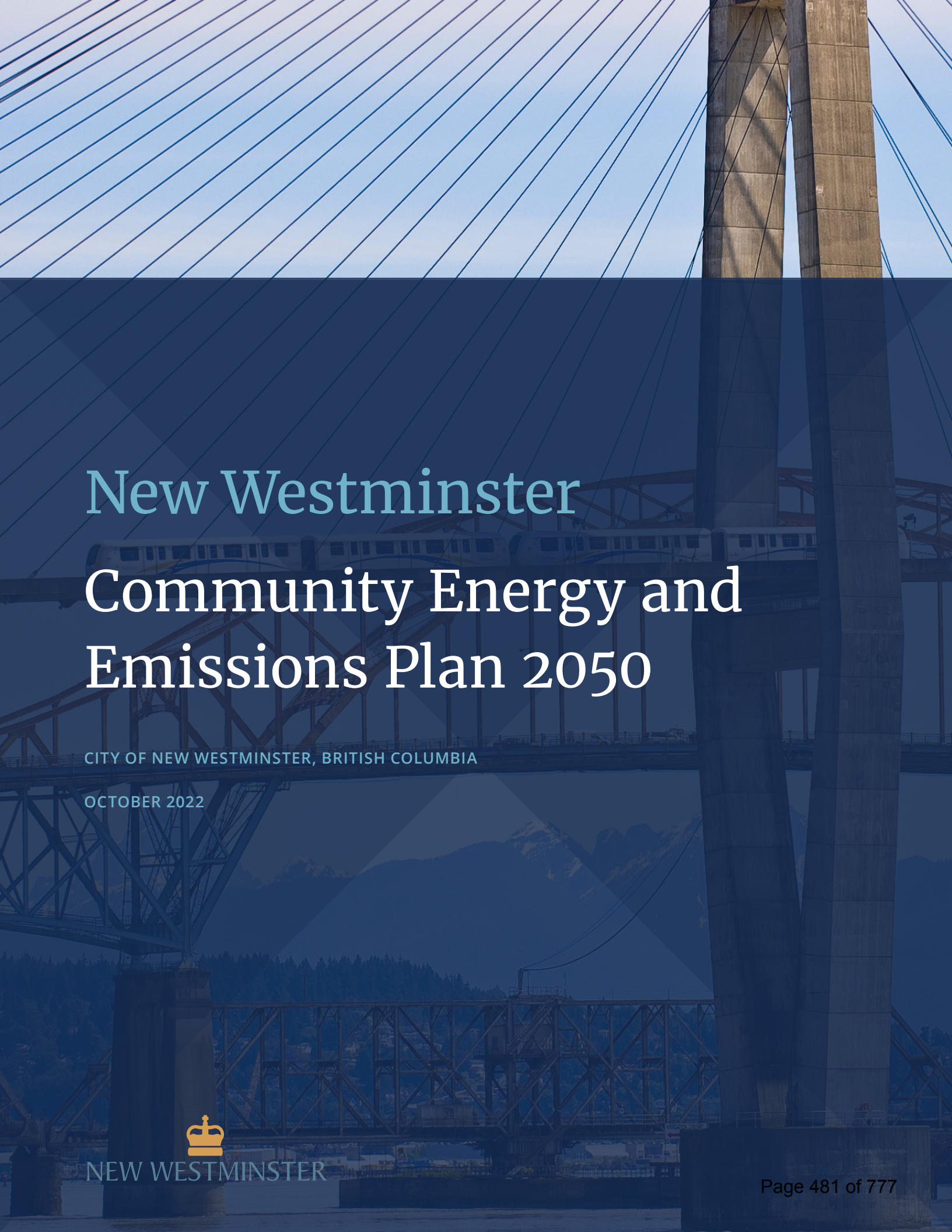


New Westminster

Community Energy and Emissions Plan 2050

CITY OF NEW WESTMINSTER, BRITISH COLUMBIA

OCTOBER 2022

NEW WESTMINSTER

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Land Acknowledgement

The City of New Westminster is located on the unceded and unsurrendered land of the Halkomelem speaking peoples. We acknowledge that colonialism has made invisible their histories and connections to the land. As a City, we are learning and building relationships with the people whose lands we are on.

Message from Mayor and Council



The global climate emergency is a significant challenge that requires continued attention and action. New Westminster residents have repeatedly validated the importance of climate action, and City staff and Council are committed to finding opportunities to take bold action to mitigate climate change and achieve a zero-emissions future.

New Westminster's Seven Bold Steps for Climate Action have provided us a great framework for action, allowing us to integrate climate initiatives into the City's budget. The Community Energy and Emissions Plan builds on the Seven Steps by updating our emissions inventory and providing a strategic lens for the effective reduction of emissions in order to reach the net-zero goal by 2050.

The targets and actions in this plan are ambitious. The City is looking for any opportunity to meet the climate challenge, and will need to be prepared to adapt quickly as new technologies and regulatory tools become available. As a community, together we can proactively transition to a livable, equitable, and low-carbon community.

Contributors and Acknowledgements

The City would like to recognize the contributions made to the Community Energy and Emissions Plan process by community members, the Environment and Climate Task Force, the Environment and Climate Advisory Committee, Mayor and Council, and participating industry partners and business representatives. Their contributions ensured that this Plan captures the climate action aspirations of the community.

Modelling and plan development was led by an external consulting team, Sustainability Solutions Group.

Glossary

TERMS

Adaptation	The process of adjusting to the current and future effects of climate change.
Carbon Neutral	Making no net release of greenhouse gases into the atmosphere, either by reducing emissions to zero, or by offsetting emissions.
Climate equity	Ensuring the just distribution of the benefits of climate protection efforts and alleviating unequal burdens created by climate change.
GHG intensity	The amount of emissions associate with a certain metric. For example, per the energy use of a square metre of a building; per litre of gasoline burned; per kilowatt-hour of electricity used.
Green infrastructure	The range of measures that use plant or soil systems, permeable pavement or other permeable surfaces or substrates, stormwater harvest and reuse, or landscaping to store, infiltrate, or evapotranspirate stormwater and reduce flows to sewer systems or to surface waters. Certain green infrastructure, like engineered wetland systems, can contribute to carbon sequestration.
Low-carbon energy system	Energy systems that provide heating, cooling, and sometimes hot water, with limited GHG emissions, typically regulated through a maximum annual emissions per square meter basis.
Mitigation	The process of making the impacts of climate change less severe by preventing or reducing the emission of GHGs into the atmosphere.
Net-zero Emissions	As defined in the Canadian Net-zero Emissions Accountability Act: anthropogenic emissions of greenhouse gases into the atmosphere are balanced by anthropogenic removals of greenhouse gases from the atmosphere over a specified period.
Renewable Natural Gas	Biogas (the gaseous product of the decomposition of organic matter) that has been processed to purity standards and is interchangeable with conventional natural gas.

Scope 1, 2, 3 Emissions	**Scope 1** covers emissions from sources that a community owns or controls directly; **Scope 2** covers emissions that a community causes indirectly from the energy it uses that is imported from outside the community boundary; **Scope 3** encompasses emissions that are not produced in the community itself, and not the result of activities from assets owned or controlled in the community, but those that it is indirectly responsible for across its supply chain.
Sequestration	The process of capturing and storing atmospheric carbon dioxide, either through geologic sequestration (e.g. carbon capture) or biologic sequestration (e.g., through trees, soils, aquatic environments, and vegetation).

ACRONYMS

CEEP	Community Energy and Emissions Plan
CEERS	Corporate Energy and Emissions Reduction Strategy
CO2	Carbon dioxide
CO2e	Carbon dioxide equivalents
DE	District energy
GHG	Greenhouse gas
RNG	Renewable natural gas

UNITS

GHG emissions	1 ktCO2e = 1,000 tCO2e
Energy	1 GJ= 278 kWh 1 MWh= 1,000 kWh



Executive Summary

The climate emergency calls for bold and rapid action to mitigate and adapt to climate change.

The City of New Westminster has set responsible and ambitious targets to become a net-zero greenhouse gas (GHG) emissions community by 2050, and achieve significant interim reductions by 2030 and 2040. Reaching these targets will take unwavering focus by the City, collaboration with senior levels of government and the private sector, and proactive participation by all community members.

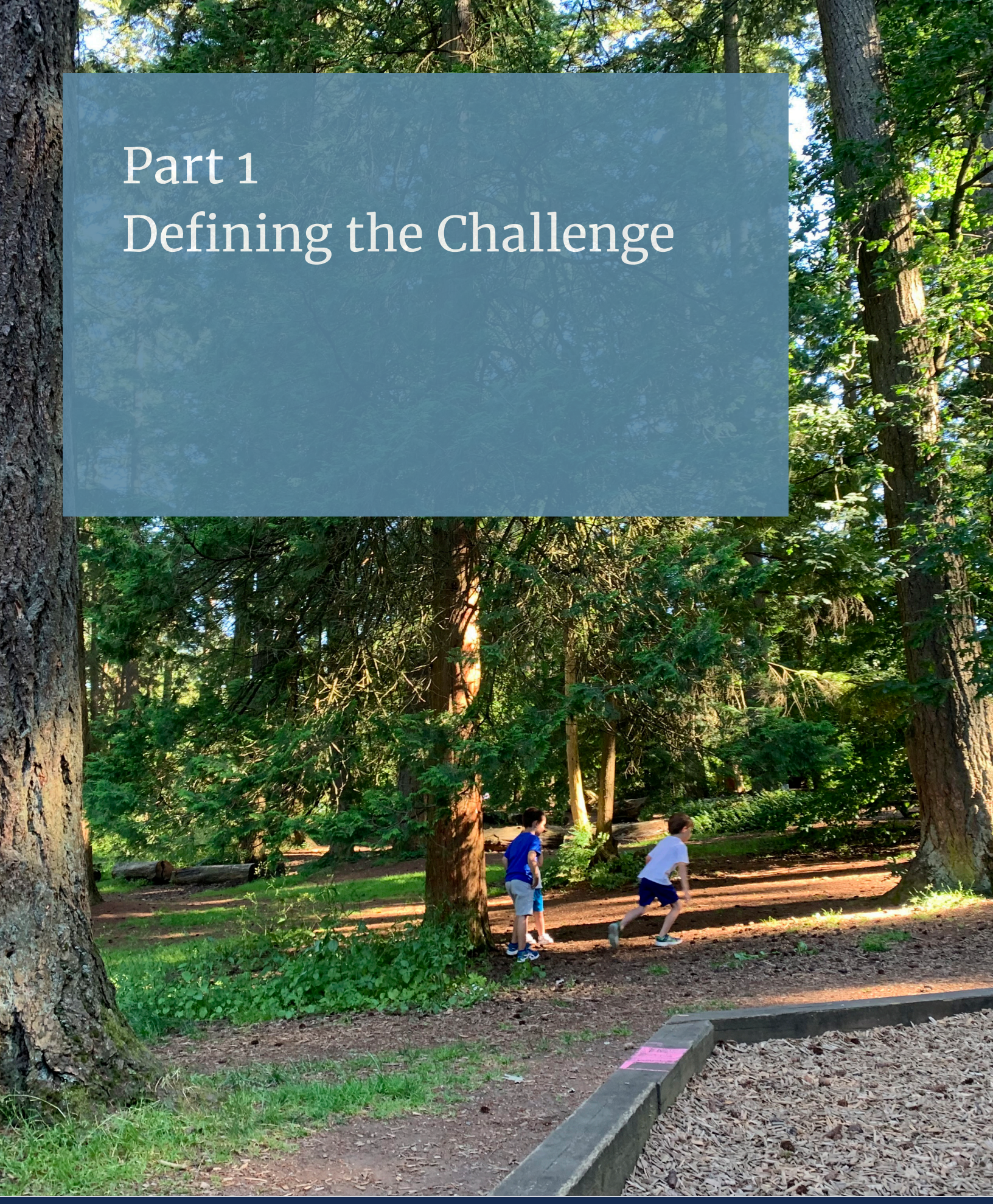
This Community Energy and Emissions Plan (CEEP) provides an action plan to reach net-zero by 2050, and is a call to action for the City and the broader community. The CEEP outlines 63 actions for the City to take across five sector focus areas. The actions are informed by community and industry perspectives, the latest research on climate science, emissions modelling, and an exploration of the most impactful emissions reduction opportunities.

