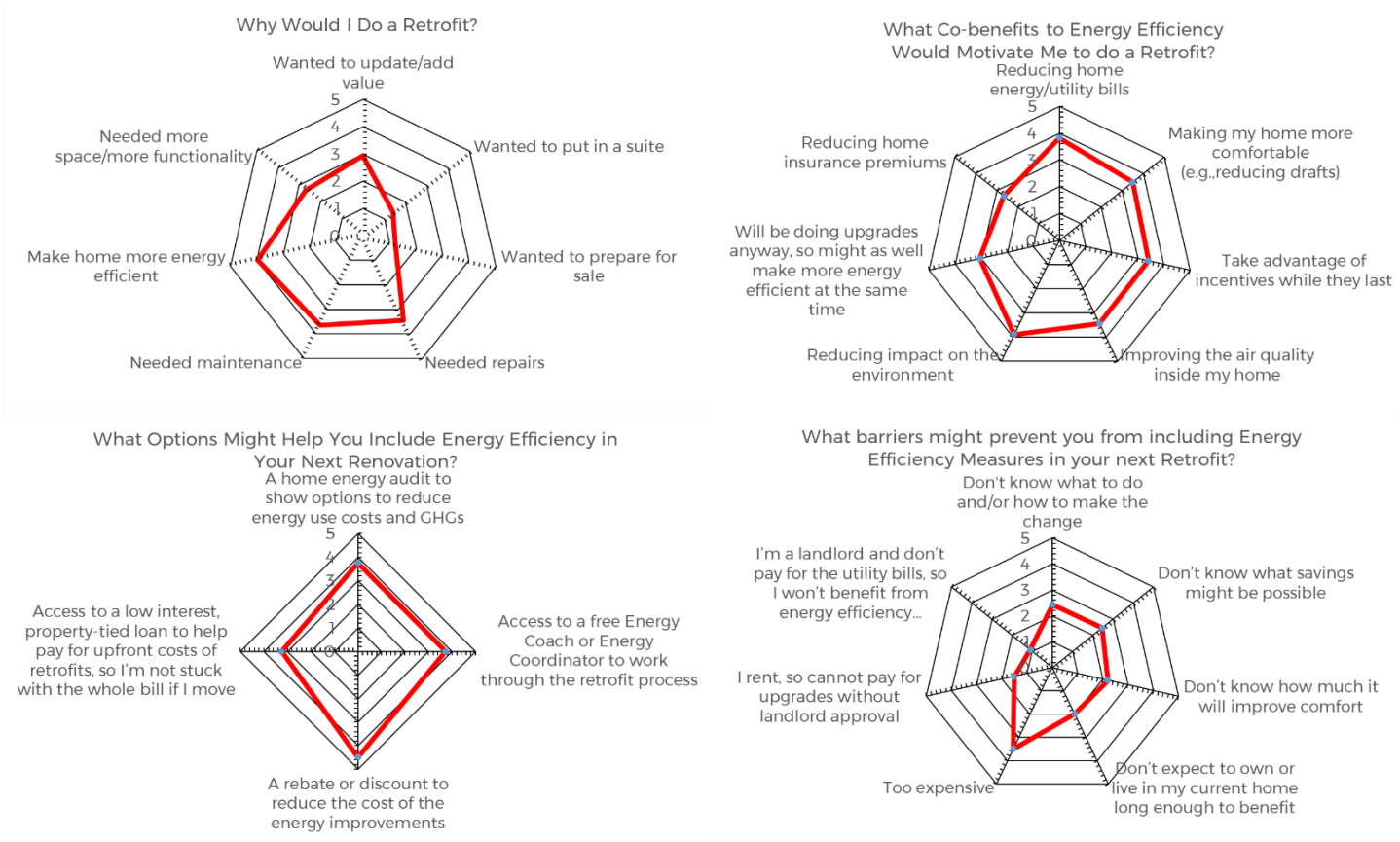


Figure 34 – Drivers and Barriers to Home Energy Retrofits

Information Sources

Respondents were also asked to disclose what sources of information they use to get information about renovating or retrofitting their home, along with how much trust they place in each source, which was rated from 1 (no trust) to 5 (most trust). As per Figure 35, online searches were most popular source of information at 36%, followed by a contractor and utility (e.g. FortisBC) at 24%. The most trustworthy source of information was a utility at 3.3, followed by a contractor at 3.1, although all information sources scored similarly, with the exception of hardware stores being less trustworthy at 2.6.

