

New Westminster

Community Energy and Emissions Plan

June 2022

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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

[Still to Come]

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 stakeholders. Their contributions ensured that this Action Plan captures the climate action aspirations of the community.

Modelling and plan development was led by Sustainability Solutions Group (SSG).

Executive Summary

The climate emergency calls for bold and rapid action. The City of New Westminster has set responsible and ambitious emissions reduction targets of becoming a net zero greenhouse gas (GHG) emission community by 2050, and achieving significant 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 action by community members.

This Community Energy and Emission Plan (CEEP) provides a roadmap to approach net zero by 2050, and is a call to action for the City and the broader community. 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 CEEP provides five sector focus areas, and 55 actions for the City to take. The sectors and corresponding action areas are as follows:

Sector	Action Areas
Transportation	<ul style="list-style-type: none">• Shifting to sustainable transportation modes• Accelerating adoption of electric mobility
Buildings	<ul style="list-style-type: none">• Retrofitting existing buildings to be more efficient and use renewable energy• Ensuring new buildings are as high performing as possible
Energy	<ul style="list-style-type: none">• Reducing energy demand• Generating local renewable energy• Expanding district energy and waste heat recovery systems• Exploring Smart Grid technology
Waste and Circular Economy	<ul style="list-style-type: none">• Reducing and diverting waste• Implementing circular economy principles
Natural Areas and Green Infrastructure	<ul style="list-style-type: none">• 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 these areas look to ensure we reduce energy demand first, improve efficiency, and ultimately switch fuel sources to low carbon sources. This approach will help manage impacts on the electricity grid and build community resilience.

Implementation of the CEEP will need to include flexibility, to ensure the City can adapt and pivot as new action opportunities arise with legislative and technological change. Ensuring actions are implemented in an equitable way will also be critical to ensuring the transition to a low carbon community benefits everyone.

Part 1: Defining the Challenge

1. Introduction

The importance of rapid climate change response cannot be overstated. Human-induced climate change through fossil fuel use is a global crisis that threatens health and public safety, infrastructure, livelihoods, biodiversity, 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 Report¹ confirms that without 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, frequent weather and geological catastrophes. Limiting heating to the +1.5°C global target will curb the severity of climate change impacts to human and natural systems but will not prevent them. The Assessment Report concludes that rapid fossil fuel use elimination across all socio-economic sectors is imperative 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% of 2010 levels by 2030, 65% by 2040, and 100% by 2050. The Community Energy and Emissions Plan (CEEP) is the blueprint for taking the bold action required to address the emergency. The targets and actions identified in this plan show the low-carbon pathway to net-zero greenhouse gas (GHG) emissions by 2050, as well as ambitious interim targets.

The modelling that informed the CEEP shows that getting to near 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 certain emissions reduction actions. When it arrives, the City will need to act quickly to incentivize energy efficiency retrofits, roll out waste bans, and implement other emissions reduction measures.

The CEEP focuses on actions the City can take within its jurisdiction, to lead by example, set the regulatory context, explore incentives, and create the neighbourhoods that will enable low-carbon living. However, the City does not control all the mechanisms needed to achieve zero emissions. Critically, collective action is also needed by community members to proactively undertake retrofits to homes, to choose sustainable transportation when able, to reduce and divert waste, and more. Rapidly reducing emissions and reaching net-zero is a community effort. The CEEP helps sharpen our focus on the scale and urgency of the challenge and identifies how we will meet it.

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

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 actions, and adjusts and extends targets out to 2050, providing a data-backed pathway to zero emissions.

This CEEP replaces 2011's Community Energy and Emissions Plan, which guided climate action for the past decade. The climate crisis has grown more urgent in the intervening years. There has also been rapid evolution of low-carbon technologies as well as 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 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 the city, and fundamentally influence the way community members live and move.

- **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.
- **Master Transportation Plan (2015)** and neighbourhood transportation plans: establish long range transportation network plans and priorities, focusing on advancing sustainable transportation.

Subject Specific Plans

- **Environment Strategy and Action Plan (2018):** includes a vision, set of goals and actions on energy and emissions, built environment, waste and natural areas and habitat.
- **Biodiversity Strategy (2022):** analyses the state of natural areas and biodiversity in the City and provides a suite of recommended actions and guidelines that will help the City to prioritize

protection, enhancement, and restoration of natural habitat areas and the species that live there.

- **Urban Forest Management Strategy** (2016): outlines actions to protect the city's urban forest and ecosystems by increasing the city's tree canopy, improving tree management practices, and building community ownership of the urban forest.
- **eMobility Strategy** (2022): accelerates and supports the move towards sustainable and electric transportation systems in the community, including supporting e-bikes and other e-micromobility options, increasing EV charging infrastructure and supporting adoption of EVs, and enhance electric utility management to accommodate increased electrical demand.
- **Integrated Stormwater Management Plan** (2017): helps the City manage rain water, prevent sewer overflows and flooding, and enhance watersheds, through a suite of green infrastructure approaches.
- **Corporate Energy and Emissions Reduction Strategy** (2020): identifies actionable strategies for the City to become a carbon neutral corporation by 2030.

These plans offer strong, relevant direction for the CEEP. Their implementation will support climate change mitigation and adaptation goals. The urgency of their implementation is underscored by the CEEP modelling which confirms the need for immediate, ambitious action to meet our 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.

- **Pan-Canadian Framework** is the federal framework for climate action, including the approach to pricing carbon pollution and 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 actions to provide guidance on GHG reporting, advance climate change adaptation, and build resilience to climate impacts across the country.
- **CleanBC Roadmap to 2030** outlines Provincial commitments to meet the legislated target of achieving net-zero GHG emissions by 2050. Achieving the CleanBC target requires all jurisdictions across the province to use clean energy and reduce GHG emissions as much as possible. Doing so can put ambitious communities at the forefront of initiatives and enable them to capture opportunities as they arise; the CEEP can thus be seen as a significant opportunity.
- **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.

- **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.

SIDEBAR: Climate Leadership to Date

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

- Launching Energy Save New West (ESNW) 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.
- Being one of the first jurisdictions in North America to introduce requirements for all new residential buildings to be 'EV ready' in 2019.

Following First Nations Climate Leadership

New Westminster is within the traditional territory of the Halkomelem (hən'qəmin'əm, Halq'eméylem, Hul'q'umi'num') and Skwxwú7mesh sníchim-speaking peoples. Since time immemorial, Halkomelem and Skwxwú7mesh peoples have lived with these lands and hold an intimate awareness of its value to life and wellbeing. The City of New Westminster recognises, values, and respects these Indigenous connections to this land and all we can learn about how it sustains everyone. For over 150 years this land has been harmfully exploited by colonization which 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 arrays (a new array powering the Nation's administrative building as pictured here).



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/>)

Solutions to the climate emergencies must be led by Indigenous knowledge systems such as the Medicine Wheel. The Medicine Wheel teaches us about the interconnection of all things. It teaches us that the living world is sacred and what happens to one, happens to us all. The City is learning to apply the holistic lens of the Medicine Wheel in our objective to heal the land, and in so doing, as we implement the CEEP, we can begin to heal ourselves as well.

Finding a path out of the climate emergency requires learning from, and working with, First Nations and Indigenous residents of this land. The City must seek ways to work with our Indigenous partners to deliver on the goals of the Community Energy and Emissions Plan. Implementation must grow a

relationship of mutual respect, trust and reconciliation with local First Nations and indigenous people.

Climate Equity

Improved equity outcomes are a principal goal of the CEEP. Climate action must enhance equity and address the wellbeing of everyone, especially equity-denied groups.

