

Town of View Royal

May 17, 2022



VIEW ROYAL
COMMUNITY
CLIMATE ACTION
STRATEGY



Prepared by:



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Acronyms / Abbreviations

Acronym / abbreviation	Full phrase	Glossary
AAA	All Ages and Abilities	X
AFOLU	Agriculture, Forestry, and Other Land Use	X
BAU	Business as Usual	X
CARIP	Climate Action Revenue Incentive Program	X
CDD	Cooling Degree Days	X
CEA	Community Energy Association	
CEEI	Community Energy and Emissions Inventory	X
CO ₂	Carbon dioxide	X
CO ₂ e	Carbon dioxide equivalent	X
CRD	Capital Regional District	
EV	Electric Vehicle	
FCM	Federation of Canadian Municipalities	X
GHG	Greenhouse Gas	X
GIS	Geographic Information System	X
GJ	Gigajoules	X
GMF	Green Municipal Fund	X
GPC	Global Protocol for Community-Scale Greenhouse Gas Emission Inventories	X
GWh	Gigawatt Hour	X
HDD	Heating Degree Days	X
ICE	Internal Combustion Engine	
IPCC	Intergovernmental Panel on Climate Change	X
IPPU	Industrial Process and Product Use	X
KPI	Key Performance Indicators	X
MWh	Megawatt Hour	X
OCP	Official Community Plan	X
tCO ₂ e	Tonnes of carbon dioxide equivalent	X
VKT	Vehicle Kilometers Travelled	
ZEV	Zero-Emission Vehicle	

Glossary

Term	Definition
All Ages and Abilities	AAA Infrastructure is pedestrian and cycling infrastructure suitable for all ages and abilities.
Agriculture, Forestry, and Other Land Use	Greenhouse gas sources and sinks related to agriculture, forestry, and other land uses, also including land use change. Included in GPC BASIC+ inventories.
Backcasting	Imagining a future scenario that is unimpeded by limitations or constraints of past experience.
BC Energy Step Code	An optional compliance path in the BC Building Code that local governments may use, if they wish, to incentivize or require a level of energy efficiency in new construction that goes above and beyond the requirements of the BC Building Code.
Business as Usual	An emissions or energy trajectory or scenario if no further action to decrease emissions beyond what is already planned.
Big Move	Broad categories of actions, defined by CEA, that have the biggest impact on reducing greenhouse gas emissions.
Carbon dioxide	A greenhouse gas, with both natural and anthropogenic sources.
Carbon dioxide equivalent	A simplified way of expressing the global warming potential of multiple greenhouse gases, as if it was an equivalent amount of carbon dioxide. Often expressed in tonnes.
CleanBC	The Province of BC's plan to reduce greenhouse gas emissions.
Climate Action Revenue Incentive Program	A conditional grant program, run by the Province of BC, that typically provided funding to local governments that had signed the BC Climate Action Charter equal to one hundred percent of the carbon taxes they had directly paid. It has been cancelled, although an intention to replace it has been announced.
Cooling Degree Days	A measure that helps to simplify the cost of projected energy consumption. It is based on the number of days where the temperature is <i>above</i> a certain threshold (i.e. a building will require <i>cooling</i>).
Community Energy and Emissions Inventory	Energy and emissions inventories for every local government area in BC created by the Province.
Decarbonize	Efforts to reduce greenhouse gas emissions.
Deep energy retrofits	Substantial efforts to reduce energy consumption / greenhouse gas emissions from a building. May achieve reductions of almost one hundred per cent of operating greenhouse gas emissions.
Dutch Woonerf	A community-first approach to designing streets, used in Holland (and other countries). It uses techniques of shared spaces, traffic calming, and low speed limits, and pedestrians and cyclists can have legal priority over motorists.
Federation of Canadian Municipalities	A network of over two thousand local governments from across Canada, acting as the national voice of municipal government.
Fuel switching	The practice of switching from a fossil fuel to one with lower greenhouse gas emissions.
Geographic Information System	A computer system / software for capturing, storing, checking, and displaying data related to positions on Earth's surface.
Gigajoules	A standard unit of energy. Often used for natural gas, but can be used for any form of energy.
Gigawatt Hour	A thousand Megawatt Hours.

Term	Definition
Global Protocol for Community-Scale Greenhouse Gas Emission Inventories	An initiative of the Global Covenant of Mayors for Climate and Energy. It offers local governments a robust, transparent and globally-accepted framework to consistently identify, calculate and report on city greenhouse gases.
GPC BASIC+	An inventory methodology from the Global Covenant of Mayors for Climate and Energy. This is the methodology selected by the Capital Regional District for itself and its member municipalities.
Green Municipal Fund	A program administered by the Federation of Canadian Municipalities which distributes grants to local governments for environmentally friendly initiatives.
Greenhouse Gas	A gas that absorbs infrared radiation, traps heat in the atmosphere, and contributes to the greenhouse effect.
Heating Degree Days	A measure that helps to simplify the cost of projected energy consumption. It is based on the number of days where the temperature is <i>under</i> a certain threshold (i.e. a building will require <i>heating</i>).
Home energy label	A label that describes how much energy a home needs for its operation under a standard set of circumstances.
Intergovernmental Panel on Climate Change	An intergovernmental body of the United Nations dedicated to providing the world with an objective science-based view of climate change, its possible impacts, risks, and response options.
Industrial Process and Product Use	Estimated emissions attributed to the population from Province-wide industrial processes and product use. Included in GPC BASIC+ inventories.
Key Performance Indicators	Metrics that used to track progress.
Megawatt Hour	A standard unit of energy. Often used for electricity, but can be used for any form of energy.
Micro e-mobility	Small electric vehicles, e.g. electric scooters, electric bikes.
Official Community Plan	<p>An official community plan describes the long-term vision of communities. It:</p> <ul style="list-style-type: none"> • Contains a statement of objectives and policies that guides planning and land use management • Impacts a community’s sustainability and resilience • Outlines long-term development plans for a community • Outlines how a local government plans to exercise its powers
Transit oriented developments	Developments designed to prioritise transit over single occupant vehicle use.
Transportation Demand Management	Measures to reduce the demand for single occupant vehicle use.
Zero emission	Having no associated greenhouse gas emissions.

Executive Summary

The Town of View Royal Community Climate Action Strategy outlines a path towards a low carbon future: a future where 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. In 2021 the region experienced the extreme impacts of these changes in the form of record breaking temperatures in a heat dome, bomb cyclones, and an atmospheric river that caused widespread flooding. 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 strategy focuses on leveraging municipal powers to help residents, businesses and visitors save energy, emissions, and money. It is the residents and businesses 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 strategy lays out actions for transportation, buildings, waste, and organizational readiness.

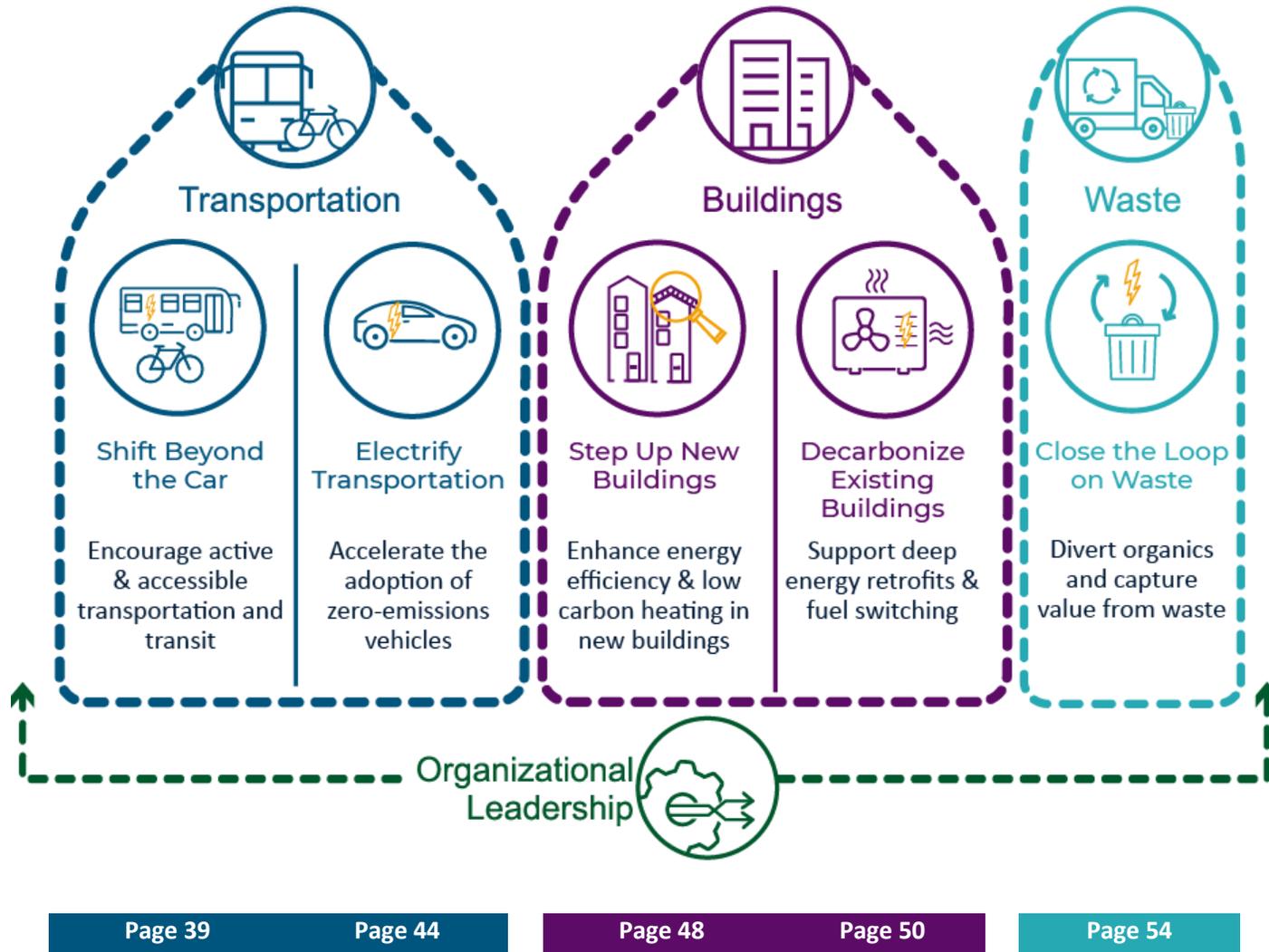
Actions fall into three categories:

- **Infrastructure:** Investments into Town-owned infrastructure such as active transportation networks and public charging stations that enable residents to make lower-emissions choices.
- **Policy:** Changes to Town policies and regulations 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.



The Big Moves

The strategy is organized into five 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 under the sphere of influence of local government powers. The strategy lays out strategies and actions under each of the five Big Moves.



Our Community’s Low Carbon Vision

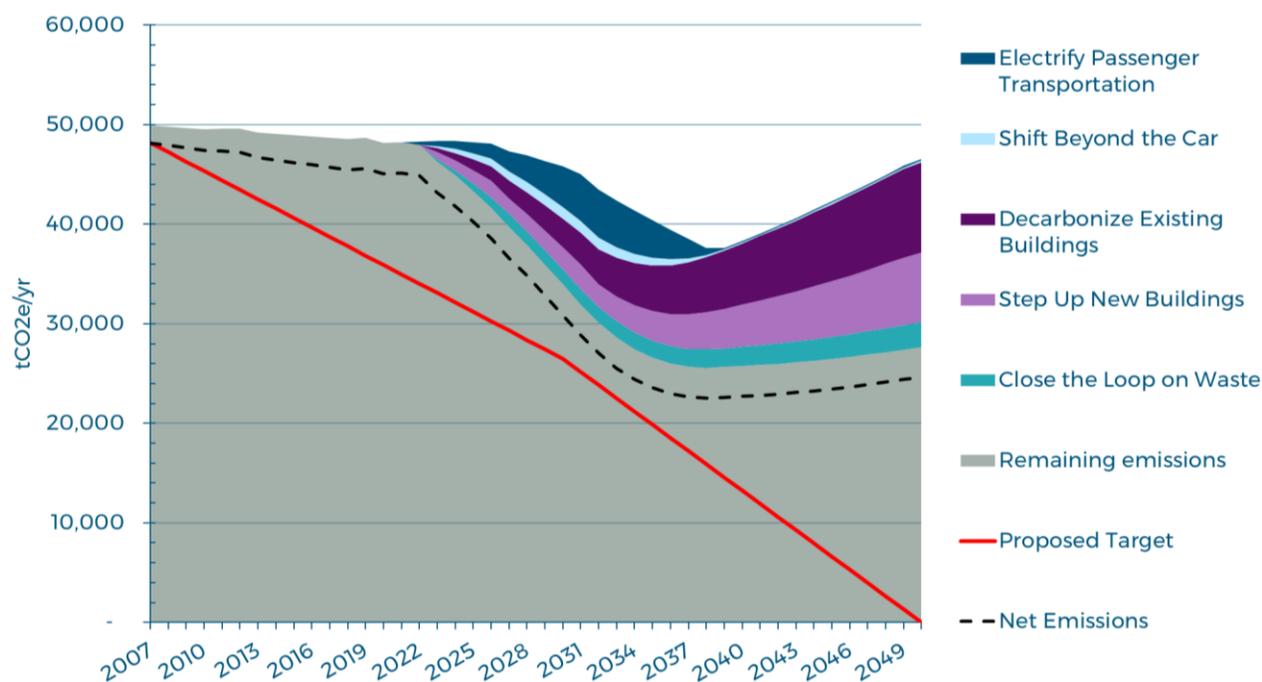
During the planning and engagement process, community stakeholders went through a visioning exercise called “backcasting” to imagine what a low carbon future for Town of View Royal could look like. We chose 2040 as our visioning year to allow for a slightly longer time horizon than ten years but short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

The Future of Transportation	The Future of Buildings	The Future of Waste
<p>An integrated multimodal transportation network</p> <p>Zero emissions transportation network</p> <p>Culture shift towards cycling and other forms of active transportation</p> <p>Continuous and safe infrastructure for walking</p> <p>Fewer cars due to autonomous vehicles and zero emissions car share options</p> 	<p>By 2030, no fossil fuels and wood are used for heating buildings in View Royal. We've transitioned all buildings to zero emissions fuels, e.g. heat pumps, geothermal, etc.</p> <p>All new buildings meet step five of the BC Energy Step Code. They are built using low carbon products and recycled materials</p> <p>Residents are supported through the building retrofit process. 50% of all existing buildings have received a low carbon retrofit that includes insulation, windows, and heat pumps</p> <p>Our buildings are resilient to the impacts of climate change with green and white roofs, heat pumps for cooling and air filtration</p> <p>Residential and commercial development is located within walking and cycling distance to public transit, neighbourhood services and recreation opportunities</p> 	<p>In 2040 – all waste is reused or recycled. Municipally supported education campaigns mean that everyone knows what to do with their waste, and we have changed mindsets. Waste is as close to zero GHGs as possible.</p> <p>Recycling of materials from construction and deconstruction of buildings has sharply improved.</p> <p>The community also grows much of its own food, and is maintaining & preserving natural assets including our urban tree canopy</p> 

Plan Implementation

By implementing this strategy, View Royal can reduce its emissions by an estimated 36% below 2007 levels by 2030, and work towards the new long-term target of a reduction of 100% below 2007 levels by 2050. In doing so, View Royal will place itself as a leader in taking significant action on climate change. See the following pages for a description of how each Big Move contributes to the reduction in emissions.

View Royal Emissions by Sector-Fully Implemented Climate Action Strategy



Note: net emissions include all sources and sinks. Natural lands within the municipal boundary help absorb carbon dioxide.