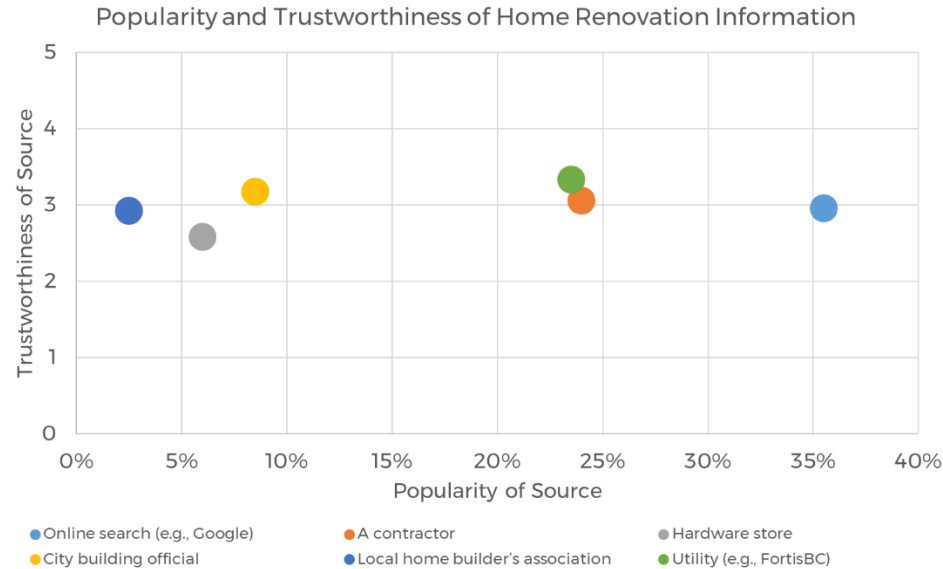


Figure 35 – Popularity and Trustworthiness of Home Renovation Information

HELP

The last set of questions were on awareness of Penticton’s Home Energy Loan Program, and whether the respondent will consider using HELP if it is expanded to include bigger retrofits above the current cap of \$10,000. Overall, 78% of respondents said that they were not aware of HELP. There was moderate interest for using HELP if the cap was raised to accommodate larger retrofits, at an average rating of 3.1 out of 5. Given this data, it is suggested to focus efforts on promoting HELP more to demonstrate its benefits.

Demographic Quick Stats

% of respondents that:

Live/Live and Work in Penticton: 87%
 Age 40-64: 61%
 Age 65+: 24%
 Own their home: 89%

Live in a single detached home: 77%
 Rely on natural gas heating: 66%
 Rely on electric baseboard heating: 16%
 Have air conditioning: 92% (56% central air, 21% through heat pump)

Electric Vehicle Survey

HELP for E-Mobility

Respondents were asked to gauge their interest on using HELP to assist in funding the purchase of electric mobility devices on a scale of 1 (not at all) to 5 (extremely likely). As per Figure 36, electric vehicles scored the highest at 3.1, followed closely by electric bikes at 3.0. E-scooters/motorcycles and non-electric bikes were considerably less popular, at 1.8-1.9. This seems reasonable, as the process of going through the loan program would be more applicable for more expensive capital purchases.

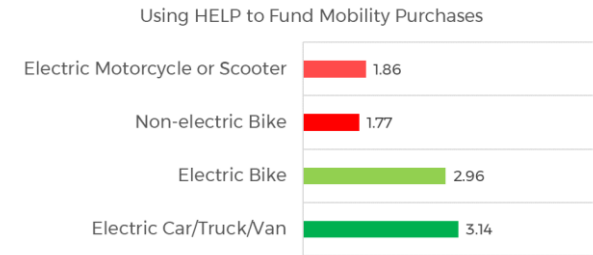


Figure 36 – HELP for e-Mobility

City Actions to Encourage Different Transportation Modes

Next, respondents were asked to rank potential City actions from 1 (most important) to 13 (least important) by how much each would encourage them engage in using different modes of transportation other than conventional vehicles, as illustrated in Figure 37. Overall, safety and availability/connectivity of non-vehicle transportation modes, and safe, convenient bike lock-up facilities were seen as the biggest drivers, ranking approximately 4 to 4.3. Improving transit frequency, public charge points for e-mobility devices, and secure bike parking in new multi-family, mixed-use, and commercial developments were next at approximately 5.6-5.7. The least influential drivers were the city-wide drive less competition and transit pass subsidies for businesses.

In order of importance, rank which of these City actions would encourage you to use different types of transportation other than your car.