Live-alone and frail seniors, low-income groups, racialized communities, people with physical and mental health conditions, and those experiencing homelessness are more likely to be exposed to or impacted by climate hazards. These populations 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. If they own a private vehicle, it is also likely to be gasoline powered, and potentially older with poor fuel efficiency. The City's implementation of the CEEP must ensure that equity-denied groups benefit from the transition to a low-carbon society and are meaningfully involved in decision-making that informs this transition.

SIDEBAR: Addressing Energy Poverty

The median energy cost burden for Canadian households is 3% of after-tax income. A household is experiencing energy poverty when its energy cost burden exceeds two times the national median or 6% on their home energy bills. In 2016, 9% of New Westminster households were experiencing energy poverty.

The City collaborated with other local governments to address this issue and carried out a detailed assessment of energy poverty. This study identified the contributing factors to energy cost burden and prevalent barriers that have prevented equity-denied groups from benefitting from energy efficiency programs and available incentives at the provincial level. 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 rigorous data available, the City is better equipped to design targeted initiatives that will allow us to identify opportunities to reduce energy poverty and expand on building adaptation initiatives.

Resilience and Adaptation

The primary focus of the Community Energy and Emissions Plan is to mitigate local GHG emissions. However, climate impacts are already being felt in the community, and climate adaptation is increasingly critical. Resilience and adaptation are important lenses for climate action planning.

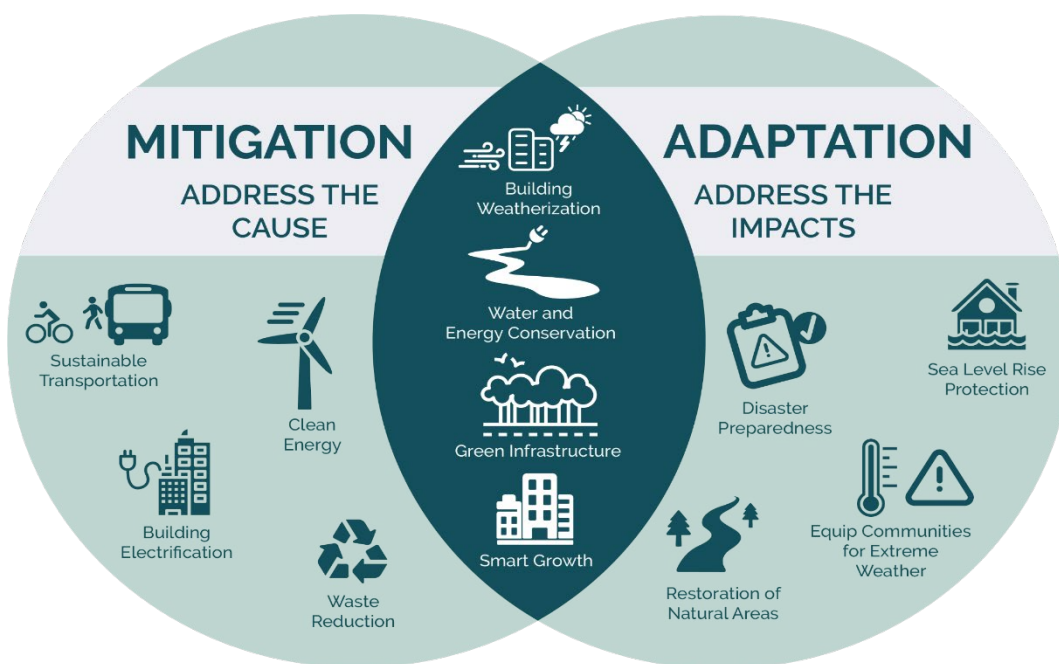


Figure 2. Areas of overlap between climate change mitigation and adaptation actions.

Several of the City's existing plans include climate actions that support both mitigation and adaptation, such as enhancing the tree canopy and developing green infrastructure to better manage stormwater. Some CEEP emission reduction actions also have climate change adaptation benefits. For example, building energy efficiency retrofits will provide more insulation against extreme cold or heat events. Adding local renewable energy production and battery storage will increase resilience against power outages or 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 strategy identifies adaptation benefits of its emissions reduction actions. Considering adaptation benefits and applying an equity lens to the distribution of these benefits will be critical during action implementation. Further work to identify adaptation strategies and actions is also needed through a separate process.

3. Climate Impacts

Though climate change is a global phenomenon, its effects are and will be felt at the local level. Unless immediate and drastic action is taken to reduce GHG emissions, New Westminster can expect continued climate disruption, further heating, and increased severity and frequency of local climate impacts.

The annual average temperature is projected to increase by 3°C by the 2050s.² Days hotter than 30°C, which New Westminster almost never sees, may increase to 16 per year.³ 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 which resulted in the tragic premature deaths of 28 community members in New Westminster, including seniors and those living with pre-existing health conditions.

The region’s already dry summers are also projected to receive 15% less rain, although annual precipitation is also projected to increase 7%.⁴ 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.

The following local climate impacts are also expected:

- Warmer temperatures and more humid air from increase rainfall in the winter and spring months will result in greater air front variances, resulting in more frequent and intense storms;
- Warmer annual mean temperatures will result in flora and fauna species migration, with some currently local species moving north. This may result in an increase of invasive species and risk to local biodiversity;
- Warmer winters will decrease heating demand in winter months;
- Wetter winters and springs will increase flood risk frequency and severity, as well as risk of decreased slope stability;
- 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. Existing drainage infrastructure may need capacity increases or retention ponds;
- Increased drought will increase wildfire risk, wildfire smoke presence, and airborne particulate pollutants; and

² Pacific Climate Impacts Consortium’s Plan2Adapt for the region of Metro Vancouver.
<https://services.pacificclimate.org/plan2adapt/app>

³ Climate Atlas of Canada report for Vancouver, British Columbia.
<https://climateatlas.ca/sites/default/files/cityreports/Vancouver-EN.pdf>

⁴ Ibid, 2.

- Longer dry seasons may increase the length of forest fire season.

SIDEBAR: 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 impacts to ecosystems and agriculture are 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 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.

4. Emissions and Climate Action Pathways

What Emissions are Included?

The CEEP considers Scopes 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 to control. Similarly, indirect 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.

