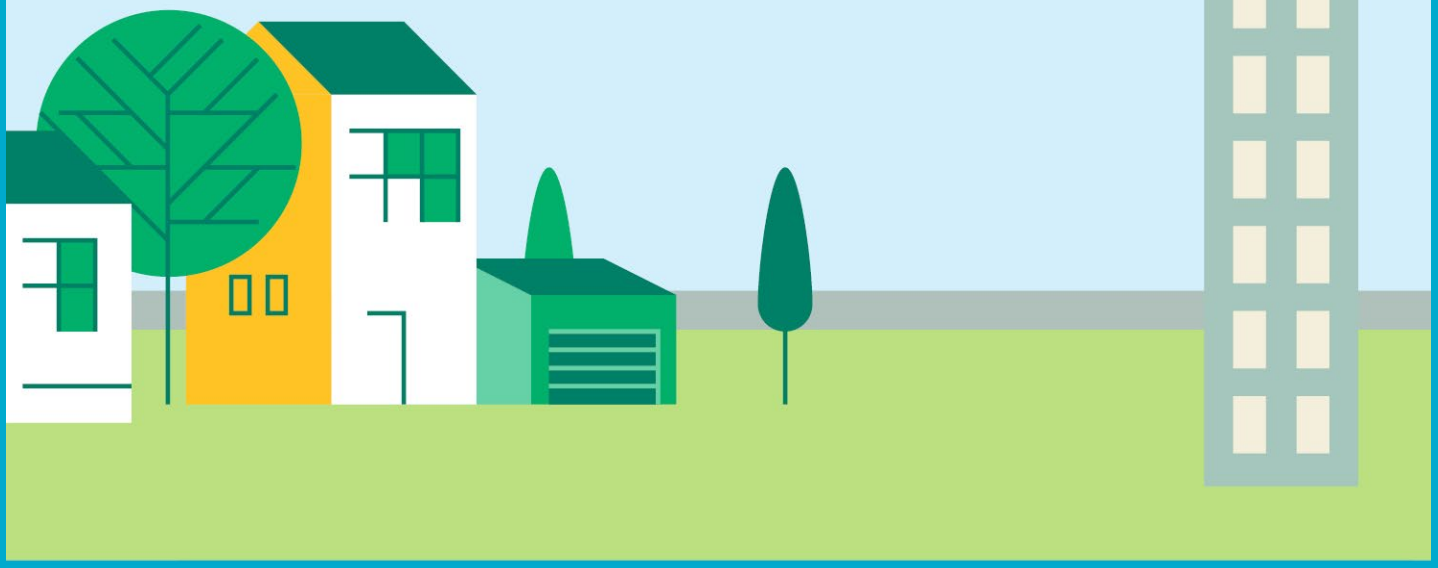
PORT MOODY'S CLIMATE ACTION PLAN

Climate Ready Homes and Buildings Plan

July 2022



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PORT MOODY
CITY OF THE ARTS

Contents

ACKNOWLEDGMENTS

First Nations Territory Acknowledgement

The City of Port Moody carries out our business on the ancestral and unceded homelands of the kʷikʷəƛ̓əm (Kwikwetlem), səlilwətaɬ (Tsleil-Waututh), xʷməθkʷəy̓əm (Musqueam), Sḵwx̱wú7mesh (Squamish), q̓i1̓əy̓ (Katzie), q’ʷa:n̓ƛ’ən̓ (Kwantlen), qiqéyt (Qayqayt), and Stó:lō (Sto:lo) Peoples, and extends appreciation for the opportunity to work on this territory.

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- Mayor Rob Vagramov
- Councillor Diana Dilworth
- Councillor Meghan Lahti
- Councillor Amy Lubik
- Councillor Hunter Madsen
- Councillor Steve Milani
- Councillor Zoë Royer

Stakeholders

- Building Owners and Managers Association of BC (BOMA BC)
- City of Coquitlam
- City of Port Coquitlam
- Fraser Health Authority
- Home Builders Association Vancouver (HAVAN)
- Metro Vancouver
- Province of BC: *Ministry of Energy, Mines, and Low Carbon Innovation, and Office of Mass Timber Construction.*
- RDC Fine Homes
- School District 43
- Suncor Energy
- Urban Development Institute (UDI)
- Vancouver Zero Emissions Building Exchange (ZEBx)
- Village of Belcarra
- Wesgroup

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1 INTRODUCTION TO CLIMATE READY BUILDINGS

1.1 BACKGROUND

Climate change poses an urgent threat that requires ambitious and immediate action. It is now unequivocal that climate change is caused by the increase in concentrations of **greenhouse gases (GHGs)** in the atmosphere caused by human activities including the use of fossil fuels in our buildings. The latest reports from the Intergovernmental Panel on Climate Change (IPCC) state that human influence on the climate system has already impacted all continents. The IPCC has urged governments to keep warming under 1.5°C.[i] Every degree of warming beyond this threshold is expected to lead to prolonged summer heat and drought, wildfire smoke, and extreme weather such as flooding and windstorms. Each poses serious risks to Port Moody residents, the economy, livelihoods, as well as the global population.

Our actions today will shape how people adapt, and nature responds to increasing climate risks. Keeping warming under 1.5°C through rapid decarbonization, can help us avoid the worst impacts of climate change. Working in our community to reduce GHG emissions and increase our **resilience** to the effects of a changing climate, can help us maintain a safe, healthy, and sustainable Port Moody now and in the future.

Climate Change refers to long-term shifts in temperatures and weather patterns. These shifts may be natural, but since the 1800s, human activities have been the main driver of climate change, primarily due to the burning of fossil fuels (like coal, oil, and gas), which produces **greenhouse gases** (**GHGs)** (e.g., water vapour, carbon dioxide, nitrous oxide, and methane) that trap energy from the sun. This trapped energy causes the Earth's temperature to rise – this is called the greenhouse effect. Without greenhouse gases, heat would escape back into space, and Earth's average temperature would be -18°C. Human activities over the last 150 years, however, have led to an increase in greenhouse gas emissions, a rise in global temperatures (global warming), and climate change.

1.2 HOW IS PORT MOODY ADDRESSING CLIMATE CHANGE?

In June of 2019, the City of Port Moody joined many other local governments in declaring a climate emergency, bringing to light the need to take accelerated action on climate change. The resolution called for the City to ramp up its climate actions in line with efforts to limit global warming to 1.5°C. In 2020, Port Moody adopted a *Climate Action Plan* to set a high-level direction to adapt to climate change and reduce GHG emissions from major contributing sectors in the community such as transportation, waste, and buildings.[ii] One of the key recommendations in the *Climate Action Plan* is to develop a *Climate Ready Homes and Buildings Plan*. This is because buildings have a vital role in our community by providing shelter, recreation, spaces for gathering and connection, and goods and services, and account for 46% of our community's GHG emissions (see Figure 1). Specific actions that Port Moody has taken to reduce GHG emissions and increase resilience to climate change in buildings are listed throughout this Plan.

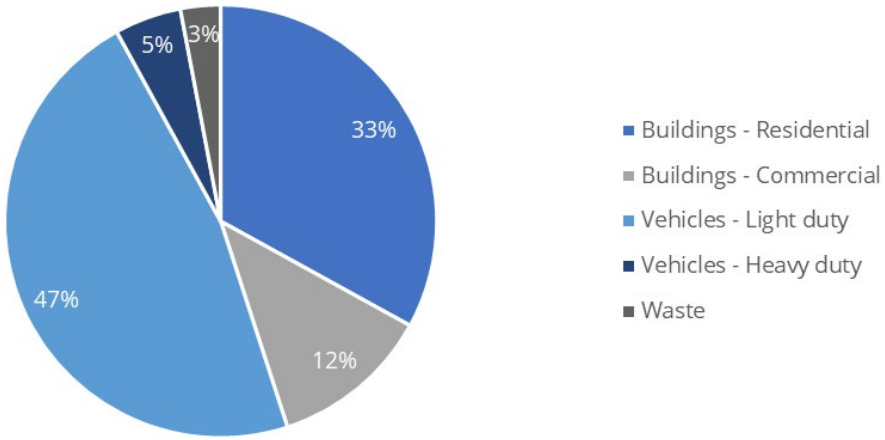


Figure 1. Community-wide GHG Emissions by Sector in Port Moody (2018)

Traditionally, GHG emissions of communities are calculated using the territorial-based approach, which typically includes Scope 1 and 2 emissions as defined by the World Resources Institute (WRI). Territorial emissions include the entirety of emissions that occur within the city boundary. These are direct emissions from production (goods and services, and transport) and final consumption (households) within the City limits. Scope 3 emissions are not commonly accounted for in local emissions inventories due to limited data availability, inconsistent methodologies, and overlap of emissions inventories leading to double-counting. The WRI defines the GHG emissions scopes as follows:

- **Scope 1**: GHG emissions from sources located within the city boundary (e.g., emissions from natural gas combustion in buildings)
- **Scope 2:** GHG emissions occurring because of the use of grid-supplied electricity, heat and/or cooling within the city boundary (e.g., emissions from electricity use).