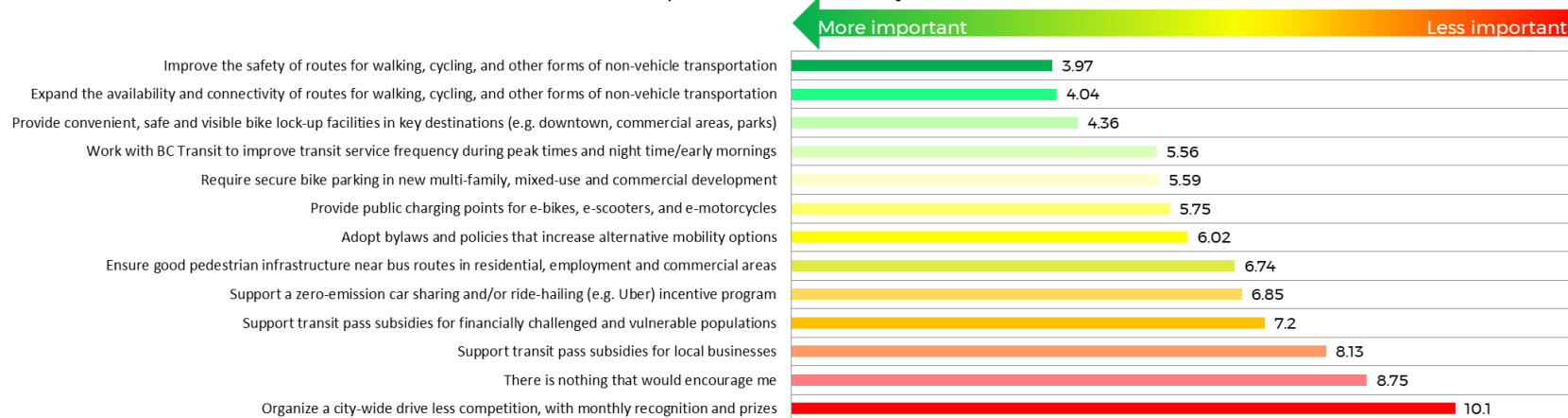


Figure 37 – Actions to Encourage Transportation Mode Shifts

The following questions were directed specifically to electric vehicle owners

Motivators and Challenges in Owning an Electric Vehicle

Illustrated in Figure 38), EV owners were asked to rate motivators to purchasing an EV and challenges to being an EV Owner from 1 (not important/not a challenge) to 5 (extremely important/extremely challenging). The biggest motivator by a considerable margin was to reduce one’s impact on the environment (4.9). Other motivators that scored relatively high included increases in driving range (3.9), availability of public charging (3.8), and saving money on gas (3.7) and maintenance costs (3.5). The least important motivators were public image (2.1) and smoothness/quiet ride (2.3). As for challenges, respondents were most concerned with the limited options for towing and off-road activities, which is prevalent as most current EVs are small passenger cars. This should become less prevalent as EV trucks and other commercial vehicles begin to reach the market. Access and cost of public charging are also seen as moderate barriers (3.0). That said, installation and cost of a home charger are not seen as challenges (1.3).