The sectors and corresponding action areas are as follows:

Sector	Action Areas
Transportation	■ Shifting to sustainable transportation modes (transit, walking, rolling, biking, etc.) ■ Accelerating adoption of electric mobility
Buildings	■ Retrofitting existing buildings to be more efficient and to use low-carbon energy ■ Ensuring new buildings are as energy efficient as possible, with limited emissions
Energy	■ Reducing energy demand ■ Generating local renewable energy ■ Expanding district energy and waste heat recovery systems ■ Enhancing the resilience and data responsiveness of the electricity grid
Waste and Circular Economy	■ Reducing and diverting waste ■ Implementing circular economy principles
Natural Systems	■ Expanding the urban forest canopy ■ Expanding naturalized areas ■ Developing more green infrastructure

The biggest GHG reduction opportunities are in the transportation and buildings sectors. Action recommendations in the CEEP generally look to ensure the City aims to prioritize reducing energy demand, then improving efficiency, and finally switching fuel sources to low-carbon sources. This approach will help manage impacts on the electricity grid and build community resilience.

CEEP implementation requires flexibility to ensure the City and community can adapt and respond as new action opportunities are identified with legislative and technological changes. Demanding that such actions achieve equitable outcomes is also critical to ensuring a transition to a low-carbon community that benefits everyone.



Part 1
Defining the Challenge

1. Introduction

The importance of rapid climate change response cannot be overstated. Human-caused climate change through fossil fuel use is a global crisis that threatens health and public safety, infrastructure, livelihoods, biodiversity, economic systems, and ecosystems. As local and global greenhouse gas (GHG) emissions increase, the Earth continues to heat at an unprecedented rate. The Intergovernmental Panel on Climate Change's (IPCC) 2021 6th Assessment Report[1] confirms that without immediate intervention, global heating of greater than +2°C will occur in the next 30 to 80 years. Heating of +1.5°C is the point at which major, disruptive weather events will occur; heating beyond this level will result in severe and frequent extreme weather and natural disasters. Limiting heating to the +1.5°C global target will help reduce the severity of climate change impacts on human and natural systems, but will not prevent them. The Assessment Report concludes that rapid fossil fuel elimination across all socio-economic sectors is needed to avoid the worst climate impacts.

Following a community call for action to address this threat, the City of New Westminster declared a climate emergency in 2019 and committed to reducing GHG emissions across the community by 45% from 2010 levels by 2030, 65% by 2040, and 100% by 2050. This Community Energy and Emissions Plan (CEEP) is the City's action plan for mitigating the climate emergency. The targets and actions identified in this plan show the low-carbon pathway to approach net-zero emissions by 2050, as well as ambitious interim targets.

The energy, emissions, and financial modelling that informed the CEEP shows that approaching zero emissions is possible but challenging. Following the low-carbon pathway requires focus by the City, ongoing commitment from senior levels of government, and participation from a range of partners, including businesses and building owners. New enabling legislation from the provincial government is needed to implement some actions, such as a framework allowing municipalities to require low carbon energy systems for building heating and hot water. Once enacted, the City will need to act quickly with local emission reduction mechanisms enabled under the legislation.

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1 Intergovernmental Panel on Climate Change, 6th Assessment Report (2021): https://www.ipcc.ch/assessment-report/ar6

The CEEP focuses on actions the City can take within its jurisdiction to lead by example, set the regulatory context, explore incentives, and create neighbourhoods that will enable low-carbon living. However, the City does not control all mechanisms needed to achieve net-zero emissions. Community members must proactively undertake home retrofits, choose sustainable transportation when able, reduce and divert waste, and much more. Rapidly reducing emissions and reaching net-zero is a community effort.



2. Background and Policy Context

BUILDING ON NEW WESTMINSTER'S BOLD STEPS FOR CLIMATE ACTION

Following the City's 2019 climate emergency declaration and adoption of ambitious emission reduction targets, City Council endorsed *"Seven Bold Steps for Climate Action"* to guide the community toward a low-carbon future.

This plan builds on and supports the implementation of the Seven Bold Steps, which include seven targets for 2030. The modelling that informs the CEEP indicates that actions to reduce emissions need to be taken in areas beyond the Seven Bold Steps as well. The CEEP therefore includes these additional actions, and adjusts and extends targets out to 2050, providing a data-backed pathway to net-zero emissions.

This CEEP replaces the 2011 Community Energy and Emissions Plan, which guided climate action for the past decade. The climate crisis has grown more urgent in the intervening years, which have also seen the rapid evolution of low-carbon technologies and new policy and regulatory tools. The CEEP considers this changed context in charting the path to more ambitious emission reductions.

CONNECTION TO EXISTING PLANS

The challenge of bold action on climate can be daunting but substantial work is already underway to create the community conditions for low-carbon living. The Environment Strategy and Action Plan (2018) provides guidance for a wide range of environmental and climate initiatives at the City, including recommended actions on energy and emissions, built environment, waste and natural areas and habitat. Many of the actions in this plan are complete or underway, and the updated CEEP provides bolder, deeper climate direction.

The City has a suite of overarching plans that incorporate climate change mitigation and adaptation actions, and various subject-specific plans on rolling out climate action in particular areas.

Overarching Plans

These overarching plans set the long-term land use and transportation pattern for New Westminster, and fundamentally influence the way community members live and move.

- The **Official Community Plan** (2017) provides a vision, goals, and policies for New Westminster to the year 2041. Together, these elements connect the community's "big picture" aspiration with the tools needed to achieve it, including specific actions, development permit guidelines, and land-use designations.
- The **Master Transportation Plan** (2015) and neighbourhood transportation plans establish long-range transportation network plans and priorities, focusing on advancing sustainable transportation.

Subject Specific Plans

- The **Biodiversity Strategy** (2022) analyzes the state of natural areas and biodiversity in the city and provides recommended actions and guidelines that will help the City prioritize protection, enhancement, and restoration of natural habitat areas and the species that live there.
- The **Urban Forest Management Strategy** (2016) outlines actions to protect the city's urban forest and ecosystems by increasing tree canopy, improving tree management practices, and building community ownership of the urban forest.
- The **eMobility Strategy** (2022) accelerates and supports the move towards sustainable and electric transportation systems in the community by supporting e-bikes and other e-micromobility options, increasing EV charging infrastructure, supporting EV adoption, and enhancing electric utility management to accommodate increased electrical demand.
- The **Integrated Stormwater Management Plan** (2017) helps the City manage rainwater, prevent sewer overflows and flooding, and enhance watersheds through a suite of green infrastructure approaches.
- The **Corporate Energy and Emissions Reduction Strategy** (2020) identifies actions for the City to become a carbon neutral corporation by 2030.

These plans provide strong, relevant direction for the CEEP, which is focused primarily on climate change mitigation. Their implementation will support both mitigation and adaptation goals. The CEEP modelling underscores the urgency with which these plans must be implemented if the city is to meet its emission reduction targets.

SENIOR GOVERNMENT CLIMATE PLANNING

The following federal, provincial, and regional plans offer mandates, policies and implementation strategies that support the transition to a net-zero emissions future.

- The **Pan-Canadian Framework** is the federal framework for climate action. It outlines the government's approach to pricing carbon pollution and suggests measures to achieve emission reductions across all economic sectors. It aims to drive innovation and growth by increasing technology development and adoption to ensure Canadian businesses are competitive in the global low-carbon economy. It also includes guidance on GHG reporting, and actions to advance climate change adaptation, and build resilience to climate impacts across the country.
- The **CleanBC Roadmap to 2030** outlines provincial commitments to meet the legislated target of net-zero GHG emissions by 2050. Achieving the CleanBC target will require all jurisdictions across BC to use clean energy and reduce GHG emissions as much as possible.
- **Metro Vancouver's Climate 2050** is the strategic framework guiding the region's climate change policies and collective actions to transition towards a low-carbon future. The framework is being supplemented by area-specific action plans to guide municipal, industry, and other partner actions on emissions reduction and adaptation. **Metro Vancouver's Clean Air Plan** (2021) is the regional plan for managing air quality and GHGs over the next 10 years. It includes key actions to reduce GHGs in the region, in pursuit of 2030 emissions targets. It also includes actions to reduce health-harming air contaminants to improve day-to-day air quality.
- **Transport 2050** is the long-term strategy that shapes the future of transportation in Metro Vancouver, setting the goals, directions, and key initiatives for the entire regional transportation system, across all modes. Transport 2050 has a strong climate focus and includes bold action on advancing carbon-free transportation.

CLIMATE LEADERSHIP TO DATE

New Westminster has a history of taking innovative climate action. Some noteworthy achievements include:

- **Launching Energy Save New West in 2013** to assist community members and industry partners to improve the energy efficiency of new and existing buildings and reduce community-wide GHG emissions;
- **Creating the community's first solar garden in 2018**;
- **Adopting a climate action budgeting framework in 2019** in response to the climate emergency declaration;
- **Being an early adopter of the BC Energy Step Code in 2019**; and
- **Being one of the first jurisdictions in North America to introduce requirements in 2019** for all new residential buildings to be 'EV ready'.

FOLLOWING FIRST NATIONS CLIMATE LEADERSHIP

New Westminster is within the traditional territory of the Halkomelem (hən̓q̓əmin̓əm, Halq'eméylem, Hul'q'umi'num') and Sḵwxwú7mesh sníchim-speaking peoples. Since time immemorial, Halkomelem and Sḵwxwú7mesh peoples have lived on this land, and hold an intimate awareness of their value to life and wellbeing. The City of New Westminster recognizes, values, and respects these Indigenous connections to these lands, and the knowledge built over millennia by local peoples about how the land sustains everyone. We acknowledge that, for over 150 years, this land has been harmfully exploited by colonization, and this has contributed to the climate crisis we all face today.

First Nations communities are leaders in addressing the climate emergency and much can be learned from local examples, such as the Tsleil-Waututh Nation's leadership on solar power adoption. Pictured below is a new solar array powering the Nation's administrative building.



Figure 1. The largest ground-mount solar array in Metro Vancouver powers the Tsleil-Waututh Nation's administrative building (https://twnsacredtrust.ca/twn-says-yes-to-renewable-energy).

Our responses to the climate emergency must include Indigenous knowledge systems such as the Medicine Wheel. The Medicine Wheel teaches us about the interconnection of all things, that the living world is sacred, and that what happens to one, happens to us all. The City is learning to apply the holistic lens of the Medicine Wheel to its objectives around healing the land; in so doing—and as we implement the CEEP—we can begin to heal ourselves as well.

The City recognizes that finding a path out of the climate emergency requires learning from, and working with, First Nations and Indigenous residents of this land. This includes seeking ways to work with our Indigenous partners to deliver on the goals of the Community Energy and Emissions Plan. Implementation must contribute to building a relationship of mutual respect, trust and reconciliation with local First Nations and Indigenous people.

CLIMATE EQUITY

Ensuring the transition to a low-carbon community benefits everyone is a principal goal of the CEEP. This plan is informed by our diverse community, including residents with lived and living experience in poverty who were directly engaged. Potential equity impacts were considered in selecting actions for the plan, and implementation must enhance equity and address the wellbeing of everyone, especially equity-denied groups.

The BC Regional Adaptation Collaborative offers the following:

> *"Climate change poses the greatest threat and risk to those that have been the least responsible – generally people that face deep-rooted and systemic challenges like poverty. Populations that are more privileged and have more resources subsequently have much stronger capacity to protect themselves from the impacts of climate change. As the effects of climate change rise in BC, so does the urgency of addressing this equity challenge."*[2]

Climate change impacts are felt differently by different groups. Impacts are compounded when multiple forms of discrimination combine in the experiences of equity-denied groups (intersectionality). Seniors who live alone and/or are frail, low-income groups, racialized communities, people experiencing physical and mental health conditions, and those experiencing homelessness are more likely to be exposed to or impacted by climate hazards. These community members are less able to adapt to a changing climate and severe weather events (including extreme heat and poor air quality). They are also more likely to live in areas with less green space and reside in older buildings with inefficient heating and no cooling systems.

Incentives for reducing emissions and saving on energy costs need to be structured equitably. For example, the high purchase price of electric vehicles puts them out of reach for many equity-denied groups, even with rebates. Renters may not benefit from building retrofits targeted at homeowners. The transition to low-carbon mobility and buildings needs to benefit everyone. As the economy transitions, ensuring just access for all workers to receive retraining and benefit from green job opportunities is a priority.