Plan Summary

Big Move	Strategy	Timeframe		
		Short	Med	Long
<p>1. Shift Beyond The Car</p> 	SHIFT 1: Optimize land use planning tools to enable compact community growth			
	1.1.1 Prioritize compact forms of development in residential zones (accessory dwelling units, missing middle zoning)			
	1.1.2 Normalize low-car and zero-emission living in View Royal (e.g., Official Community Plan (OCP) and other documents)			
	1.1.3 Allow for more mixed used and greater density along corridors (especially those well served by transit), and close to service and employment areas			
	1.1.4 Develop employment areas in the Town			
	1.1.5 Develop and deliver outreach on the climate and livability benefits of compact, complete communities			
	1.1.6 Continue to advocate for strong urban growth boundaries			
	1.1.7 Develop "Work from Home" community and business engagement strategy			
	SHIFT 2: Enable walking, cycling and other forms of zero emission mobility			
	1.2.1 Develop an active transportation strategy	In progress		
	1.2.2 Review policies/bylaws that could allow micro mobility on existing sidewalks/bike lanes			
	1.2.3 Normalize pedestrian and cycling first streets in View Royal (e.g., Dutch Woonerf living street concept)			
	1.2.4 Encourage transportation demand management to facilitate mode shift			
	1.2.5 Build safe routes for walking, cycling and other forms of zero emission mobility	In progress		
	1.2.6 Develop and implement an active transportation engagement strategy			
	1.2.7 Raise awareness and availability of micro e-mobility			
	SHIFT 3: Promote transit ridership and support a zero emissions transit network			
1.3.1 Make the connection between transit and land use, e.g. Transit Oriented Developments				

1.3.2 Collaborate with CRD & BC Transit to develop high frequency transit priority routes along corridors (e.g., Highways)	In progress	
1.3.3 Collaborate with transit providers to expand transit ridership through free days or reduced fares for certain age groups		
1.3.4 Advocate for a zero-emission transit network (collaborate with BC Transit)		
Total GHG emissions reductions for this Big Move in 2030		1,260 tonnes CO₂e

Big Move	Strategy	Timeframe		
		Short	Med	Long
2. Electrify Passenger Transport 	ELECTRIFY 1: Accelerate the adoption of zero emission vehicles			
	2.1.1 Adopt EV-ready building requirements - single family home	Complete		
	2.1.2 Adopt EV-ready building requirements – multi-unit residential buildings (MURB) & Commercial	Complete		
	2.1.3 Implement supportive policies to accelerate EV adoption			
	2.1.4 Design, fund, and build public EV charging stations (with CRD)			
	2.1.5 Provide incentives to EV drivers such as priority parking			
	2.1.6 Develop and deliver an EV outreach strategy			
	2.1.7 Advocate to higher levels of government to continue offering EV purchase rebates - esp. for lower income			
	Total GHG emissions reductions for this Big Move in 2030			4,700 tonnes CO₂e

Big Move	Strategy	Timeframe		
		Short	Med	Long
3. Step Up New Buildings 	NEW BUILDINGS: Adopt higher steps of the Energy Step Code and low carbon approach			
	3.1.1 Adopt the Energy Step Code and timeline for full implementation (i.e., Step 5)	In progress		
	3.1.2 Prioritize a low carbon approach to Step Code (e.g., heat pumps)			
	3.1.3 Require home energy labelling as part of Step Code compliance			
	Total GHG emissions reductions for this Big Move in 2030	2,180 tonnes CO₂e		
4. Retrofit Existing Buildings 	EXISTING BUILDINGS: Improve energy efficiency and enable fuel switching			
	4.1.1 Encourage and enable energy retrofits through supportive policies and removing barriers			
	4.1.2 Establish requirements for home energy labelling and building energy benchmarking			
	4.1.3 Provide top-up incentives to CleanBC rebates for residents of View Royal to adopt heat pumps	In progress		
	4.1.4 Support the development of CRD regional retrofit service for residents	In progress		
	4.1.5 Identify and remove barriers to heat pump installation			
	EXISTING BUILDINGS 2: Build Industry Capacity and Increase Demand			
	4.2.1 Partner with other CRD on any long-term marketing campaigns to encourage building envelope improvements, electrification, or low carbon fuel sources			
	4.2.2 Partner with CRD to educate renovators/realtors on energy efficiency and low carbon choices for heating/hot water			
	Total GHG emissions reductions for this Big Move in 2030	3,290 tonnes CO₂e		

Big Move	Strategy	Timeframe		
		Short	Med	Long
5. Close the Loop on Waste 	WASTE 1: Divert organics from landfill			
	5.1.1 Adopt policies that drive increased organics diversion (e.g., deconstruction policy)	█		
	5.1.2 Include multi-unit residential buildings, institutional (e.g., Island Health), and commercial properties in requirements to divert organics and recycle	█		
	5.1.3 Implement enhanced organics collection (public waste bins)		█	
	5.1.4 Collect construction, demolition, agricultural, and industrial wood waste	In progress		
	5.1.5 Develop and deliver a comprehensive zero-waste outreach program (e.g., education)	In progress		
	5.1.6 Consider advocating to the CRD for expanded regional organics processing (facility for composting, or anaerobic digestion)		█	
	5.1.7 Establish regular yard waste pickup for detached dwellings. Consider integrating it into the kitchen waste pickup program.		█	
Total GHG emissions reductions for this Big Move in 2030		1,480 tonnes CO₂e		

Community Climate Action Strategy Introduction

The Town of View Royal is a growing community of over 11,000 people located within the Capital Regional District (CRD). As a largely residential community it boasts a high standard of living supported by a wealth of natural amenities including Esquimalt Harbour, Portage Inlet, Thetis Lake Regional Park, the mouth of both Craigflower and Millstream Creeks, and numerous pockets of rare Garry Oak and Arbutus ecosystems. View Royal is home to the regionally critical Victoria General Hospital and a growing development node supporting health care and services in the Capital Regional District.

View Royal is the westernmost municipality of the five core CRD municipalities, yet is also the transition to, and geographically part of the West Shore. Residents enjoy recreation services through West Shore Parks and Recreation, and the Island Highway Business Corridor straddles the municipal border shared with the City of Colwood.

Four major transportation corridors – Trans Canada Highway, Island Highway, the Galloping Goose Regional Trail, and the Esquimalt & Nanaimo Railway – travel through and bisect the municipality. Regional traffic congestion continues to have real impacts on View Royal residents, businesses, and greenhouse gas (GHG) emissions. For this reason, View Royal has been a strong proponent of promoting investments in non-vehicular transportation modes and infrastructure.



Municipal Commitment to Climate Action

The Town of View Royal has held a longstanding commitment to climate action. The Town's last Climate Action Strategy was completed in 2012 to address community-wide greenhouse gas emissions. A Corporate Energy and Emissions Plan was also created during that time. The interim target from the previous Community Climate Action Plan – a 12% decrease below 2007 levels by 2017 and 33% by 2030 – was not met. Between 2007 and 2018 there was an increase in emissions of 6.8%, with some annual fluctuations in between.

However, since the Community Climate Plan and Corporate Energy and Emissions Plan were prepared, the Town has transformed from a place with a quiet, small town feel into a vibrant community that is integral to the larger urban region. It is one of the fastest growing municipalities in the province, but the Town no longer has a large supply of greenfield properties available for development. Future growth will come from intensifying existing urban areas and will require a balance of effective stakeholder engagement strategies and realistic, sustainable development standards to manage this growth in a way that will lower the Town's impacts on global climate change.

View Royal has also joined nearly 1,500 jurisdictions around the world in declaring a climate emergency. This declaration necessitates a very strong policy response and provides the rationale for this Community Climate Action Strategy and updated targets. View Royal embraces the concept of a triple bottom line approach to sustainability, which balances social, economic and environmental values. Now, more than ever before, the Town and its residents know that future sustainability and prosperity depends on the decisions we make in the near term.

View Royal's Climate Action Successes to Date



Organic waste composting



Municipal top-up to CleanBC rebates for oil to heat pump heat source conversions



Partnership with CRD on Galloping Goose and E&N Rail Regional Trail connections

30.5 km of bike lanes



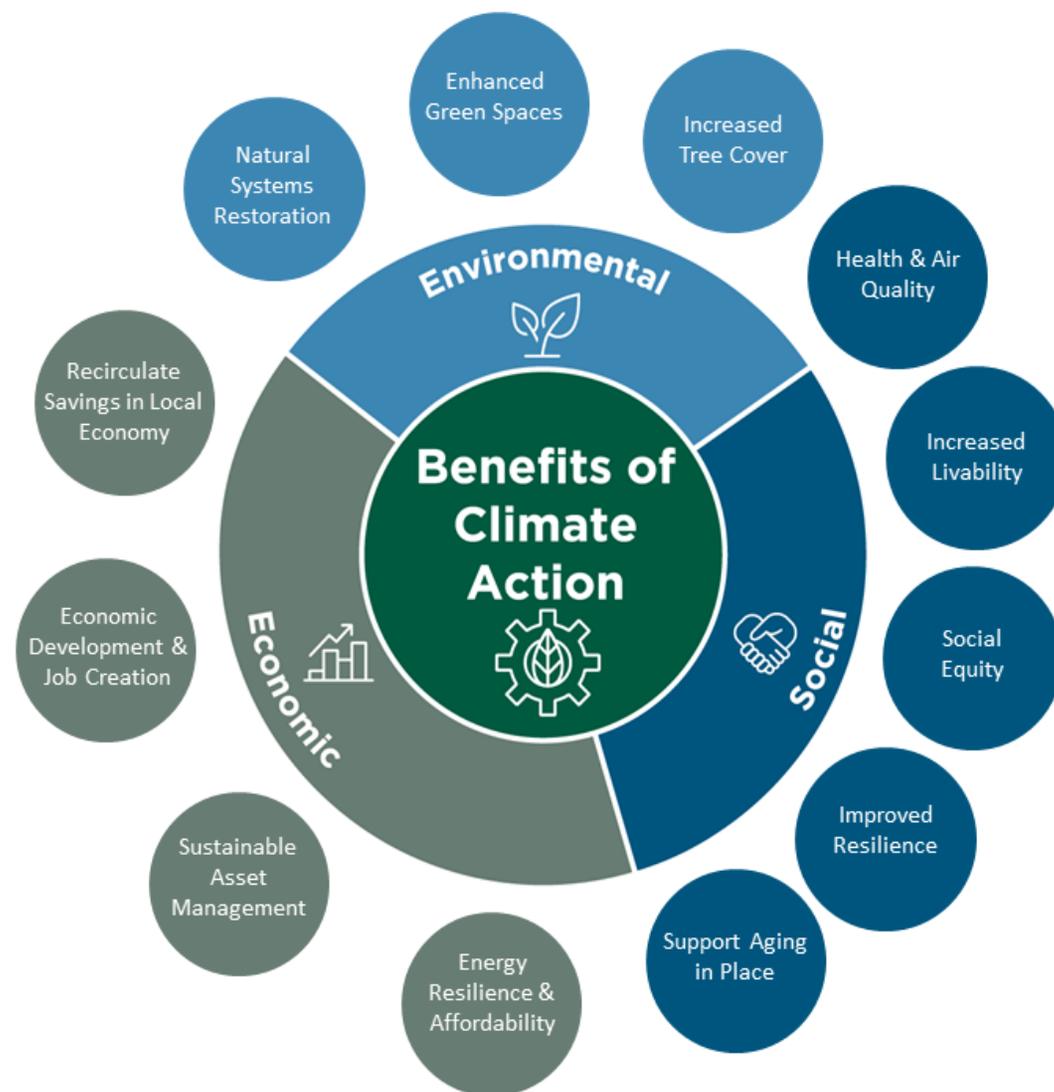
EV ready car and bike parking in new developments

The Town of View Royal, like most communities across British Columbia, is responding to climate change. View Royal 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 Strategy helps with this, and also makes the Town ready to apply for funding from the Federal or Provincial governments and other funders to implement strategies in the plan.

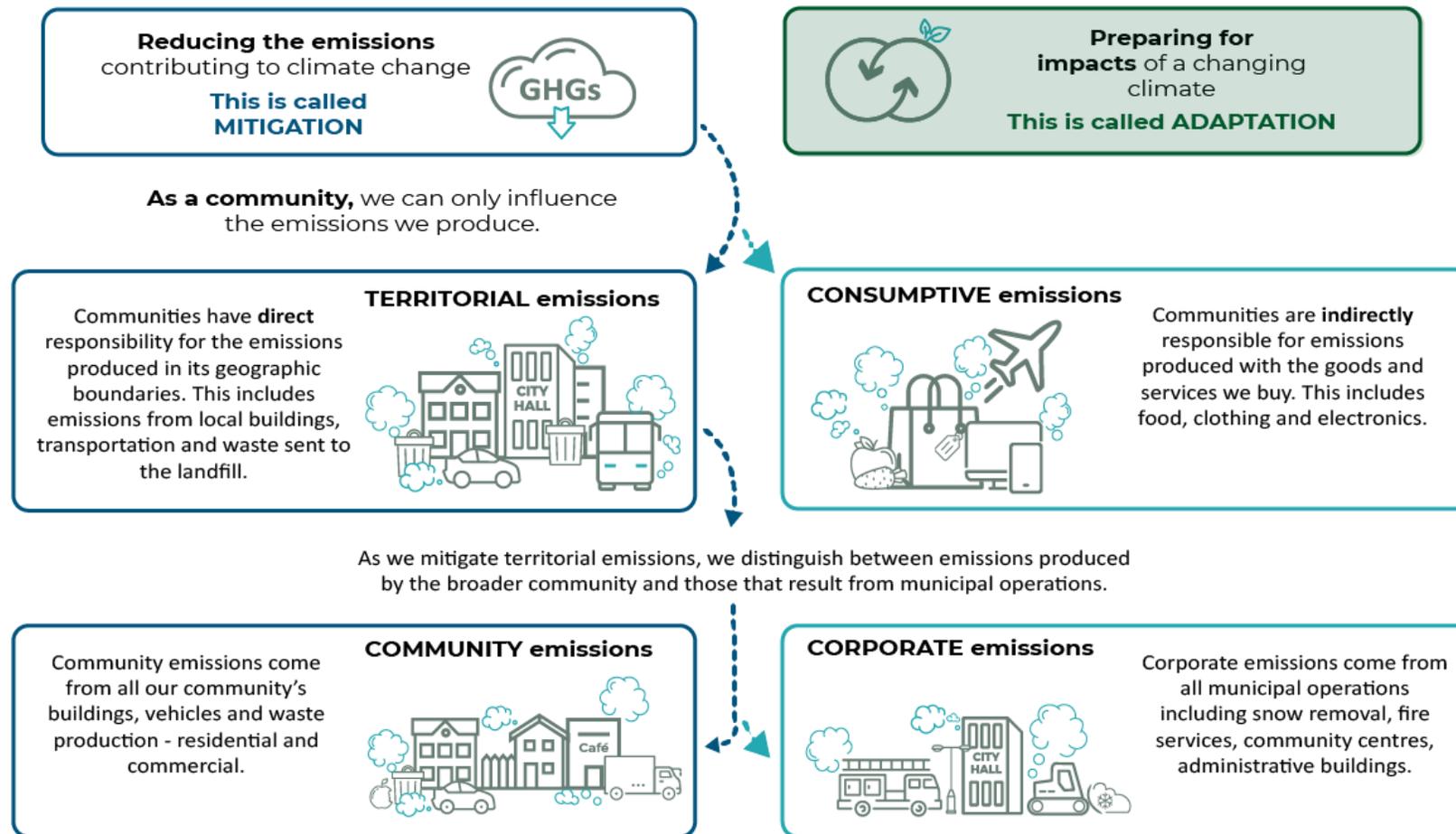
Implementing this updated strategy will result in numerous social, economic, and environmental benefits to the community, as outlined by this diagram.



The Scope of View Royal's Community Climate Action Strategy

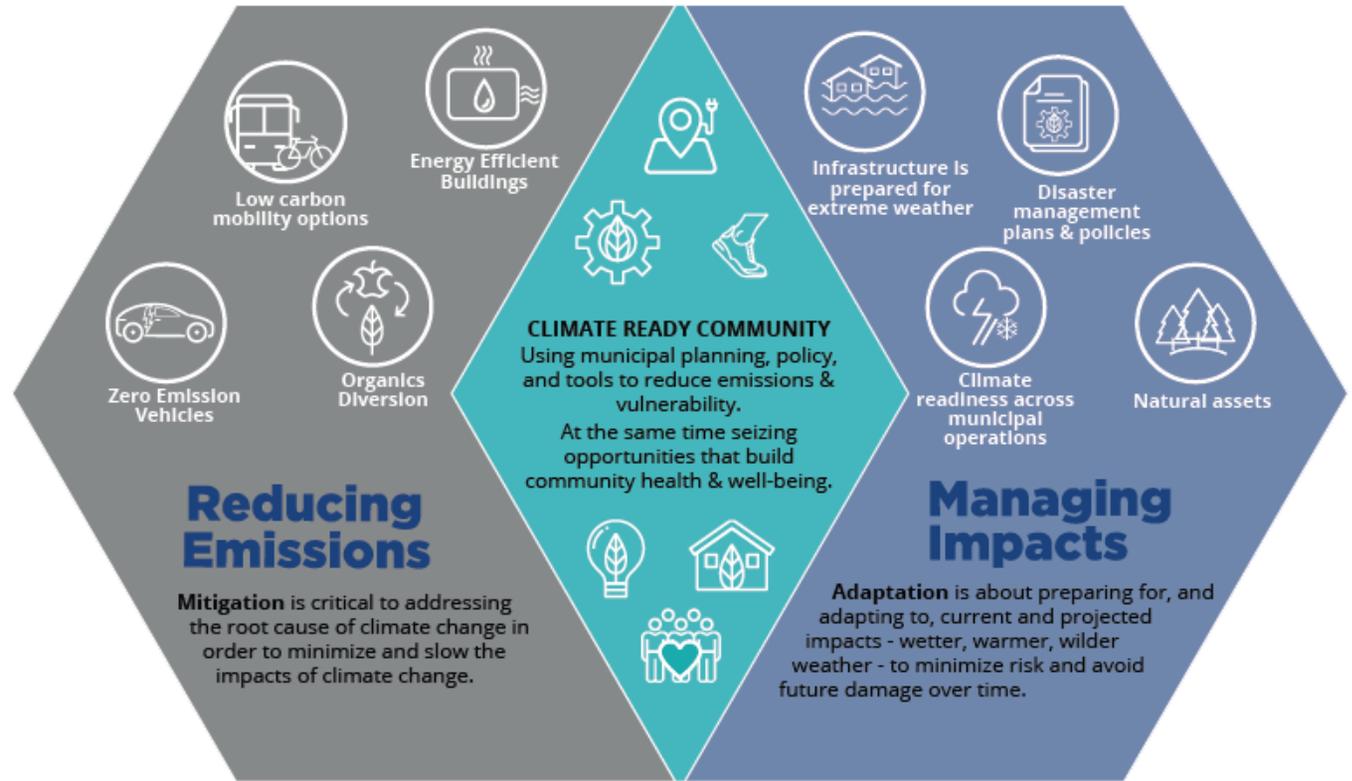
Climate action consists of both reducing emissions (*mitigation*) and preparing for the impacts of a changing climate (*adaptation*). The scope of this plan includes the elements on the left: mitigation, territorial emissions, community emissions, as well as considering the adaptation benefits of mitigation strategies. It is not a climate adaptation plan, with a risk and vulnerability assessment. It does not cover corporate emissions in detail, although it does not exclude them either. Consumptive emissions are not in the scope of this plan because choices about food, goods and travel are made by individuals. Consumptive emissions inventories are very difficult to calculate, and measures to reduce them are difficult for local governments to implement.