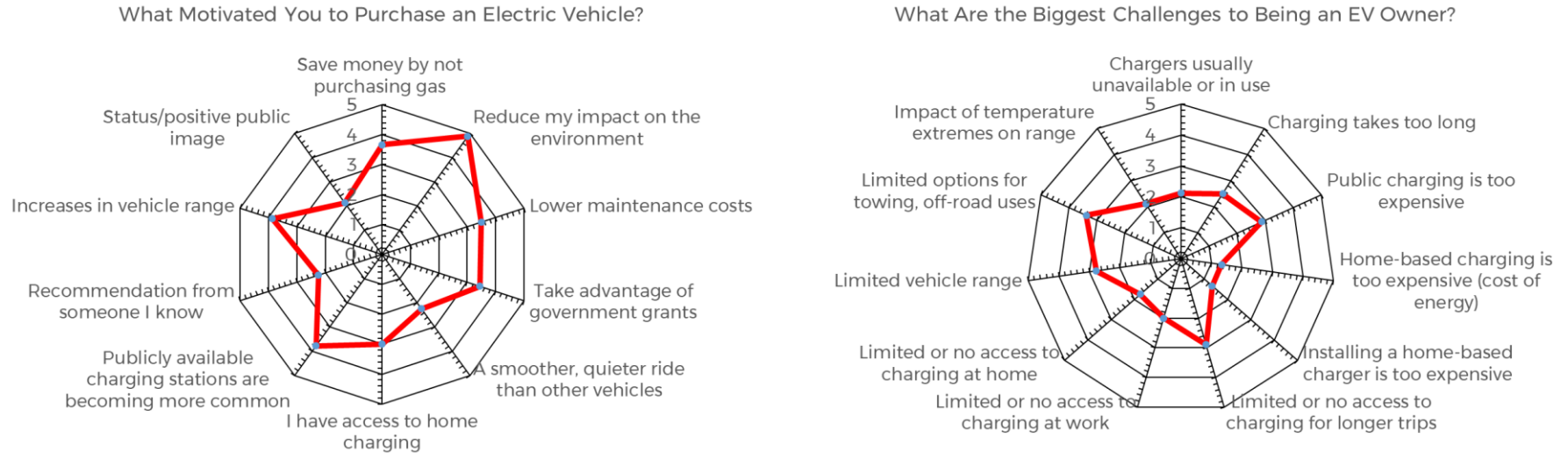


Figure 38 – Motivators and Challenges for Electric Vehicle Owners

EV Charging

EV owners were asked to rate how often they charge at different locations, shown in Figure 39. The majority of them charge at home, multiple times per week. Public Level 2 and fast charging stations were considerably less frequent, roughly once per month. Level 2 charging at work either by employer-provided public charging was very infrequent, and wall plugs at work were never used.

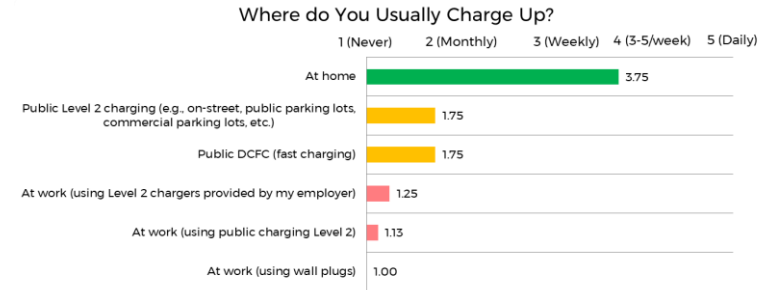


Figure 39 – Charging Habits of EV Drivers

Next, in Figure 40, respondents were asked to rate the importance of different factors in determining how often they charged from 1 (Not important) to 5 (Extremely Important). Free or low cost of electricity & free parking (4.1), convenience of charging at home (3.9), and battery running low (3.9) were deemed very important to owners. Availability of shared charging was the lowest priority, registering as somewhat important (2.4).

How important are the following factors in determining how often you charge?

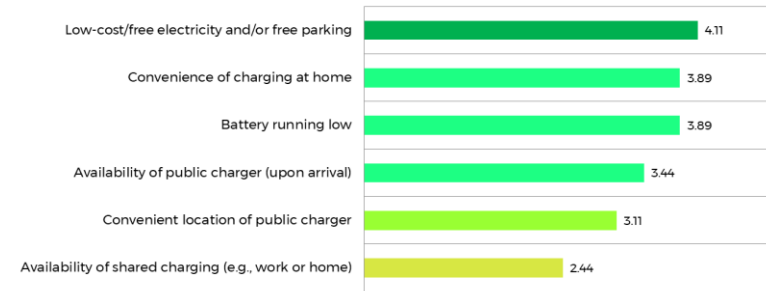


Figure 40 – Factors in Charging Frequency for EV Drivers

Public Charging Stations

EV owners are opportunistic in their use of public charging infrastructure, as shown in Figure 41. 56% of respondents will charge if it's convenient, and 44% if public charging is free/lower cost vs. home charging. Otherwise, they will rarely use public charging (56%). Beyond that, owners would use public charging (33% for Level 2, 22% for fast chargers) if there were more of them.