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2 ReTooling for Climate Change, Climate Equity page (2022): https://retooling.ca/climate-change/climate-equity

ADDRESSING ENERGY POVERTY

The median Canadian household spends 3% of after-tax income on energy bills (its 'energy cost burden'). According to the Canadian Urban Sustainability Practitioners network, a household is experiencing energy poverty when its costs are more than two times the national median, or 6% or more of their after-tax income.[3] In 2016, 9% of New Westminster households were experiencing energy poverty.

The City collaborated with other local governments to conduct a detailed assessment of energy poverty within the region. This study identified the contributing factors to energy cost burden and barriers that have prevented equity-denied groups from accessing provincial incentives. A data toolkit was created that gives the City a detailed understanding of the New Westminster context. This will be used to review City policies and programs through an equity lens.

With this data available, the City is better equipped to target initiatives to reduce energy poverty and expand on building retrofit initiatives.



3 CUSP, Energy Poverty in Canada Backgrounder (2019): https://energypoverty.ca/backgrounder.pdf

RESILIENCE AND ADAPTATION

The primary focus of the Community Energy and Emissions Plan is to reduce local GHG emissions. However, climate impacts are already being felt in the community, and climate adaptation is increasingly critical. Building community resilience is a key strategy in adapting to climate change and the disruptions it causes. Resilience and adaptation are therefore important lenses for climate-action planning.

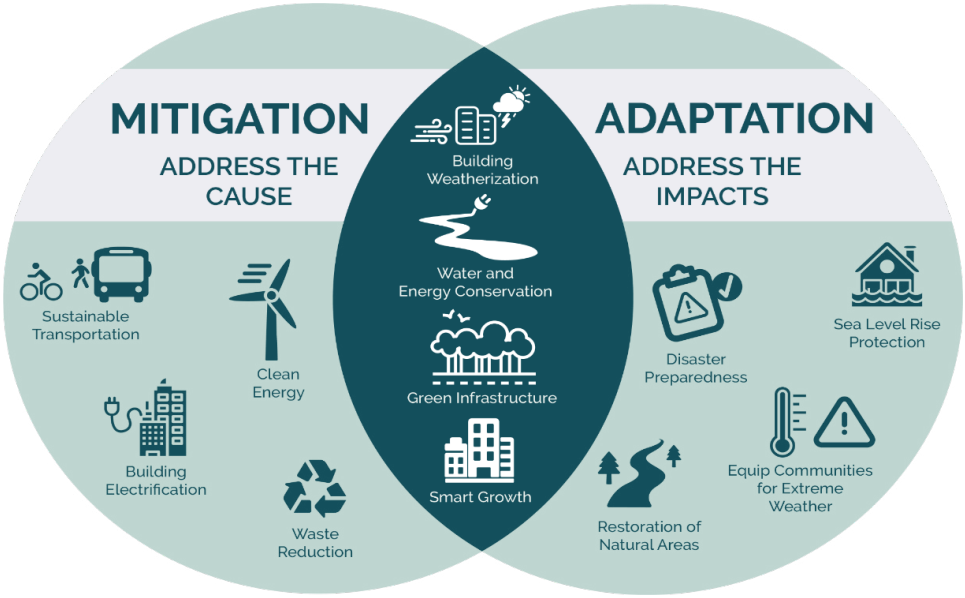


Figure 2. Areas of overlap between climate change mitigation and adaptation actions.

Several of the City's existing plans include climate actions that support both mitigation and adaptation. For example, planting more trees sequesters carbon, lowers building heating and cooling energy demand, and buffers against extreme heat. Using green infrastructure to better manage stormwater is another example, reducing stormwater management emissions, supporting biodiversity, and building resilience to higher-intensity rainfall events.

Some CEEP emission reduction actions also have climate change adaptation and resilience benefits. For example, retrofitting buildings to improve energy efficiency will provide more insulation against extreme cold or heat events. Adding local renewable energy production and battery storage will increase the community's resilience to power outages and price shocks. Continuing to develop compact and walkable communities will help residents easily get help or resources if roads or transit systems are damaged. This plan identifies the adaptation benefits of its emission reduction actions. Considering adaptation benefits and applying an equity lens to the distribution of these benefits will be critical during implementation. Further work is needed, through a separate process, to identify targeted adaptation and resilience strategies and actions.

3. Climate Impacts

Climate change impacts are already being experienced in New Westminster. Immediate and ambitious action is needed to avoid major disruptions from climate change impacts.

The annual average temperature is projected to increase by 3°C by the 2050s.[4] Days hotter than 30°C, which are historically rare in New Westminster, may increase to 16 per year.[5] These hot days will increase the amount of energy needed to cool indoor spaces. In summer 2021, the region experienced a record-breaking "heat dome" event that resulted in the tragic premature deaths of 28 community members, including seniors and those living with pre-existing health conditions, in New Westminster.

The region's already dry summers are also projected to receive 15% less rain than they do today, although annual precipitation (including snow) is projected to increase 7% at other times of the year.[6] Fall and winter storms–like the atmospheric rivers that drenched the region in November 2021–will become more likely, which could damage infrastructure and affect biodiversity in the Fraser River.

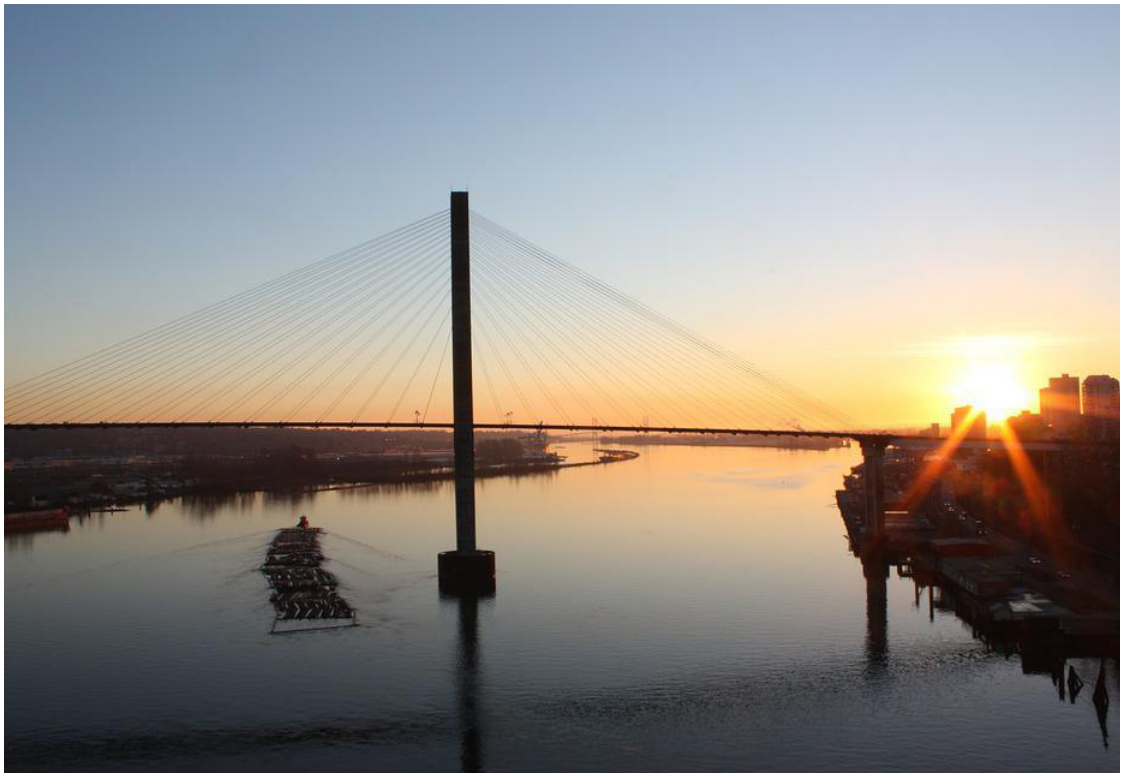
New Westminster will also experience the following climate impacts:

- Warmer temperatures and more humid air from increased rainfall in the winter and spring months will result in more frequent and intense storms;
- Warmer annual mean temperatures will drive migration of flora and fauna species, with some currently local species moving north. This may lead to an increased threat from invasive species and risks to local biodiversity;
- Warmer winters will decrease heating demand in winter months;
- Wetter winters and springs will increase flood risk frequency and severity;
- Decreased snowpack will mean less water for the summer months, increasing drought risk;
- More frequent, higher river flows combined with expected sea level rise will cause increased strain on dikes and other flood protection infrastructure;
- Increased drought will increase wildfire risk, wildfire smoke presence, and airborne particulate pollutants; and
- Longer dry seasons may increase the length of the forest fire season.

4 Pacific Climate Impacts Consortium's Plan2Adapt for the region of Metro Vancouver. https://pacificclimate.org/analysis-tools/plan2adapt
5 Climate Atlas of Canada report for Vancouver, British Columbia. https://climateatlas.ca/sites/default/files/cityreports/Vancouver-EN.pdf
6 Ibid, 2.

WIDER CLIMATE CHANGE DISRUPTIONS

As a global phenomenon, climate change disrupts the local, regional, and global systems we rely on to live safe, consistent lives. Climate change is expected to have major impacts on food and water availability across the globe, affecting billions of people. New Westminster residents are at lower risk of water shortages due to high local precipitation levels and our watershed management and conservation practices. However, food availability disruptions caused by climate change may disproportionately reduce access to healthy diets by increasing food costs. New Westminster residents will also be impacted by disruptions to supply chains, insurance markets, and economic systems caused by climate change-induced events across the globe.



4. Emissions and Climate Action Pathways

WHAT EMISSIONS ARE INCLUDED?

The CEEP considers Scope 1 and 2 GHG emissions, as well as Scope 3 GHG emissions for waste and energy transmission (Figure 3). Agriculture and other land-use emissions are excluded as these are insignificant within New Westminster. The carbon sequestration value of forests is included, however. Out-of-boundary transportation by rail or aviation are excluded, as these are typically outside of the City's jurisdiction and control. Similarly, emissions from activities like product manufacturing and construction materials are excluded under the assumption that these emissions are included in the inventories of the jurisdictions in which they occur.

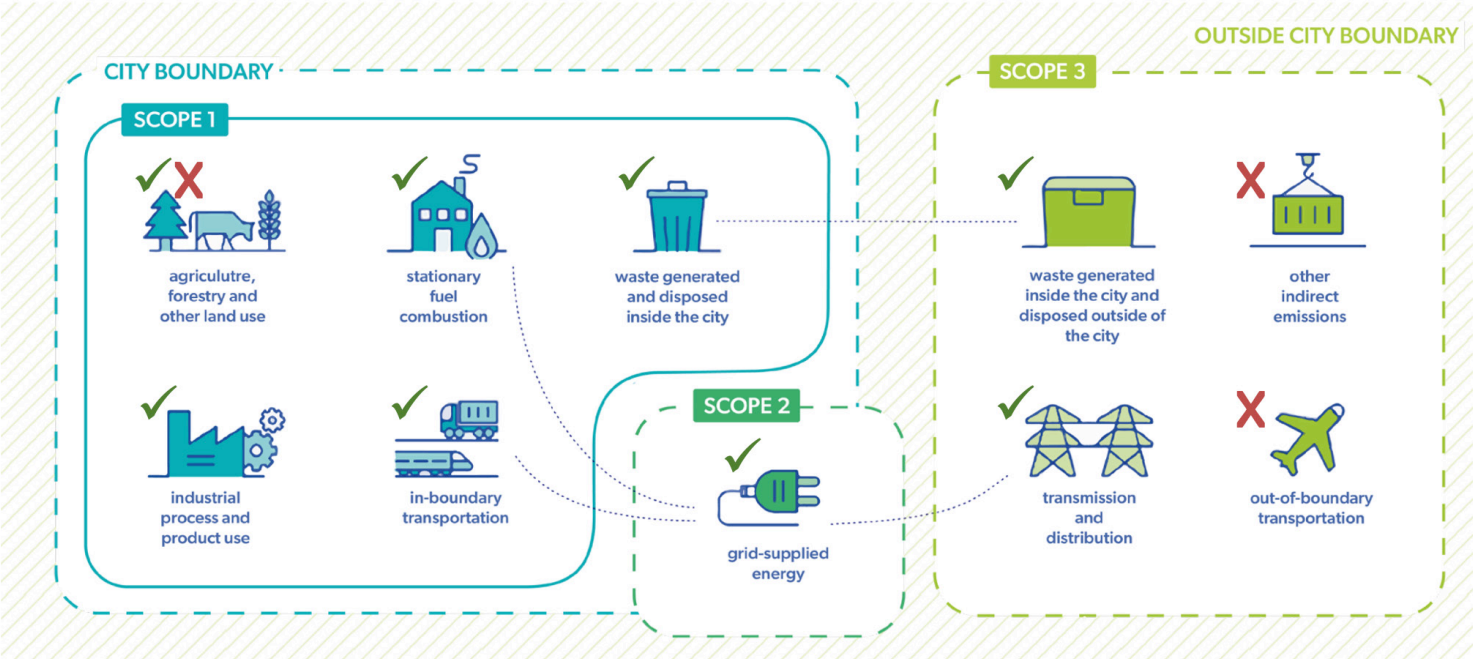


Figure 3. Emission scopes as they relate to geographic and inventory boundaries.[7]