- **Scope 3:** All other GHG emissions that occur outside the city boundary as a result of activities taking place within the city boundary (e.g., emissions associated materials used Port Moody, but produced outside the city boundary)

1.2.1 ACCOUNTING FOR EMBODIED EMISSIONS

In a growing community like Port Moody, scope 3 emissions make up significant and growing portion of the emissions footprint. The GHG emissions associated with materials and construction are referred to as ***embodied emissions*** *(Scope 3 emissions)* and include GHG emissions created through the manufacturing of building materials, the transport of those materials to the job site, and the construction practices used (see Figure 2). Based on Metro Vancouver's *Consumption-Based Emissions Inventory*[iii], embodied emissions accounts for an additional 21,000 tCO_2e annually from production and transportation of building materials in Port Moody, or 19% of building sector emissions.

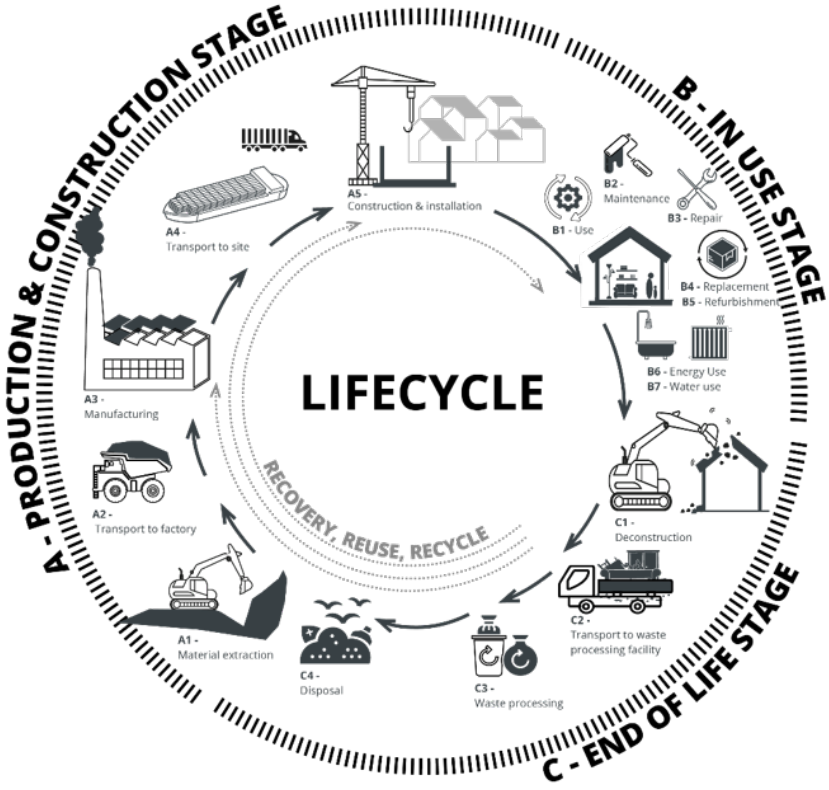


Figure 2. Lifecycle stages of buildings and associated embodied emissions (source: Integral Group)

1.2.2 ACCOUNTING FOR OPERATIONAL GHG EMISSIONS

The operational emissions from new homes and buildings in Port Moody has been, in part, addressed through the implementation of the BC Energy Step Code. The BC Energy Step Code (Step Code) is an optional compliance path in the BC Building Code that local governments may use to incentivize or require a level of energy efficiency in new construction. The Step Code is implemented through four or five incremental steps, with the final Step achieving net-zero energy-ready performance.

Despite the strides in efficiency, the Step Code does not regulate GHG emissions. Regardless of the efficiency, homes and buildings that use natural gas will still emit higher levels of GHG emissions (compared to electrically heated building). As shown in the image below, electric heating results in a more than 90% reduction in GHG emissions compared to natural gas heating, due to BC's clean, renewable hydroelectricity.

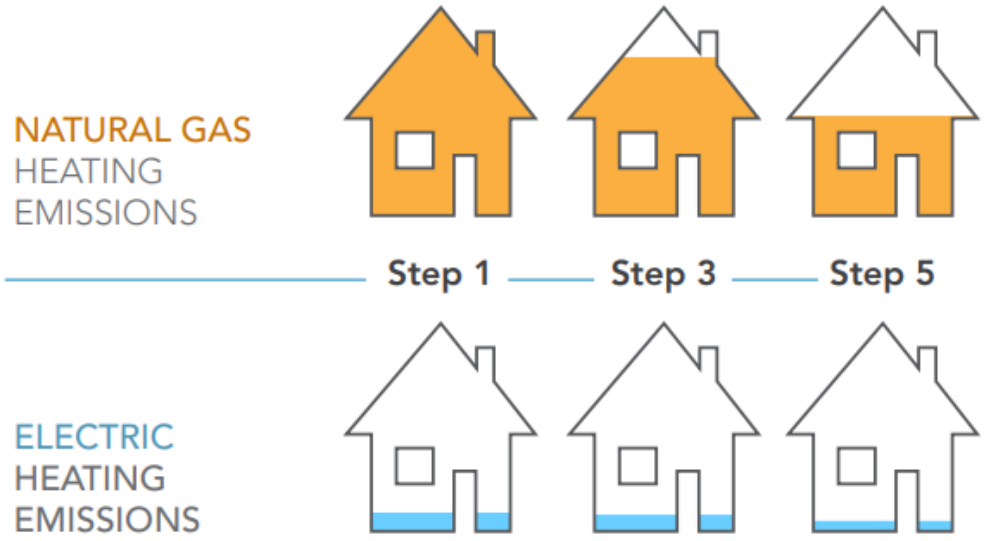


Figure 3: Building Greenhouse Gas Emissions by Heating Type in BC (source: Metro Vancouver, Climate 2050 Buildings Roadmap)[iv]

1.2.3 PORT MOODY CLIMATE RESILIENT HOMES AND BUILDINGS

To address these challenges, Port Moody's *Climate Action Plan* has set specific goals and targets for making homes and buildings in our community climate-ready in the coming decades. A climate ready home or building is one that has been designed or modified to meet low carbon and high energy-efficiency standards; and manage many of the risks that are linked to climate change such as heat-related illness, poor indoor air quality, or damage from flooding or windstorms.

Table 1. Port Moody's 2020 Climate Action Plan - Goals and Targets for Buildings

Goals Design, construct, and renovate buildings that are:	**Targets**
Low-carbon and efficient. Use relatively little energy to operate.	**By 2025** (latest 2030), all new and replacement heating and hot water systems are zero emissions **By 2050,** all buildings have replaced heating and hot water with zero-emission systems
Low embodied emissions. Use Materials that are associated with low levels of embodied carbon; and materials that store carbon.	**By 2030**, reduce the carbon equivalent content of new buildings and construction projects by 40% (compared to 2018)
Low-carbon and resilient energy. Use sources of energy that produce lower amounts of GHGs and energy systems that are more likely to withstand or recover quickly from disruptive events.	**By 2030**, all oil and propane heating and hot water systems are replaced with zero-emission systems
Resilient. Are durable and more likely to withstand or recover quickly from the anticipated effects of climate change.	**n/a**
Healthy. Provide a healthy indoor environment with good air quality.	**n/a**

1.3 TAKING A LOW CARBON RESILIENT APPROACH

Planning for **mitigation** and **adaptation** through separate actions and processes can often lead to inefficient and sometimes even conflicting policies that can exacerbate **climate risks** or increase emissions. By taking a low carbon resilience approach, the actions outlined in this Plan integrate these two priorities, breaking down the silos between adaptation and mitigation and considering them in tandem. Prioritizing these dual climate objectives at all levels of policy, planning and implementation can streamline resources, prevent inconsistencies, and identify strategic co-benefits for health, safety, and equity.