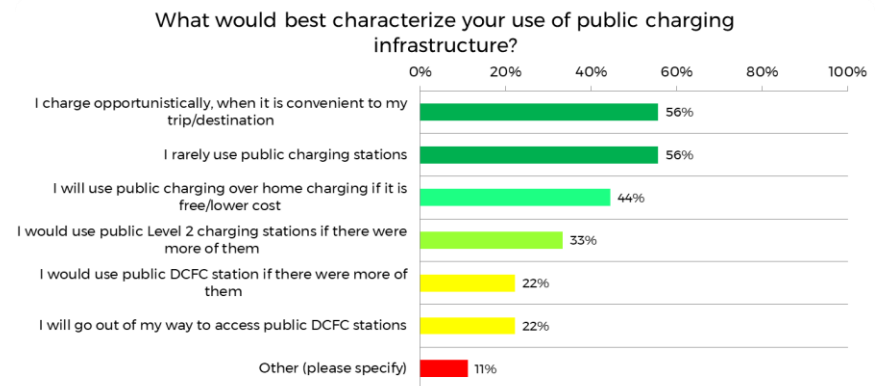


Figure 41 – Public Charging Infrastructure Usage by EV Drivers

Lastly, EV owners were asked about the importance of features of a public Level 2 or fast charging station from 1 (not important) to 5 (extremely important), as shown in Figure 42. Note that the last two features, ‘Waiting stalls available’ and ‘Charging speed’, were only asked for fast chargers. For both Level 2 and fast chargers, reliability was seen as the most important feature, rated at 4.25/5. Charging speed for fast chargers was deemed very important at 4.1. Cost to charge was slightly more important with fast chargers (3.9 vs. 3.5), as was perceived safety (3.75 vs. 3.6). Amenities nearby and the ability to pay with a credit card also rated relatively high at 3.5. The least important features among respondents were accessibility/wheelchair access (2.5-2.6), and being located at a facility/business (2.6).

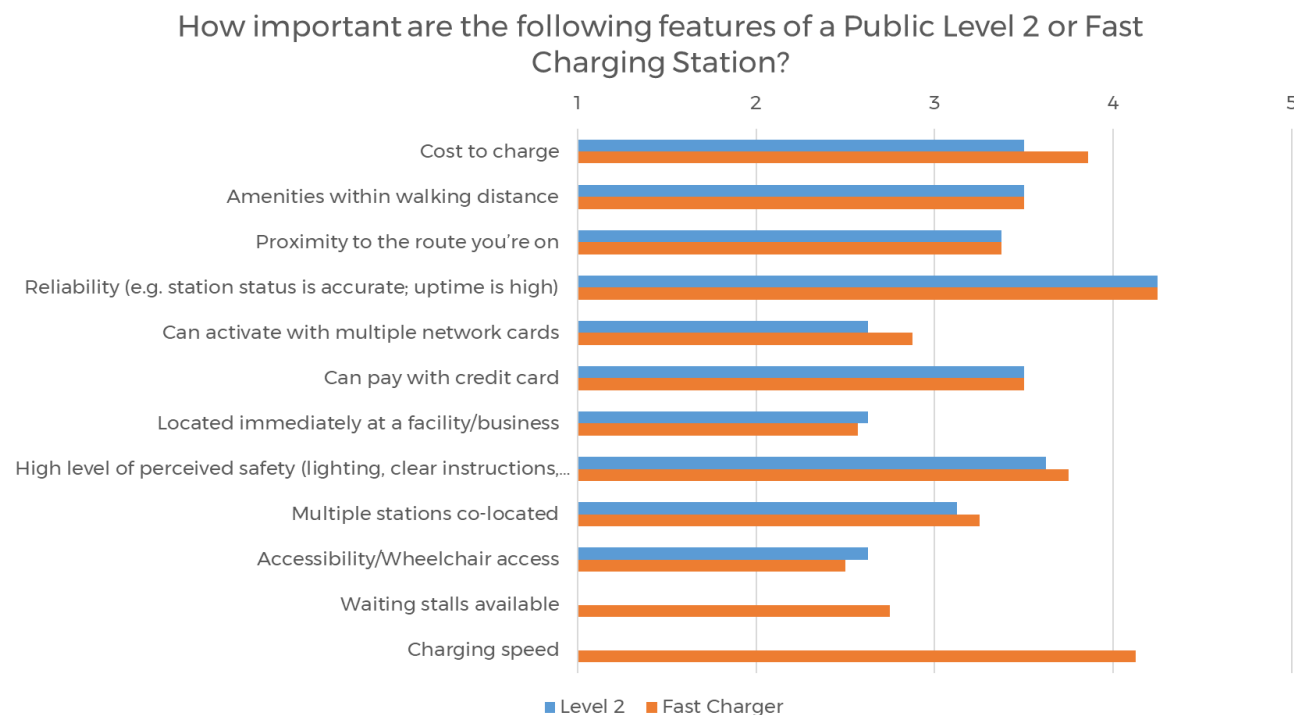


Figure 42 – Important Features for Public Charging Stations

Lastly, most respondents prefer to use public charging stations between 9 am and 5 pm (89%, not shown graphically).