7 Image source: Consumption-Based Inventories of C40 Cities. https://www.c40.org/researches/consumption-based-emissions

GHG EMISSION TYPES

GHG inventories typically track carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O) emissions—the three main types of greenhouse gases over which governments have the most influence. Gases are measured in tonnes and converted into tonnes of carbon dioxide equivalents (tCO2e). The conversion allows comparison of each gas' greenhouse gas effect—or global warming potential (GWP)—relative to one unit of carbon dioxide. For example, the global heating effect of one tonne of methane is 86 times that of one tonne of CO2 over 20 years. Acknowledging the different heating effects of the main greenhouse gases allows appropriate action in mitigating their sources. For example, it is historically widely acknowledged that vehicle tailpipe emissions need to be reduced, but only more recently has it been acknowledged that natural gas use needs to be reduced, as the methane released has such severe global heating consequences.

Greenhouse Gas	Global Warming Potential Value	
	Over 20 years	Over 100 years
Carbon Dioxide (CO2)	1	1
Methane (CH4)	86	34
Nitrous Oxide (N2O)	268	298

2010 AND 2016 EMISSIONS INVENTORIES

New Westminster's community emission reduction targets are set against 2010 emission levels, which totalled 240,610 tonnes of carbon dioxide equivalents (tCO2e) (calculated proportional to population from provincial data). The CEEP uses 2016 as a modelling base year, since local energy and emissions data is available for this year, thus increasing the accuracy of the inventory. The embodied carbon of materials (e.g. construction materials, vehicle materials) are not included. Figure 4 shows New Westminster's 2016 emissions by fuel source and by sector.

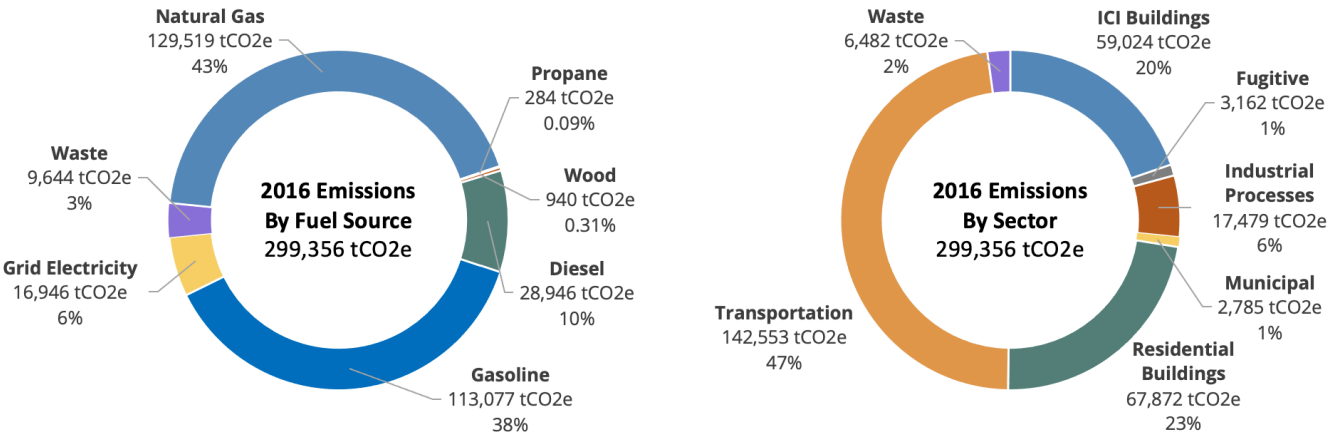


Figure 4. Emissions by fuel source and sector in New Westminster's 2016 base year (ICI = industrial, commercial, institutional).

Natural gas was the largest source of GHG emissions (43%) in 2016, followed by gasoline (38%). The transportation sector accounted for the largest percent of emissions (47%), followed by 23% in the residential buildings sector, and 20% in the ICI buildings sector. The emission inventory shows us the most critical areas of action for emission reduction efforts.

EMISSION REDUCTION PATHWAYS

New Westminster is a growing community. The 2021 national census identified New Westminter's population as approximately 79,000. By 2050, the population is projected to grow to roughly 120,000.[8] The number of homes and jobs in the city will increase as well, with energy use and emissions rising in line with these increases.

Taking action to reach net-zero emissions is crucial. When and with what ambition we act is also critical; the longer we wait, the greater the emissions, and the greater the climate change impacts. Ambitious action in the short term achieves the greatest reductions. The longer we wait to act, the greater the cumulative emissions, and the more we lock in greater heating and more extreme impacts.

8 This projection was made by extrapolating population projections in New Westminster's Official Community Plan for the year 2040.

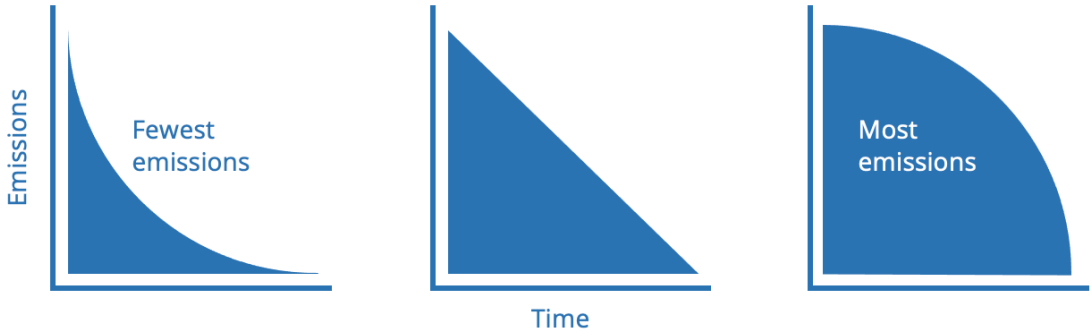


Figure 5. Differences in cumulative emissions (blue areas) when different reduction pathways are followed.

Modelling was done to assess the emissions of current and project activities across all community sectors (i.e., buildings, transportation, waste, natural systems, and energy). Energy consumption and emissions production were modelled to 2050, accounting for population growth, and providing an emissions projection estimate. This projection is the top dotted line in Figure 6.

A low-carbon scenario was also modelled, to determine a pathway for New Westminster to achieve its net-zero emissions target. The emissions reduction pathway in this scenario is the bottom dotted line in Figure 6. This scenario reflects reductions from projected industrial sector energy efficiency and fuel switching, senior government commitments, and New Westminster-specific actions.

The low-carbon reduction pathway most closely aligns with the middle scenario in Figure 5. Our community may not have the capacity (capital, legislative tools, energy capacity, technology, etc.) to cut emissions as rapidly as a "fewest emissions" scenario (far left in Figure 5)–especially not in an equitable manner–but we can work quickly to avoid the "most cumulative emissions" scenario (far right), being careful to ensure the transition promotes equity.

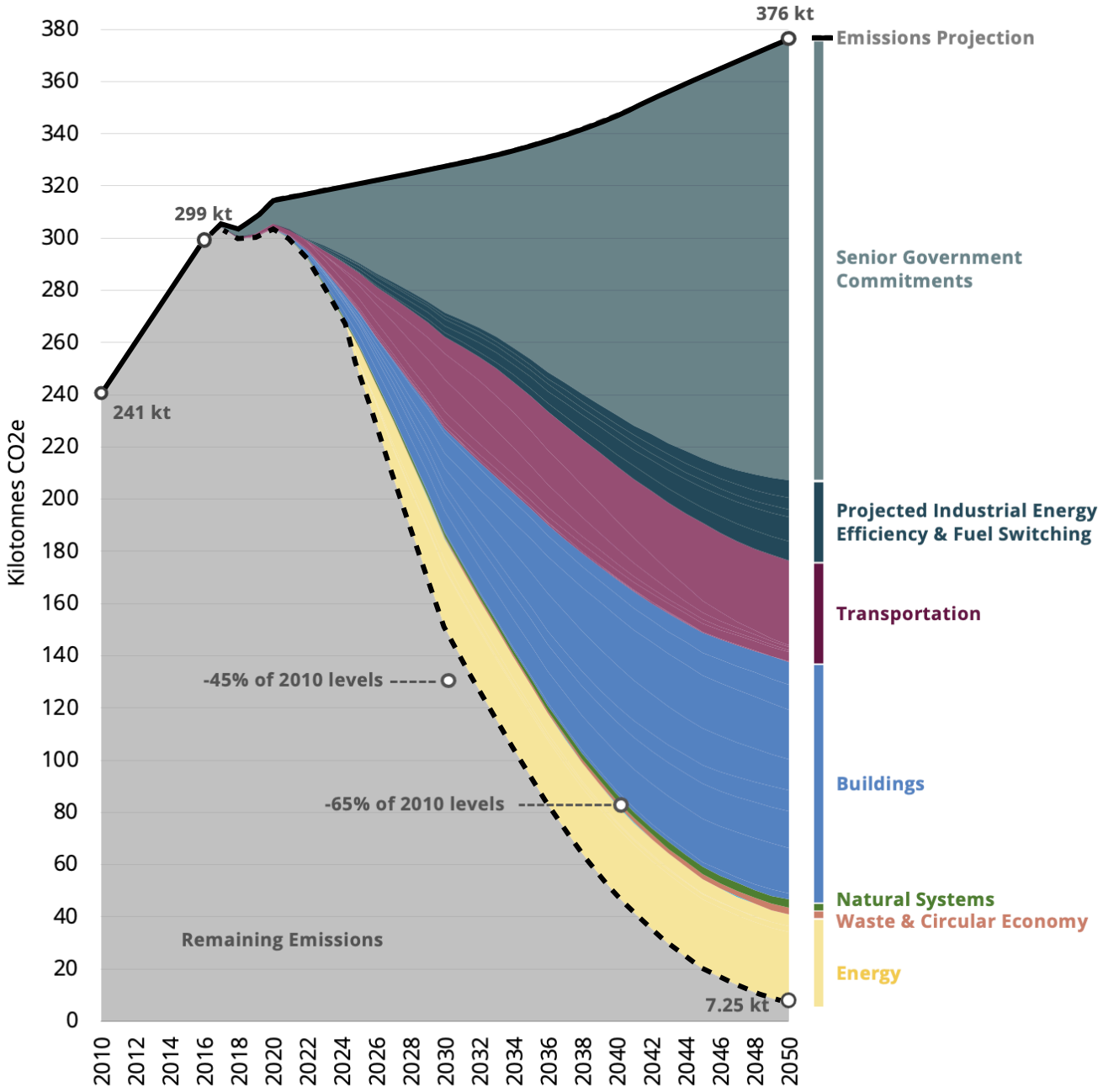


Figure 6. New Westminster's community emissions projection and modelled emission reduction effects of various provincial and local low-carbon actions, 2010-2050.[9]

Taking the actions modelled in the low-carbon scenario would reduce emissions 97% from 2010 levels (97.6% from the 2016 base year), bringing New Westminster close to its 2050 net-zero target. While the actions are ambitious, the resulting

9 *The sharp emissions increase from 2010 to 2016 is likely primarily due to differences in the emission inventories taken in those years, rather than a huge increase in actual emissions (although it is likely emissions did rise some with population, housing, and vehicle use growth over this period).*

emission reductions fall short of achieving the interim target—a 45% reduction under 2010 levels by 2030—primarily due to the short timeframe available for action. More rapid and ambitious action in the residential buildings and transportation sectors could help to achieve that target. However, the interim target of reducing emissions by 65% under 2010 levels by 2040, can be met by implementing these actions.