How Can Local Governments Take Climate Action?



Adaptation Considerations

Although this Strategy is focused primarily on mitigating greenhouse gas emissions that cause climate change, it is equally critical to properly prepare for climate impacts. As highlighted in the next section, the climate is changing and View Royal is already experiencing these changes.



While some solutions fall clearly on one side of climate action, the best solutions are those that lead to both adaptation and mitigation benefits. Adaptation benefits for each of the mitigation strategies are identified in the Action Plan section.

Examples of actions that reduce emissions while preparing for climate change impacts:



Walking/biking paths: reduces emissions, increases access for vulnerable populations, reduces congestion, reduces pollution, and increases air quality and health.



Building retrofits: use less energy, reduce emissions, save costs, increase thermal comfort and air quality during extreme heat and wildfire events.



Green infrastructure: increases rainfall absorption, reduces flood risk, sequesters carbon, recharges aquifers, increases green space.

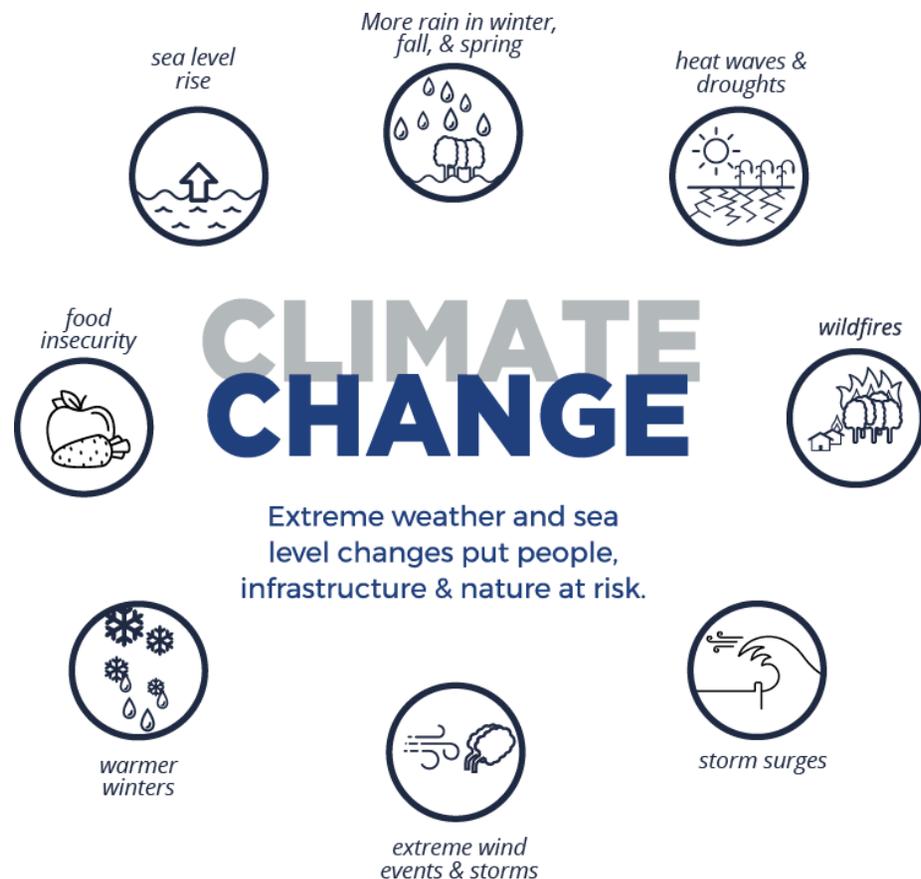
Climate Change Risks in View Royal

The climate is changing in British Columbia as it is around the world. In 2021 the region experienced the extreme impacts of these changes in the form of record-breaking temperatures in form of a heat dome, bomb cyclones, and an atmospheric river that caused widespread flooding. 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 recent and anticipated climate changes will impact community buildings and infrastructure, human safety and health, natural resources, and the water supply in View Royal. Evaluating adaptation strategies now and, where possible, complementary low emissions strategies, will help advance the Town's overall resiliency and ability to respond and thrive over the short and long-term.

As part of the project, CEA assisted the Town with an adaptation capacity readiness assessment, using the Municipal Climate Action Hub (MCAHUB.CA) online tool. This tool assesses readiness and helps communities to understand next steps in Policy, HR, and Technical realms.

Further details can be found in Appendix B.



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>



A wide range of strategies can be instituted by local governments and their partners to enhance resiliency and adapt to potential impacts, such as:

- Defining land uses and bylaws to better protect buildings from lake and river flooding; through the creation of 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
- Diversifying or upgrading community infrastructure like drinking water, storm water, and wastewater systems helps each to withstand heavy precipitation and extreme weather events. Natural assets like wetlands can be restored to 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 land management 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

This strategy focuses on leveraging municipal powers in the areas of infrastructure, policy and regulation, and engagement and outreach, 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 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.

Projected impacts for the region



Source: Climate Projections for the Capital Region (CRD, 2017). See crd.bc.ca/data for more information.

Infrastructure	Policy & Regulation	Engagement & Outreach
 <p>Investments into infrastructure owned by the Town that enable residents to make lower-emissions choices, such as active transportation networks and public charging stations.</p>	 <p>Changes to Town of View Royal 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>

As a local government, there are numerous ways the Town of View Royal 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 Town can lead by example. This strategy 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 five Big Moves for transportation, buildings, and waste.



Aligning with the Science - 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. View Royal's long-term community target is now aligned with the Intergovernmental Panel on Climate Change's recommendations for limiting warming to 1.5°C and avoiding the worst impacts of climate change.

To meet the 2030 target, View Royal needs to produce at least 21,700 fewer tonnes of GHGs in 2030 (relative to 2007 levels). The actions in this plan are projected to achieve annual emission reductions of 18,400 tonnes CO₂e relative to 2007, which is a 38% reduction.

View Royal's New Community Greenhouse Gas Reduction Targets

45% reduction in emissions below 2007 levels by 2030

100% reduction in emissions below 2007 levels by 2050



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

Inventories: What is Measured in this Plan?

Local governments have varying degrees of influence over the various sources of emissions within their boundaries. **View Royal's 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).**

View Royal's GHG reduction target references only local (territorial) emissions. These emissions are measured in the energy and emissions inventory produced by the Capital Regional District, using the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC) BASIC+ inventory methodology. The major categories of emissions included in this inventory are stationary energy (residential buildings; commercial and industrial buildings; and agriculture, forestry and fishing activities); on-road transportation (passenger vehicles and commercial vehicles); off-road transportation; waste; industrial processes and product use (IPPU); and agriculture, forestry, and other land use (AFOLU) emissions.



While not a main consideration in this Plan, residents and businesses in View Royal can reduce the embodied carbon of goods and materials by considering the full life cycle of purchasing decisions.

For example, thrifted clothing has lower embodied carbon than new clothing, and wood as a building material has lower embodied carbon than concrete.

This plan does not comprehensively address 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 important for residents to consider when buying goods or services. How was the item created, how far did it travel, how is it packaged, or is it even a necessary purchase? These are all important questions to consider when buying consumer goods.

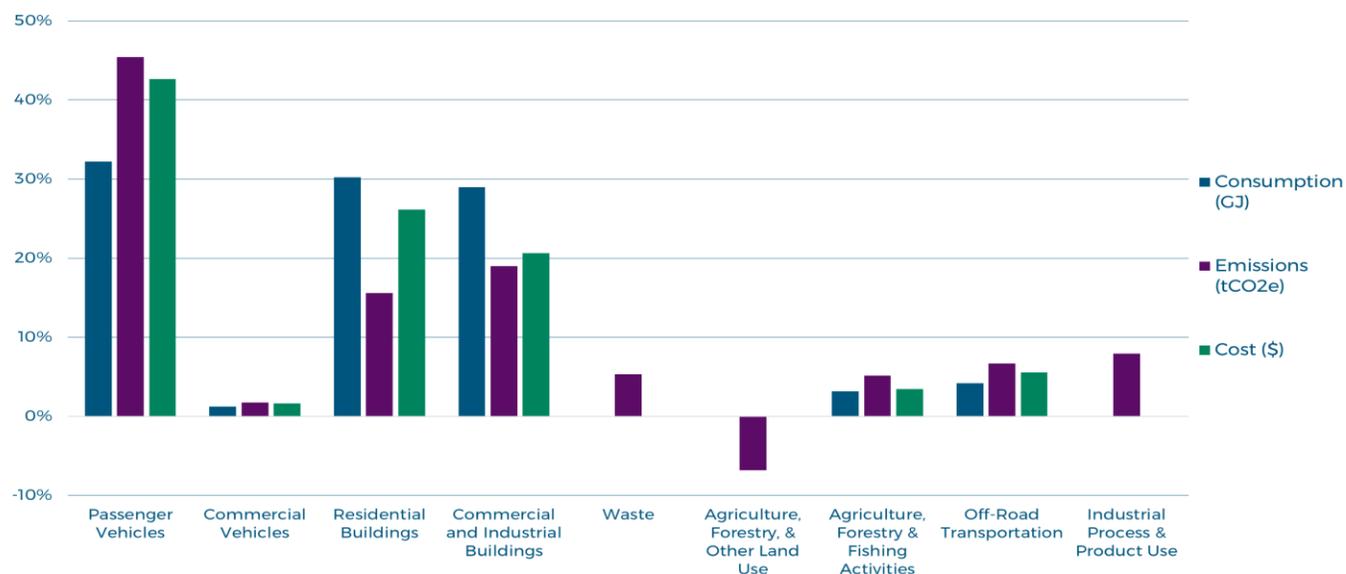
View Royal’s Energy, Emissions, and Costs

The most recent dataset available in the inventory report¹ was from 2018, and was used to describe View Royal’s current energy consumption and emissions. The only additional dataset available was from 2007. The two inventory years can be compared to identify changes over time, however more years of data would be needed to have confidence in any trends. See Appendix A for a full description of the inventory and modelling methodology. Note that there are varying degrees of uncertainty in aspects of the data.

In 2018, for the whole community of View Royal;

- Total energy consumption was 999,000 GJ
- Total GHG emissions were 45,500 tonnes of CO₂e
- Total energy expenditure was \$26,800,000

View Royal’s Energy, Emissions, and Costs by Sector



The chart shows energy consumption, GHG emissions and energy cost by sector for 2018.

Passenger vehicles account for 45% of View Royal’s GHG emissions and residents spend approximately \$11.4 million annually at the gas station. Commercial vehicles account for 2% of emissions and businesses spend approximately \$450,000 annually on transportation fuel.

¹ Capital Regional District - Municipalities and Electoral Areas: 2007 Base Year and 2018 Reporting Year Energy and GHG Emissions Inventory

Overall emissions from vehicles have decreased by 10% between 2007 and 2018 which may be due in part to low carbon fuel standards and vehicle emissions standards.

Residential buildings account for 16% of emissions, and commercial and industrial buildings account for 19% of emissions. It should be noted that multi-family buildings (e.g., apartment buildings) are typically categorized as commercial buildings in emissions inventories, since they often have a commercial utility account. Residents and businesses spend over \$12 million annually on energy for their homes and buildings. Emissions from residential buildings have decreased by 6% and between 2007 and 2018 whereas emissions from commercial and industrial buildings have increased by 10%. The emissions factor of electricity has decreased over this time period, and has likely contributed to the decrease in emissions in residential buildings. Commercial building saw an increase in the consumption of natural gas over this time period.

Waste accounts for 5% of View Royal's emissions. 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 results in emissions. Emissions from waste have decreased by 26% between 2007 and 2018, likely due to enhanced landfill gas capture at the Hartland landfill.

Agriculture, forestry, and other land use (AFOLU) emissions are those that are captured or released because of land management activities. In View Royal, emissions in this category are net negative, thereby reducing View Royal's overall emissions by 7%. Sequestration increased by 77% between 2007 and 2018, but the reason for this is unknown.

Agriculture, forestry, and fishing activities emissions include those from buildings and facilities, and off-road transportation in this sector. They account for 5% of View Royal's emissions. Emissions from this sector decreased by 4% between 2007 and 2018.

Off-road transportation emissions include those from aviation and marine transportation and account for 7% of View Royal's emissions. Emissions from this sector remained relatively unchanged between 2007 and 2018.

Industrial process and product use (IPPU) emissions include those from industrial processes that chemically or physically transform materials and products used by industry and end-consumers (e.g., refrigerants, foams and aerosol cans). IPPU emissions account for 8% of View Royal's total emissions. Emissions from this sector increased by 82% between 2007 and 2018. From the calculation methodology this is just due to increases in population in View Royal and increases in industrial emissions in BC – it is not due to any increase in emissions within the municipal boundary.

View Royal's Emissions and Costs by Fuel Type

The charts below show energy costs and emissions by fuel type for 2018.

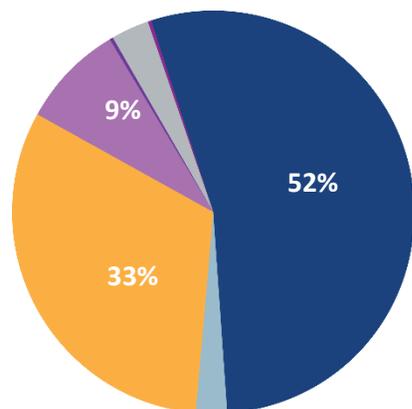
Mobility fuels are comprised of gasoline and diesel from passenger and commercial vehicles. They make up the large majority of community emissions and energy costs, at 58% and 52%, respectively.

Natural gas provides heating and hot water in residential and commercial buildings. It accounts for 23% of View Royal's emissions and 9% of community energy spend. Electricity also provides heating and hot water in buildings, but also powers appliances and electric vehicles (EV's). It accounts for 2% of emissions in View Royal and is responsible for 33% of community energy spend. Electricity in British Columbia is largely produced from renewable resources, and therefore has much lower emissions than natural gas. Currently, natural gas costs less per unit of energy than electricity, however energy prices may change in the future.

Heating oil, propane, and wood are the main source of heat in a relatively small number of homes in View Royal, therefore they do not contribute significantly to overall emissions.

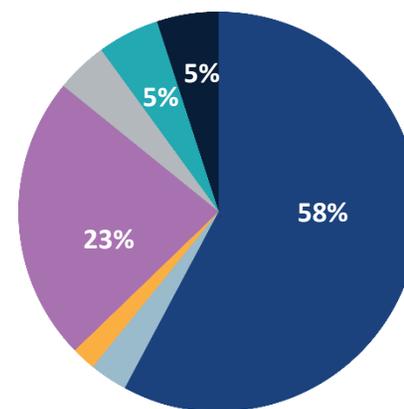
The decomposition of waste in landfill contributes 5% of total emissions in View Royal. There is no energy cost associated with waste.

View Royal's Energy Costs



■ Mobility Fuels \$13,360,309	■ Non-Mobility Diesel \$654,008
■ Electricity \$8,603,097	■ Natural Gas \$2,235,240
■ Wood \$104,756	■ Heating Oil \$832,719
■ Propane \$108,595	

View Royal's Emissions tCO₂e



■ Mobility Fuels 27,974	■ Non-Mobility Diesel 1,335
■ Electricity 918	■ Natural Gas 11,417
■ Heating Oil 1,893	■ Waste 2,415
■ Other 2,281 (Wood & Propane both 0%)	

Creating View Royal's Climate Action Strategy

The process consisted of four steps: Modelling & Analysis, Engagement, Recommending Actions and Draft Plan, and the Final Plan.