Demographic Quick Stats

% of respondents that:

Live/Live and Work in Penticton: 87%

Age 40-64: 59%

Age 65+: 23%

Own their home: 89%

Drive <20 km per day: 76%

Drive 20-60 km per day: 18%

Own a battery electric vehicle: 5.5%

Charge at home with a wall plug: 7.7%

Live in a single detached home: 75%

Rely on gas/diesel vehicle for primary mode of transport: 67%

Have 1 personal vehicle in their household: 37% (41% for 2 vehicles)

Park in a driveway or garage: 79%

Drive mainly within Penticton: 67%

Split driving evenly within Penticton and to other communities: 22%

Own a plug-in hybrid vehicle: 4.4%

Charge at home with a Level 2 charger: 2.2%

Youth Activity

An activity package included key facts about climate change in Penticton, a summary of the draft plan as well as a one-question survey was provided to 25 classrooms. Teachers were asked to lead a discussion about climate change and invite students to share what they would like Penticton to do to reduce GHGs in the community.

The 502 responses from the youth survey were very encouraging, and highlights the importance of integrating them into the overall climate discussion moving forward. One questions was asked on what the City can do to help reduce GHGs in the community, and is illustrated in Figure 43. Overall, the most important measures for the City to focus on were home energy efficiency (65%), composting (62%), and encouraging biking (60%).

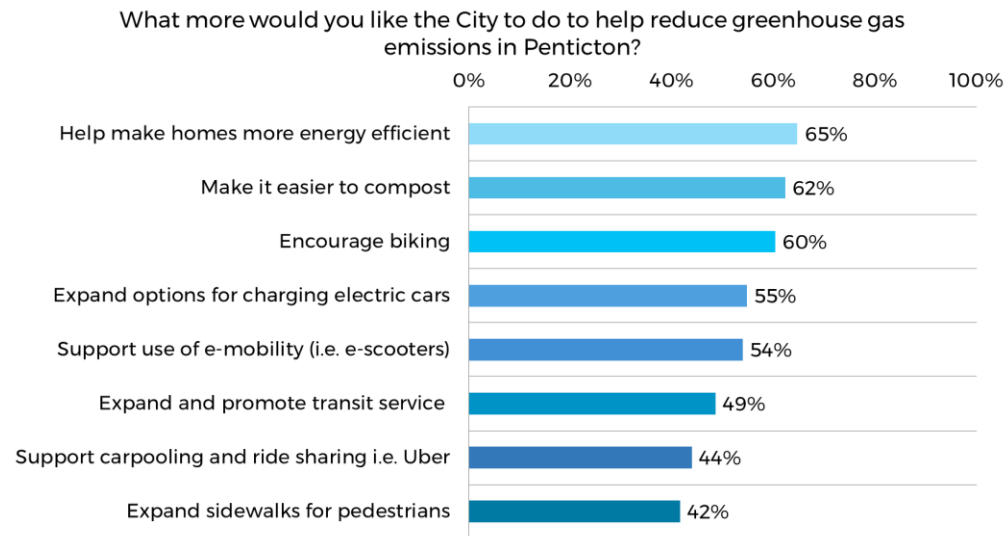


Figure 43 – Climate Actions of Importance to Penticton Youth

Beyond this survey question, students were also able to provide written comments. There were some common themes that are important to note, and are listed as follows:

- More solar panels on buildings
- Reusable and renewable materials to reduce waste, and reduce reliance on plastic
- Affordability and chargers for electric vehicles
- Planting more trees

Lastly, see Figure 44 for results from a mindmap exercise with students from KVR Middle School on what they see as the ultimate impacts of climate change over their lifetime.