If all the modelled emission reduction actions are taken over the next 28 years, 7.25 kilotonnes CO2e will still be generated in 2050. The remaining 2050 emissions are from three main sources:

- Natural gas use in industrial processes and buildings that have not switched to low-carbon energy sources;
- Single detached dwellings using wood stoves for heating; and
- Solid waste that is already in landfills and continues to emit methane.

This 7.25 ktCO2e gap is going to be challenging to bridge. The remaining emitting energy sources can be switched to low-carbon energy sources, but the existing solid waste in the landfill will continue to decompose and emit methane over long periods. Capping the landfill and capturing the methane provides a partial solution: about 45% of the methane produced can typically be captured by this method. Additional solutions could include increasing carbon-sequestering green spaces and forest or investment in gold standard carbon offsets. Determining the final actions may not be necessary at this time; technologies will advance and conditions will change over the next 30 years, providing different emission reduction opportunities. The focus must be on implementing actions that can be taken right now to ensure New Westminster's emissions can be reduced by 97% by 2050.

COMMUNITY VOICE

CEEP development involved gathering input from community members and industry representatives to inform the plan's actions and priorities, including discussion around which actions would be most likely to foster community uptake, which were most appropriate to the New Westminster context, and which might generate additional benefits like improved health and well-being. Representatives of equity-denied groups were engaged to ensure proposed actions are grounded in the lived reality of residents. Further engagement will be critical during implementation.

REDUCE, IMPROVE, SWITCH

The philosophy of **"Reduce, Improve, Switch"** sees lowering energy use as the top priority, followed by maximizing energy efficiency improvements, and then switching to low-carbon energy sources to meet remaining demand.

- **"Reduce"** means decreasing energy consumption through actions like mindful purchasing, reducing personal vehicle use, increasing walking and biking, and incorporating passive design measures, such as awnings, into buildings.
- **"Improve"** refers to increasing energy efficiency through actions like replacing lighting and appliances with more efficient options or driving a more fuel-efficient vehicle.
- **"Switch"** includes actions like replacing natural gas furnaces with electric heat pumps or replacing an internal combustion engine vehicle with an electric one.

British Columbia has the benefit of low-carbon hydroelectricity, but its supply is limited. Reducing electricity use and improving energy efficiency can "free up" electricity and help avoid new electricity generation and distribution infrastructure costs.



Part 2
CEEP Actions

The CEEP provides a data-informed action plan to reduce emissions and contribute to limiting climate change impacts.

This action plan:

- Supports implementation of the City's Seven Bold Steps for Climate Action;
- Reinforces the importance of ambitiously implementing the recommendations of existing plans;
- Identifies and fills policy gaps with new measures for areas where more ambitious action is needed;
- Integrates the results and priorities identified through engagement with community and industry representatives;
- Describes short- and medium-term actions and their role in meeting the City's climate emergency targets (emission reduction targets of 45% by 2030, 65% by 2040, and 100% by 2050, from 2010 levels); and
- Indicates actions with strong potential to advance equity and inclusion, build community resilience, and achieve other benefits.

Structure of the Action Plan

The CEEP includes five action sectors, selected based on where City and community action can best effect change: transportation, buildings, energy, waste and circular economy, and natural systems. The industrial sector is not included as the City has few policy and regulatory mechanisms to influence this sector. Industrial sector emissions are expected to decrease as energy efficiency and fuel switching efforts are made in response to carbon pricing set by senior government.

2030 and 2050 targets are defined for each sector, to help guide progress toward the overarching 2050 zero emissions target. These area-specific targets are tangible goals for the City to work toward. They are trackable and can therefore be measured and reported on.

Each action sector includes a suite of actions for the City to take with its partners. Actions are evaluated for their GHG emission reduction potential, additional benefits, the magnitude of City resources required to implement them, and the suggested timeline. These ranges and concepts are defined in the following table.

GHG REDUCTION	PREVENTATIVE	LOW	MEDIUM	HIGH
		Less than 10 ktCO2e	Between 10 & 25 ktCO2e	More than 25 ktCO2e
BENEFITS	Many actions could result in additional benefits, like population health improvements, adaptation and resilience, and enhanced equity. These benefits are noted when actions offer particular potential.			
CITY RESOURCES	$	$$	$$$	
	< $100,000	$100,000-$500,000	> $500,000	
	Note these are City capital resources. Action implementation may have staffing and other ongoing operational cost implications in addition to the capital costs. These costs are considered separately in the implementation section of the plan. Costs for community members to proactively make changes and investments are not captured here.			
TIMELINE	ONGOING	SHORT TERM	MEDIUM TERM	
	Already underway & slated to continue	Within the next three years	By 2030	
	Note that the timeline provided for actions is the timeline for initiating the action. Actions may be ongoing once they are initiated.			

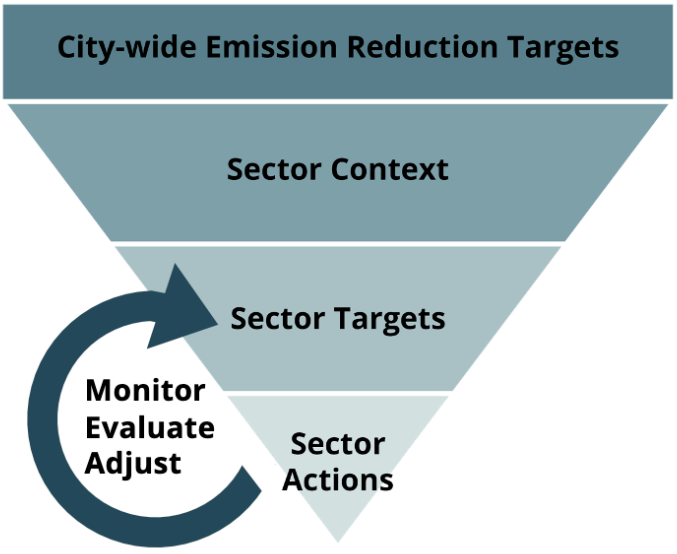


Figure 7. CEEP actions structure.

1. Transportation

Transportation accounted for nearly 30% of the community's energy use in 2016 and was responsible for nearly half (48%) of community GHG emissions.

Gasoline- and diesel-powered cars and light trucks generated 88% of all transportation emissions. Many New Westminster residents use personal vehicles to get around. Our community also has significant through-traffic and congestion challenges.

The good news is that New Westminster is well-positioned to significantly reduce emissions from transportation; the city is compact and continues to focus housing near rapid transit nodes, services, jobs, and amenities in many neighbourhoods. We have steep terrain but remain a walkable community. With five SkyTrain stations and various Frequent Transit Network routes, we are well-served by transit.

The City's first priority is to support more walking, biking, transit use, and multi-occupant use of vehicles. These sustainable modes of transportation are affordable and widely accessible, and work for a broad range of community members, beyond those with driver's licenses. They also better support local businesses. Active transportation promotes health, reduces congestion, and makes efficient use of energy and resources. To facilitate this shift, walking and biking must be safe and comfortable for more users, transit must be reliable and convenient, and "last mile" challenges related to the last leg of journeys must be solved. eMicromobility options such as e-bikes and e-scooters can help with the last mile, overcome the challenge of steep terrain, and further the distance that can be comfortably travelled without a car.

Electrification of vehicles—including transit, commercial and personal vehicles—will also reduce emissions and improve air quality. Adoption of electric vehicles (EVs) for trips that cannot be done by active transportation will provide significant gains. Vehicle electrification goals can be supported by providing charging options at home, work, and key destinations.





WHAT COMMUNITY MEMBERS ARE DOING

We engaged residents online and in person, and here are some of the ways community members are being proactive about reducing their transportation emissions:

- Making trips on foot or by bike when possible, for a healthier lifestyle.
- Thinking about moving closer to their place of work or carpooling or using transit to get there.
- Working from home some days, if they're able.
- Using a car share service to save on car payments, insurance costs, and parking fees, and avoid ever having to get gas.
- Using e-bikes, e-scooters, and e-boards for shorter trips. They're quick, convenient, and inexpensive compared to cars.

Targets

2030

- 60% of all trips within the city are by sustainable modes of transportation (walking, biking, rolling, transit, and riding in multi-occupant shared vehicles)
- 93% of new light-duty vehicle sales are zero-emission vehicles.[10]

2050

- 80% of all trips within the city are by sustainable modes of transportation.
- 100% of vehicles (sales and in use) are zero emissions models.

10 This target stems from modelling that underpins the City's eMobility Strategy.

TRANSPORTATION SECTOR ACTIONS	GHG REDUCTIONS	BENEFITS	RESOURCES	TIMELINE
Sustainable Transportation Modes				
1. Continue to implement the Official Community Plan, including: a. pursuing complete communities with transit-supportive densities and land use mixes; and b. enabling transit-oriented development in the downtown and near SkyTrain stations.	Preventative	Equity Health Resilience	Current staffing	Ongoing
2. Continue to prioritize sustainable transportation action implementation from the Master Transportation Plan, including: a. rapidly completing a network of active transportation infrastructure; b. supporting transit use by improving customer facilities and information, and exploring transit priority measures; and c. supporting transportation demand management initiatives which promote shifts to sustainable transportation and a reduction in single occupancy vehicle trips	High	Equity Health Resilience	$$$	Ongoing

3. Review the Zoning Bylaw, Development Permit Area guidelines, and other policies and regulations to directly or indirectly reduce demand for personal vehicles, for example by changing from parking minimums to maximums.	High	Equity Health Resilience	Current staffing	Short-term
4. Implement the Regional Greenway and Major Bikeway Networks within New Westminster, in collaboration with Metro Vancouver and TransLink.	Medium	Equity Health	$$	Medium-term
5. Advocate for and support implementation of TransLink's regional Transport 2050 plan, including: a. expanding frequent transit service, and improving service along the Major Transit Network (development of rapid bus along 8th Street, and capacity relief measures on the Expo SkyTrain line); and b. improving affordability, accessibility, and safety of transit and active transportation for all community members.	High	Equity	Current staffing	Ongoing, on a priority basis
6. Explore holding car-free days and creating car-free areas.	Low	Equity Health	$	Short-term

7. Advocate for more exploration of mobility pricing or road use charges, in collaboration with Metro Vancouver and TransLink.	Medium	Equity Health	$	Short-term
eMobility				
8. Accelerate EV and eMicromobility (e-bikes, etc.) adoption by implementing the eMobility Strategy.	High	Equity Health Resilience	$$	Short-term
9. Support the achievement of TransLink's regional Transport 2050 goal of transitioning to zero emission vehicles, including by: a. Increasing availability and access to electric bikes, scooters, and other forms of electric micromobility; b. accelerating the electrification of light-duty passenger vehicles; and c. supporting the transition of medium and heavy-duty vehicles to low emissions in the short-term and zero emissions over the long-term.	High	Equity Health Resilience	$$$	Ongoing
10. Support TransLink in implementing the 2050 Low Carbon Fleet Strategy to advance battery electric bus service in New Westminster.	Low	Equity Health Resilience	Current staffing	Ongoing

11. Explore partnering with TransLink, Metro Vancouver, or other agencies as appropriate, to establish zero emissions vehicle zones in which access is limited to persons using active transportation modes and zero emissions vehicles only.	Medium	Equity Health Resilience	$	Short-term
12. Show leadership by continuing to transition to an energy efficient and low-carbon corporate fleet, as directed by the Corporate Energy and Emissions Reduction Strategy (CEERS).	Low	Health Resilience	$	Short-term
13. Collaborate with Metro Vancouver and other partners to advocate to senior governments to support the transition to zero emissions medium and heavy duty vehicles.	High	Health Resilience	Current staffing	Medium-term
14. Collaborate with Metro Vancouver and other partners to explore opportunities to reduce emissions from deliveries, including online deliveries, by supporting fleet transitions to zero emissions, off-peak deliveries, small urban consolidation centres, and cargo bike deliveries.	Medium	Health Resilience	Current staffing	Short-term

2. Buildings

The operation of buildings accounted for approximately 53% of total energy use and 43% of total GHG emissions in New Westminster in 2016.