Mitigation refers to efforts to reduce or prevent the emission of greenhouse gases. This may include new technologies and renewable energies, or energy-efficient equipment. It may also encompass attempts to remove greenhouse gases from the atmosphere

Adaptation refers to the actions taken to manage the unavoidable impacts of climate change. Adapting successfully leads to improved resilience.

Climate Risk: refers to the potential for consequences where something of human value is at stake and where the outcome is uncertain. The risk results from a combination of hazard exposure, sensitivity to impact, and adaptive capacity.

LOW CARBON RESILIENCE IN PRACTICE

Home A and home B both have natural gas boilers that need to be replaced and have experienced overheating in the summer and are looking to incorporate air conditioning (AC). Home A takes a low-carbon resilient approach, and home B takes a business-as-usual approach:

Home A (Low Carbon Resilience) replaces the natural gas boiler with an electric heat pump. The heat pump is a highly efficient, low carbon heating source that also provides cooling to increase resilience to extreme heat.

Home B (Business as Usual) replaces the existing natural gas boiler with the same system and adds a central AC unit. This approach will address overheating, while intensifying energy use, and locking into an emissions-intensive heating source for the life of the new boiler.

1.4 THE IMPORTANCE OF EQUITY

Climate change, health, and equity are inextricably linked. The health, social and economic consequences of climate change affect everyone; however, not everyone is affected equally. Based on the findings of the IPCC, it is evident that people who are already most vulnerable and marginalized will also experience the greatest impacts of climate change.[v] These intersections were considered throughout the development of this Plan and will be central in the policy design and implementation of key actions. Some of the key equity considerations for homes and buildings include:

Unequal Vulnerability: Those who already experience structural inequities such as colonization, racism, accessibility needs, health conditions, and low income are often most vulnerable to climate change risks and impacts. These factors include (1) susceptibility to negative health outcomes (e.g., being a child with asthma), (2) level of exposure (e.g., living near sources of air pollution), and (3) the ability to adapt to these circumstances (e.g., income, access to services, and family support).

Energy Poverty. Energy poverty describes households that are unable to access and afford adequate energy for necessities, such as heating and cooling. Households that spend more than 6% of their after-tax income on home energy services (or roughly twice the national median) are experiencing energy poverty.[vi] According to an analysis done by Canadian Urban Sustainability Practitioners (CUSP), approximately 20% of households in Canada experience energy poverty. Levels of energy poverty in Port Moody are lower than the national average but are still estimated to impact over 10-15% of residents.[vii]

Housing Affordability: Port Moody's *Housing Need Report*[viii] found that there is a rapid increase in housing costs and a growing gap between what households can afford and the availability of housing. While the housing supply is diverse with respect to typology, much of the stock in Port Moody is expensive and developing new homes and buildings that meet climate objectives may in some cases increase the costs of design and construction that are ultimately passed on to buyers and renters.

1.5 DEVELOPING THE PLAN

Port Moody followed four main steps in the development of the *Climate Ready Homes and Buildings Plan*.

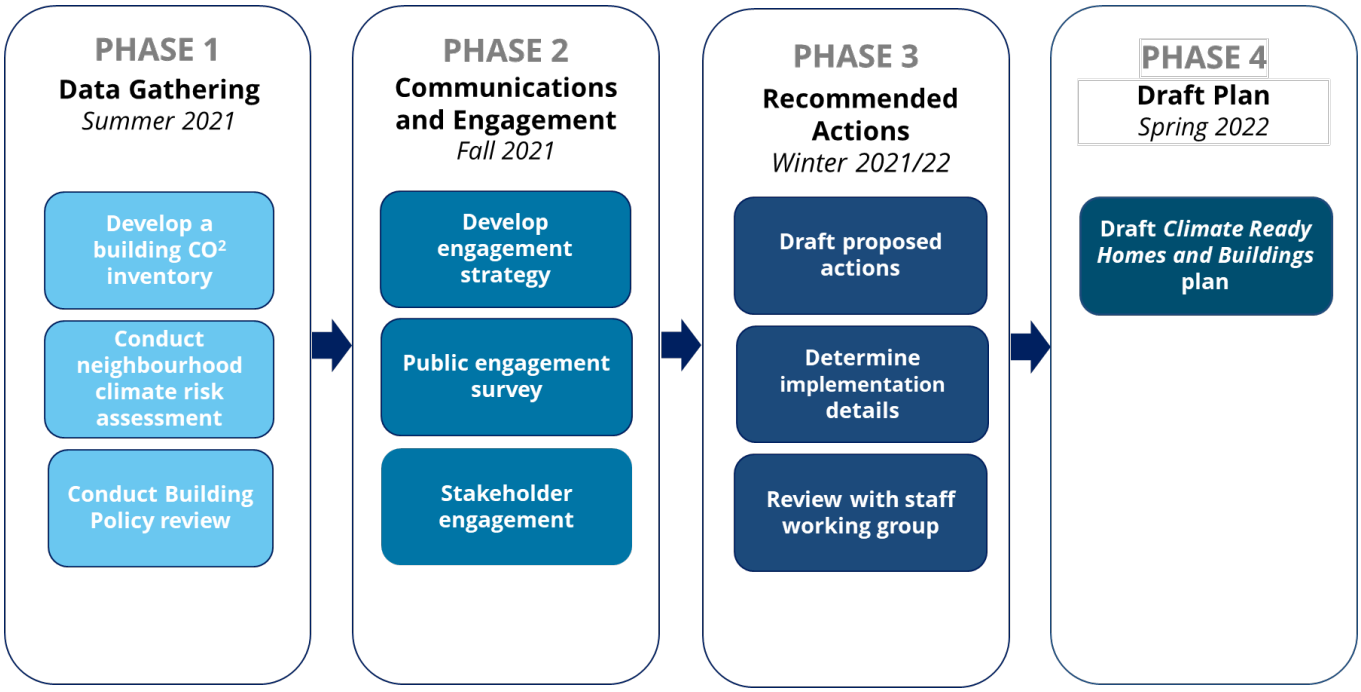


Figure 4. Key steps in developing the Climate Ready Homes and Buildings Plan

Port Moody engaged with stakeholders, businesses, and residents in the development of the Plan to outline a pathway to achieve GHG emissions reduction targets and protect homes and businesses against the changing climate (Appendix F). Throughout the engagement process, three key priorities emerged that informed and guided the development of the actions contained in the Plan:

- Prioritize high-impact policy actions to meet the urgency of the challenge;
- Integrate climate mitigation, resilience, and equity objectives; and
- Align actions with other jurisdictions and create partnerships to reduce complexity for industry and building owners.

Since federal, provincial, and local governments have different and sometimes shared authority over buildings, the *Climate Ready Homes and Buildings Plan* was developed to leverage existing programs at federal and provincial levels, identify gaps where home and building owners need additional support, and use the tools at Port Moody's disposal to help support the construction and renovation of a low-carbon, resilient building sector. Figure 3 outlines key policy tools for the different levels of government and examples of shared authority.

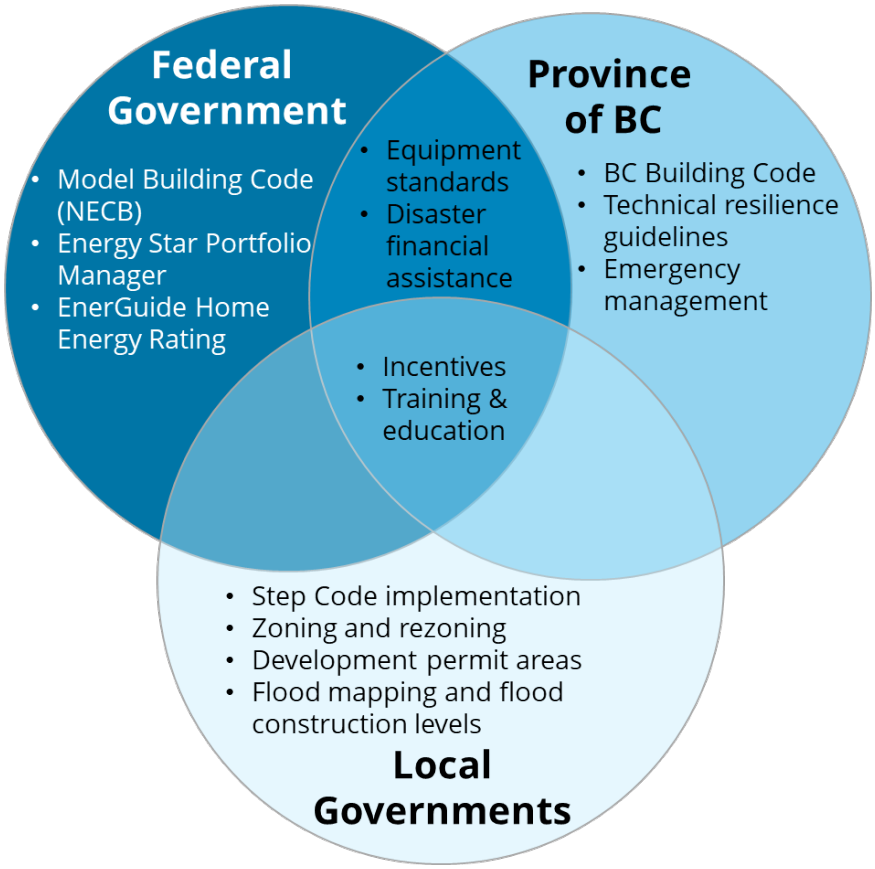


Figure 5. Examples of Key Policy Tools for Provincial, Federal and Local Governments (as of January 2022)