Modelling & Analysis

- Review and analyse community energy use and emissions in relation to baseline year
- Model “business as usual” projections



Engagement

- Presentation to Committee of the Whole
- Facilitate two stakeholder workshops to gather feedback on potential climate actions and how stakeholders may collaborate on climate initiatives
- Facilitate two surveys for View Royal residents to understand what they think and feel about the changing climate, and what they think priorities for community climate action in View Royal should be



Recommend Actions and Draft Plan

- Draft potential actions based on engagement, modelling, analysis and targets
- Model the possible impact of new proposed actions on energy use and emissions
- Create an implementation strategy



Deliver Final Plan

- Refine draft plan following feedback from staff and committee members
- Final presentation to Committee of the Whole

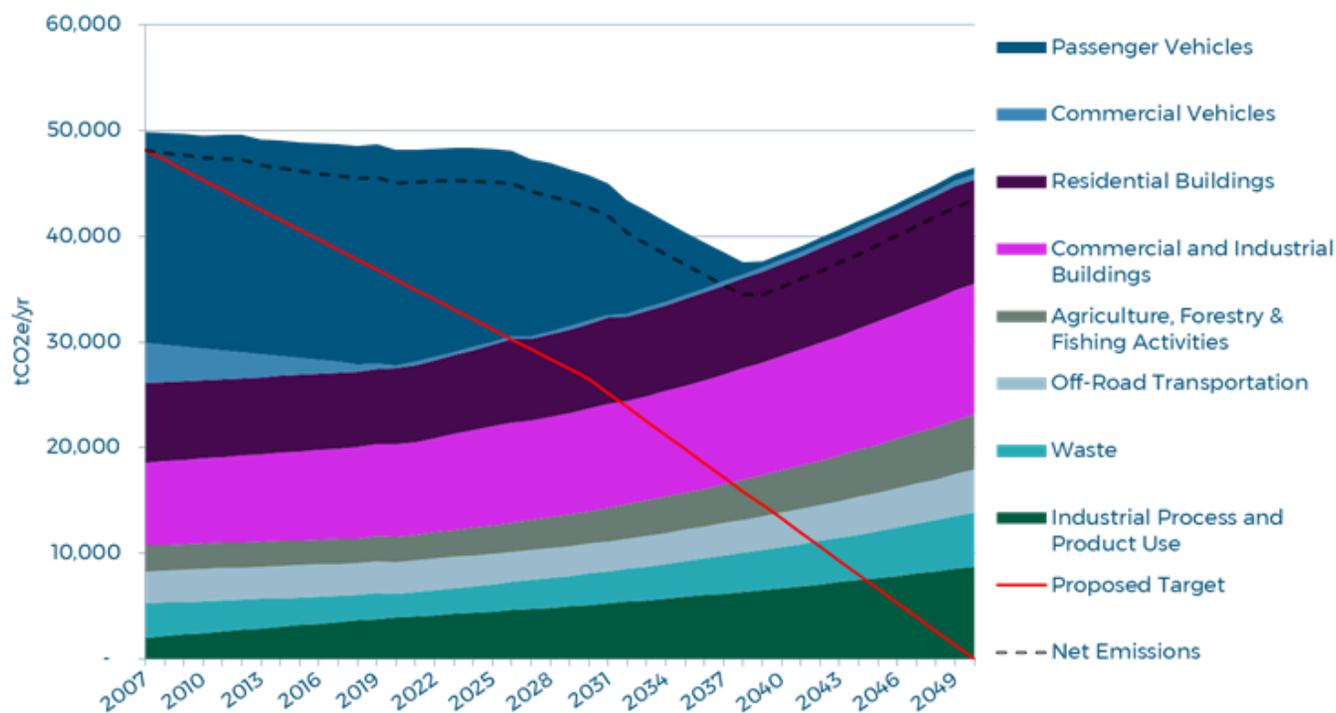
Forecasting and Backcasting



There were two different approaches used in the development of the strategy: 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: Business as Usual Projections



This chart shows View Royal’s GHG emissions inventory from 2007 to 2018 and its business-as-usual forecast from 2019 to 2050. It shows emissions from the eight sectors stacked on top of one another, to show total emissions. Emissions from Agriculture, Forestry & Other Land Use (AFOLU) are not shown here because they are net negative. However, the chart does indicate View Royal’s net emissions which take into account sequestration from AFOLU. Between 2007 and 2018 there was a decrease in overall emissions of 5.6%.

Under a business-as-usual scenario, emissions are

expected to decrease slowly between 2019 and 2026 as a result of reduced emissions from passenger vehicles (due to increased EV sales) but increased emissions in other sectors due to population growth. From from 2027 to 2038, electric vehicles are expected to replace almost all internal combustion engine vehicles in the personal vehicle sector, and this will outweigh increased emissions in other sectors (other mobility technologies such as micro e-mobility and autonomous vehicles may assist this transition but there is less certainty associated with them). Beyond 2038, overall emissions may begin to increase again as population growth will lead to an increase in emissions in all categories except for passenger vehicles.

The red line indicated the emissions reduction target of 45% below 2007 levels by 2030 and 100% below 2007 levels by 2050. In a business-as-usual scenario, View Royal will fall well short of the targets for both 2030 and 2050.

What does 'Business As Usual' mean?

Business As Usual, or BAU, is a way of describing what is estimated to happen to View Royal's emissions if the Town 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 increases in a community, more buildings are needed/used and more vehicles are driven on roads.

Other considerations that were taken into account to develop the BAU emissions scenario for this report include the following:

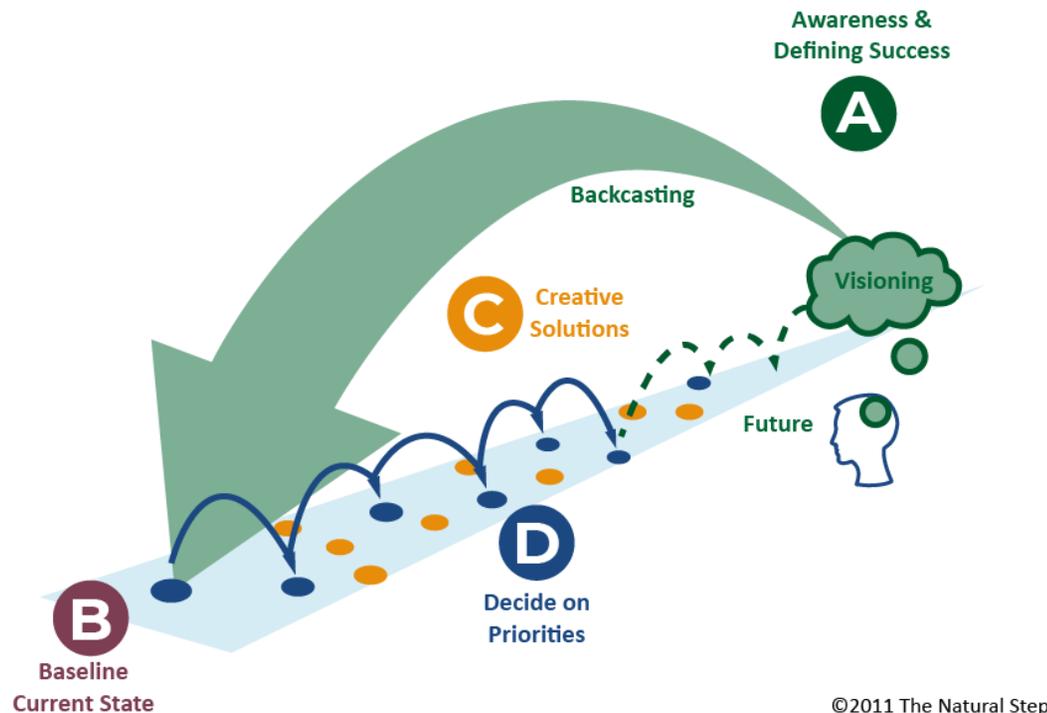
- Changing climate patterns— as warmer winters and hotter summers occur, they are and will continue to change the way that energy is consumed in buildings
- Likely future impacts of policies already adopted by other orders of government, such as:
 - Renewable and low carbon fuel standards
 - Vehicle tailpipe emissions standards
 - Provincial and Federal Zero-Emission Vehicle (ZEV) mandates requiring 10% of new light-duty vehicle purchases by 2025 as ZEVs, 30% by 2030, and 100% by 2035 as ZEVs
 - The Provincial CleanBC commitment to a zero-carbon building code by 2030

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 the diagram to the right.

Over the course of two workshops, Town of View Royal 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
- Prioritized the solutions



Climate Action at All Levels

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

Local governments are the front lines of climate action because communities are where the buildings, vehicles & infrastructure are.

	Plans	Authority	Actions/Levers
Federal 	Pan-Canadian Framework on Clean Growth and Climate Change	<ul style="list-style-type: none"> • National standards • Funding • International commitments • Taxation 	<ul style="list-style-type: none"> • Vehicle fuel efficiency standards • Infrastructure funding • Model national building codes • Energy ratings & tools (e.g., EnerGuide) • Green infrastructure bank • National carbon price • CCS (Carbon Capture & Sequestration) • Information sharing
Provincial 	CleanBC (mitigation) Climate Ready BC (adaptation) <i>2021 release</i>	<ul style="list-style-type: none"> • Constitutional authority for Energy and for Municipalities • Taxation 	<ul style="list-style-type: none"> • Codes (e.g., Building code including Energy Step Code) • Data (e.g., Community Energy & Emissions Inventory) • Green infrastructure (e.g., EV charging) • Provincial roads & transit funding • Direction to BCUC on BC Hydro, FortisBC, ICBC • Municipal regulation & authority • Carbon neutral government operations • Carbon tax • RNG (Renewable Natural Gas) • ZEV (Zero Emissions Vehicle) mandate
Local 	<ul style="list-style-type: none"> > 120 Community Energy & Emissions Plans > Multiple Adaptation Plans > Integrated Climate Action Plans 	<ul style="list-style-type: none"> • Land-use / community form • Local infrastructure • Local engagement • Waste management 	<ul style="list-style-type: none"> • New / adjusted community infrastructure • Restricting land use in key areas • Sidewalks/bike & scooter lanes • Complete compact walkable communities • Transit • EV strategy • BC Energy Step Code • Local engagement • Energy retrofit programs • Organics diversion • Natural assets • Water management • Extreme climatic event / disaster preparation



Governments set the stage, but it is residents and businesses who reduce their emissions and adapt to climate change through individual choices:

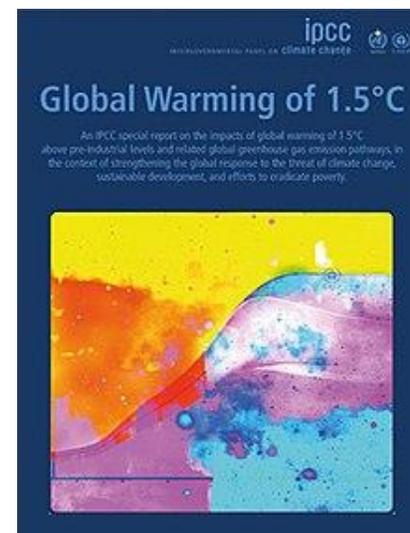
- where you locate/live/work
- heating / cooling
- vehicle & travel choices
- extreme climatic event / disaster preparedness
- landscaping choices
- water management

Global Action

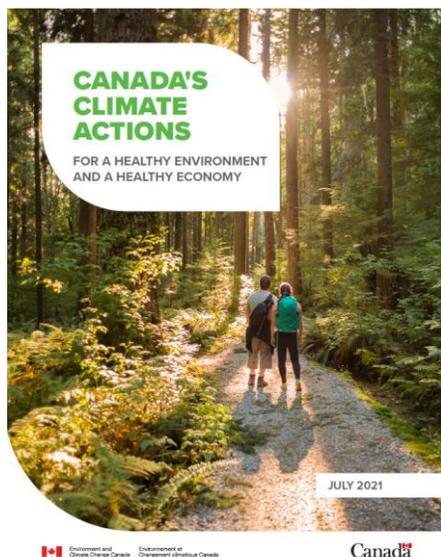
When Canada signed the Paris Agreement in 2015, we joined a global commitment to keep global warming below 2°C, and as close to 1.5°C as possible. In October 2018, the United Nations Intergovernmental Panel on Climate Change (IPCC) released a major report that emphasized the dramatic difference in consequences 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.



National Action



In July 2021, the Government of Canada released a new federal climate action plan. It sets out the federal government's strategy to meet its commitment under the Paris Agreement to reduce national greenhouse gas (GHG) emissions to 40-45% below 2005 levels by 2030, and to net-zero by 2050. In 2019, the most recent emissions inventory year, Canada's emissions were 730 megatonnes (million tonnes) of CO₂ equivalent (Mt CO₂e), which is a 1.1% decrease from 2005 levels, or virtually no progress. Meeting the 2030 target, and the newly established target of net-zero emissions by 2050, requires 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

During the drafting of the strategy, the Province of British Columbia released its newest climate strategy, the CleanBC Roadmap to 2030. The plan reaffirmed the province's previous target to reduce emissions 80% below 2007 levels by the year 2050, and established a new interim target to reduce emissions 40% by 2030. In 2019, BC's provincial emissions were 5% above 2007 levels, which means that in order for BC to meet its emissions reduction target, we need a decrease of 45% from 2007 levels in under ten years. When the first CleanBC plan was released it outlined a range of actions to meet 75% of the target, this new roadmap outlines the full extent of action necessary to meet the 2030 targets.



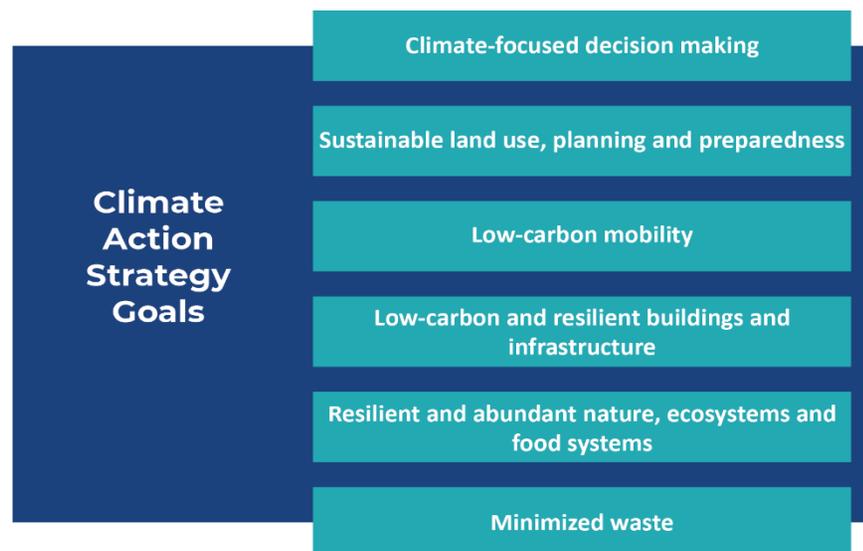
Foundational Actions in the Roadmap include²:

- A stronger price on carbon pollution, aligned with or exceeding federal requirements, with built in supports for people and businesses
- Increased clean fuel requirements and doubling the target for renewable fuels produced in B.C. to 1.3 billion litres by 2030
- An accelerated zero-emission vehicle (ZEV) law (26% of new light-duty vehicles by 2026, 90% by 2030, 100% by 2035). New ZEV targets for medium- and heavy-duty vehicles aligned with California, the leading jurisdiction in North America
- Actions to support mode-shift towards active transportation and public transit
- Enhancing the CleanBC Program for Industry to reduce emissions while supporting a strong economy
- New requirements for all new buildings to be zero carbon and new space and water heating equipment to be highest efficiency by 2030
- Implement a 100% Clean Electricity Delivery Standard for the BC Hydro grid
- A new program to support local government climate and resiliency goals with predictable funding
- Support for innovation in areas like low carbon hydrogen, the forest-based bioeconomy, and negative emissions technologies

² Source: Province of BC: CleanBC Roadmap to 2030 - https://www2.gov.bc.ca/assets/gov/environment/climate-change/action/cleanbc/cleanbc_roadmap_2030.pdf

Regional Action – Capital Regional District

CRD's Updated Climate Action Strategy Goals



View Royal is one of 13 municipalities and three electoral areas served by the Capital Regional District. The CRD is one of the only regional districts, outside of Metro Vancouver, that has a climate action program. The CRD established their climate action service in 2009, to act as a resource and facilitator for local governments, citizens and organizations

In 2021 the CRD updated the organization's Climate Action Strategy



CRD Target:
33% below 2007 levels by 2020,
61% by 2038.

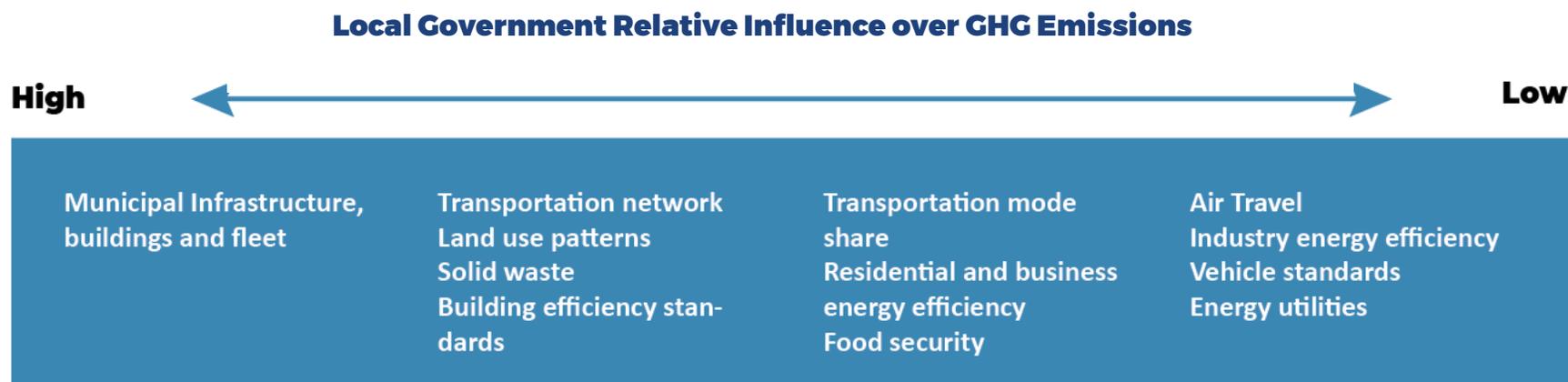
The CRD climate action staff provide support to View Royal and other local governments with GHG inventories, climate policy, and research. They also convene an inter-municipal working group of local governments, track local government progress on climate action across the region, engage in regional outreach and education programming, and apply for funding for joint projects.