Even though 49% of homes use electric heating, emissions from natural gas heating account for 95% of emissions from buildings. Transitioning to high performance standards in new and existing buildings is a critical part of our low-carbon pathway.

New Westminster is a very built-up city, with many heritage buildings and strong rent protection that provides needed affordable housing. As such, working with existing buildings is a key strategy. Retrofitting existing buildings to reduce energy demand (e.g. adding insulation, draft sealing), improving efficiency (e.g. using efficient lighting and appliances), and switching fuel sources (e.g. from fossil fuel furnaces to efficient electric heat pumps), will result in more efficient use of energy and resources. Retrofits can also help improve the livability and safety of homes, especially important in the context of increased frequency and severity of extreme weather events.

Achieving retrofit goals will require solving challenges related to retrofitting existing multi-unit residential buildings, switching to low carbon energy sources, and requiring fuel source switching when municipalities are given the authority to do so. Supporting appropriate incentives and inspiring residents and rental building owners to proactively invest to reduce emissions will be critical. Careful consideration to affordability impacts for owners and renters will be needed, as well as tenant protection.

As the city continues to grow, it is also essential that new buildings are constructed to the highest energy efficiency standards and to be able to adapt quickly as new technologies develop and energy standards change. New Westminster uses the BC Energy Step Code to ensure high energy performance. Modelling shows that significant emission reductions can be achieved over the mid- to long-term by accelerating requirements for higher Step Code levels in new construction, and requiring that new buildings do not use fossil fuel energy sources. The City can continue to expand opportunities for energy efficient housing typologies in existing neighbourhoods. The City can also look for opportunities to be bold and innovative in reducing emissions from the built environment in large scale developments, such as those at the Braid and 22nd Street SkyTrain station areas.

WHAT COMMUNITY MEMBERS ARE DOING

- Upgrading their home's energy efficiency by improving insulation, improving airtightness, or replacing the furnace or electric baseboard heating with an electric heat pump. There are many subsidies available, and residents save money with lower energy bills.
- Regularly maintain heating/cooling appliances, including changing filters. Choosing ENERGY STAR rated models when appliances need to be replaced.
- Working with condo strata boards to determine the best energy efficiency solutions for their building. This can include replacing windows, upgrading insulation, installing heat pumps, and installing external window shades/ awnings.

Targets

2030

- Retrofit 50% of existing buildings to achieve 50% heating demand reduction and switch space and water heating to electric.
- All new buildings meet the highest tier of the BC Energy Step Code.
- All new buildings use low-carbon energy systems.

2050

- Retrofit 95% of existing buildings to achieve 50% heating demand reduction and switch space and water heating to electric.
- All new buildings are net-zero emissions.

BUILDING SECTOR ACTIONSW	GHG REDUCTION	BENEFITS	RESOURCES	TIMELINE
EXISTING BUILDINGS				
1. Increase the supports and programs for energy retrofits for existing residential, institutional, commercial, and industrial buildings, including by: a. prioritizing the unique retrofit needs of existing multi-unit residential buildings, especially rental buildings; b. focusing on the least efficient building stock (pre-1980); c. adapting retrofit strategies to work with heritage and character buildings; d. collecting and analyzing energy and spatial data of existing buildings to identify priority building archetypes and optimal strategies to support energy retrofits; e. exploring innovative financing mechanisms and tools to support retrofits (e.g. on-bill financing, green revolving load funds, or Property Assessed Clean Energy Financing (PACE)); and f. exploring one-stop-shop models of retrofit management.	High	Equity Health Resilience	$$	Short-term
2. Advocate to senior government and agencies to increase incentives and financing programs for energy retrofits, particularly for multi-unit residential buildings.	High	Equity Health Resilience	Current staffing	Short-term

3. Explore incentivizing transitioning from fossil fuels to low carbon energy sources, and when legislation changes, regulate fuel sources in existing buildings.	High	Health	Current staffing	Short- to medium-term
4. Review the City's regulatory and policy context for opportunities to better incentivize energy retrofits in exchange for additional density or other benefits, where appropriate.	High	Health Equity	Current staffing	Short-term
5. Continue to pursue heritage retention and revitalization where appropriate, to efficiently use energy and resources through adaptive reuse of buildings.	Low	Resilience	Current staffing	Ongoing
NEW BUILDINGS				
6. Incentivize low carbon energy systems in new buildings, including by implementing a two option framework for Step Code compliance for Part 9 buildings (smaller residential buildings) in 2023 (allowing construction either to Step 5, or to Step 3 with installation of or connection to a low carbon energy system).	Medium	Equity Health Resilience	N/A	Short term
7. As legislation changes to allow fuel sources to be regulated through GHG intensity, ensure City regulations require low carbon energy sources for new buildings.	Medium	Equity Health Resilience	N/A	Mid-term
8. Require maximum BC Energy Step Code tier for residential and non-residential buildings before 2030.	Medium	Equity Health Resilience	N/A	Mid-term
9. Identify appropriate performance standards for institutional and industrial buildings, and encourage meeting these standards through policy.	Medium	Equity Health Resilience	N/A	Mid-term

ALL BUILDINGS				
10. Continue to implement the Official Community Plan, including expanding infill housing options where appropriate and enabling more energy efficient housing typologies.	High	Equity Resilience	Current staffing	Ongoing
11. Explore ways to define low-carbon energy systems to include systems such as electric heat pumps, connection to low-carbon district energy, or on-site renewable energy, but exclude fuels such as RNG; and advocate to the Province for a similar approach in provincial legislation.	High	Resilience	Current staffing	Short-term
12. Continue to support and participate in pilot projects targeting energy performance improvements that are advanced by partners, the community, or the development sector, and assist in disseminating lessons learned.	Low	Resilience	Current staffing	Ongoing
13. Review the Zoning Bylaw, Development Permit Area guidelines, and other policies and regulations to remove any remaining barriers, and to further incentivize energy efficiency and GHG emission reductions.	Low	Resilience	Current staffing	Short-term
14. Continue to offer educational opportunities to the building industry, and explore ways to support industry training to enable adaptation to high performance building standards and lead the way on innovative buildings.	High	Health Resilience	Current staffing	Ongoing

15. Continue to demonstrate leadership through high energy performance City facilities (new and retrofitted) constructed with low embodied carbon materials, as directed by CEERS.	Low	Resilience	Current staffing	Ongoing
16. Advocate to the Province for the development of a mandatory energy labelling and benchmarking program for buildings and, in the interim, explore tools the City can use to encourage voluntary energy disclosure.	Low	Equity Health Resilience	Current staffing	Short-term





ENERGY SAVE NEW WEST

Energy Save New West (ESNW) is a community energy program designed to improve energy efficiency and reduce greenhouse gas emissions in new and existing homes and businesses in New Westminster. ESNW works closely with a network of program partners to provide a wide range of services, incentives, industry training, and information to help local residents and businesses better manage energy use and related costs. Examples include collaborating with Metro Vancouver on the Strata Energy Advisor program, and delivering Virtual Builder & Designer Breakfasts (with over 250 attendees in 2021). ESNW also focuses on making it easier for people to improve the energy performance of their home or business. By the end of 2021, over 900 people had participated in ESNW's programs for existing homes, and 66 people had participated in programs for new homes.

ESNW has had a tremendous impact in the community, providing:

- A comprehensive suite of rebates and incentives including access to energy assessments, technical energy coaching, energy upgrades (e.g., smart thermostats), and access to utility rebates;
- A secure customer journey with end-to-end program support to make it straightforward and easier for homeowners and businesses to participate;
- Proactive consultation with participants to maximize the potential benefits of energy efficiency retrofits including increased uptake of program rebates and incentives; and
- Positive industry engagement with local builders, designers, and architects including training and professional development from the program that encourages design and construction of better homes in New Westminster.

3. Energy

Energy sources have major emissions implications; broad electrification presents a major opportunity to reduce emissions.

Gasoline cars and trucks accounted for 38% of 2016 emissions, while natural gas heating accounted for another 43%. Emissions related to electricity accounted for only 6% of GHGs, as BC's predominantly hydroelectric-powered grid is one of the cleanest in Canada.[11]

Continued growth and electrification may create electricity supply constraints and load management challenges, however. Energy conservation and demand management are important strategies to avoid reaching the limit of grid electricity supply. These initiatives will entail both using less energy and better managing energy use through smart technologies, resulting in household energy cost savings and reduced need for new electricity infrastructure.

New Westminster can also address increased grid demand through local renewable energy generation. As solar photovoltaics, solar thermal, renewable energy storage, and other technologies evolve, there will be on-site and community-scale opportunities to build grid resilience.

The actions in this section help to implement energy conservation and demand management initiatives, encourage local renewable energy systems, embrace emerging smart grid technologies, and expand connections to district energy systems. As a City with its own electric utility, New Westminster is well positioned to take bold action on energy.



11 Emissions from electricity use in BC stem from imported electricity that is generated by fossil fuels outside the province. The provincial government and BC Hydro have committed to 100% net-zero emissions electricity delivery by 2030.

WHAT COMMUNITY MEMBERS ARE DOING

- Switching to energy efficient light bulbs.
- Turning off lights and disconnecting charging plugs from outlets when not in use.
- Air drying dishes and clothes.
- Switching from baseboard heating to a heat pump to use less electricity.
- Installing solar panels to take advantage of New Westminster's net metering program.

Targets

2030

- Per capita energy demand is reduced by 30% from 2016 levels.[12]
- 2% of electricity is generated from local and renewable sources of energy.

2050

- Per capita energy demand is reduced 60% from 2016 levels.
- 5% of electricity is generated from local and renewable sources of energy.

12 Per capita targets allow for some change due to population growth, but a decrease in energy demand when divided by the population of the City. Per capita demand will be determined as a community-wide average.

Energy Sector Actions	GHG Reduction	Benefits	Resources	Timeline
Energy Conservation and Demand Management				
1. Continue to implement and expand on educational campaigns to encourage and raise awareness about energy conservation, including providing additional information on utility bills.	Low	Equity Resilience	$	Short-term
2. Encourage the use of smart technology to better manage energy usage (e.g., smart thermostats).	Low	Resilience	$	Short-term
3. Collect and share resources on energy conservation programs developed by BC Hydro and other partners to build knowledge and capacity among commercial and institutional building Electric Utility customers to reduce their energy consumption.	Medium	Resilience	Current staffing	Short-term
4. Work with Electric Utility and BC Hydro to implement energy conservation and demand management strategies, including continuing to ensure New Westminster customers have access to programs offered by BC Hydro or an equivalent program offered by the City.	Medium	Resilience	Current staffing	Short-term

5. Evaluate New West Electric rate structure and explore development of a low-income home energy assistance program that assists eligible households with their heating and cooling costs, weatherization, and energy-related home repairs.	Medium	Equity Resilience Health	Current staffing	Short-term
6. Continue to lead by example with phasing out the use of fossil fuels in City hand-held landscaping equipment and explore further regulating their use for personal and commercial purposes in the community.	Low	Health	$	Short-term
7. Implement the strategies of CEERS related to formalizing the internal application of carbon pricing as part of the City's internal processes and adopting a procurement policy that considers energy and emissions.	Low	Equity Resilience	Current staffing	Medium-term
8. Advocate to senior levels of government to adjust carbon pricing over time, or consider a regional carbon price supplement, to prompt industry emissions reduction.	High	Equity Resilience Health	Current staffing	Short-term
Local Energy Generation				
9. Complete a renewable energy study that identifies viable supply sources and a prioritized list of initiatives.	High	Equity Health Resilience	$	Short-term

10. Explore how to encourage cost effective, on-site renewable energy generation in new and existing buildings through incentives and policy tools, such as preferential net-metering rates.	Medium	Equity Health Resilience	$	Short-term
11. Explore opportunities to expand urban solar gardens that enable community members to invest in solar projects.	Low	Health Resilience Equity	$	Ongoing, on a priority basis
District Energy and Waste Heat Recovery				
12. Explore the viability of extending Sapperton's district energy system or developing new systems as new opportunities arise.	Medium	Resilience	$$$	Short-term
13. Explore opportunities to encourage on-site waste heat recovery systems in buildings with a net positive internal rate of return.	Medium	Resilience	$	Short-term
Smart Grid Technologies				
14. Assess the business case and feasibility of energy storage within the City's existing grid.	Medium	Resilience	$$	Medium-term
15. Explore opportunities to partner on a pilot of a solar-battery demonstration project on a building.	Low	Resilience	$	Short-term

16. Conduct feasibility studies that test low-carbon backup power systems to reduce reliance on fossil fuel backup power generators.	Low	Resilience	$	Short-term
17. Continue to explore upgrading electrical metering equipment with advanced metering infrastructure to allow community members to better monitor and assess their energy use.	Medium	Equity Resilience	$$$	Ongoing

URBAN SOLAR GARDENS

There are two urban solar gardens in New Westminster. They consist of community-owned solar photovoltaic arrays. One is located on the City public works yard and the other is located on the Queensborough Community Centre. This City-led renewable energy project provides an opportunity for interested residents, businesses, and non-profit organizations to voluntarily subscribe to a portion of the total electricity generated by the array. The solar power generated is credited back to each subscriber's electricity bill twice per year for up to 25 years. As of the end of 2021, the two arrays had generated over 325 MWh of renewable energy.