1.6 WHAT DOES THE PLAN CONTAIN?

The *Climate Ready Homes and Buildings Plan* outlines:

- The state of low carbon resilience in Port Moody buildings, by identifying the key sources of emissions for buildings, and the biggest climate threats;
- Policy actions to achieve low-carbon resilient new, existing, and municipal buildings;
- The impact these actions will have on climate targets;
- How the actions can be targeted to prioritize vulnerable neighbourhoods and groups of people; and
- Key considerations for implementing the plan and next steps.

2 CLIMATE CHANGE AND PORT MOODY'S BUILDINGS

2.1 PORT MOODY'S BUILDING SECTOR EMISSIONS

While the *Climate Action Plan* identified the GHG emissions from buildings in Port Moody, it did not break down how emissions differ by building type or sector. Figure 6 shows the breakdown of floor area recorded in the BC Assessment database for Port Moody. There are approximately 26.5 million square feet of building floor area, of which 69% is single-family residential housing (including both attached and detached). Multi-family housing makes up another 18% of the floor area, with commercial and institutional making up 13% of the floor area. Only 1% of the total floor area in Port Moody is owned by the City for their own operations and services provided to residents and businesses. (See Table 5 in Appendix A for the full listing of floor area and share by building type.)

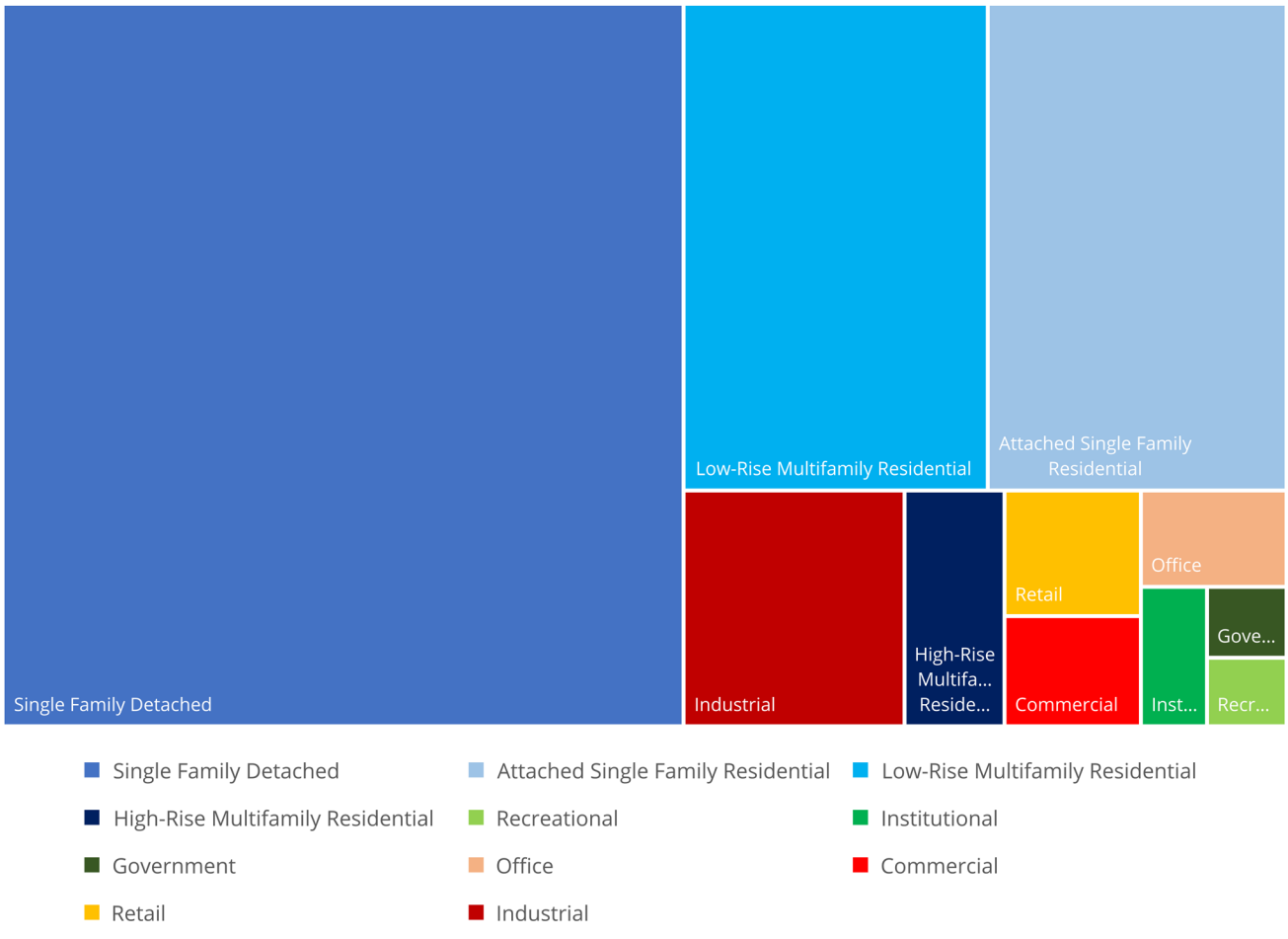


Figure 6. Port Moody Floor Area by use type (based on BC Assessment data)

As shown in Figure 7, the baseline GHG emissions distribution between the building types is similar, although commercial buildings use more energy per unit of floor area than residential buildings, commercial and institutional buildings make up 20% of the GHG emissions, with single-family and multi-family residential making up the remaining 80%. [3]