Currently the CRD has been given direction to expand its climate action service to create a regional retrofit service that provides energy coaching to residents, and support for regional electric vehicle infrastructure implementation.

The CRD is a leader in waste management in the province, providing composting for organics and landfill gas capture at the Hartland landfill.

Local Action

To date, more than 120 British Columbia local governments have enacted community climate action plans or strategies which outline actions they can take, or are taking, to reduce greenhouse gas emissions. As the most subordinate level of government, local governments have varying degrees of influence over different sources of emissions within their boundaries, as shown below, compared to provincial and national governments. However, there are still many areas that are well within the local government scope of control, one of the most prominent of these being land use planning.



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 BC 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.

A Call to Action - 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, how to prepare for extreme events, landscaping choices e.g. that affect the urban tree canopy and are wildfire smart, and being careful with water use.



Governments set the stage, but it is residents and businesses who reduce their emissions and adapt to climate change through individual choices.

- where you locate/live/work
- heating/cooling
- vehicle & travel choices
- extreme climatic event/disaster preparedness
- landscaping choices
- water management

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.

In conjunction with the strategy, View Royal has also developed an online accessible resource guide to help to increase community awareness and encourage action by individuals, households, or business to reduce community greenhouse gas emissions. The resource guide can be found on the Town's website.

The online resource guide covers the following topics:

1. Climate Change Background
2. Climate Change in View Royal
3. Solutions for our community
4. Solutions for our residents

What We Heard from Community Members - Engagement

Engagement for the development of the View Royal Community Climate Action Strategy was conducted in two phases. The first involved workshops with community stakeholders, staff, and a few members of Council to inform the creation of the plan. The second phase focused on broader community feedback, in the form of two community surveys, to provide additional confirmation on 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.



The workshops were facilitated by CEA staff and featured in-depth discussion on the current sources of community emissions in View Royal, climate risks for the area, envisioning a low carbon and resilient future, and reviewing and prioritizing the “Big Moves,” the actions local governments can take to reduce community GHGs.

**VIEW ROYAL
COMMUNITY
CLIMATE ACTION
STRATEGY**

**The Town of View Royal
is taking action on
climate change**

**How can you get involved in shaping
View Royal's climate strategy?**

- Complete both resident surveys
- Learn more about climate change in View Royal
- Apply to attend a stakeholder workshop (space is limited)

Social media card used to recruit residents to provide feedback on the Community Climate Action Strategy

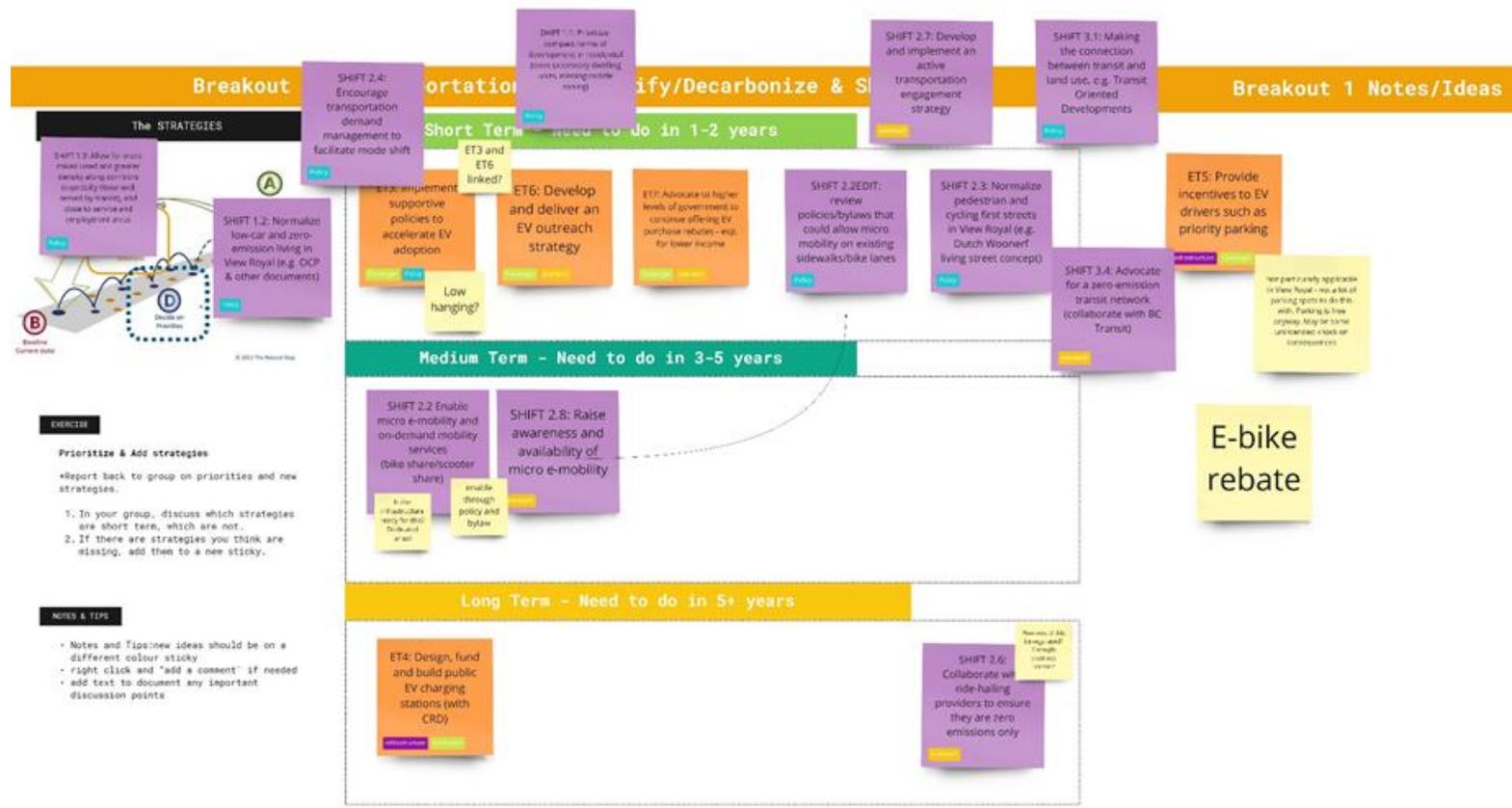
Workshop #1 - Vision & Current State

During planning and engagement process for this strategy, community stakeholders went through a visioning exercise called “backcasting” to imagine what a low carbon future for Town of View Royal 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-created visions for the Town as imagined by stakeholders was:

	The Future of Transportation	The Future of Buildings	The Future of Waste
Vision	<p>An integrated multimodal transportation network</p> <p>Zero emissions transportation network</p> <p>Culture shift towards cycling and other forms of active transportation</p> <p>Continuous and safe infrastructure for walking</p> <p>Fewer cars due to autonomous vehicles and zero emissions car share options</p>	<p>By 2030, no fossil fuels and wood are used for heating buildings in View Royal. We've transitioned all buildings to zero emissions fuels, e.g. heat pumps, geothermal, etc.</p> <p>All new buildings meet step five of the BC Energy Step Code. They are built using low carbon products and recycled materials</p> <p>Residents are supported through the building retrofit process. 50% of all existing buildings have received a low carbon retrofit that includes insulation, windows, and heat pumps</p> <p>Our buildings are resilient to the impacts of climate change with green and white roofs, heat pumps for cooling and air filtration</p> <p>Residential and commercial development is located within walking and cycling distance to public transit, neighbourhood services and recreation opportunities</p>	<p>In 2040 – all waste is reused or recycled. Municipally supported education campaigns mean that everyone knows what to do with their waste, and we have changed mindsets. Waste is as close to zero GHGs as possible.</p> <p>Recycling of materials from construction and deconstruction of buildings has sharply improved.</p> <p>The community also grows much of its own food, and is maintaining & preserving natural assets including our urban tree canopy</p>
Future State	<p>Heavy through-traffic</p> <p>Safety concerns for pedestrians</p> <p>Pedestrians not prioritized</p> <p>Bus #14 is well used but other areas are underserved</p> <p>Concerns over bike theft</p> <p>World class E&N and Galloping Goose Regional Trails</p>	<p>Talent and expertise already exist in the region for new construction and retrofits. Energy advisors, builders, contractors, etc.</p> <p>Knowledgeable and motivated residents.</p> <p>Heat pumps are now needed for cooling and that is driving change.</p> <p>There are supply chain issues that are impacting uptake of retrofits and new low carbon new construction</p>	<p>There is lots of room for improvement, but there are good things happening. Knowledge / awareness are major issues, producer responsibility, mindsets, the amount and what we consume, and how we reuse and repair</p>

Workshop #2 - Creative Solutions and Action Prioritization

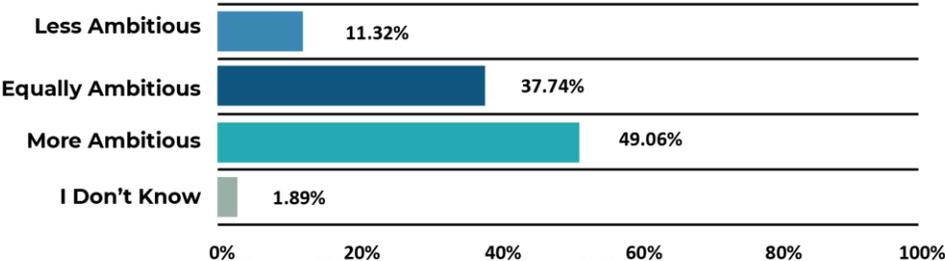
In the second workshop, attendees were asked to examine the actions identified in the Big Moves and balance that against the vision and current state developed in the first workshop, in order to inform the customized actions which will enable View Royal to meet their climate objectives. They were then 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.



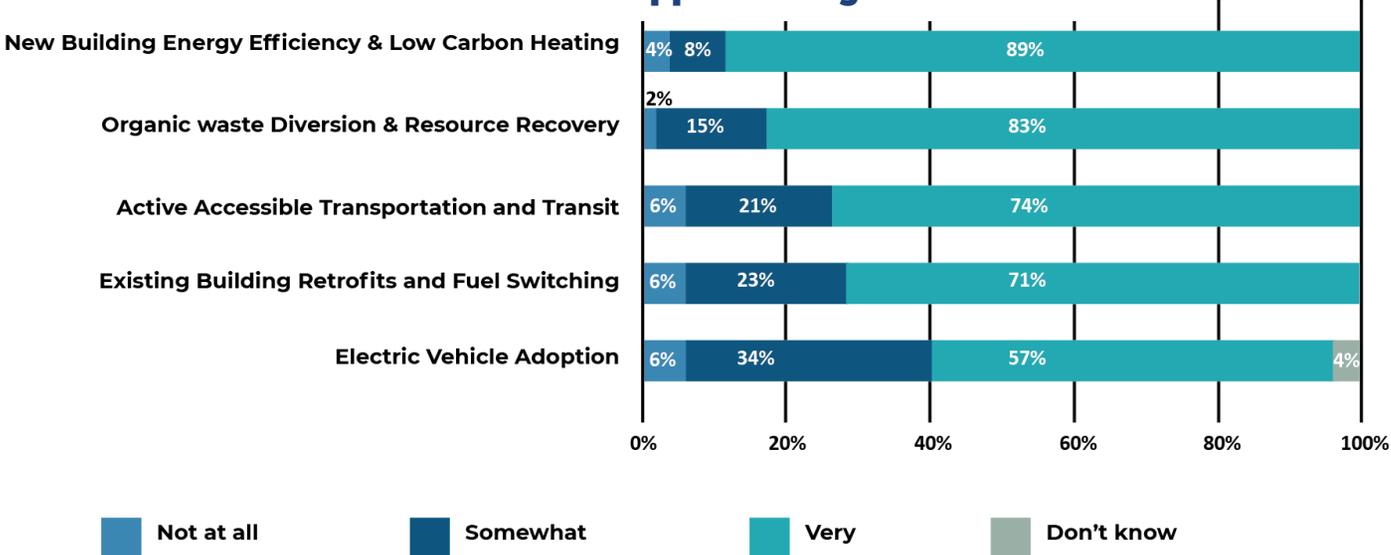
Survey Highlights

Public surveys were conducted after the stakeholder workshops to confirm the direction articulated by workshop participants – just under 100 respondents to the first survey, and 54 to the second. Overall, respondents agreed with ambitious GHG reduction targets, with 49% believing that the targets should be more ambitious. Respondents also supported each of the Big Moves, with very strong support for new building energy efficiency and low carbon heating and organic waste and resource recovery actions.

Do you want View Royal’s GHG reduction targets to less, equally, or more ambitious than 40-45% by 2030 and net zero by 2050?

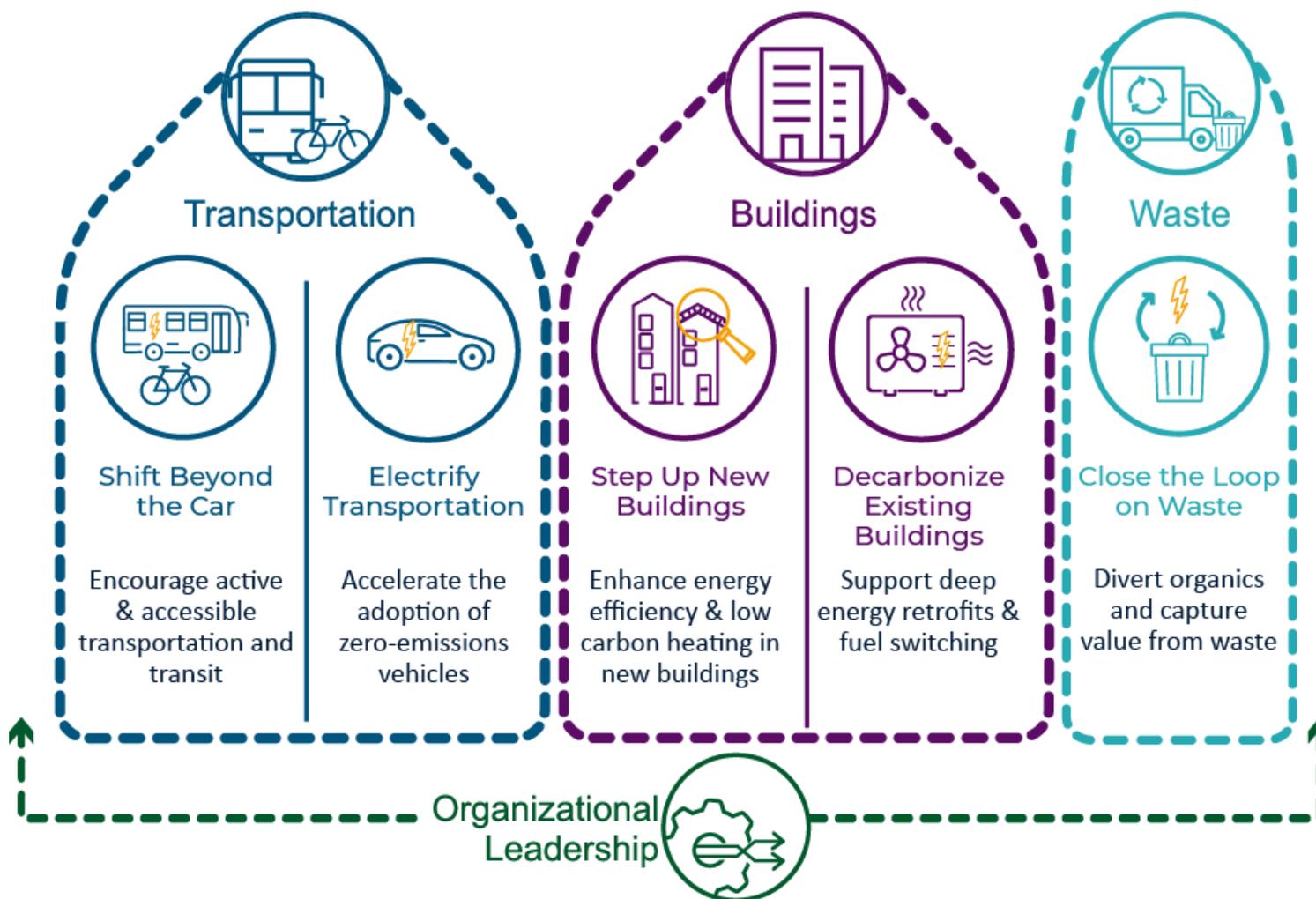


Support for Big Moves



Taking Action

The strategy is organized into five 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 within the control of local governments. Each big move has a vision and objectives as well as specific actions the Town can take to lay the foundation for individuals and businesses to make cleaner choices.



Action Plan Guide

The following pages outline each of the five 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.