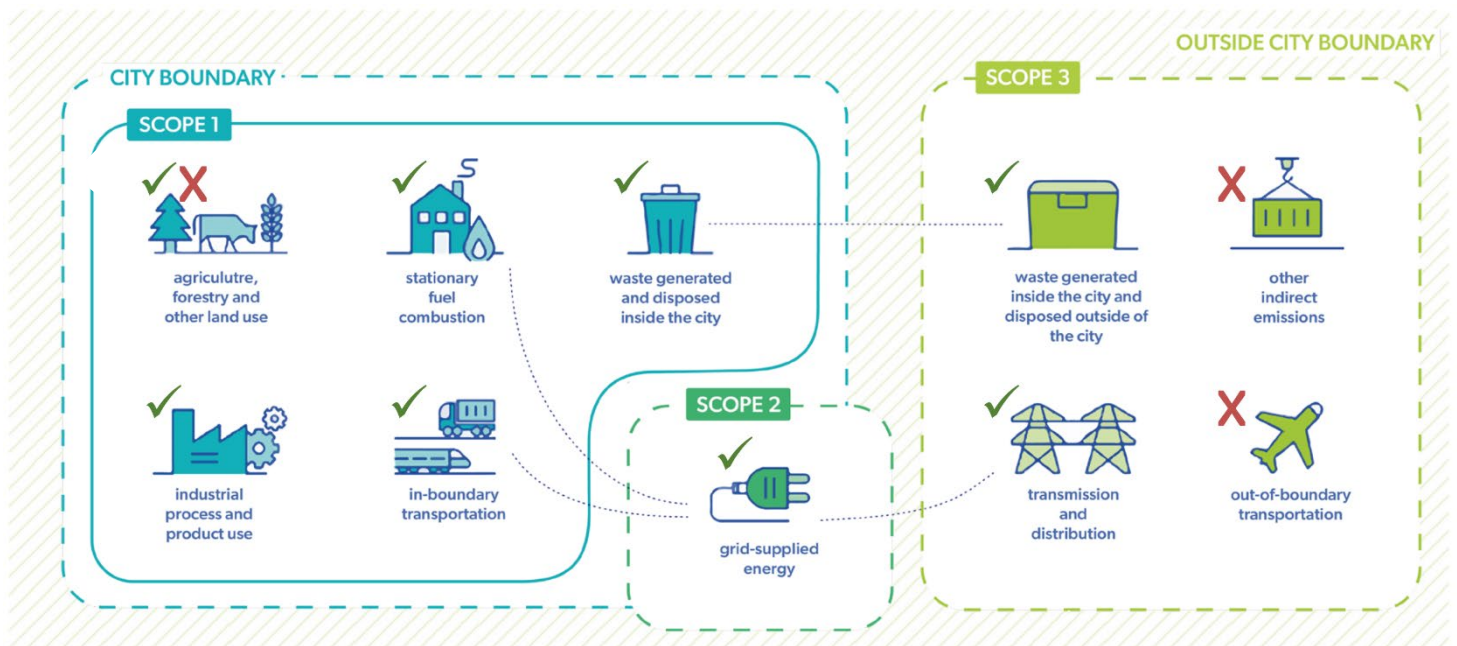


Figure 3. Emissions scopes as they relate to geographic and inventory boundaries.⁵

⁵ Image source: Consumption-Based Inventories of C40 Cities. <https://www.c40.org/researches/consumption-based-emissions>

GHG inventories typically track carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) emissions—the three main types of greenhouse gases that governments can most control. Gases are measured in tonnes and converted into tonnes of carbon dioxide equivalents (tCO₂e). The conversion allows comparison of each gas' greenhouse effect (global warming potential, GWP) relative to one unit of CO₂.

Greenhouse Gas	Global Warming Potential Value	
	Over 20 years	Over 100 years
Carbon Dioxide (CO ₂)	1	1
Methane (CH ₄)	86	34
Nitrous Oxide (N ₂ O)	268	298

2010 and 2016 Emissions Inventories

New Westminster's emission reduction targets are set against 2010 emission levels, which were 240,610 tCO₂e total emissions. 2010 inventory data is downscaled from provincial data. The CEEP uses 2016 as a modelling base year, as local energy and emissions data is available for this year, increasing the accuracy of the inventory for this year. Figure 4 shows New Westminster's 2016 emissions by fuel source and by sector.

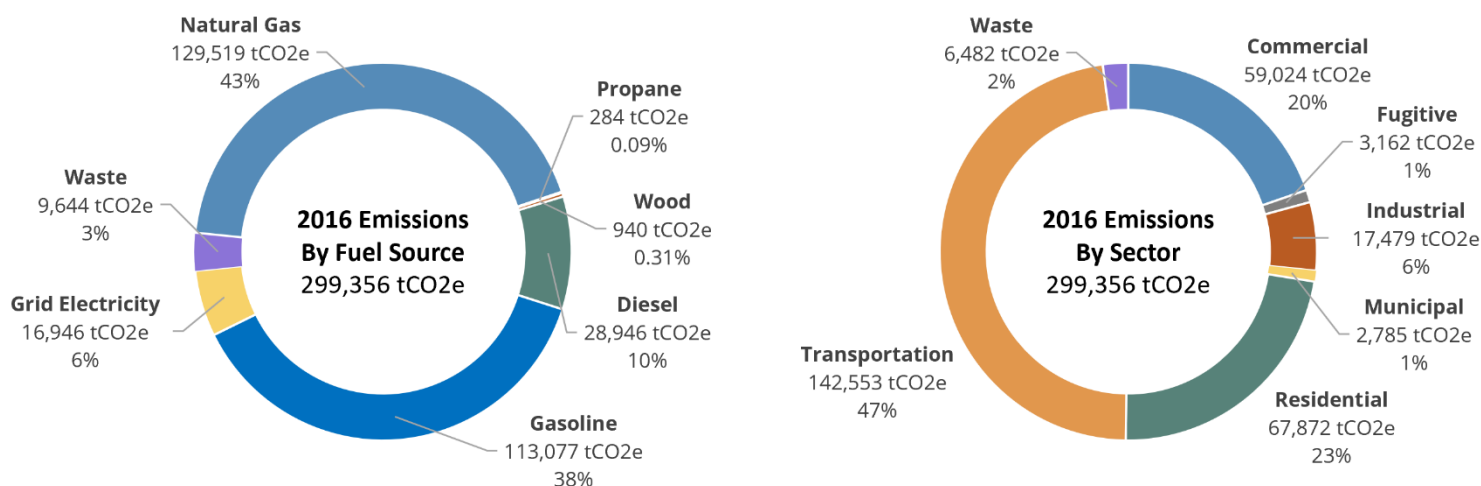


Figure 4. Emissions by fuel source and sector in New Westminster's 2016 base year.

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 sector, and 20% in the commercial buildings sector. The emission inventory shows us the most critical areas of action for emission reduction efforts.

Emissions Reduction Pathways

New Westminster is a growing community. In 2016, approximately 76,600 people lived in New Westminster. By 2050, the population is projected to grow to roughly 120,000. The number of homes and jobs in the city will increase as well. Energy use and emissions production is directly tied to these increases.

Determining an ambitious pathway to net-zero emissions is crucial. Cumulative emissions lock in greater heating and more extreme planetary conditions. There are different potential timelines to take for climate action, each resulting in differing cumulative emissions production (Figure 5). Ambitious action in the short term achieves the greatest reductions. Steady action starting now and continuing in the coming decades results in greater cumulative emissions. Waiting until closer to the 2050 emission reduction target date results in much greater cumulative emissions. The longer we wait to act, the greater the resulting emissions, and the greater the climate change impacts.

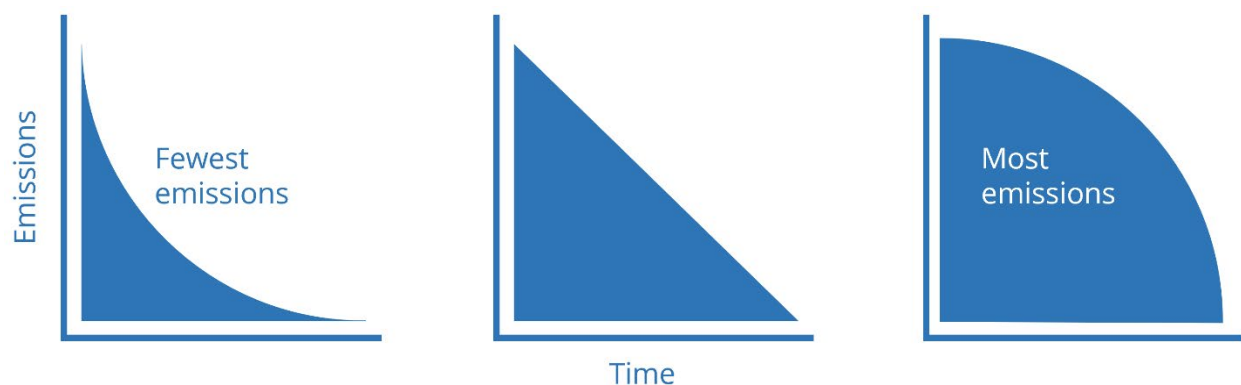


Figure 5. Differences in cumulative emissions when different reduction pathways are followed.

Rigorous scenario modelling was conducted to assess the emissions impact of energy consuming activities across all community sectors (i.e., buildings, transportation, waste, natural areas and green infrastructure, and energy). Accounting for community growth, energy consumption and emissions production were modelled to 2050, providing an emissions projection estimate.