DISTRICT ENERGY

The Sapperton district energy project will supply clean, affordable, and renewable heating to residents in the area while reducing emissions. The Royal Columbian Hospital will be an anchor customer for the system, with its significant annual heating requirements. The system will also serve new residential and commercial development. As the underground piping network expands into new neighbourhoods near Sapperton and Braid Stations, it may be possible to connect existing commercial and multi-unit residential buildings, replacing their heating equipment as it reaches replacement age. New buildings along East Columbia Street may also be able to connect.

The district energy system has potential to generate local revenue and keep energy dollars within the community. The system is anticipated to reduce GHG emissions by approximately 8,600 tCO2e per year—125,000 tCO2e over its lifespan.

THE ROLE OF RENEWABLE AND LOW-CARBON FUELS

As energy and carbon prices change and senior government directives further the energy transition, industry is changing and new types of pipeline fuels are emerging, including green and blue hydrogen, renewable natural gas (RNG), and biomass. However, the supply of low-carbon fuels is anticipated to be limited.[13] Also, accounting for lifecycle emissions, not all of these options are necessarily low-carbon.

The modelling underpinning the CEEP strategically anticipates that fuels such as RNG may be used to decarbonize hard-to-electrify industrial processes, for example, but that the transportation and buildings sectors will largely electrify. While the City will continuously monitor and adapt to changes in the energy sector, urgent emissions reductions require reducing energy demand, increasing efficiency, and relying on our grid electricity supplemented by district energy and local renewable energy generation.

13 B.C. Renewable and Low-Carbon Gas Supply Potential Study (2022). Province of BC, Fortis BC, BC Bioenergy Network. *https://www.cdn.fortisbc.com/libraries/docs/default-source/about-us-documents/renewable-gas-study-final-report-2022-01-28.pdf*

4. Waste and Circular Economy

Waste relates to a number of environmental challenges, including emissions from upstream materials extraction, manufacturing and processing, and downstream environmental degradation. Emissions from waste (mostly from methane from landfills) represented 3% of total emissions in New Westminster in 2016. Although this is a small portion of the emissions profile, as population grows emissions from waste are anticipated to increase by 46%, making waste reduction important for emission reduction.

Metro Vancouver has jurisdiction over waste management and processing for New Westminster. The City can exert influence through its collection services, partnerships, advocacy, and policies in key areas. The City can support more composting, diversion of organics, increased recycling of more types of materials, and can help ensure buildings are configured to make composting and recycling as convenient as possible.

Substantial waste-related emission reductions can also come from shifting to a circular economy model. In a circular economy, waste is "designed out", as outputs from one process become inputs for another; instead of being extracted, used, and discarded, resources are potentially used indefinitely. Achieving this shift would require significant societal change, but the City can use regulations, policy, and advocacy to help build momentum within our local business and resident community.

Targets

2030

- Annual waste reaching landfills is reduced by 5% from 2016 levels.

2050

- Annual waste reaching landfills is reduced by 20% from 2016 levels.

WHAT COMMUNITY MEMBERS ARE DOING

- Avoiding food waste, composting their food waste, yard trimmings, and soiled paper where allowed.
- Reducing waste by avoiding single use items, making quality clothing purchases and resisting fast fashion, and creating memories, not garbage when it comes to gifts.
- Donating or repairing quality used materials.
- Championing improved recycling at placed of work and in housing complexes.
- Saving up specialty waste items and bringing them to the United Boulevard Recycling and Waste Centre.



Waste and Circular Economy Sector Actions	GHG reduction	Benefits	Resources	Timeline
Waste Reduction				
1. Support senior government action on reducing use of single use plastics and packaging, and explore implementing changes locally.	Low	Resilience	Current staffing	Ongoing
2. Support and amplify waste reduction and diversion educational programs delivered by Metro Vancouver and other partners (e.g. community groups supported through City grants).	Low	Resilience	Current staffing	Ongoing
3. Explore opportunities to host or support regular waste reduction events such as zero waste days, community repair events, or neighbourhood garage sales.	Low	Resilience	$	Ongoing
Waste Diversion				
4. Continue to expand and improve household recycling and yard and food scraps diversion and collection programs.	Low	Resilience	$$	Ongoing
5. Continue to require recycling and organics facilities on site in multi-unit residential, industrial, commercial, and institutional buildings, and consider expanding guidelines to improve the convenience and experience of recycling and organics storage and pick-up.	Low	Resilience	Current staffing	Ongoing
6. Work with businesses to reduce waste and divert organics from restaurants, the tourism industry, and the commercial sector overall.	Low	Resilience	Current staffing	Ongoing

7. Expand green demolition by reviewing and increasing requirements for construction waste diversion, encouraging deconstruction, salvaging, and improving enforcement for better compliance.	Low	Resilience	Current staffing	Short-term
8. Support Metro Vancouver in its update to and implementation of the Regional Solid and Liquid Waste Management Plans, and advocate for a stronger climate lens in these regional plans, including: a. Applying an emissions reduction lens to efforts to strengthen the market for recycling and recycled materials, expand Extended Producer Responsibility, and pursue circular economy opportunities; and b. Enhanced GHG emissions capturing methane (biogas) from landfills, expanding low emissions waste-to-energy facilities as appropriate, and reducing emissions from organics.	Low	Resilience	Current staffing	Ongoing

Circular Economy				
9. Collaborate with Metro Vancouver and regional municipalities to coordinate development of a circular economy, including the potential development of a regional strategy.	Low	Equity Resilience	$	Ongoing
10. Engage with local businesses in circular economy initiatives and support the adoption of circular economy approaches in the materials use, design, manufacturing, transport, retailing, and repurposing of products and services.	Low	Equity Resilience	$	Short-term

5. Natural Systems

In addition to taking action to reduce emissions from different sectors, addressing the climate emergency requires restoring and leveraging natural systems, to buffer against the impacts of climate change.

Natural areas, including the soils and plants in parklands and our urban forest canopy, sequester carbon. Growing the City's forest canopy coverage to 27% would result in the removal of up to 4,050 tonnes of carbon pollution every year, and increase our forest's carbon storage capacity by 50%. Green infrastructure like rain gardens and bioswales also allows water to slow down and to be filtered, reducing indirect emissions associated with grey infrastructure (stormwater, pipes).

Natural areas and green infrastructure can also help improve New Westminster's resilience and adaptability to climate change by managing stormwater runoff, mitigating the urban heat island effect, improving air quality, and fostering biodiversity. Integrating the natural environment within the public realm can also support human well being and mental health, and has an added benefit of making walking and biking more compelling. Similarly, supporting a sustainable local food system, including community gardens, can also have an impact on GHG emissions.

The City's Integrated Stormwater Management Plan, Biodiversity Strategy, and Urban Forest Management Plan contain sound recommendations for enhancing natural systems within the city. Implementing these plans is vital to enhancing resilience and off-setting emissions.

WHAT COMMUNITY MEMBERS ARE DOING

- Limiting driveway space and hardscaped areas, choosing permeable materials whenever possible.
- Keeping the trees on their property and planting new ones.
- Letting lawns go golden in the summer or replacing lawns with rain gardens or climate-adapted plants.
- Installing rain barrels to capture rainwater for use on plants and lawns.
- Adopting a catch basin on their street.

Targets

2030

- Urban forest canopy cover is increased to 27%.

2050

- Urban forest canopy cover is maintained at 27%.
- 10% of the City's land base is protected as natural park area.

NATURAL SYSTEMS ACTIONS	GHG REDUCTION	BENEFITS	RESOURCES	TIMELINE
1. Develop an adaptation strategy that outlines principles and actions to mitigate climate related risks and build climate resilience, emphasizing natural capital and opportunities for ecological benefits.	Low	Health Resilience Equity	$	Short-term
2. Continue to implement the Integrated Stormwater Management Plan, including: a. creating additional resources and enhanced guidelines for green infrastructure on private property; and b. expanding the use of green infrastructure on public lands.	Low	Health Resilience Equity	$$	Ongoing

3. Continue to implement the Urban Forest Management Strategy and Biodiversity Strategy, including: a. incentivizing community members to install habitat features and plant trees; b. further encouraging developers and builders to integrate green spaces into developments; c. integrating natural systems into the public realm, such as parks, greenways, and active transportation corridors; and d. pursuing land acquisition and restoration to expand natural park areas.	Medium	Health Resilience Equity	$$	Ongoing
4. Explore opportunities to support sustainable local food systems, such as by: a. continuing to encourage communal gardens and private balcony or roof gardens in new multi-unit residential buildings; b. reviewing regulations to remove barriers to urban farming; and c. supporting local food procurement and farmers markets.	Medium	Health Resilience Equity	$	Ongoing

5. Seek opportunities to reduce water consumption by promoting grey water reuse and the use of technologies such as timers and leak detectors by residents and businesses.	Low	Health Resilience Equity	$	Short-term
6. Explore opportunities to increase the City's water pumping efficiency.	Low	Resilience	$$$	Ongoing

Implementation, Monitoring, and Evaluation

Implementing the CEEP and reaching the City's emissions reduction targets will require focus across the organization, and a continued cultural shift, to apply a climate lens across departments. Rapid implementation and scaling up of actions will also require additional staffing across the organization. Additional positions on the Climate Action Team may be needed—to build momentum on achieving building retrofit targets, for example. The Climate Action Team will lead implementation of the CEEP, but many actions have interdepartmental responsibilities.

Action implementation will be informed by the creation of a decision support tool that helps the City prioritize climate action, by considering factors such as cost effectiveness, GHG emission impact, equity, additional community benefits, and opportunities to further reconciliation.

Implementation must also include strong monitoring and evaluation. GHG emission inventories will be updated regularly. The City will measure, track and report on its targets and actions, making adjustments where required. This reporting will be part of a larger key performance indicator reporting project.

Taking a flexible and iterative approach to action implementation will help manage the risk and uncertainty with these efforts and allow the City to take advantage of evolving federal and provincial government policy and regulations, and emerging technologies.

Next Steps

The modelling and analysis which underpins this Plan makes it clear how urgently we need to act to reduce emissions by the extent needed to meet our community energy emission reduction targets. Bold action is needed to retrofit our existing buildings, build new buildings to the best standards available, shift out of our polluting vehicles, reduce our waste, and restore and enhance natural systems. This plan provides a roadmap; following it through will require significant focus and collective action.

The City is committed to continuously learning and deepening action on the climate emergency. Following current best practices in municipal emissions accounting, the inventory underpinning the CEEP focuses primarily on “scope 1 and 2 emissions” (see Figure 3). However, we know that out-of-scope emissions have a real impact on climate and also need to be addressed.

Next steps in GHG emissions reduction must address these upstream and downstream emissions. Approaches such as lifecycle analysis can bring accountability for the embodied carbon from upstream emissions (e.g., the emissions from materials extraction and processing) and consideration of downstream emissions (e.g. from disposal of products). We as a community need to reconsider our consumption patterns and look for circular economy options, and critically examine our lifestyles to shift to low-carbon living.

The City will look for opportunities to lead this shift through corporate actions as well as new policy and programs that inspire collective community action. Potential future actions include adopting consumption-based emissions accounting for the City, an evidence-based carbon budget approach, or developing a sustainable consumption strategy that identifies and prioritizes options for lower carbon consumption.