Strategy	Actions Summary	Lever	Time	Cost
SHIFT 1: Compact community growth SHIFT 1.1 – Optimize policies and bylaws for compact growth	Apply OCP policies, development permit guidelines and zoning bylaws that focus development in complete, compact centres and transit-oriented corridors.			\$

Objective

Timeframe (short, med, long)

Strategy

Summary of actions under the strategy

Primary local government lever (infrastructure, policy, engagement)

Investment (low, med, high)

Legend

Lever		Timeframe			Cost	Definition	
Infrastructure		Short (1-3 years)			Low	<\$25,000	\$
Policy & Regulation		Medium (3-7 years)			Med	\$25,000 - \$100,000	\$\$
Engagement & Outreach		Long (7+ years)			High	>\$100,000	\$\$\$

Notes:

- Many strategies utilize more than one local government lever.
- 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:

Passenger vehicles are responsible for 45% of the greenhouse gas emissions generated from residents and businesses in View Royal. Transportation fuels such as gasoline and diesel are the largest expenditure on energy in the community at \$13M 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.



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, equitable, economical and environmentally-friendly modes of transportation. View Royal can continue to design and build well-connected, accessible, safe and enjoyable routes. 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 equitable 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

- More accessible active transportation, transit, and shifts in land use patterns result in each resident making 75 fewer trips in their personal vehicle each year.
- 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.
- 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

The CleanBC Roadmap commits to increasing the share of trips (e.g., commuting for work and personal activities) made by walking, cycling, transit to 30% by 2030, 40% by 2040 and 50% by 2050.

The government also developed [Move Commute Connect – B.C.’s Active Transportation Strategy](#) to outline how the Province plans to work with local governments to achieve these targets.

Federal Action

The Government of Canada’s recent climate plan 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

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 timescale of development.

Strategy	Actions Summary	Adaptation Benefits	Lever	Time	Cost
SHIFT 1: Optimize land-use planning for compact community growth					
1.1.1 – Prioritize compact forms of development in residential zones (accessory dwelling units, missing middle zoning)	<ul style="list-style-type: none"> ✓ Amend the OCP and zoning bylaw to prioritize compact development. ✓ Allow for accessory dwelling units across the Town and create missing middle zones. ✓ Review OCP and planned development to identify opportunities to further incent or require infill development. ✓ Leverage CLIC (Community Lifecycle Infrastructure Costing) tool to assess financial impacts of development proposals. 	<p>Development can be prioritized in areas that are more resilient to climate change.</p> <p>As infrastructure is installed / replaced, it can be designed to be more climate resilient.</p>			\$
1.1.2 – Normalize low-car and zero-emission living in View Royal	<ul style="list-style-type: none"> ✓ Use the OCP and transportation plans to highlight the benefits of low-car and zero-emissions living. 	<p>As summer temperatures increase, tailpipe emissions will increase ground level ozone. Reducing these emissions will improve air quality. Improving air quality and access to transportation alternatives, and reducing congestion also helps to build resilience.</p>			\$
1.1.3 - Allow for more mixed used and greater density along corridors and close to service and employment areas	<ul style="list-style-type: none"> ✓ Consider amending the OCP and zoning bylaw to allow for more density along corridors, especially those well served by transit. ✓ Add mixed-use neighborhood commercial as a permitted use in zoning bylaw for specified locations such as corner lots and centrally located larger properties 	See 1.2			\$

1.1.4 - Develop employment areas in the Town	<ul style="list-style-type: none"> ✓ Consider amending the OCP and zoning bylaw to create zoning categories for industrial and commercial employment areas. ✓ Review employment locations and link location/land use to local economic development goals 	This will help to build resilience by increasing ability of people to work closer to home. It may reduce congestion and thus improve air quality.				\$
1.1.5 - Develop and deliver outreach on the climate and livability benefits of compact, complete communities	<ul style="list-style-type: none"> ✓ As part of outreach materials for the Community Climate Action Strategy and OCP, highlight the health, climate, affordability, local economic development, and budgetary benefits of compact, complete communities. 	See 1.2 In addition, this may help the Town reduce development in areas at higher risk from climate change, and protect natural assets. A complete compact community can also have lower infrastructure costs, enhancing resilience.				\$
1.1.6 - Continue to advocate for strong urban growth boundaries	<ul style="list-style-type: none"> ✓ Advocate for strong urban growth boundaries in the CRD's Regional Growth Strategy process. 	See 1.5				\$
1.1.7 - Develop "Work from Home" community and business engagement strategy	<ul style="list-style-type: none"> ✓ Develop a strategy to encourage people who work remotely to reside in the community, e.g. promote the benefits of living in the community. 	This action will help improve air quality. It will also promote community resilience by increasing employment options.				\$
SHIFT 2: Increase walking, cycling and other forms of zero emission mobility						
1.2.1 – Develop an active transportation strategy	<p>IN PROGRESS</p> <ul style="list-style-type: none"> ✓ Develop an Active Transportation Strategy that identifies gaps in the network. ✓ Implement supportive policies such as a Complete Streets Policy and others to increase AAA infrastructure. ✓ Survey the community on travel habits and what services / opportunities are needed within the community to reduce out-of-community travel. 	See 1.2				\$ \$
1.2.2 – Review policies/bylaws that could allow micro	<ul style="list-style-type: none"> ✓ Continuously improve active transportation infrastructure including reconfiguring existing streets and building safe and convenient active transportation paths to connect all neighborhoods. 	See 1.2				\$

mobility on existing sidewalks/bike lanes						
1.2.3 – Normalize pedestrian and cycling first streets in View Royal (e.g. Dutch Woonerf living street concept)	<ul style="list-style-type: none"> ✓ Ensure that there is integration of walking and cycling infrastructure in all future transportation engagement and planning. 	See 1.2				\$
1.2.4 – Encourage transportation demand management to facilitate mode shift	<ul style="list-style-type: none"> ✓ Require comprehensive TDM plans as part of the Development Permit process for larger developments. ✓ Work with existing employers such as the hospital to develop a comprehensive TDM strategy. ✓ Apply trip-end facility requirements to all commercial and industrial buildings regardless of gross floor area. 	See 1.2				\$
1.2.5 – Build safe routes for walking, cycling and other forms of zero emission mobility	<p>IN PROGRESS</p> <ul style="list-style-type: none"> ✓ Building off a comprehensive active transportation strategy, begin to allocate capital dollars to priority routes in View Royal. ✓ Prioritize budgeting for key AAA transportation infrastructure that will connect major destinations (schools, shopping) to main residential areas. 	See 1.2				\$ \$ \$
1.2.6 – Develop and implement an active transportation engagement strategy	<ul style="list-style-type: none"> ✓ Connect with community members to learn about their active transportation needs with a special focus on equity-seeking groups. ✓ Dedicate staff time for promotion and education around active transportation. ✓ Collaborate with communities in the region on shared outreach capacity. ✓ Promote events such as Bike to Work Week. 	See 1.2				\$
1.2.7 – Raise awareness and availability of micro e-mobility	<ul style="list-style-type: none"> ✓ 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. 	See 1.2				\$

SHIFT 3: Increase transit ridership and a support a transition to a zero emissions transit network						
1.3.1 – Make the connection between transit and land use, e.g. Transit Oriented Developments	<ul style="list-style-type: none"> ✓ Allow for greater density in nodes and corridors well serviced by transit. 	See 1.2 Also should help with compact land-use and reduced infrastructure costs.				\$
1.3.2 – Collaborate with CRD & BC Transit to develop high frequency transit priority routes along corridors (e.g. Highways)	<p>IN PROGRESS</p> <ul style="list-style-type: none"> ✓ Continue work with BC Transit on the development of high frequency transit and the use of the E&N corridor for commuter rail. 	See 3.1				\$
1.3.3 - Collaborate with transit providers to expand transit ridership through free days or reduced fares for certain age groups	<ul style="list-style-type: none"> ✓ Promote transit ridership by offering free transit days (such as those with bad air quality or very cold weather) and celebrating new routes. ✓ Ultimately explore universal free transit with transit providers. 	See 3.1				\$
1.3.4 - Advocate for a zero-emission transit network (collaborate with BC Transit)	<ul style="list-style-type: none"> ✓ Work with BC Transit, the CRD and neighbouring communities to ensure that transit progressively transitions to zero emissions vehicles (e.g. electric), thus improving air quality in View Royal. 	Will improve air quality				\$



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 GHG 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.

View Royal has already begun this journey by ensuring that all new residential buildings are EV ready and provided with the infrastructure to easily support the installation of charging stations in parking spaces in the future.

Looking Forward to 2030 - An Aspirational Target

- All new passenger vehicles purchased by View Royal residents are electric and EVs account for over 50% of cars on the road.
- A robust and strategically designed charging network ensures infrastructure is available at workplaces and public parking spaces.

Objectives

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

The Clean BC Roadmap commits to accelerating the existing [Zero Emissions Vehicle Act](#) to 26% of new light-duty vehicles by 2026, 90% by 2030, 100% by 2035).

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.

Federal Action

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

Strategies for Electrifying Passenger Transportation

New vehicle sales are approximately 10% of total vehicle stock annually. Switching to an EV from a fossil fuel 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 Town of View Royal can help influence local EV adoption.

Strategy	Actions Summary	Adaptation Benefits	Lever	Time	Cost	
2.1.1 – Adopt EV-ready building requirements - single family home	✓ COMPLETE – Zoning bylaw amendments passed in 2021	As summer temperatures increase, tailpipe emissions will increase ground level ozone. Reducing these emissions will improve air quality. Improving air quality also helps to build resilience.				\$
2.1.2 – Adopt EV-ready building requirements - MURBs & Commercial	✓ COMPLETE – Zoning bylaw amendments passed in 2021	See 1.1				\$
2.1.3 - Implement supportive policies to accelerate EV adoption	✓ Adjust speed limits to enable low-speed EVs on select streets.	See 1.1				\$
2.1.4 - Design, fund and build public EV charging stations (with CRD)	<ul style="list-style-type: none"> ✓ Leverage grant opportunities to install an annually increasing number of EV charging stations at key locations throughout the community. ✓ Collaborate with other local governments and the CRD on a regional charging network strategy. 	See 1.1				\$\$ \$

Strategy	Actions Summary	Adaptation Benefits	Lever	Time	Cost
2.1.5 - Provide incentives to EV drivers such as priority parking	<ul style="list-style-type: none"> ✓ Provide perks to EV drivers such as priority parking. Incent ride hailing, taxi operators and other fleet operators to switch to EV's. 	See 1.1			\$
2.1.6 - Develop and deliver an EV outreach strategy	<ul style="list-style-type: none"> ✓ 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. ✓ Provide information to residents about Provincial EV charging incentives ✓ Advise local groups of EV outreach incentives from Emotive 	See 1.1			\$
2.1.7 - Advocate to higher levels of government to continue offering EV purchase rebates	<ul style="list-style-type: none"> ✓ With a focus on rebates for used vehicle and differing incentive rates for lower income residents and charging station rebates for MURB's. 	See 1.1			\$

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 25% of the greenhouse gas emissions generated in View Royal. The main source of emissions is natural gas and fuel oil used for space and water heating in existing building.

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

View Royal's population is growing rapidly, and every new building built to minimum code standards and using fossil fuels for heating is a lost opportunity for improved energy efficiency, reduced carbon emissions. One more building that will have to be retrofitted down the road.

While existing buildings generate the majority of building-related greenhouse gas emissions, new construction is still very important for reducing emissions. 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 influence emissions by implementing the regulation in tandem with incentives that target zero-emission heating and cooling systems in advance of the new provincial target of 2030.

Looking Forward to 2030 – An Aspirational Target

- All new buildings will be built to the BC Energy Step Code and will begin to become more efficient ahead of the provincially mandated timeline.
- 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. Adopt the BC Energy Step Code
2. Prioritize a low-carbon approach (e.g. heat pumps)

Provincial Action

The province's CleanBC Roadmap to 2030 The Provincial commits the province to developing a zero-carbon building code by 2030

This accelerated the existing timelines for the BC Energy Step Code performance targets:

- By 2027, all new buildings will be 40% more energy efficient

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.

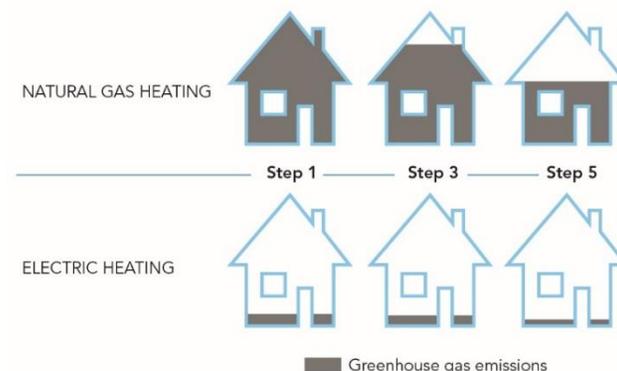
Federal Action

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

Step Code is an efficiency code, not a GHG code. Energy 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. The graphic to the right illustrates that the Energy Step Code alone does not sufficiently address GHG emissions in new buildings. The fuel source for heating is the biggest influencer of emissions. *Source: Metro Vancouver Climate 2050 Buildings Roadmap.*

Greenhouse Gas Emissions by Heating Type



Strategy	Actions Summary	Adaptation Benefits	Lever	Time	Cost
3.1.1 Adopt the BC Energy Step Code and timeline for full implementation (i.e.) Step 5	<ul style="list-style-type: none"> ✓ Amend Building Bylaw to require Step 3 for Part 9 buildings, and exploring Step 4 in advance of the Provincial deadline of 2027 (and Step 5 in 2032). ✓ For Part 3 buildings, the Town should work to phase in requirements for the various categories of Part 3 buildings in advance of the Provincial deadlines. 	<p>Better insulated buildings will be better able to withstand periods of extreme heat.</p> <p>More airtight buildings, and those with heat recovery ventilators (aka “fresh air machines”), will be more resilient during episodes with poor air quality.</p>			\$
3.1.2 Prioritize a low-carbon approach (e.g. heat pumps)	<ul style="list-style-type: none"> ✓ Conduct consultation with the local building industry about low carbon approaches to the Energy Step Code ✓ 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 (primarily heat pumps). ✓ Adopt the Provincial GHG metrics when they become available in 2022. 	<p>Heat pumps also provide efficient air conditioning, and will make a building more resilient during periods of extreme heat.</p>			\$
3.1.3 Require home energy labelling as part of Step Code compliance	<ul style="list-style-type: none"> ✓ Require that all new homes receive an EnerGuide label as part of the administrative requirements for step code compliance. http://energystepcode.ca/app/uploads/sites/257/2018/07/Bulletin1-HomeEnergyLabelling-July2018.pdf 	<p>Ties in to the same adaptation benefits as 1.1 and 1.2, as the more efficient the building and the more efficient the heating / cooling system, the better the EnerGuide label.</p>			\$



Where We Live and Work

Decarbonize Existing Buildings

Support deep energy retrofits and fuel switching

Overview

In 2030, the vast majority of the buildings in View Royal 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.

The Town of View Royal 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.

Objectives

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

Provincial Action

The CleanBC Roadmap to 2030 commits to incorporating energy-efficiency standards for existing buildings into the BC Building Code starting in 2024.

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.

Looking Forward to 2030 – An Aspirational Target

- Approximately 80 homes will undergo an energy efficiency retrofit annually between now and 2030.
- Approximately 40 homes with a fossil fuel heating and hot water systems will replace them with low carbon systems annually between now and 2030.

Strategies for Decarbonizing 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	Actions Summary	Adaptation Benefits	Lever	Time	Cost
EXISTING BUILDINGS: Improve Energy Efficiency and Enable Fuel Switching					
4.1.1 Encourage & enable energy retrofits through supportive policies and removing barriers	<ul style="list-style-type: none"> ✓ The Town will explore the various policy recommendations for supporting low carbon retrofits as per sections 3 and 4 of this report: https://docs.communityenergy.ca/wp-content/uploads/2021-03-19_BCH_LCB_Toolkit_Final-1.pdf AND will monitor the upcoming “Retrofit Code” expected to be released in 2024. 	<p>Better insulated buildings will be better able to withstand periods of extreme heat.</p> <p>More airtight buildings will be more resilient during episodes with poor air quality.</p>			\$
4.1.2 Establish requirements for home energy labelling and building energy benchmarking	<ul style="list-style-type: none"> ✓ Making energy use visible is an important part of creating value for energy efficiency in the market and driving emissions reductions in from buildings. ✓ View Royal should explore joining Building Benchmark BC and signing up large building owners in the Town to the program. ✓ The Province of BC committed to home energy labelling as part of the recently launched CleanBC roadmap to 2030. 	<p>Ties in to the same adaptation benefits as 1.1 and 1.2, as the more efficient the building and the more efficient the heating / cooling system, the better the Benchmark rating / EnerGuide label.</p>			\$

Strategy	Actions Summary	Adaptation Benefits	Lever	Time	Cost
4.1.3 Continue to provide top-up incentives for building through CleanBC rebates top-ups	✓ IN PROGRESS – In the fall of 2021 View Royal Council supported providing heat pump top-up rebates to residents through the CleanBC Better Homes program.	Heat pumps also provide efficient air conditioning, and will make a building more resilient during periods of extreme heat.			\$\$
4.1.4 Support the development of CRD regional retrofit service for residents.	✓ IN PROGRESS – Work with the CRD to develop a retrofit concierge service that aids View Royal residents to better understand the retrofits needed to reach the Town’s climate targets. The service will also provide support on applying to available incentives and choosing contractors.	See 1.1			\$ \$
4.1.5 Identify and remove barriers to heat pump installation	✓ The Town should identify and remove barriers to heat pump installation, including streamlining permitting processes, optimizing noise regulations, and restructuring permit fees.	See 1.3			\$
EXISTING BUILDINGS 2: Build Industry Capacity and Increase Demand					
4.2.1 Partner with other CRD on any long-term marketing campaigns	✓ The Town will collaborate with the CRD, through the Regional Retrofit Service, to develop a long-term marketing campaign aimed at encouraging residents to undertake building envelope improvements, electrification or low carbon fuel sources	See 1.1 and 1.3 In addition, this action can help with marketing to the public on how to make their properties more resilient to climate change.			\$
4.2.2 Partner with CRD to educate renovators/realtors on energy efficiency and low carbon choices for heating/hot water	✓ 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.	See 1.1 and 1.3 In addition, this action can help with marketing to key stakeholders and the public on how to make buildings more resilient to climate change.			\$

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 5% of our community's GHG emissions. There is currently organic waste pick up service in View Royal but it needs to be expanded to more building types and further efforts to keep construction and demolition waste out of the landfill are needed.