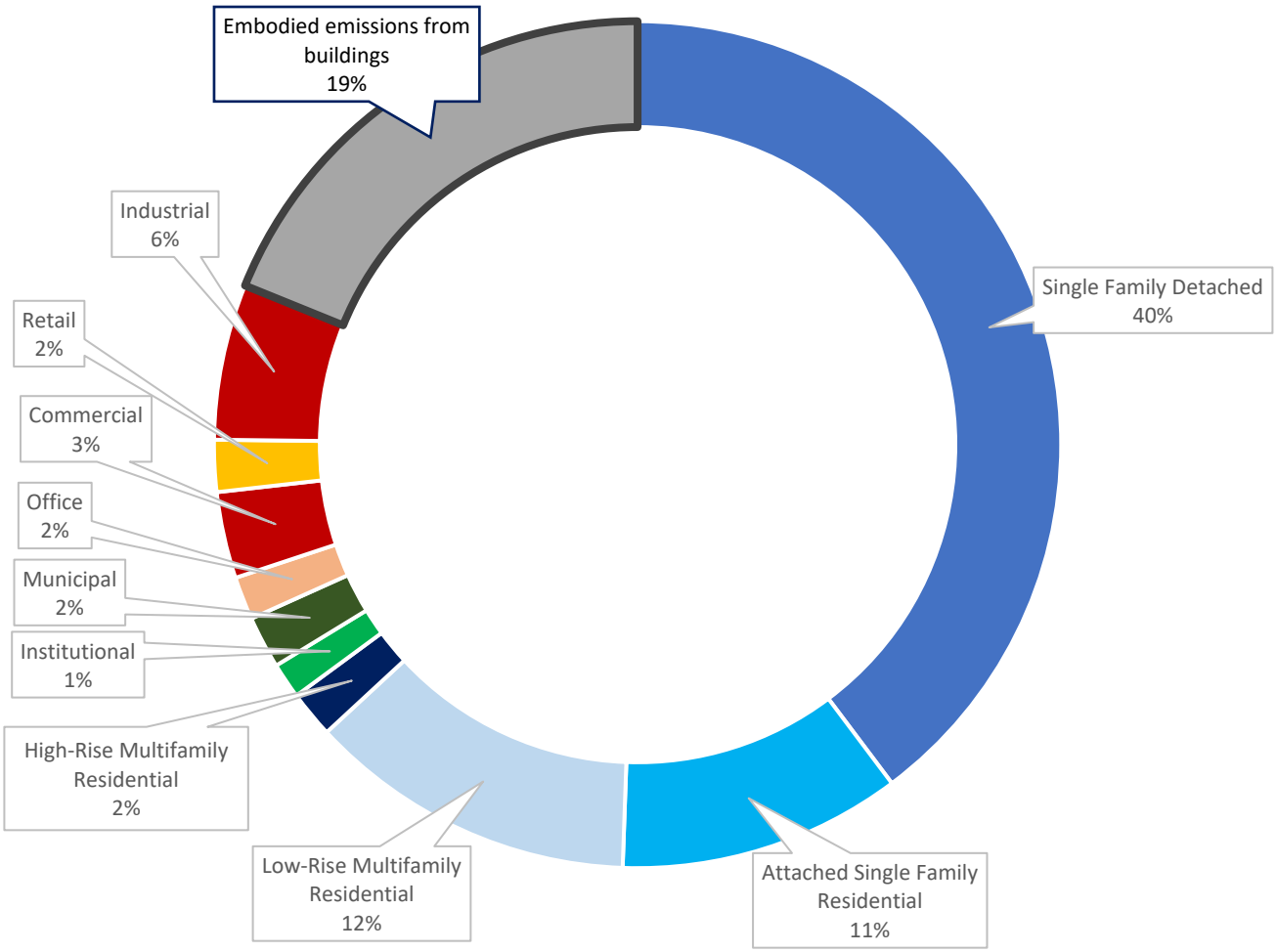


Figure 7: Breakdown of baseline (2018) emissions by building type, including estimated embodied emissions

For the purposes of developing a model to predict potential future increases in residential and commercial floor area, current working population and employment projections generated by staff were used. These projections indicate the potential for the City's population to grow from 34,000 to nearly 66,000 by 2050 – an annual potential growth rate of 2.21%. Potential job increases during this same period are projected to increase by about two-thirds from 11,500 to nearly 19,500 – an average potential growth rate of 1.71%. Using these potential growth rate assumptions, the modelling predicted that residential and municipal building floor area would grow at a rate of 2.21% per year, and commercial floor area would grow at a rate of 1.71% per year.

Understanding the most common building types, and largest sources of building GHG emissions was a key input to guide the development of policy actions and understand their

impact in achieving building-related climate targets. These baseline data, along with key assumptions for the embodied emissions in the materials used to construct and renovate buildings, was used to model the emissions reductions from recommended actions in section 3. Modeled impacts are presented in section 4.

2.2 CLIMATE RISKS FACING PORT MOODY'S BUILDINGS

Temperatures in Metro Vancouver are warming due to climate change. A report by the Pacific Climate Impacts Consortium (PCIC) projects an average increase of about 3°C in the region by the 2050s.[ix] Port Moody's ability to adapt to climate change requires an understanding of local impacts, seasonal variation, and new climate extremes. By 2050, we can expect some of the following changes in climate to occur, many of which will likely vary throughout the region, seasonally, and year-to-year.[x]

How climate change will be affect the Metro Vancouver region by 2050

Drinking water supply

Decreased snowpack (over 50% less) in our mountain watersheds and drier summers (20% less rain) are putting a strain on existing water supply.

Buildings & energy systems

Higher summer temperatures mean more energy is required for cooling systems.

Air quality & human health

Hotter, drier summers are increasing the risk of respiratory ailments (as a result of smoke from wildfires) and heat-related illness .

Communities and infrastructure

Flood risk-extreme rainfall events, storm surges, and up to half a metre of sea level rise are increasing the risk of flooding in the region.

Ecosystems and agriculture

Our changing climate is disruptive the fragile equilibrium in our natural environment and threatening local plants, trees, and animals.

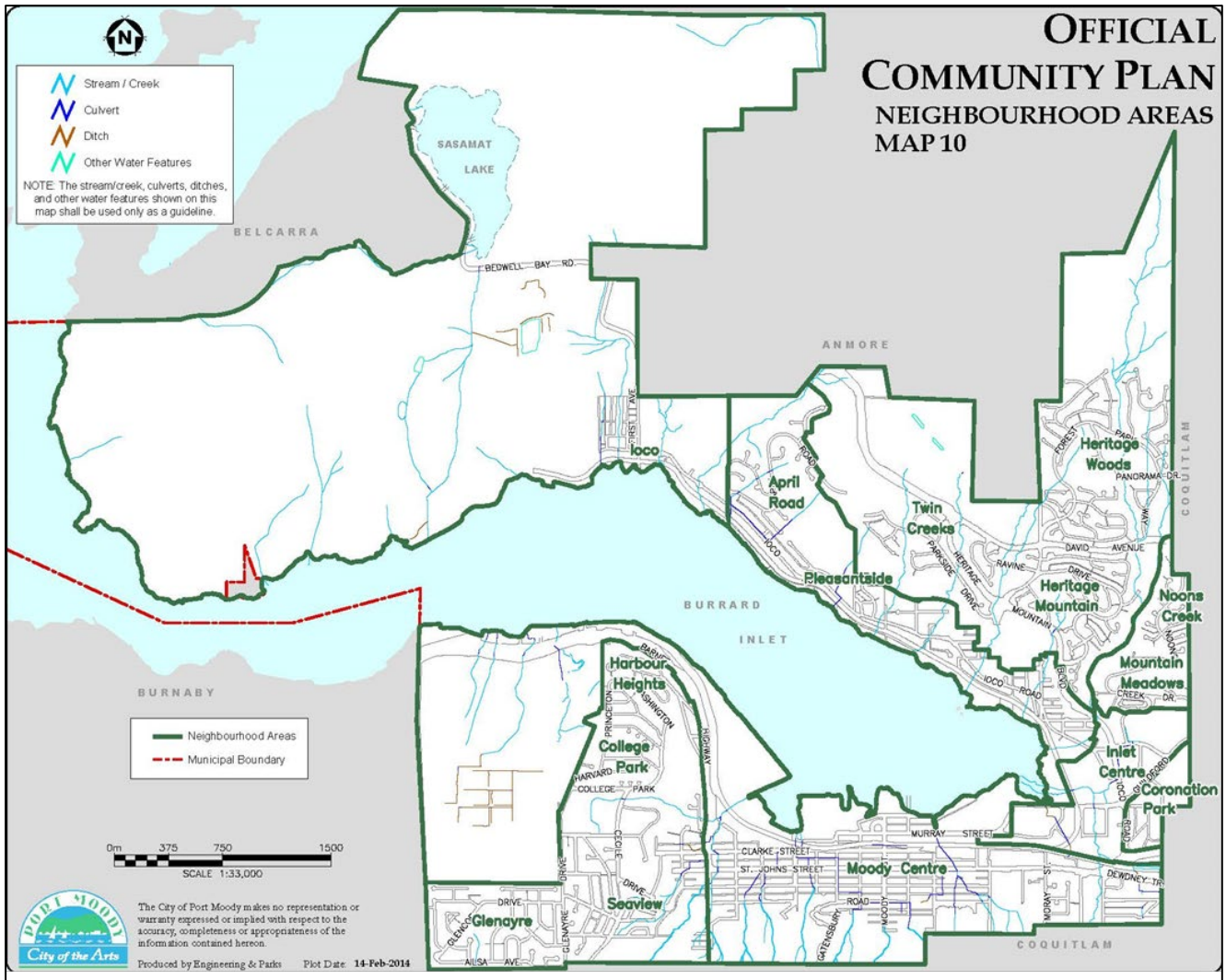
Sanitary/storm sewers drainage

Sea level rise and higher volumes of wastewater mean more energy is required for pumping and wastewater treatment facilities.