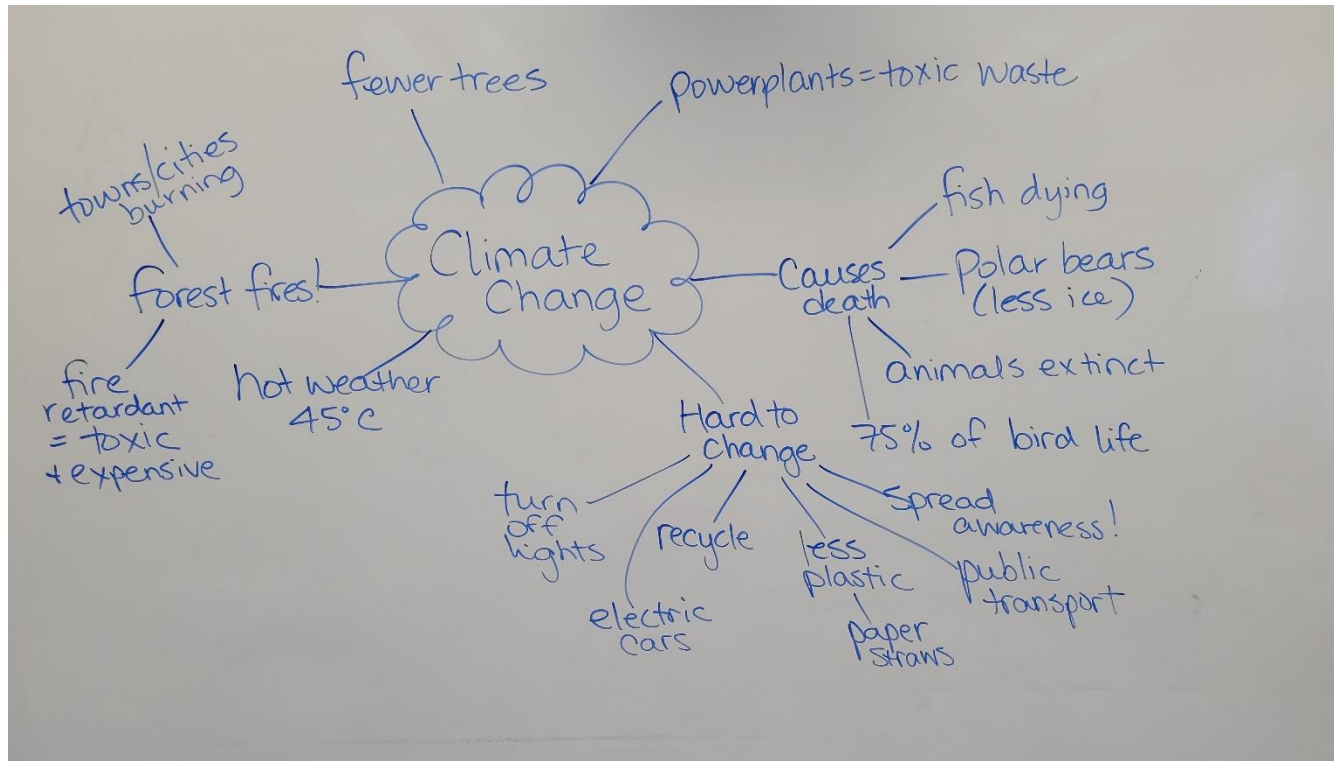


Figure 44 – Mindmap Results from KVR Middle School Students on Climate Change

Demographic Quick Stats

% of students that are in:

College: 3.8%

High School: 19.3%

Middle School: 58.4%

Elementary School: 14.8%

Other: 3.8%

Appendix G. Urban Tree Canopy Recommendations

This appendix is in development, and will outline recommendations for the City of Penticton on preserving and maintaining its urban tree canopy. Initiatives will likely be led by the Parks department.

Appendix H. Electric & Active Mobility Recommendations

This appendix is in development, and will outline some key recommendations for the City of Penticton on expanding the use of electric mobility (e.g. electric cars, e-bikes, e-scooters) and active mobility (e.g. cycling and walking) in the community.

Appendix I. Home Energy Retrofit Strategy Recommendations

This appendix is in development, and will examine the current and potential future impact of HELP, new incentives for heat pump retrofits, and ongoing work to build industry capacity and education on emission-reducing home retrofits.

Appendix J. Internal Funding Mechanisms for Climate Action

Background

Having predictable funding to support the implementation of climate action initiatives is a vital pathway to achieving a community's climate action objectives. While grants and other external funding sources can be a welcome supplement to this support, it is critical to success that communities directly dedicate resources to achieving their energy and emissions reduction goals.

Just as with other priorities, staff time as well as monetary allocations contribute to implementation. In the case of investments in climate action initiatives, when wisely managed these resources not only provide valuable services for the community but can also provide a positive return on investment for the corporation via reduced energy costs, creation of revenue generation opportunities, and leverage for external funding opportunities.

While addressing corporate emissions is often easier for communities, as they are largely in the direct control of the local government and typically provide financial savings for the corporation, it is also important for communities to recognize the relative impact of addressing corporate emissions vs. community wide emissions (corporate emissions typically represent <5% of total emissions).

Current State

The City of Penticton's Reserve Policy provides for the annual provision of funds to a Climate Action Reserve for carbon neutral objectives as part of working towards corporate carbon neutrality as per the City's Climate Action Charter commitments.