A Low-carbon Scenario (LCS) of emission reduction actions was also modelled to determine a pathway for New Westminster to achieve its net-zero emissions target (Figure 6). The LCS includes a variety of actions based on known and projected technological trends, higher level government commitments, and community inputs.

The LCS reduction pathway most closely aligns with the middle scenario in Figure 5. We do not necessarily have the capacity to cut emissions as rapidly as a fewest emissions scenario but we can work quickly to avoid the most cumulative emissions scenario.

Figure 6 depicts the projected emissions to 2050 and the emission reduction impacts of senior government commitments (CleanBC and federal actions), projected industrial sector energy efficiency and fuel switching, and local actions modelled in the Low-carbon Scenario.

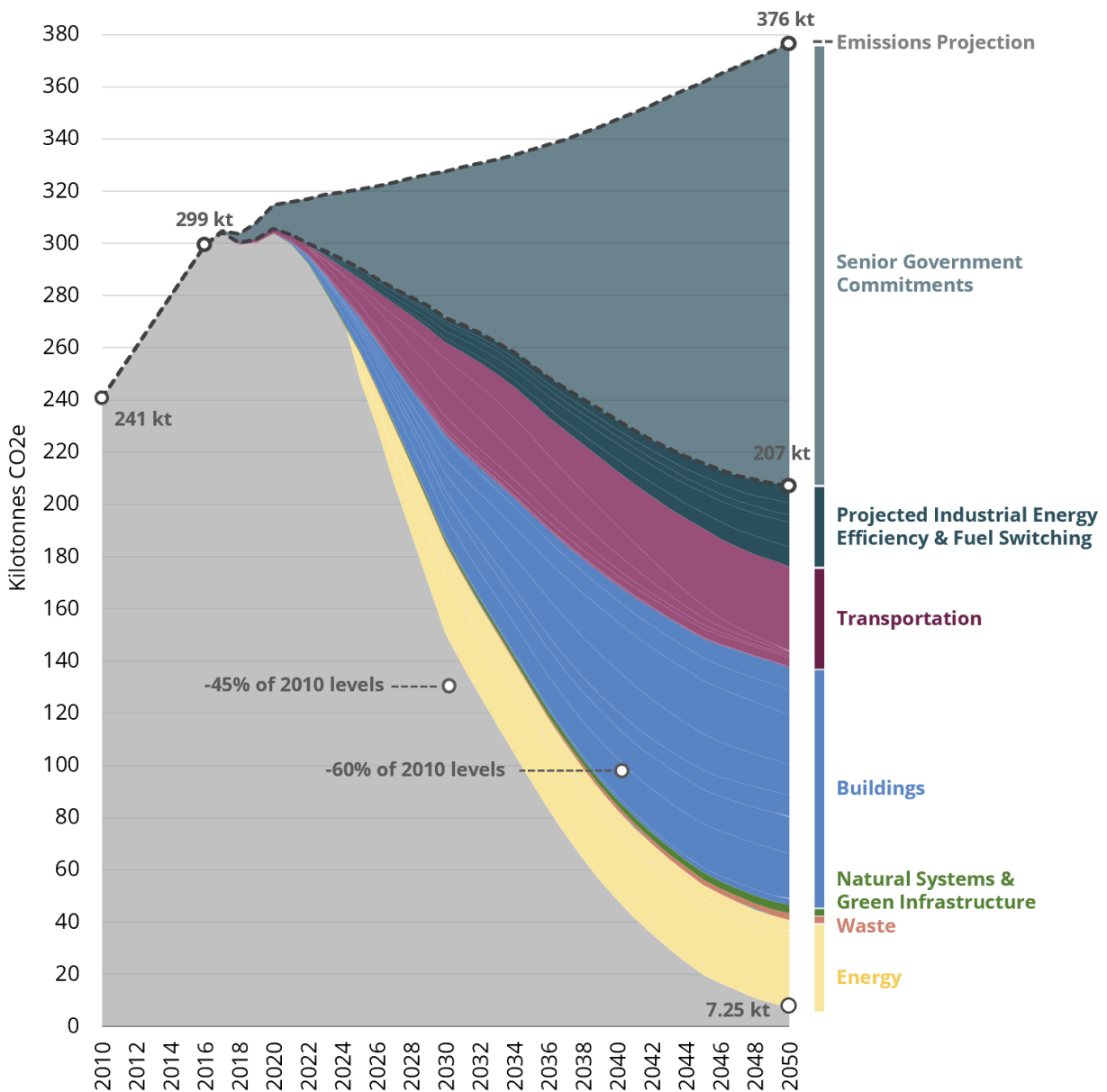


Figure 6. New Westminster's community emissions projection and modelled emission reduction effects of various provincial and local low-carbon actions, 2010-2050. The sharp emissions increase from 2010 to 2016 is likely primarily due to emission inventory differences, not necessarily an actual emissions increase (although it is likely emissions did rise some with population, housing, and vehicle use growth over this period). 2010 inventory data is derived from downscaled provincial emissions data while the 2016 inventory data is based on observed data.

LCS actions reduce emissions 97.0% from 2010 levels (97.6% from the 2016 modelling base year), getting New Westminster close to its 2050 net-zero target. Although LCS actions modelled are ambitious, their emission reductions fall short of achieving the interim emission reduction target of -45% by 2030 under 2010 levels, primarily due to the short timeframe for action. More rapid and ambitious action in the residential buildings and transportation sectors could achieve the target. The interim target of -65% by 2040 under 2010 levels can be easily met by implementing these actions.

7.25 kilotonnes of emissions remain in 2050 after emission reduction actions are taken over the next 28 years. Bridging the gap to net-zero will require extra fossil fuel elimination and potentially carbon sequestration efforts. Three main sources are responsible for the remaining 2050 emissions:

- Natural gas use in industrial processes and buildings that haven't switched to low-carbon energy sources;
- Single detached dwellings still using wood stoves for heating; and
- Legacy solid waste that pre-dates improved organics diversion efforts emitting methane from anaerobic decomposition in landfills.

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

SIDEBAR: Community Voice

CEEP development involved gathering input from community members and industry representatives to inform emission reduction actions and priorities, including: 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 economic development and diversification, and improved health and well-being. Representatives of equity-denied groups were engaged to ground the actions in the lived reality of residents. Further engagement will be critical during implementation.

SIDEBAR: Reduce, Improve, Switch

The philosophy of 'Reduce, Improve, Switch' puts avoiding 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 reducing personal vehicle use, increasing walking and biking, and incorporating passive design measures such as solar 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. It's supply is limited, however, and reducing electricity use and improving energy efficiency "frees up" electricity and helps avoid costly new electricity generation and distribution infrastructure.

Part 2: CEEP Actions

The CEEP provides a data-informed actions roadmap to reduce emissions and curb 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 in existing plans;
- Identifies and fills policy gaps with new actions for areas where more ambitious action is needed;
- Integrates the results and priorities from 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 under 2007 levels); and
- Indicates actions with strong potential to advance equity and inclusion, build community resilience, and achieve other benefits.

Structure of the Plan

The CEEP has five action sectors: transportation, buildings, energy, waste and circular economy, and natural areas and green infrastructure. 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 increasing carbon pricing set at the federal level. 2030 and 2050 targets are defined for each sector and actions are described for reaching the targets. As CEEP actions are implemented, a continuous cycle of monitoring progress, evaluating outcomes, and adjusting approaches to improve outcomes occurs.