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. While View Royal currently has organic waste pick-up for food waste from homes, other sources of organic materials (such as wood waste and paper) that cannot be recycled (such as food-soiled paper), and textiles are still ending up in the landfill.

While the CRD has been a leader in diverting the region’s organic waste from the landfill and capturing landfill gas, there is still action to be taken to ensure that other organics like clothing, construction and demolition waste, organics for multi-unit residential buildings, etc. remain out of the landfill.

A 2017 CRD study pointed out the “only material to have increased in waste generation compared to all other years since 2001 was wood and wood products, now representing 61 kg/capita”¹ in the Hartland Landfill. This is primarily wood from construction, renovation and demolition activities.

Note that the Hartland Landfill has been capturing landfill gas for electricity generation for BC Hydro, but will instead soon start selling this to FortisBC for its Renewable Natural Gas program.

Looking Forward to 2030 - An Aspirational Target

- 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. Further divert organics from the landfill
2. Expand organics pick up to more building types including multi-unit residential buildings, commercial properties, etc.

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	Adaptation Benefits	Lever	Time	Cost
5.1.1 – Adopt policies that drive increased organics diversion (e.g. deconstruction policy)	<ul style="list-style-type: none"> ✓ Despite curbside organics pick-up, organic waste still makes up a large portion of the waste stream in the CRD. ✓ Part of this organic waste stream is composed of wood waste from demolition of existing buildings (particularly wood framed homes). View Royal should evaluate the benefit of a deconstruction policy to ensure that the valuable old growth timber in these buildings is reused and does not end up in the landfill where it turns to methane. ✓ Support CRD in identifying and pursuing options to support and grow the market for salvaged deconstruction materials. 	The composted waste from organics diversion initiatives can have a strong adaptation benefit. Compost added to soil can help the soil's capacity to absorb water (e.g. during high precipitation events), and to retain it (e.g. during periods of drought).			\$
5.1.2 – Include MURBs, institutional (e.g. Island Health), and commercial properties in requirements to divert organics & recycle	<ul style="list-style-type: none"> ✓ Work with CRD to complete assessment (inventory) of community organic waste volumes and feasibility of further landfill diversion from MURBS. ✓ Expanding this service will ensure further organics stay out of the landfill. 	See 1.1			\$\$ \$
5.1.3 - Implement an enhanced organics collection (public waste bins)	<ul style="list-style-type: none"> ✓ Implement organics collection in public waste bins in high traffic areas throughout View Royal (including Recreation Centre, major shopping centres, transit hubs, etc). 	See 1.1			\$
5.1.4 - Collect construction, demolition, agricultural, and industrial wood waste	<p>IN PROGRESS</p> <ul style="list-style-type: none"> ✓ This waste is currently not sufficiently collected. Although there can be difficulties in collecting some of this waste due to potential contamination issues, opportunities to expand collection of it could be explored with CRD. 	See 1.1			\$
5.1.5 - Develop and deliver a comprehensive zero-waste outreach	<p>IN PROGRESS</p> <ul style="list-style-type: none"> ✓ Work with the CRD and neighbouring communities to share a zero-waste outreach program that may include community-led composting projects, school programs, participation in the 	See 1.1			\$

Strategy	Actions Summary	Adaptation Benefits	Lever	Time	Cost
program (e.g. education)	<p>Provincial “Love Food Hate Waste” campaign and education around source-separation requirements.</p> <ul style="list-style-type: none"> ✓ Educate and communicate the source-separation requirements in the region on Town social media. ✓ Support existing and new capacity for reusable resources, including Free Swaps, Share Sheds, free-store for unwanted goods, and building materials depot. 				
5.1.6 - Consider advocating to the CRD for expanded regional organics processing (facility for composting, or anaerobic digestion)	<ul style="list-style-type: none"> ✓ Work with the CRD to ensure that capacity for regional organics processing is expanded, to help ensure that organics stay out of the landfill. 	See 1.1			\$
5.1.7 - Establish a regular yard waste pickup for detached dwellings	<ul style="list-style-type: none"> ✓ Consider integrating it in to the kitchen waste pickup. 	See 1.1			\$

Other Opportunities

In the engagement workshops we explored opportunities for the Town of View Royal beyond the prescribed Big Moves. These included local renewable energy actions, primarily rooftop solar, carbon sequestration actions including preservation of natural assets, wood-framed buildings for new buildings, and carbon capture technologies. The action summaries and timelines for implementation are shown below.

Strategy	Actions Summary	2022	2023	2024	2025	Later
LOCAL RENEWABLE ENERGY						
6.1.1 Remove barriers to building-level renewable energy projects.	Amend zoning bylaws, permitting process, etc. to remove barriers to local renewable energy projects such as rooftop solar panels.	X				
SEQUESTRATION						
6.2.1 Explore encouraging 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	
6.2.2 Preserve & expand urban tree canopy within the municipal boundary	Create a strategy or plan to achieve this, and then implement.	X				
6.2.3 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
OTHER						
7.1.1 Encourage people to buy local in our grocery stores (to reduce commercial vehicle traffic)	Conduct public engagement on this. This action will help to reduce waste, commercial vehicle traffic, and promote resilience by supporting local businesses and people and keeping money local.	X				
7.1.2 Encourage people to buy less and waste less, encourage meal planning, try to change mindsets	Create a public engagement campaign to provide support for repair cafes, tool lending libraries, etc. Share info on CRD's food waste campaign on Town social media.	X				



Organizational Leadership Implementation for Success

Several key factors are important for the successful implementation of community climate action strategies 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.

Incorporate	Embed climate action into other planning documents such as the OCP, bylaws and policies, departmental/master plans, as well as development proposals. Climate action could also be incorporated into Town staff job descriptions. Some communities report on climate action or sustainability implications in reports to Council.
Budget	Embed climate action into the budgeting process. Further ideas for external funding are provided in the chart on the following page.
Monitor	Monitor indicators as outlined in the Monitoring and Evaluation section.
Network & Convene	Network with leaders in the climate action sector. View Royal staff can join CEA’s BC Hydro funded Step Code, retrofit, and EV peer networks. A View Royal Council member might also want to join CEA’s BC Municipal Climate Leaders Council. Continue to 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. In the past many communities aligned this reporting with the annual CARIP reporting for the Province. CARIP is currently being redesigned and the opportunity to align will most likely still exist. Submit the plan to Federation of Canadian Municipalities’ Partners for Climate Protection Program (CEA can assist). A Monitoring and Evaluation Framework with key performance indicators is located in Appendix C. Staying Accountable.

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

Renew

Prepare for plan renewal approximately every five years.

Funding Climate Action

Funding sources that communities typically use for climate action are shown in the table below.

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 	<ol style="list-style-type: none"> 1. Union BC Municipalities Gas Tax Agreement Funds 2. Federation of Canadian Municipality’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 10. Potential funding from CARIP replacement

Forecasting: Action Plan Projection

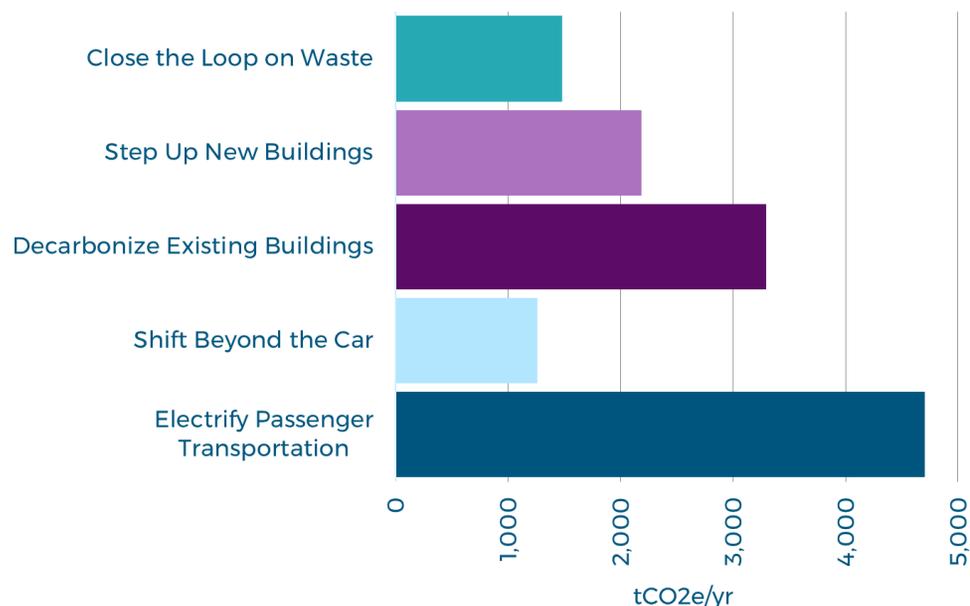
The chart shows the modelled emissions reduction by Big Move for the year 2030, relative to business as usual (BAU) projections. If all Big Moves are implemented in View Royal to the degree outlined in this Plan, GHG emissions in 2030 could be reduced by 12,900 tonnes of CO₂e below the 2030 BAU, or 17,300 tonnes below 2007 levels, a total reduction of 36%.

Whilst the BAU scenario assumes a certain level of passenger vehicle electrification, this Big Move still presents the greatest opportunity for emissions reductions, at 4,700 tonnes CO₂e. Shifting Beyond the Car offers the potential to further reduce transportation emissions by 1,260 tonnes CO₂e. Retrofitting the existing building stock by fuel switching and improving energy efficiency presents a savings of 3,290 tonnes CO₂e.

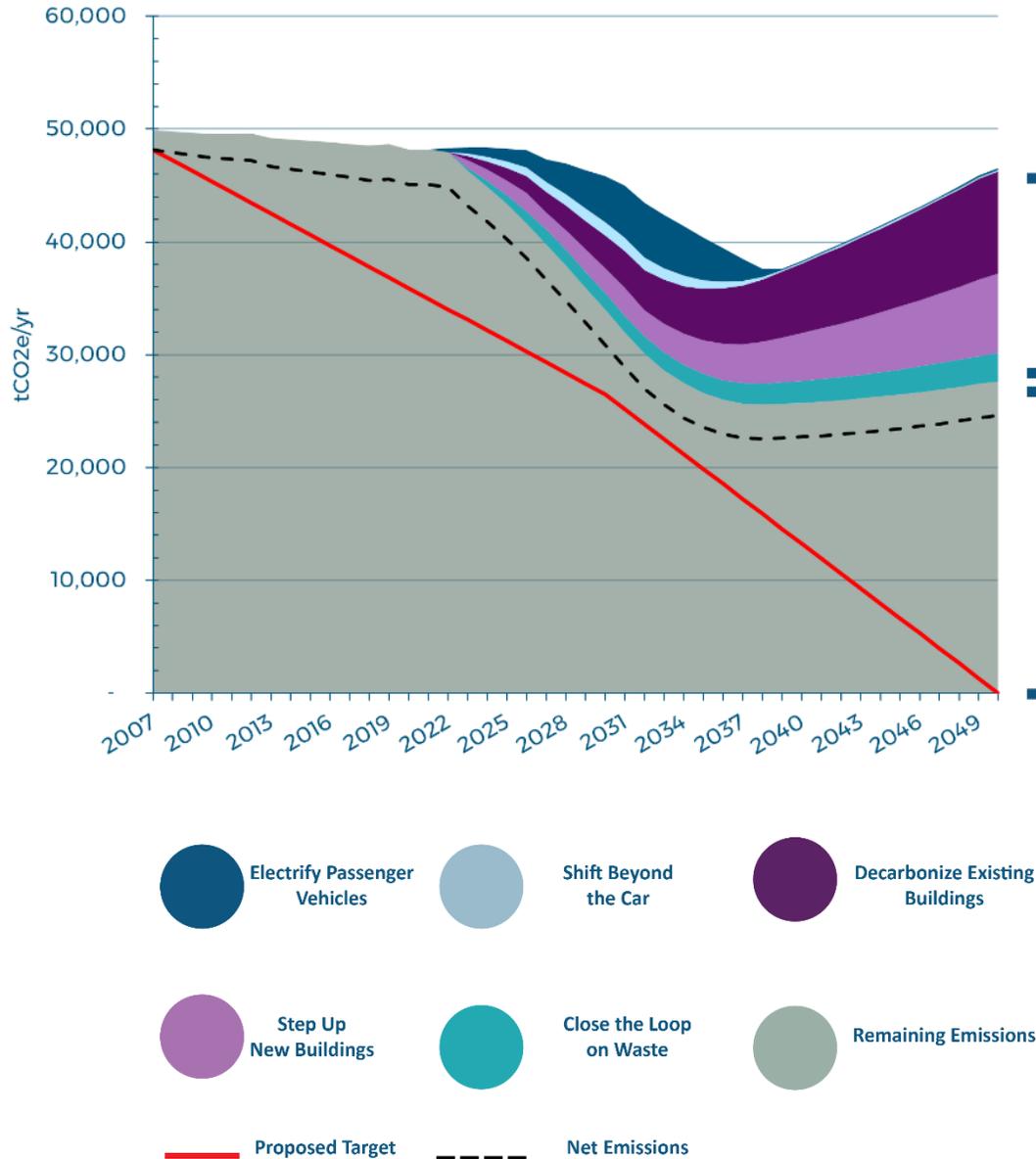
Enhancing efficiency and implementing GHG reduction measures for new buildings can reduce emissions by 2,180 tonnes CO₂e. Closing the Loop on Waste by diverting more organics from landfill can reduce emissions by 1,480 tonnes CO₂e.

The following chart shows the emissions reduction by Big Move to 2050 relative to the BAU. 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 View Royal to achieve the target.

Modelled Emissions Reduction By Big Moves 2030



Emissions Reductions by Action From BAU, tonnes/year



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 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.

Appendix A. Inventory and Modelling Methodology

This appendix contains details on the methodology and assumptions for creating the GHG inventory and projections for Town of View Royal.

Inventory

View Royal's GHG inventory was created using data for buildings, transportation, waste, and other sectors sourced from the Stantec report *Capital Regional District – Municipalities and Electoral Areas 2007 Base Year and 2018 Reporting Year Energy & GHG Emissions Inventory*, herein referred to as the "Stantec Municipal Report".

Selected methodological data will be made available in this report; for a full list of methodologies employed, please consult the following Stantec report: *Capital Regional District 2018 GPC BASIC+ Community Greenhouse Gas (GHG) Emissions Inventory Report*, herein referred to as the "Stantec CRD report". Based on the data compiled, full inventory years were created for 2007 and 2018.

The following emission sources were included as part of this inventory, and divided into the appropriate scope:

Scope 1 Emissions

Stationary Energy

- Residential buildings
- Agriculture, forestry, and fishing activities
- Commercial and institutional buildings, and facilities
- Energy industries
- Fugitive emissions from oil and natural gas systems

Transportation

- On-road
- Waterborne
- Aviation
- Off-road

Industrial Process & Produce Use (IPPU)

- Product Use

Agriculture, Forestry, and Other Land Use (AFOLU)

- Land-Use
- Livestock
- Aggregate Sources and Non-CO2 Emissions Sources On Land

Scope 2 Emissions

Stationary Energy

- Emissions from the consumption of grid-supplied electricity, steam, heating, and cooling

Scope 3 Emissions

Stationary Energy

- Transmission and distribution losses of electricity, steam, heating, and cooling

Transportation

- On-road
- Waterborne
- Aviation
- Off-road

Waste

- Solid waste disposal
- Biological treatment of waste
- Wastewater treatment and discharge

The Stantec CRD report states that:

- *BC Hydro and Fortis BC provided the Province of BC electricity and natural gas consumption data in MWh and GJ, respectively.*

- *The Province developed 2007, 2010 and 2012 residential fuel oil, propane and wood GHG energy use estimates from the number and type of dwellings and the average dwelling consumption by authority and region from the BC Hydro Conservation Potential Review. This data was used to estimate the reporting year GHG emissions for all CRD members except for the District of Saanich and the City of Victoria who provided fuel oil estimates for residential and commercial buildings.*
- *Fortis BC provided the fugitive emission estimate.*
- *The CRD provided landfill gas energy generation data from the Hartland landfill.*
- *Applicable, off-road GHG emissions included in the Stationary Energy Sector are based on the 2020 NIR as prepared by Environment and Climate Change Canada. These emissions are pro-rated to the CRD on a per capita basis.*
- *The Province of BC provided 2007, 2010 and 2018 ICBC vehicle registration data.*
- *BC Transit provided total diesel and gasoline fuel use. This data was used to estimate GHG emissions from busses serving the CRD.*
- *The 2017 CRD Origin Destination Travel Survey was used to estimate on-road in-boundary and transboundary split for registered vehicles and busses. The CRD Origin Destination Travel Survey is based on travel patterns observed in the Capital Regional District (CRD) level.*
- *Aviation GHG emissions from the Victoria International Airport were estimated using 2015 aircraft flight profiles, and the total number of aircraft movements reported in 2018. These data sets were provided by the Victoria International Airport.*
- *Victoria harbour aviation GHG emissions were estimated using Victoria harbor aircraft movement statistics, estimated taxi times, and estimated fuel use for the DHC-6 Twin Otter type of plane. This data was taken from Statistics Canada.*
- *Marine watercraft GHG emissions were estimated using published BC Ferries fuel statistics. GHG emissions from the Coho Ferry, the Victoria Clipper Ferry, personal and commercial watercraft, were estimated based on a Study entitled “Marine Vessel Air Emissions in BC and Washington State Outside of the GVRD and FVRD for the Year 2000”. The Transport Canada Vessel Registration System provided the total number of registered waterborne vehicles for the reporting year.*
- *The Greater Victoria Harbour Authority provided an estimate of cruise ship emissions.*
- *Other off-road transportation emissions are based on the 2020 NIR as prepared by Environment and Climate Change Canada.*

Emissions factors for the 2007 base year, and 2018 inventory year are shown in the following table and are sourced from the 2020 National Inventory Report.