Under this policy, the Climate Action Reserve is meant to receive an annual transfer from the community works gas tax reserve in lieu of purchasing corporate carbon credits, in addition to the Climate Action Revenue Incentive Program (CARIP) funds received from the Province. Other than requiring approval by Council through the annual budgeting process (Financial Plan Bylaw), at this time there are no policy guidelines for the spending of the Climate Action Reserve funds.

While CARIP funds have historically been allocated to the Reserve, transfers in lieu of carbon credits have not been made to date; however, the City has been purchasing carbon credits to offset corporate emissions and achieve carbon neutrality in operations.

In 2021, the Province of British Columbia announced the end of the CARIP program, and no equivalent replacement program has been named or is expected in the immediate future.

The City does not currently have an annual operating budget for climate action initiatives; it is up to individual departments to put projects into their budgets and then those must be prioritized individually against other capital and operating expense requests.

Funding Mechanism Options

Option Description	Opportunities	Challenges
<p>Allocate annual funding to a climate action operating budget^{i, ii}</p> <p><i>The amount can be a set dollar value, a percentage or multiplier of the total operating budget, or an amount equivalent to offsets.</i></p>	<p>Predictable and stable; provides strong basis for annual planning and good support for implementation; reduces burden on individual departments; improves transparency; enables leveraging for grants & further staff resources; demonstrates municipal leadership</p>	<p>Can limit implementation if carry-forwards not permitted (only small budget items possible); no policy currently in place to guide spending; requires staff ownership/oversight; community may not achieve corporate carbon neutrality if funds redirected from credits</p>
<p>Allocate annual funding to a reserve fund^{i, ii}</p> <p><i>The amount can be a set dollar value, a transfer of excess operating funds, or an amount equivalent to offsets.</i></p>	<p>Stable; can be predictable (depending on how calculated); provides strong basis for long-term planning and excellent support for implementation; enables leveraging for grants & further staff resources; demonstrates municipal leadership</p>	<p>Without combination of other items, limits agility and can increase staff time requirements to access</p>
<p>Allocate funds to annual purchase of carbon creditsⁱⁱ (current state)</p>	<p>Allows City to offset corporate emissions and achieve carbon neutrality in operations</p>	<p>Without combination of other options, severely limits ability to achieve low carbon vision as corporate emissions represent a small segment of total emissions; staff time is required to calculate credits and process purchase</p>
<p>Develop a green revolving fundⁱⁱ</p>	<p>Incentivizes strong business cases and deep GHG reductions; can be structured to self-fund growth over time; demonstrates municipal leadership</p>	<p>Moderately intensive staff time requirements to administer</p>

Option Description	Opportunities	Challenges
Do not allocate funding / rely entirely on external funding	Can spur creative thinking and collaboration as it relates to developing funding proposals	Severely limits ability to achieve low carbon vision; staff time is required to develop and manage funding proposals; many external funding sources require match funding, so can make these more difficult to apply to

- i. Council may choose to continue to allocate dollars to purchasing carbon credits in addition to this amount, or may choose to forego the purchase of credits and redirect those dollars here.
- ii. Can be combined with other mechanism options.

Recommendations

1. Establish an annual operating budget for climate action initiatives.
 - a. For simplicity, a set multiplier of the annual operating budget (i.e., 0.001x) is recommended rather than an amount equivalent to carbon credit purchases (which requires more intensive calculations).

2. Update the Climate Action Reserve components of the City’s Reserve Policy (Sections 7.3 & 9) as follows:

Purpose - To provide funding for climate action initiatives; part of reducing emissions and vulnerabilities as per the Climate Action Charter commitment & Climate Action Plans.

Source - Excess revenue over expense in the Climate Action operating budget will be transferred to the Climate Action Reserve, as will any funds received from the Province as part of being a member of the Climate Action Charter commitment.

Minimum \$ Level / Optimum \$ Level / Rationale for \$ Levels Established – N/A

3. Create a policy document that outlines the parameters for use of climate action operating & reserve funds, such as criteria for requiring measurable greenhouse gas emissions savings, covering incremental costs only, prioritization of corporate emissions reductions, etc.

4. Consider development of a green revolving fund in the medium-term future, once further climate action funding processes and policies have been established and adequate staffing resources have been assigned.

Reserves v. Operating Funds

Operating funds can be thought of as a chequing account – regular transactions to cover typical expenses, spent over the course of a fiscal year.

Reserves are more like a savings account – an accumulated amount that spans budget cycles used for special projects or items too costly for the operating budget.