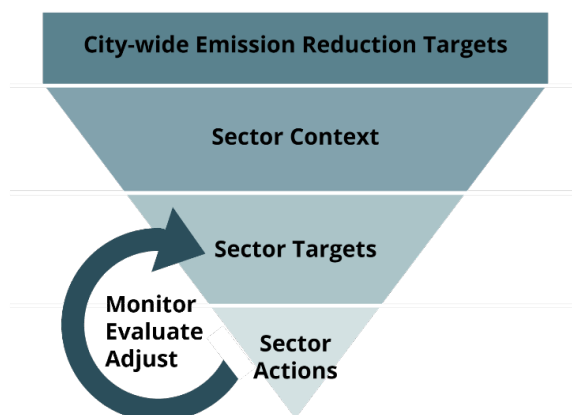


Figure 7. CEEP structure.

1. Transportation

Transportation accounted for nearly 30% of community energy in 2016 and was responsible for nearly half (48%) of community GHG emissions. 88% of all transportation emissions came from gasoline powered cars and light trucks. New Westminster residents usually choose 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 the way we move. The city boasts a compact form of development and has a land use framework that continues to focus housing near SkyTrain stations, services, jobs, and amenities in many neighbourhoods. We have steep terrain but remain a walkable community. With five SkyTrain stations, we are well-served by transit.

The City's first priority is to support more walking, biking, transit use, and use of multi-occupant shared vehicles. These modes are affordable and active transportation promotes health, reduces congestion, and makes efficient use of energy and resources. To make this shift, walking and biking need to feel safe, transit needs to be comfortable and convenient, and "last mile" challenges need to be solved. eMicromobility adoption such as e-bikes and e-scooters will 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 reached by supporting charging at home, work, and key destinations.

WHAT YOU CAN DO

- Get around on foot or by bike for a healthy lifestyle.
- Is it possible to live close to your place of work or use transit to get there?
- Work from home some days, if you're able.
- Use a car share service. You save on car payments, insurance costs, and parking fees, and you never have to get gas.
- Use e-bikes, e-scooters, and e-boards. They're quick, convenient, and inexpensive compared to cars.
- Combine transit and biking. You can take your bike on the bus and the SkyTrain.

Targets

2030

- 60% of all trips within the city by sustainable modes of transportation (walking, biking, rolling, transit, and riding in multi-occupant shared vehicles)
- 93% of vehicle sales will be zero emission vehicles.

2050

- 80% of all trips within the city by sustainable modes of transportation.
- 100% of vehicles are zero emissions models.

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 at SkyTrain station areas.	Preventative	Equity Health Resilience	N/A	Ongoing
2. 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. encouraging other transportation demand management measures that reduce demand for personal vehicle use.	High	Equity Health Resilience	\$\$\$	Ongoing
3. Collaborate with Metro Vancouver and TransLink to implement the Regional Greenway and Major Bikeway Networks within New Westminster.	Medium	Equity Health	\$\$	Mid-term
4. Advocate for and support implementation of TransLink's regional Transport 2050 plan, including: a. expanding frequent transit service, and improving service along the	High	Equity	N/A	Ongoing, on a priority basis

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.				
5. Explore holding car-free days and creating car-free areas.	Low	Equity Health	\$	Near-term
6. Advocate for more exploration of mobility pricing or road use charges, in collaboration with Metro Vancouver and TransLink.	Medium	Equity Health	N/A	Near-term
eMobility				
7. Implement the eMobility Strategy. Ensure EV and eMicromobility (e-bikes, etc.) adoption is accelerated by: a. Incorporating an eMicromobility lens into planning and policies, enhancing e-bike accessibility, and improving access to secure public and private e-bike parking; b. enabling residents to choose EVs by supporting access to charging at home, work, and in public spaces, and supporting EV affordability; and c. proactively managing electricity grid impacts of charging.	High	Equity Health Resilience	\$\$\$	Near-term
8. Support the implementation of TransLink's regional Transport 2050 plan. Focus on actions transitioning to zero emission vehicles, such as: a. financial incentives for eMicromobility and EV adoption; b. prioritizing access for low-income residents and small businesses; and c. supporting the transition of medium- and heavy-duty vehicles to low emissions in the near-term and zero emissions over the long-term.	High	Equity Health Resilience	\$\$\$	Ongoing
9. Support TransLink in implementing the 2050 Low Carbon Fleet Strategy to advance battery electric bus service in New Westminster, positioning New		Equity Health Resilience	N/A	Ongoing

Westminster as an area to lead with this transition.				
10.Explore establishing zero emission vehicle zones, where only people walking, rolling, biking or driving EVs and other zero emission vehicles may access the area, partnering with TransLink, Metro Vancouver, or other agencies as appropriate.	Medium	Equity Health Resilience	\$	Near-term
11.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		\$\$\$	Near-term
12.Collaborate with Metro Vancouver and other partners to advocate to senior governments to support the transition to zero emission medium and heavy duty vehicles.	High		N/A	Medium-term
13.Collaborate with Metro Vancouver and other partners to reduce emissions from deliveries (including online deliveries), by exploring initiatives such as supporting transitioning delivery fleets to zero emissions, off-peak deliveries, small urban consolidation centres, and cargo bike deliveries.	Medium		N/A	Near-term

Resources Estimates: \$ – < \$100,000 \$\$ – \$100,000-\$500,000 \$\$\$ – > \$500,000

2. Buildings

Buildings accounted for approximately 53% of total energy use and 43% of total GHG emissions in New Westminster in 2016. 95% of emissions from buildings were from natural gas used to heat commercial and residential buildings, even though 49% of homes use electric heating. Transitioning to high performance buildings (new and existing) 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 critical affordable housing. Retrofitting existing buildings to reduce energy demand (e.g. adding insulation, draft sealing), improving their 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 also help improve the livability and safety of homes, especially in the context of increased frequency and severity of extreme weather events.

Achieving retrofit goals will require demystifying and solving challenges related to retrofitting multi-unit residential buildings (MURBs), as well as using regulatory tools as soon as they are available to prompt switching to low-carbon energy sources. Supporting appropriate incentives and inspiring residents and rental building owners to proactively invest to reduce emissions will be critical.

As the city continues to grow, it is also essential that new buildings are constructed to the highest energy efficiency standards. New Westminster uses the BC Energy Step Code to require high energy performance. Modelling shows that significant emission reductions can be achieved over the mid- to long-term by requiring higher Step Code levels sooner in new construction. New buildings should simply not use fossil fuel energy sources. 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 YOU CAN DO

- Upgrade your home energy efficiency by improving insulation, improving airtightness, or replacing the furnace with an electric heat pump. There are many subsidies available to make the upgrades affordable and you'll save money with lower energy bills.
- If you're using electric baseboard heating, consider upgrading to an electric heat pump, which is 300-500% more energy efficient and provides cooling in the summer.
- Clean or replace air filters on air conditioning/heat pump units regularly to maintain the units' efficiency.
- Choose energy efficient models when your appliances need to be replaced. Replace gas stoves with electric induction models. Replace gas fireplaces with electric heat pumps.
- Work with your condo strata board to determine the best energy efficiency solutions for your building. They could 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 fossil fuel free energy systems.