Emissions Factors Used for Inventory Years

GHG/GJ, by Year	2007	2018
On-road Mobility fuels	0.071	0.065
Off-road Mobility fuels	0.097	0.089
Non-Mobility Diesel	0.077	0.073
Electricity	0.007	0.003
Natural gas	0.050	0.050
Wood	0.023	0.023
Heating Oil	0.068	0.068
Propane	0.061	0.061

Note: some of the emission factors have changed over time. For example, the emission factors for mobility fuels have decreased as a result of the Renewable and Low Carbon Fuel Requirements Regulation and the emissions factor for electricity has decreased as a result of ongoing efforts to decarbonise the BC Hydro electricity grid.

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. However, 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 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 View Royal’s electricity emissions factor to be 10.67 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), then it would approximately triple.

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 View Royal 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).

Inventory Assumptions

Assumptions made with respect to the inventory are as follows:

- The Province of BC made a series of standard assumptions in the creation of the CEEI data for 2007, which are outlined on the CEEI webpage: <https://www2.gov.bc.ca/gov/content/environment/climate-change/data/ceei>.

Additional assumptions were derived from the Stantec Municipal Report as follows:

- *Stationary Energy: Propane, Wood and Fuel Oil – Residential Buildings.* Propane, and wood GHG emissions were estimated using linear regression methods. The data used in the estimates included historical propane and wood energy data published in the 2007, 2010 and 2012 CEEIs, and heating degree days (HDD) published by Environment Canada. This approach was also applied to the estimate of heating oil for all local governments, except the City of Victoria and District of Saanich. For the District of Saanich and the City of Victoria, heating oil GHG emissions were estimated based on the number of known tanks, average heated floor areas and estimated average fuel volumes.
- *Stationary Energy: Electricity and Natural Gas Consumption - All Buildings.* Prior to releasing the electricity and natural gas consumption data, the Province completes a series of quality assurance and control checks which has resulted in the re-allocation of energy between local governments. This data is then published on the Province's website. When the published 2007-2018 natural gas data was trended, several unexplained data anomalies and trends were identified for several local governments in the CRD. As these data anomalies and trends could not readily be explained, the raw natural gas data sets were acquired from FortisBC, reviewed and compared to the published data. In the 2007 and 2010 reporting years, the published data was under reporting natural gas volumes by upwards of 17% at the CRD level and had several large allocations between the City of Victoria and other local governments in 2012. Based on the issues with the published data, and on the basis the annual raw natural gas consumption trends align with the reported 2018 consumption data and align with historical raw data provided to the City of Victoria and the District of Saanich for their energy and GHG emissions inventories, the raw FortisBC dataset was used to estimate GHG emissions. A similar issue was noted for the Juan de Fuca electoral area and electricity data for the 2007, 2010 and 2012 reporting years (i.e., the under reporting of energy consumption) in the published data. As such, the raw electricity data from BC Hydro was used to estimate GHG emissions.
- *Stationary Energy: Fugitives.* FortisBC provided total fugitive emissions for the 2018 reporting year at the regional level. To estimate local government fugitive emissions, the value was prorated based on the number of reported natural gas connections (provided by Fortis BC). Since no historical numbers were provided, the 2018 value was applied to the 2007 base year as well. The estimate of fugitive emissions is an understatement of GHG emissions as FortisBC did not estimate the upstream GHG emissions as recommended by the GPC Protocol.
- *Transportation: On-Road.* The Province of BC provided Insurance Corporation of BC (ICBC) vehicle registration data from April 1, 2018 – March 31, 2019. When compared to local government population trends, there appears to be a high degree of uncertainty as to the accuracy of the 2018 vehicle registration data in terms of total registered vehicles. Without having reliable historical (e.g. 2011-2017) and current (2019) data to compare this dataset against, the reasonableness of the data was too uncertain to be applied in the estimation of GHG emissions for the 2018 reporting year.

Therefore, to estimate on-road energy and GHG emissions for the 2018 reporting year, 2010 vehicle populations were grown in proportion to the reported changes in local government populations. Each of the local government vehicle profiles were then adjusted to match the proportion of vehicle classes reported in the 2018 ICBC data.

- *Transportation: On-Road.* In cases where vehicle registration counts were 10 or less, the Province assigned a value of “<10” rather than report the actual number. In these cases, the inventory assumes there was 10 vehicles of that particular classification. This is likely to result in an over-estimation of GHG emissions, but it will be immaterial to the overall GHG inventory.
- *Transportation: On-Road.* Vehicle fuel consumption rates and Vehicle Kilometers Travelled (VKT) were taken from the activity data summary for British Columbia on-road transportation from the 2018 National Inventory Report (1990-2018) as prepared by Environment Canada. Based on the clear diesel and clear gasoline consumption values reported by the Province of BC for the Victoria region, the VKT and fuel efficiency values are reasonable and result in a similar estimate of fuel consumption for the Region.
- *Transportation: Aviation.* 2018 aviation GHG emissions were estimated using 2015 aircraft flight profiles (the last available data), and the total number of aircraft movements reported in 2018. The emissions were prorated to each local government on a per capita basis.
- *Transportation: Waterborne Recreational Watercraft.* GHG emissions from recreational watercraft and US/Canada ferries were estimated based on a publicly available year 2000 study for the Victoria, Vancouver, and Washington harbors. These GHG emissions were prorated to each local government on a per capita basis.
- *Transportation: Cruise Ships.* The Greater Victoria Harbour Authority reported on cruise ship emissions for the 2018 reporting year but did not provide an estimate for 2007. As a result, no cruise ship emissions are included in the 2007 base year inventory.
- *Waste: Solid Waste.* To quantify GHG emissions from the Hartland Landfill, the CRD utilized the waste-in-place (WIP) method which is accepted under the GPC Protocol. The WIP assigns landfill emissions based on total waste deposited during that year. It counts GHGs emitted that year, regardless of when the waste was disposed. Except for the City of Victoria, who claims 31% of the CRD’s landfill GHG emission, the remaining landfill GHG emissions were allocated to each local government on a per capita basis. Using this allocation method, the CRD members may over, or underestimate associated solid waste GHG emissions as the current year landfill GHG emissions are based upon cumulative waste over time, and each member may have contributed more waste in past years than the current year (and vice versa).
- *AFOLU: Aggregate Sources And Non-CO2 Emission Sources On Land.* These emissions are based on the 2019 NIR as prepared by ECCC and the total area of farmland BC in 2016 as reported by Statistics Canada. These GHG emissions were assigned to each local government on a per hectare (ha) of cropland basis.
- *AFOLU: Land-Use.* The land cover change analysis requires a consistent land-use category attribution and spatial resolution for the 2007 base and 2018 reporting years. For the land use change analysis, land cover data was available for the 2007, 2011 and 2017 years for only part of the CRD. Unfortunately, no more recent or higher quality data source was available to represent the land cover consistently for all three years. Furthermore, since annual data was not available, the change between land cover data years (2007-2011, 2011-2017) was averaged and may not represent actual changes in each year.

- *AFOLU: Land-Use. There was limited land-use datasets for the Juan de Fuca, Salt Spring Island and Gulf Island Electoral Areas and this data was only available for 2007 and 2011. On this basis, land-use GHG emissions estimates for these electoral areas has been withheld.*

Business As Usual Projection

Data describing the community's emissions profile are provided for 2007 and 2018 only. Emissions for the years in between are assumed to have followed a linear trajectory. From 2019 onwards, all of the data is an estimate as a BAU projection.

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 related to projections are as follows:

- The Province's incremental steps to net zero energy ready buildings by 2032, via the BC Energy Step Code
- Federal and provincial tailpipe emissions standards: new light duty vehicle emissions decline from 200 g CO₂e/km in 2015 to 119 g CO₂e/km in 2025 (federal policy), and then decline again to 105 g CO₂e/km in 2030 (provincial strengthening of this policy). This is for new vehicles, and is included in the projections taking account of vehicle turnover rates
- Renewable & low carbon transportation fuel standards: 20% by 2030, as in CleanBC Plan
- An average annual decrease of 0.6-1.1% in natural gas consumption per residential connection is included, to align with FortisBC planning
- The Province's CleanBC Roadmap commitment to Zero Emission Vehicle Mandate of 100% of new vehicles by 2035. From the impacts of this, in our BAU scenario we assume that the proportion of electric vehicles on View Royal's roads will be:
 - 5% in 2025
 - 15% in 2030
 - 68% in 2040
 - 96% in 2050 (even with 100% of all new vehicles sold having zero emissions, there is still a lag with vehicle turnover rates)
- How the impacts of a changing climate will affect building energy consumption:
 - Climate change data for the region was obtained from ClimateData.ca. CEA obtained this from the "downloads" section of the website, selected the BCCAQv2 (annual) dataset, Heating Degree Days (HDD's) or Cooling Degree Days (CDD's) variables, and the location on the map to be analysed
 - 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. As RCP 6.0 scenario not available on ClimateData.ca, RCP 4.5 (median values) were used as a proxy even though this is a more conservative scenario

- Decreases in residential and commercial natural gas consumption are assumed to be proportional to decreases in HDD's and the proportions of natural gas consumed for space heating for each sector, with this data obtained from the Navigant 2017 Conservation Potential Review for FortisBC Gas
- Based on ClimateData.ca RCP 4.5 median values, the 30-year average of HDD's around 2018 are 2,333, and in 2050 they will be 1,864
- Decreases in residential and commercial electricity consumption are assumed to be proportional to decreases in HDD's and the proportions of electricity consumed for space heating for each sector. However, for residential this is partially offset by, and for commercial more than offset by the proportions of electricity consumed for space cooling by each sector and how this will increase proportional to projected increases to CDD's. These proportions were obtained from the Navigant 2016 Conservation Potential Review for BC Hydro
- Based on ClimateData.ca RCP 4.5 median values, the 30-year average of CDD's around 2018 are 30, and in 2050 they will be 101

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 varies 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 are tailored for individual communities.

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

The QuickStart model inputs for View Royal are detailed below. Actions are assumed to be implemented in 2022.

Big Move	Modelling Assumptions – Full Implementation	
Step Up New Buildings	90%	New homes with zero-carbon heating
Decarbonize Existing Buildings	2%	Homes improving energy efficiency per year
	33%	Energy reduction as a result of energy efficiency measures
	2%	Homes replacing fossil fuel heating with low-carbon heating per year
Shift Beyond the Car	1 year	Lag time from implementation for initial impact
	20 years	Full implementation takes 20 years
	25%	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
Electrify Passenger Vehicles	20%	Attribution of VKT reduction to Land Use
	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
Waste	50%	Percentage GHG reduction from organics diversion or landfill gas capture
	5	5 years until full implementation

Appendix B. Adaptation Planning – Readiness and Next Steps

As part of the project, CEA assisted the Town with an adaptation capacity readiness assessment, using the MCAHUB.CA tool. This tool assesses readiness and helps to understand next steps in Policy, HR, and Technical realms. Next steps in each of the areas below should be implemented for the Town to manage risks and ensure resilience in the face of a change climate.

Policy

Completed:

- ✓ Council has declared a climate emergency
- ✓ Official Community Plan has recommendations on adaptation planning objectives
- ✓ Guidelines and criteria specific to sea-level rise and wildfire interface zones have been developed (but not for other items)

Next steps:

1. Communicate outcomes and benefits of adaptation planning to Council and stakeholders
2. Engage senior leadership in identifying strategic-level climate risk categories
3. Hazard Risk & Vulnerability Assessment – include lens of adaptation, and then get senior management and Council to endorse it
4. Adaptation Plan – develop one. Ensure it includes Key Performance Indicators to track progress
5. Guidelines and criteria for other adaptation items to be developed (e.g., extreme heat, air quality, and supplying generators to key locations / people during power cuts)
6. Incorporate climate adaptation into other plans, policies and actions as appropriate (e.g., asset management practices)
7. Monitor progress, conduct regular reports to Council and stakeholders, incorporate feedback

Human Resources

Completed:

- ✓ Town staff sit on the regional adaptation committee meetings, and information from these are brought back to the Town
- ✓ Town staff have an initial understanding of the risks posed by climate change to infrastructure, natural assets, and operations

- ✓ Town staff will be able to quickly identify all the relevant adaptation stakeholders

Next steps:

1. Develop an interdepartmental and cross-disciplinary corporate approach towards climate adaptation
2. Raise awareness among Town staff on potential adaptation initiatives, and the updated Hazard Risk & Vulnerability Assessment with adaptation lens (when completed)
3. Improve definitions of adaptation-related roles & responsibilities among staff (e.g., in job descriptions)
4. Consider training needs

Technical

Completed:

- ✓ Data has been compiled by the CRD, and looked at by Town staff

Next steps:

1. Explore how to access relevant data sources, or acquire necessary technical tools and systems for conducting climate risk assessments of assets and levels of service
2. Put in place structures to systematically identify gaps in the data, and then collect it. E.g., identifying and cataloguing what municipal infrastructure and private properties will be most affected by sea level rise
3. Identify priority assets for risk management, collect data on past performance during climatic extremes, and determine appropriate operational and customer levels of service for priority assets. Determine operations and maintenance needs
4. Consider climate change implications for capital projects
5. Assess costs to address immediate risks to assets / levels of service
6. Consider funding levels needed to collect data, assess risks, and implement priority adaptation initiatives on an ongoing basis

Appendix C. Staying Accountable

Monitoring and Evaluation Framework

Monitoring and evaluating the implementation of the strategy 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.

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. Biannual progress reporting should be planned by the Town of View Royal.

	Indicators	Measures of Success	Data Sources	Frequency
Primary	1. Community GHG emissions	45% reduction in emissions from 2007 levels by 2030 100% reduction in emissions from 2007 levels by 2050	Capital Regional District plans on updating the community GHG emissions inventories for its member communities every two years. If this does not occur, then it will be possible to create a partial inventory by sourcing buildings & solid waste emissions data from “Provincial Inventory Report” data split at the community level (from the Province). Energy data can be converted into emissions using latest factors from the Province	Biannually for CRD data Biannually for Provincial data
	2. Per capita energy usage	Average household and commercial energy use declines over time to 2050 Fuel sales (gas & diesel) decrease over time to 2050	As above, but prior to converting it into emissions data	Biannually for CRD Biannually for Provincial data

	Indicators	Measures of Success	Data Sources	Frequency
Transportation	3. # of public EV charging stations	Increase in number of EV stations, L2's and L3's	Websites e.g. https://www.plugshare.com/	Biannually
	4. # and % of EV vehicle insurance policies registered in the community	Increase in # and %	ICBC data	Biannually
	5. 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 	City data from infrastructure projects.	Biannually
	6. Commuting / personal travel mode split	Increase in travel around View Royal / the region by ride share, public transit, walking or cycling	BC Transit ridership data CRD Origin Destination Household Travel Survey Canada Census data	Every five years for Census data
Existing buildings	7. # of energy efficiency incentives distributed for fuel switching and building efficiency upgrades	Average increase in incentive use	Summary data from CleanBC Better Homes	Biannually
New buildings	8. # 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: set up tracking/data collection system in advance of passing Step Code)</i>	Biannually
Waste	9. Amount of organics diverted from landfill	Increase in organics at composting facility	Capital Regional District (if this data is available specifically for the community of View Royal)	Biannually

	Indicators	Measures of Success	Data Sources	Frequency
	10. Tonnes of waste per capita to landfill	Decrease in waste per capita sent to landfill	Capital Regional District (if this data is available specifically for the community of View Royal)	Biannually
Other	11. Urban tree canopy cover	Increase in canopy	GIS estimates of tree canopy cover (<i>Note: Will require remote sensing data acquisition and software licensing</i>)	Biannually
	12. Per capita water consumption	Decline in water use	Usage data on water utility bills / metering system – Capital Regional District	Biannually