Figure 8. Climate Impacts in the Metro Vancouver Region in 2050 (recreated from Metro Vancouver's Climate Projections for Metro Vancouver and 2050 Climate Discussion Paper)

To understand how climate change will impact homes and buildings in Port Moody, the City conducted a climate risk assessment to identify high-level vulnerability of different

neighbourhood groupings (Figure 7). Outcomes from this assessment were used to identify the most significant climate risks facing buildings and neighbourhoods in Port Moody.



Neighbourhood Groupings for the Climate Ready Homes and Buildings Plan

- Ioco and Northwest Port Moody
- April Road and Pleasantside
- Heritage Mountain, Twin Creeks and Heritage Woods
- Noons Creek and Mountain Meadows
- Coronation Park
- Inlet Centre
- Moody Centre
- Glenayre, Seaview, College Park and Harbour Heights

Figure 9. Port Moody's Neighbourhoods

The assessment drew on the IPCC definition of risk shown in Figure 10. In this framework, risk is defined as a function of a building's physical exposure to a climate hazard, the magnitude or likelihood of that hazard occurring, and the inherent characteristics of the building that may make it more vulnerable to impacts. For example, buildings without air

conditioning with elderly occupants will be more vulnerable to extreme heat than an air-conditioned building with younger occupants. The risk assessment used climate data from the *Climate Action Plan* and the *Climate Projections for Metro Vancouver* to explore the following key climate hazards:

1. Coastal flooding and erosion;
2. Stormwater flooding;
3. Landslides;
4. Wildfire;
5. Extreme heat/heatwaves;
6. Air quality issues from wildfire smoke, and
7. Drought.[xi]

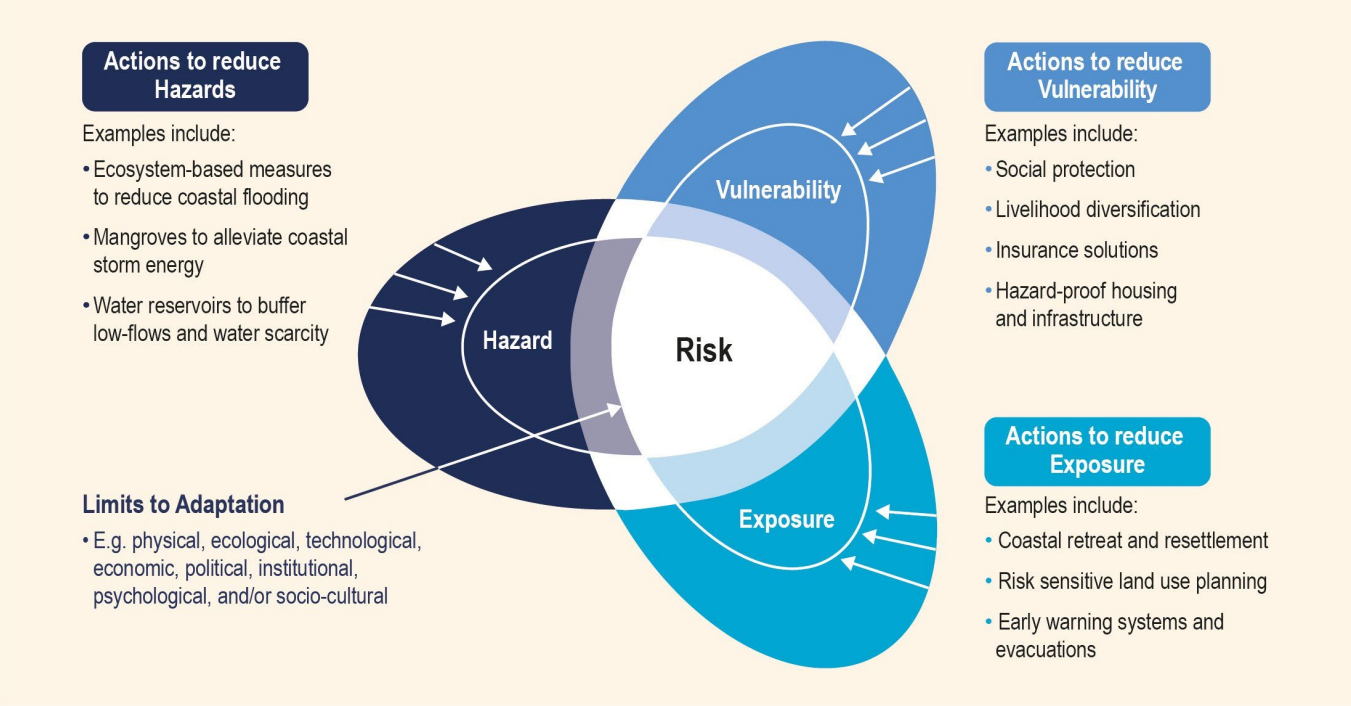


Figure 10. Climate Risk Assessment Framework. Source: IPCC[xii]

These high-level results are intended to help prioritize the next steps, including neighbourhood-level engagement, follow-up assessments, and targeted policy action, and should not be used to determine the likelihood of risk to a specific building or persons. The assessment did not include consideration of the hazard likelihood, impact consequence, or detailed risks facing individual buildings and building systems. Instead, a range of neighbourhood-scale criteria such as demographics, building type, and age were used as proxies for estimating the average risk to buildings in each neighbourhood.

2.2.1 Key climate risks and priority neighbourhoods'

The climate risk assessment identified three top hazards to buildings in Port Moody, as well as higher priority and lower priority neighbourhoods.

Table 2. Top Three Climate Hazards Facing Buildings in Port Moody

Rank	Climate Risk
1	**Poor air quality** is the climate hazard that City neighbourhoods are most vulnerable to, with six out of eight neighbourhoods rated with a "high" vulnerability to this hazard. This was largely due to the fact that few single-family homes, even newer homes, are expected to have enhanced air filtration systems installed. Ioco and Northwest Port Moody, and Coronation Park were the only two neighbourhoods with "medium" vulnerability ratings, with Ioco and Northwest Port Moody being largely undeveloped and Coronation Park taking into account opportunities for enhanced filtration as part of planned new development.
2	**Landslides** were the second most significant hazard identified. Many neighbourhoods in Port Moody have steep slopes that may become more vulnerable as more intense rainstorms paired with vegetation die-back from more frequent extreme heat and drought affect slope stability.
3 (tie)	**Wildfire** was tied as the third most significant hazard, with three neighbourhoods considered to be highly vulnerable. Neighbourhoods with the highest vulnerability were those in wildland-urban interface areas along the City's northern edge, including April Road, Pleasantside, Heritage Mountain, Twin Creeks Heritage Woods, Noons Creek and Mountain Meadows.
	Extreme heat was the third most significant hazard, with three neighbourhoods considered to be highly vulnerable. Neighbourhoods with a higher portion of older homes, lower-income residents, and less green space were considered more vulnerable to overheating due to a higher urban heat island effect and fewer air conditioning units.

Table 3. Higher and Lower Priority Neighbourhoods in Port Moody

Higher-Priority Neighbourhoods	Lower-Priority Neighbourhoods
April Road and Pleasantside was found to be the most vulnerable neighbourhood, with high vulnerabilities to coastal flooding, landslide, wildfire, extreme heat, air quality and drought.	**Coronation Park** was found to be the most resilient neighbourhood, with low vulnerability to five hazards, moderate vulnerability to two (extreme heat and air quality), and no high vulnerabilities. This is, in part, because the neighbourhood is located away from higher risk coastal, creek or forested areas, and because of the opportunity for more resilient design features in planned redevelopment.
Moody Centre was found to be the second most vulnerable, with high vulnerabilities to coastal flooding, stormwater flooding, landslide, and air quality.	**Ioco and Northwest Port Moody** was also considered relatively resilient with four medium vulnerabilities and no high vulnerabilities, primarily due to the area's large portion of undeveloped land.