2050

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

Actions	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: <ul style="list-style-type: none"> a. prioritizing addressing the unique retrofit needs of multi-unit residential buildings, especially rental buildings; b. focus on the least efficient building stock (pre-1980); c. adapting retrofit strategies to work with heritage and character buildings; d. 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 e. collecting and analysing energy and spatial data of existing buildings to identify priority building archetypes and optimal strategies to support energy retrofits. 	High	Health	\$\$\$	Near-term
2. Advocate to senior government and agencies to increase incentives and financing programs for energy retrofits, particularly for multi-unit residential buildings.	High	Health Equity	N/A	Near-term

3. As legislation changes to allow fuel sources to be regulated, ensure City regulations require low-carbon heating and hot water systems replacements.	High	Health	N/A	Near- to mid-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	N/A	Short-term
5. Continue to pursue heritage retention and revitalization where appropriate, efficiently using energy and resources through adaptive reuse of buildings.	Low	Resilience	N/A	Ongoing
New Buildings				
6. Require maximum BC Energy Step Code tier for residential and non-residential buildings before 2030.	Medium	Health Equity Resilience	N/A	Mid-term
7. Identify appropriate performance standards for institutional and industrial buildings, and encourage meeting these standards through policy.	Medium	Health Equity Resilience	N/A	Mid-term
8. 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	Health Equity Resilience	N/A	Mid-term
All Buildings				
9. 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	N/A	Ongoing
10. 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 emissions reductions.	Low	Resilience	N/A	Near-term
11. Continue to offer educational opportunities to the building industry, and explore ways to support industry training to be able to adapt to high performance building standards and lead the way on innovative buildings.	High	Health Resilience	N/A	Ongoing
12. Continue to demonstrate leadership through high energy performance City	Low	Resilience	N/A	Ongoing

facilities constructed with low embodied carbon materials, as directed by CEERS.				
13. Advocate 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		N/A	Near-term

Resources Estimates: \$ – < \$100,000 \$\$ – \$100,000-\$500,000 \$\$\$ – > \$500,000

CASE STUDY: Energy Save New West

Energy Save New West (ESNW) is a community energy program designed to improve the 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 in effort 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. Their focus is to deliver a better experience that makes it easier for people to improve the energy performance of their home or business. ESNW has had tremendous impact in the community through providing:

- A comprehensive suite of rebates and incentives including access to energy assessments, technical energy coaching, energy upgrades 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 offered by City of New Westminster, FortisBC and BC Hydro; 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

Gasoline cars and trucks accounted for 38% of 2016 emissions. Natural gas heating accounted for another 43%. Emissions related to electricity accounted for only 6% as BC's predominantly hydroelectricity grid is one of the cleanest in Canada. As transportation and buildings electrify, significant emissions gains will be made.

Continued growth and electrification may create electricity supply constraints. Energy conservation and demand management are important strategies to avoid reaching the limit of grid electricity supply. These also save on household energy costs and reduce the need for new electricity infrastructure.

New Westminster can also address increased grid demand through local renewable energy generation. This also adds resilience to the grid.

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.

WHAT YOU CAN DO:

- Switch to energy efficient light bulbs.
- Turn off switches and disconnect charging plugs from outlets when not in use.
- Air dry dishes and clothes.
- Switch from baseboard heating to a heat pump to use less electricity.
- If you own a single detached dwelling, consider installing solar panels to take advantage of New Westminster's net metering program.

CALLOUT BOX: Did you know? Vampire loads (also known as phantom plug loads) secretly drain electricity when an electronic device is turned off, but still plugged into an outlet. Any digital device charger (phone, tablet, computer, TV, stereo, etc.) plugged into a wall still consumes a small, but continuous amount of electricity, even when the actual device isn't attached.

Targets

2030

- Reduce per capita energy demand by 30% by 2030.
- Generate 2% of electricity from local and renewable sources of energy.

2050

- Reduce energy demand by 60% per capita by 2050.
- Generate 5% of electricity from local and renewable sources of energy.

Actions	GHG Reduction	Benefits	Resources	Timeline
Local Energy Generation				
1. Complete a renewable energy study that identifies viable supply sources and a prioritized list of initiatives.	High	Health Resilience	\$	Near-term
2. 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	Health Resilience	\$	Near-term
3. 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
Energy Conservation and Demand Management				
4. 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	\$	Near-term
5. Encourage the use of smart technology to better manage energy usage (e.g. smart thermostats).	Low		\$	Near-term
6. 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	N/A	Near-term

7. 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	N/A	Near-term
District Energy and Waste Heat Recovery				
8. Explore the feasibility of extending Sapperton's district energy system or developing new systems as new opportunities arise.	Medium	Resilience	\$\$\$	Near-term
9. Explore opportunities to encourage on-site waste heat recovery systems in buildings with a net positive internal rate of return.	Medium	Resilience	\$	Near-term
Smart Grid Technologies				
10. Assess the business case and feasibility of battery energy storage within the City's existing grid.	Medium	Resilience	\$\$	Mid-term
11. Explore opportunities to partner on a pilot of a solar-battery demonstration project on a building.	Low	Resilience	\$	Near-term
12. Conduct feasibility studies that test low-carbon backup power systems to reduce reliance on fossil fuel backup power generators.	Medium	Resilience	\$	Near-term
13. Continue to explore upgrading electrical metering equipment with an advanced metering infrastructure (AMI) system to allow community members to better monitor and assess their energy use.	Low	Equity Resilience	\$\$\$	Ongoing

Resources Estimates: \$ – < \$100,000 \$\$ – \$100,000-\$500,000 \$\$\$ – > \$500,000

SIDEBAR: Urban Solar Gardens

There are two urban solar gardens in New Westminister. 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.

CASE STUDY: 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 at 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.

4. Waste and Circular Economy

Emissions from waste 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 46%, making waste reduction diversion an important source of 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 and diversion of organics, increased recycling of more types of materials, and ensure buildings' configuration makes this as convenient as possible.

Substantial waste-related emissions reductions can also come from shifting to a circular economy model. In a circular economy, waste is “designed out”. Outputs from one process are inputs for another; instead of being extracted, used, and disposed, 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.

Targets

2030

- Reduce annual waste by 5% by 2030.

2050

- Reduce annual waste by 20% by 2050.

WHAT YOU CAN DO

- Follow the 5-Rs (in this order): Refuse, Reduce, Reuse, Repurpose, Recycle.
- Champion improved recycling at your work or in your housing complex.
- Save up your specialty items and bring them to the United Boulevard Recycling and Waste Centre.
- If you have a yard, compost your food waste, yard trimmings, and soiled paper.

Actions	GHG reduction	Benefits	Resources	Timeline
Waste Reduction				
1. Support senior government action on reducing use of single use plastics and implement changes locally as soon as a framework is provided.	Low	Resilience	N/A	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	N/A	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 regularly 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	N/A	Ongoing
6. Work with businesses to reduce waste and divert organics from restaurants, the tourism industry, and the commercial sector overall.	Low	Resilience	N/A	Ongoing
7. Expand green demolition by reviewing and increasing requirements for construction waste diversion and encourage deconstruction, and improving enforcement for better compliance.	Low	Resilience	N/A	Near-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: <ul style="list-style-type: none"> a. strengthening the market for recycling and recycled materials, 	Low	Resilience	N/A	Ongoing

expanding Extended Producer Responsibility, and pursuing circular economy opportunities b. enhanced GHG emissions capturing methane (biogas) from landfills, expansion of low emissions waste-to-energy facilities as appropriate, and reducing emissions from organics.				
Circular Economy				
9. Collaborate with Metro Vancouver and municipalities in the region to coordinate development of a circular economy, including the potential development of regional principles or a regional strategy.	Low	Equity Resilience	\$	Ongoing
10. Build on the results of the 2018 circular economy workshop conducted in collaboration with the National Industrial Symbiosis Program (NISP), and engage more businesses in circular economy initiatives.	Low	Equity Resilience	\$	Near-term

Resources Estimates: \$ – < \$100,000 \$\$ – \$100,000-\$500,000 \$\$\$ – > \$500,000

5. Natural Areas and Green Infrastructure

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 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 allow water to infiltrate and be filtered, reducing indirect emissions associated with grey infrastructure (e.g., stormwater gutters, pipes and tunnels, and water and wastewater treatment facilities).

Natural areas and green infrastructure can also help improve New Westminster's resilience and adaptability to climate change by managing storm water 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 a spin off benefit of making walking and biking more compelling.

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 will be important to enhancing resilience and off-setting emissions. Relatedly, supporting a sustainable local food system can also have an impact on GHG emissions.