Disclaimer

Sustainability Solutions Group exercised reasonable skill, care, and diligence to assess the information acquired during the preparation of the analysis that informs the Community Energy and Emissions Plan, but no guarantees or warranties are made regarding the accuracy or completeness of this information. This document, the information it contains, the information and basis on which it relies, and the associated factors are subject to changes that are beyond the control of Sustainability Solutions Group. The information provided by others is believed to be accurate but has not been verified.

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Appendix

Low-carbon Scenario Modelled Energy and Emissions Charts

Modelled low-carbon scenario (LCS) energy trajectory (Figure 1) and emission reductions (Figure 2) by sector, 2016-2050. As energy efficiency and renewable energy actions are taken, energy demand decreases across all sectors, except for a slight increase in the industrial sector as industry grows.

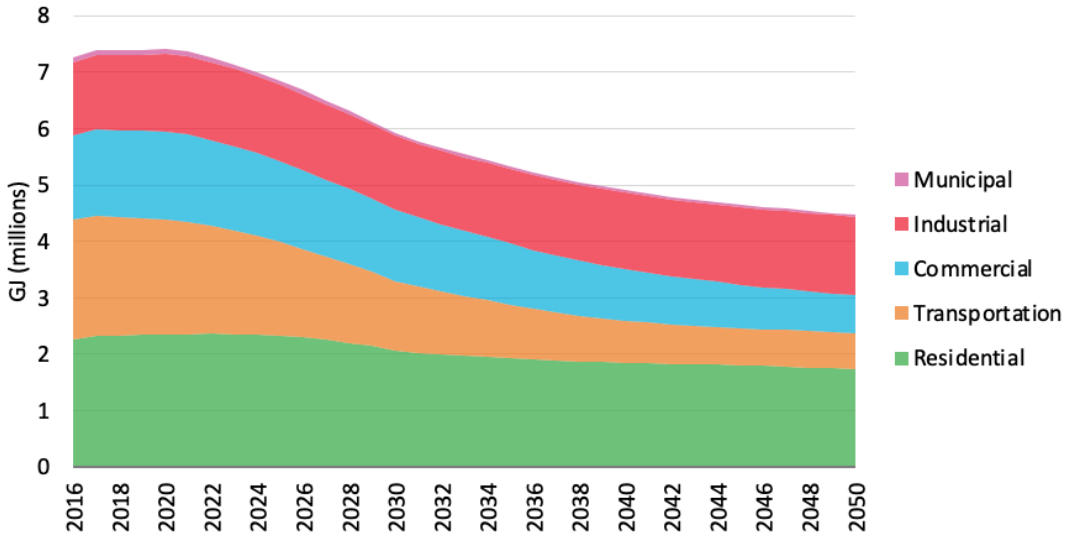


Figure 1. Modelled LCS Energy Reductions by Sector, 2016-2050.

Transportation energy demand decreases substantially, as EVs require less energy to operate and use energy more efficiently than gas and diesel vehicles. As energy sources electrify and switch to RNG and hydrogen, emissions decrease in all sectors except waste, which increases slightly with population.

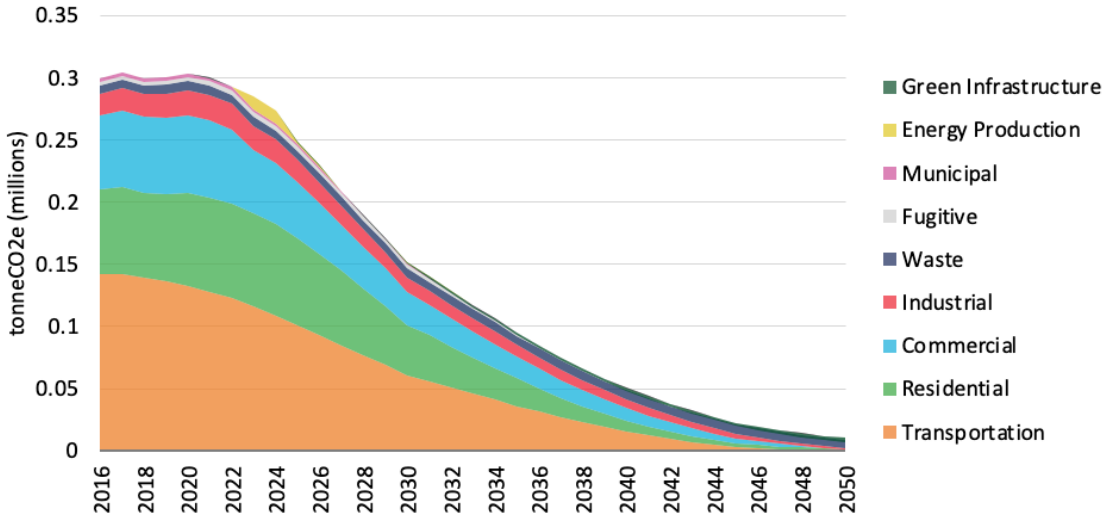


Figure 2. Modelled LCS Community Emissions by Sector, 2016-2050.

Modelled LCS energy trajectory (Figure 3) and emission reductions (Figure 4) by fuel type, 2016-2050. Gasoline and diesel use all but disappear by 2050, replaced by electricity provided by the grid and local sources. RNG and hydrogen help reduce natural gas use. District energy systems and ambient heat (electric heat pumps) reduce natural gas use as well. Building heating systems and vehicles increasingly switch to electricity use, increasing the energy drawn from the grid and local sources. All of these energy shifts and reductions have corresponding emission reductions. Emissions all but disappear by 2050, with some remaining from continued natural gas and wood use, and legacy solid waste.

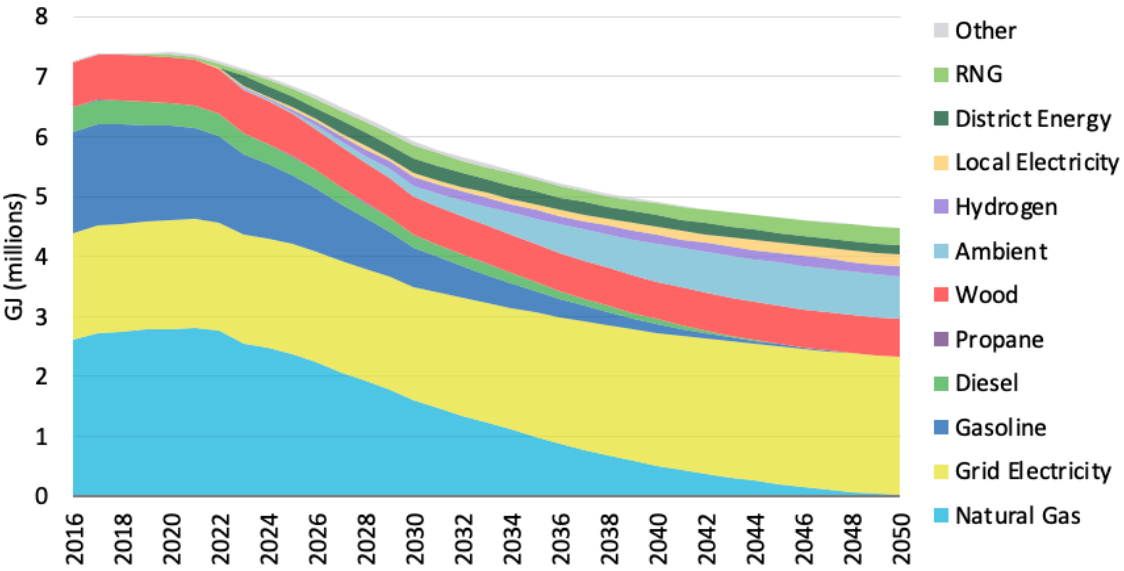


Figure 3. Modelled LCS Community Energy by Fuel Type, 2016-2050.

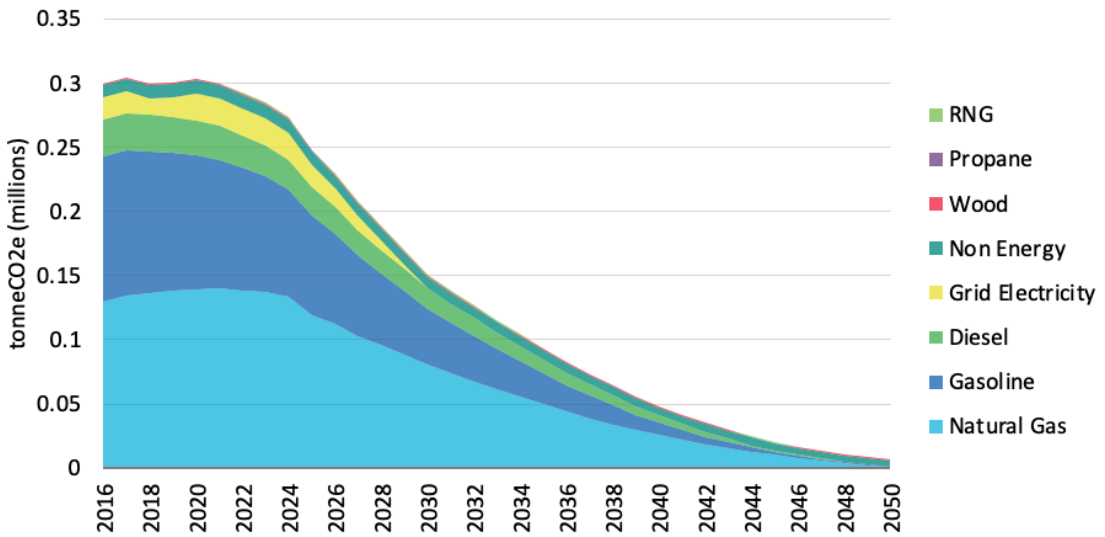


Figure 4. Modelled LCS Emissions Reductions by Fuel Type, 2016-2050.

Modelled LCS energy use trajectory by end use, 2016-2050. As winters warm and building heating systems transition to efficient electric heat pumps, overall space heating energy demand decreases, even though there are more buildings and homes to heat by 2050. The increased efficiency of hot water electric heat pumps decreases total water heating demand, even though there are more buildings using water. Total transportation energy use decreases as vehicles electrify and more trips are made by active transportation, transit, and energy efficient e-bikes, e-scooters, and e-boards. Industrial energy use grows slightly as industry grows. Space cooling energy demand increases slightly as summers warm, but the increase is small compared to the realized decrease in space heating energy.

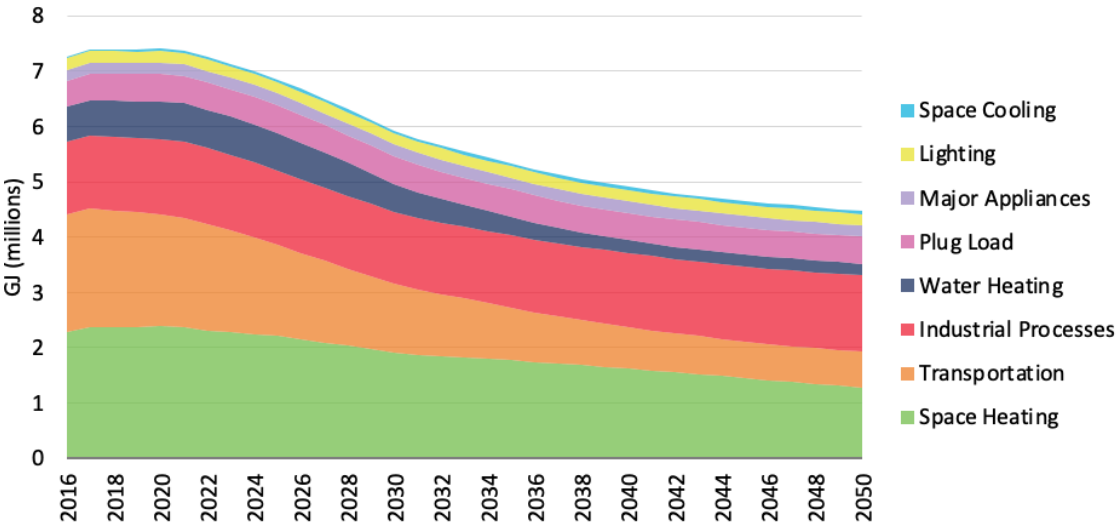


Figure 5. Modelled LCS Energy Use Trajectory by End Use, 2016-2050.