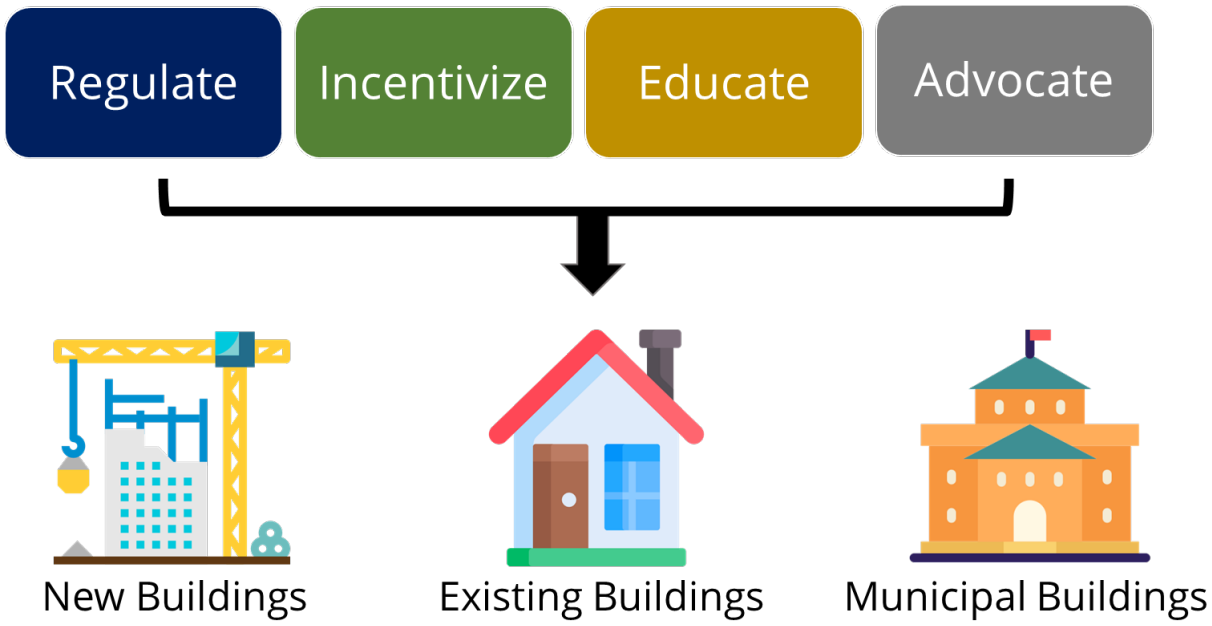
The climate risk assessment provides important insights to prioritize the actions developed through this Plan. Identifying residents and neighbourhoods that are vulnerable to climate impacts will be critical for implementing policies that are impactful and address existing inequities.

3 TAKING ACTION

The *Climate Ready Homes and Buildings Plan* outlines a set of actions to improve our resilience to climate hazards and reduce our emissions in three categories of buildings in Port Moody: new buildings yet to be constructed, existing homes and buildings, and municipal buildings and facilities. Actions were developed based on a review of leading policies in local governments in BC, Canada, and internationally, and refined through public, stakeholder and staff input, legal opinions, and alignment with Port Moody's GHG emissions reduction targets. They have been chosen based on their ability to address existing barriers, support market transformation, and align with policy actions from other levels of government.

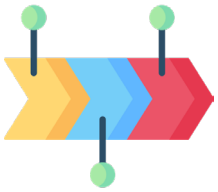
Actions fall under four main categories:

1. Regulations and requirements (e.g., building code, bylaws, zoning);
2. Incentives and financing (e.g., rebates, tax credits);
3. Education and information for residents and businesses (e.g., education campaigns, design guidelines, building energy benchmarking); and
4. Advocating to other levels of government to accelerate policy action (e.g., joining coalitions, supporting resolutions through the Union of BC Municipalities).



3.1 EVALUATION CRITERIA

Within each of the categories of actions the following criteria have been used to assess their impacts:

Criteria	Metric	Definition
Impacts 		Operational emissions
		Resilience
		Embodied emissions
Anticipated Budget 	**N/A**	Cost is covered by existing budgets and/or staff capacity
	$	$0 - $20,000
	$$	$20,000 - $50,000
	$$$	$50,000 - $200,000
	$$$$	$200,000 +
Timeline 	**Immediate**	1 year or less
	Short-term	1-2 years
	Medium-term	3 -5 years
	Long-term	5 -10+ years

3.2 CO-BENEFITS

Low carbon resilience can result in key opportunities that provide benefits in areas other than the main intent of the action, often called co-benefits. These benefits illustrate the synergistic relationship between climate action and social, environmental, and economic objectives, for example, the creation of green jobs, improved health outcomes, and cost savings.

The legend below showcases key opportunities where climate actions contribute to integrated and consistent benefits in multiple areas. The co-benefits legend is specifically formulated for Port Moody and highlighted for each focus area, providing an opportunity to communicate the various benefits of taking an integrated climate action approach. It also directly responds to calls for climate emergency planning and recognizes the crossover of climate policy and action with positive local change.

The implementation of the *Climate Ready Homes and Buildings Plan* will result in several co-benefits that align with central community priorities, including the following:

Improve cost savings. Energy efficiency improvements can result in utility cost savings.

Support the local economy and job creation. Retrofits have immense potential to create good local jobs and grow the economy.

Improve health, wellbeing, and community livability. Low carbon resilient buildings can improve thermal comfort and address poor indoor air quality by improving ventilation and addressing sources of indoor air pollution (i.e., natural gas stoves).

Waste reduction/optimize resources. Strategies to reduce embodied carbon often require reducing, reusing, and recycling materials to mitigate the carbon impacts of building construction and renovation.

3.3 NEW BUILDINGS

Port Moody is a growing community, with a population that has more than doubled over the past three decades (primarily between 1991 and 2011). New residential and commercial buildings will be needed to accommodate this growth, which presents the opportunity to build efficient, low carbon and resilient new structures. Port Moody's early adoption of the B.C. Energy Step Code means that buildings built today are already more energy efficient than the current B.C. Building Code.

WHAT WE HEARD

Two-thirds of survey respondents indicated a preference for homes with energy efficiency measures. Double and triple-paned windows, high levels of insulation, LED lightbulbs, and electric heating were the most common features that survey participants looked for.

Port Moody has already taken action to improve the performance and resilience of new homes and buildings, including:

- **Early Adoption of the Energy Step Code:** B.C. Energy Step Code allows Port Moody to require buildings to be more efficient than the B.C. Building Code. As noted, the B.C. Energy Step only regulates energy, and not GHG emissions. To address this gap, Port Moody created a ***Low-carbon Energy System Pathway*** and a ***Corporate Rezoning Policy*** to encourage buildings to further reduce GHG emissions. Port Moody currently provides ***rebates for airtightness testing*** to offset some of the costs of greater energy efficiency.
- **Sustainability Report Card:** The sustainability report card is a tool required for rezoning, heritage revitalization agreements, heritage alteration permits, and some development permit applications. The report card identifies performance measures, including a focus on resilient design, and embodied and operational emissions that new development applicants must fill out and be evaluated on.
- **Zoning Bylaw Exemptions**: Exemptions are included in the Zoning Bylaw to encourage green building features. Floor area exemptions support passive design (e.g., thicker walls, improved insulation, and natural ventilation), while height, and floor area exemptions support sustainable energy systems that provide higher building energy efficiency performance.
- **Hazardous Lands Development Permit Area (DPA)**: The Hazardous Lands DPA currently includes additional resilience requirements for buildings on land susceptible to soil liquefaction in the event of an earthquake; land slippage due to soil erosion on steep land sediments and sloping sites; flooding and debris flow during abnormal storm events.

Despite these initiatives there are still gaps in achieving low carbon resilient buildings. Embodied emissions from new buildings accounts for 19% of Port Moody's emissions from

buildings, which will increase as a portion of total emissions without further action. Many new buildings are still being heated with fossil fuels such as natural gas, built with emissions-intensive materials, and are not designed to be resilient to future climate conditions.

The following section outlines the actions Port Moody will undertake to ensure new buildings produce as little GHG emissions as possible and are resilient to the impacts of climate change.