WHAT YOU CAN DO

- Keep the trees on your property and consider planting new ones.
- Plant native species plants.
- Let your lawn go golden in the summer.
- Install a raingarden and capture rainwater for use on plants and lawns.
- Adopt a catch basin.

Targets

2030

- Increase the urban forest canopy cover to 27% by 2030.

2050

- Maintain the urban forest canopy coverage at 27%.
- Protect 10% of City's land base as natural park area.

Actions	GHG reduction	Benefits	Resources	Timeline
1. Develop an Adaptation Strategy that outlines strategies and actions to mitigate climate related risks and build climate resilience.	Low	Health Resilience Equity	\$	Near-term
2. Continue to implement the Integrated Stormwater Management Plan, including: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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. exploring 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: <ul style="list-style-type: none"> 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	N/A	Ongoing
5. Seek opportunities to reduce water consumption, such as through promoting the use of smart technologies such as timers and leak detectors by residents and businesses.	Low	Health Resilience Equity	\$	Near-term

6. Explore opportunities to increase the City's water pumping efficiency.	Low	Resilience	\$\$\$	Ongoing
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Resources Estimates: \$ – < \$100,000 \$\$ – \$100,000-\$500,000 \$\$\$ – > \$500,000

Monitoring and Evaluation

GHG emission inventories will be updated regularly. The City will measure, track and report on its targets and actions annually, making adjustments where required. This reporting will be part of a larger key performance indicator (KPI) 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.

Implementation of the CEEP 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. The City will also consider developing a carbon budget, deepening the climate budget framework that is already in place.

Rapid implementation and scaling up of actions will require additional staffing. 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 implications. Rapid implementation of the Master Transportation Plan to support emissions reductions from transportation, for example, will require additional staffing in the Transportation team.

The Next Chapter

The modelling and analysis that underpins this Plan makes it clear how urgently we need to act to make the kind of impact on emissions that is needed to meet our community energy emission reduction targets. Bold action will be needed to retrofit our existing buildings, build new buildings to the best standards available, shift out of our polluting vehicles, reduce our waste, and enhance natural systems. This plan provides a roadmap and following 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, the inventory underpinning the CEEP focuses on “scope 1 and 2 emissions”. However, we know that out of scope emissions also have a real impact on climate and need to be addressed.

The next chapter in GHG emissions reduction must address these upstream and downstream emissions, through approaches such as lifecycle analysis and consideration of embodied carbon. 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 (SSG) 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 SSG. The information provided by others is believed to be accurate but has not been verified.

This analysis includes strategic-level estimates of New Westminster that should not be relied upon for design or other purposes without verification. SSG does not accept responsibility for the use of this analysis for any purpose other than that stated above, and does not accept responsibility to any third party for the use, in whole or in part, of the contents of this document. This analysis applies to the City of New Westminster and cannot be applied to other jurisdictions without analysis. Any use by the City of New Westminster, its sub-consultants or any third party, or any reliance on or decisions based on this document, are the responsibility of the user or third party.

Abbreviations & Glossary

CEEP Community Energy and Emissions Plan

CO₂ Carbon dioxide

CO₂e Carbon dioxide equivalents

DE District energy

GHG Greenhouse gas emissions

LCS Low-carbon scenario

RNG Renewable natural gas

Units

GHG emissions

1 ktCO₂e = 1,000 tCO₂e

Energy

1 MJ= 0.0001 GJ

1 TJ= 1,000 GJ

1 PJ= 1,000,000 GJ

1 GJ= 278 kWh

1 MWh= 1,000 kWh

1 GWh=1,000,000 kWh

Appendix 1: Low-carbon Scenario Modelled Energy and Emissions Charts

Modelled LCS energy trajectory (top) and emission reductions (bottom) by sector: 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. Transportation energy demand decreases substantially as EVs require less energy to operate and use that 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.

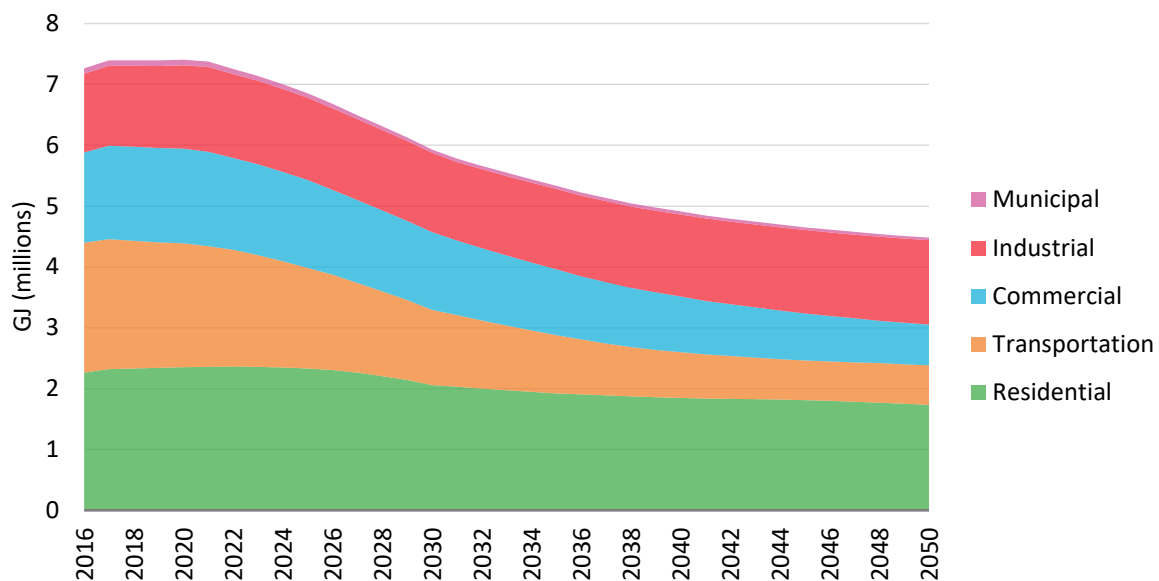


Figure 2 Modelled LCS Community Energy by Sector, 2016-2050

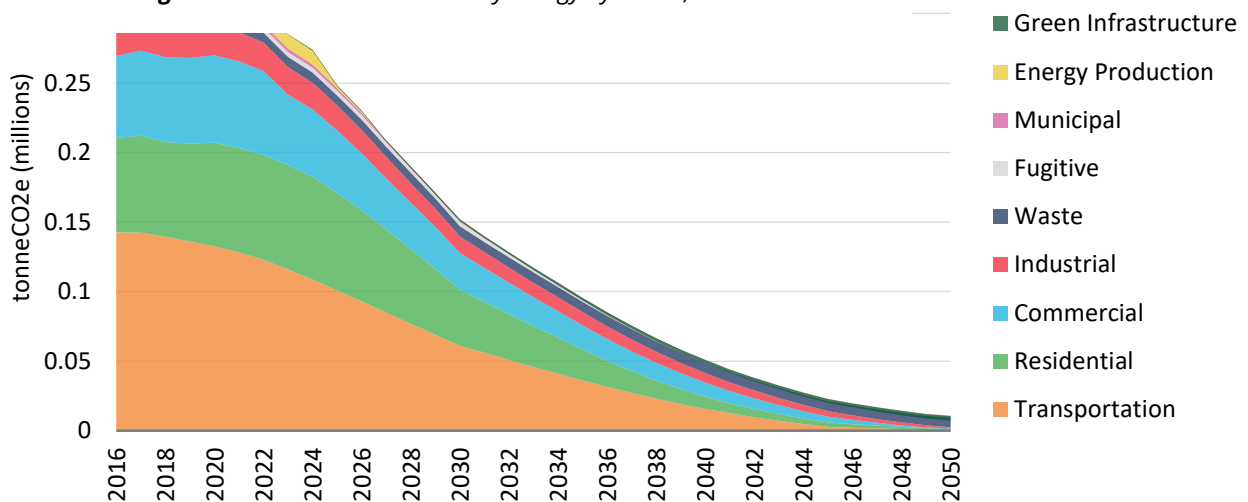


Figure 1 Modelled LCS Emission Reductions by Sector, 2016-2050

Modelled LCS energy trajectory (top) and emissions reductions (bottom) by fuel type: 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 emissions reductions. Emissions all but disappear by 2050, with some remaining from continued natural gas use, wood use, and legacy solid waste.

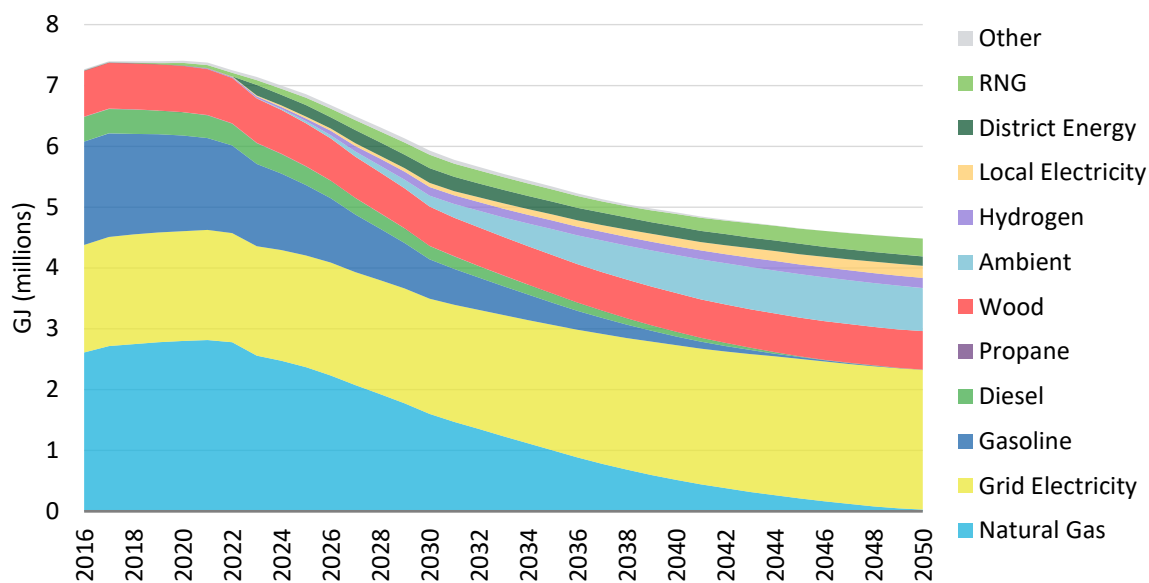


Figure 3 Modelled LCS Community Energy by Fuel Type, 2016-2050

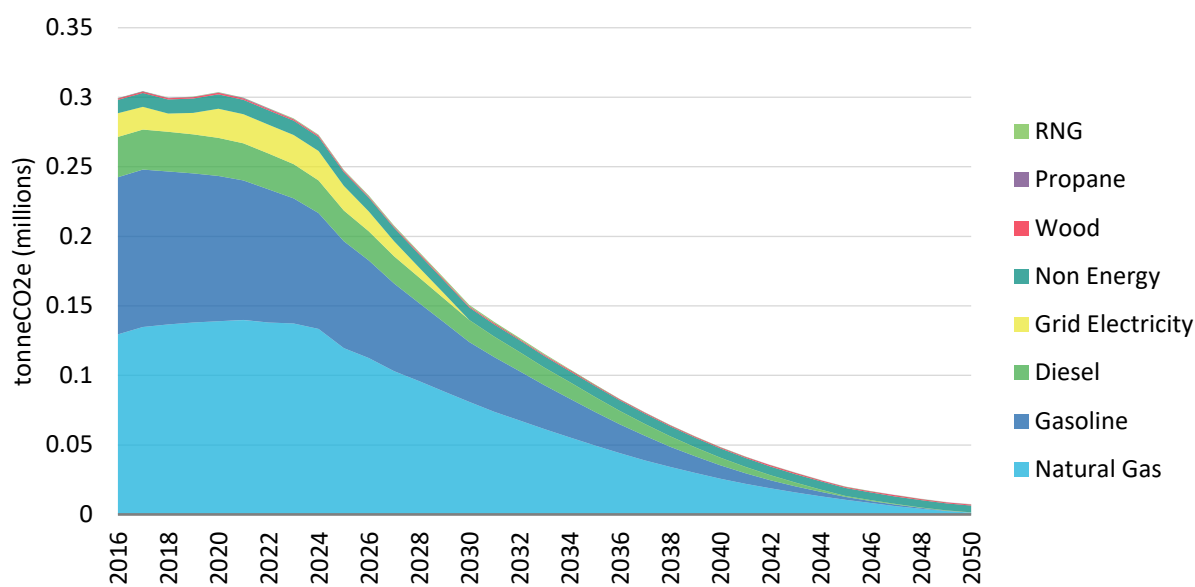


Figure 4 Modelled LCS Emissions Reductions by Fuel Type, 2016-2050

Modelled LCS energy use trajectory by end use (below): 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.

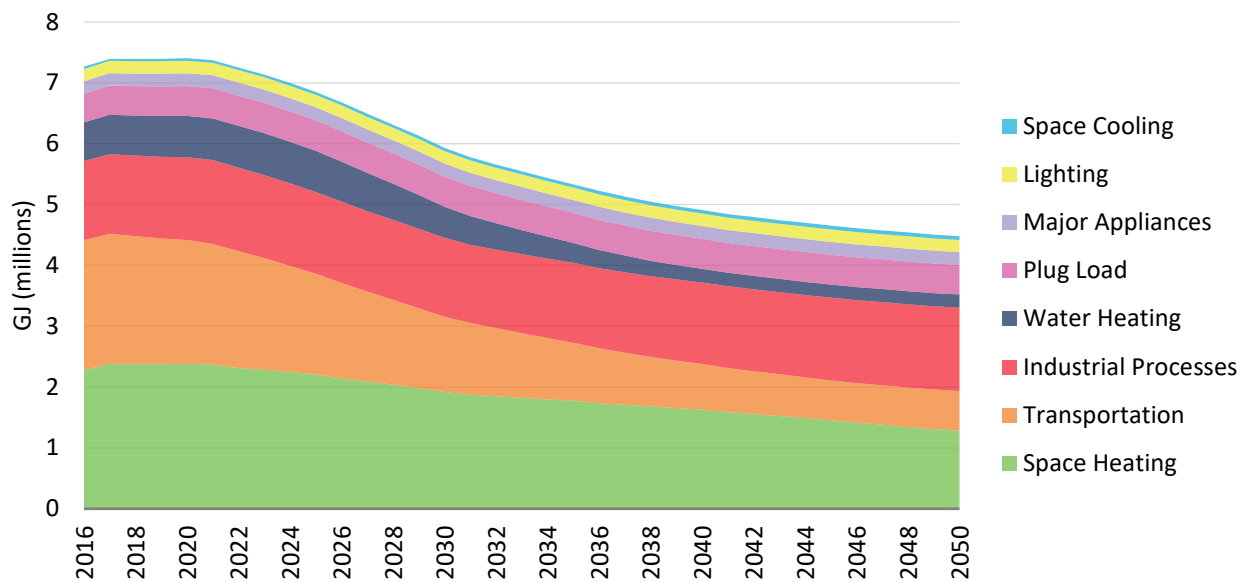


Figure 5 Modelled LCS Energy Use Trajectory by End Use, 2016-2050