CLIMATE TARGETS FOR NEW BUILDINGS

To increase low carbon resilience in new buildings, Port Moody has set the following targets and actions:

- By 2025 (latest 2030), all new and replacement heating and hot water systems are zero emissions
- By 2030, reduce the carbon content of new buildings and construction projects by 40% (compared to 2018)

REGULATE				
ACTION	**IMPACTS**	**BUDGET**	**TIMELINE**	**LEAD DEPT**

1.1. Accelerate Adoption of the B.C. Energy Step Code
• Adopt the highest steps of the BC Energy Step Code
  ○ Step 5 for Part 9 buildings by 2025
  ○ Step 4 for Part 3 buildings by 2025
• Adopt GHG intensity (GHGi) limits for Part 3 and Part 9 buildings in 2023 and increase stringency in 2025.
  ○ 2023: 2.5 – 4 kg CO_2e/m^2/ year
  ○ 2025: 1.5 – 2 kg CO_2e/m^2/ year
• In the absence of the Province including GHGi targets in the Step Code, Port Moody will increase Low Carbon Energy System requirements to equivalent levels.
		$	Immediate	Policy Planning

1.2. Update and Expand Existing Rezoning Policies Include the following measures in the short and long-term: • **Short-term:** Require rezoning applicants to meet more stringent GHGi targets, disclose embodied emissions, use future climate data in building design, incorporate cooling, and minimum level of filtration (i.e., MERV 13). • **Long-term:** Add embodied emissions performance targets for rezoning applicants.		$	Short and long-term	Policy Planning
1.3. Rezoning Policy for Large Developments Create an additional rezoning policy for large development projects to install electric heating and cooling. Large developments can be defined as projects with over 45,000 m^2 of new floor area or parcel of land over 8,000 m^2.		$$	Short-term	Policy Planning
1.4. Development Permit Areas (DPAs) Explore local government authority to use DPAs to require low-embodied emissions construction and electric heating and cooling for Part 3 and Part 9 buildings.		$$	Short-term	Policy Planning

1.5. Hazardous lands development permit areas (DPA) Increase requirements in the hazardous lands DPA to include additional resilience requirements based on localized risks identified in climate risk assessment (e.g., cooling, filtration, and ventilation, geohazards, flood protection, FireSmart methods, drought-tolerant landscaping, and water conservation features.)[xiii]		N/A	Medium-term	Policy Planning
1.6. Clarify authority for embodied emissions requirements in new construction Undertake research, industry consultation, and legal opinion to outline options for including embodied emissions reduction requirements in new construction projects.		$$	Immediate	Policy Planning
1.7. Embodied emissions disclosure at time of permit Implement an administrative requirement for embodied emissions disclosure through a lifecycle assessment (LCA) for Part 3 and Part 9 buildings at the time of permit application and occupancy. Buildings will be required to calculate and report the life-cycle emissions (in carbon dioxide equivalent) of the structure and enclosure in $kgCO_2e/m^2$ for modules A-C over 60-years (include module D separately when available).[xiv]		N/A	Immediate	Policy Planning
1.8. Parking minimums and maximums Review and revise parking minimums and establish parking maximums for Part 3 and Part 9 buildings to reduce the size and number of parking structures and associated embodied emissions from concrete and encourage lower rates of car ownership.		$	Short-term	Infrastructure Engineering
1.9. Development Permit Form & Character Guidelines Identify and remove any conflicts with high-performance design strategies (e.g., building orientation, massing, and articulation, shading and glazing, envelope efficiency and thermal bridging).		$$	Short-term	Development Planning

INCENTIVIZE				
ACTION	**IMPACTS**	**BUDGET**	**TIMELINE**	**LEAD DEPT**
1.10. Permit streamlining Incentivize low-carbon and/or resilient buildings by expediting permitting for buildings that meet specified criteria.		N/A	Short-term	Policy Planning

1.11. Bylaw barriers to low-carbon buildings Explore options to identify and remove bylaw barriers to low-carbon buildings, for example: • Provide height limit exceptions for mechanical equipment. • Create exceptions to setback requirements for heat pumps, and external shading. • Review and update existing zoning bylaw exceptions for green building systems.		N/A	Immediate	Policy Planning

EDUCATE				
ACTION	**IMPACTS**	**BUDGET**	**TIMELINE**	**LEAD DEPT**
1.13. Design guidelines • Explore existing gaps and amend existing design guidelines to include low-carbon and resilient building design and best practice. • Create low-carbon building design guidelines for single-family homes (small lot single-family and laneway homes).		$	Short-term	Policy Planning

ADVOCATE	
ACTION	**IMPACTS**
Advocate to the Province to include GHGi in the B.C. Energy Step Code	
Advocate to the Province to include resilience measures in the B.C. Building code	
Advocate to the Province to create embodied emissions reporting requirements	
Advocate to the Federal government to create a Canadian life cycle inventory database	
Advocate to the Federal government to create an environmental product declaration program	

3.4 EXISTING BUILDINGS

Operational emissions from existing buildings account for 78% of Port Moody's emissions. Meeting Port Moody's climate targets will require eliminating GHG emissions pollution from heating and hot water systems in all homes and buildings by 2050. Decarbonization of heating, through fuel switching, should also be paired with upgrades to building envelopes and ventilation systems to reduce overall energy use, reduce energy bills, improve air quality, ensure thermal comfort, and increase resilience to extreme weather events.

WHAT WE HEARD

The vast majority of survey participants had not taken action to address GHG emissions or resilience in their homes. Residents indicated they experience a range of barriers, including the cost of making upgrades; challenges in obtaining landlord, strata council, or co-op approval; and a lack of knowledge about the upgrades that are needed. The strongest motivators for residents in taking action were improving the safety and comfort of their homes, cashback incentive programs and opportunities to save money, and the financial risk of not taking action.

Port Moody has started to take action on low carbon resilient existing buildings through the following initiatives:

- **Demolition permit requirements:** Port Moody requires a demolition permit to regulate and minimize the amount of waste sent to landfills for disposal from the demolition of a home or building. To receive the maximum refundable amount of the waste management fee at least 70% of recyclable or reusable project waste must be recycled or reused.
- **Legal Review for Existing Regulatory Authority:** Port Moody has been working to understand local government authority for regulating existing building emissions performance, to ensure that in the absence of adequate Federal or Provincial action, climate targets can still be met. The legal review concluded the following:
    - Local governments have the authority to require **building energy and carbon benchmarking and disclosure.**
    - Local governments (aside from the City of Vancouver) do not currently have the authority to implement **building performance standards**.[xv] As an alternative, Metro Vancouver is in the process of developing standards for the region, which Port Moody can support.
- **Extreme Weather Resilience Plan:** The City is currently undertaking an assessment and outlining actions to ensure the City and community are prepared and able to respond and adapt to a changing climate. This work includes a neighbourhood climate risk and vulnerability assessment with an equity lens to help the City in understanding where to focus resources.

Although the technology and processes to decarbonize buildings are available today, retrofitting presents a range of challenges, including high upfront costs and payback expectations, split incentives, lack of awareness and education, and limited industry capacity. There are currently no standards for energy efficiency, GHG emissions, or resilience for existing buildings; therefore, meeting emissions reduction targets requires building owners to make voluntary upgrades to their buildings.

The Province of BC has committed to regulating existing building performance with a *High-Efficiency Heating and Hot Water Requirement* for all new and replacement systems by 2030, and an *Alterations Code* by 2024. The implementation of these requirements will help transform the supply chain and create deep energy reductions but may fall short in achieving emissions reduction targets. The Province has signaled these policies will be fuel agnostic, meaning buildings can continue using fossil fuels. Port Moody can accelerate action and drive early adoption for low carbon resilient buildings through innovative policy, partnerships, and advocacy.

CLIMATE TARGETS FOR EXISTING BUILDINGS

To increase low carbon resilience in existing buildings, Port Moody has set the following targets and actions:

- By 2025 (latest 2030), all new and replacement heating and hot water systems are zero emissions
- By 2030, all oil and propane heating and hot water systems are replaced with zero-emission systems
- By 2050, all buildings have replaced heating and hot water with zero-emission systems

REGULATE				
ACTION	**IMPACTS**	**BUDGET**	**TIMELINE**	**LEAD DEPT**
2.1. Thermal conditioning permit Support proper heat load calculations, mechanical design, and installation, by requiring permits for all space heating, cooling and domestic hot water equipment in new and existing buildings.		$$	Short-term	Policy Planning
2.2. Mandatory building energy benchmarking and disclosure requirement Implement mandatory benchmarking and disclosure of energy and emissions performance in Part 3 buildings through Metro Vancouver's planned regulation. In the absence of regional action, implement a benchmarking and disclosure requirement at the municipal scale, first by encouraging local building owner participation in the voluntary Building Benchmark BC program to help build awareness and capacity of the local building industry to measure, track and improve their performance.		$$$	Immediate - Medium-term	Policy Planning

2.3. Demolition permit with recycling and deconstruction requirements Revise the existing demolition permit to require 75% - 90% waste diversion through reuse and recycling when a home or building is demolished. [xvi]		$	Immediate	Building Bylaws and Licensing
2.4. Rate structure for water Develop a plan to work towards a consumption-based billing structure for potable water and universal water metering.		$$-$$$$	Medium-term	Infrastructure Engineering
2.5. Community-level flood risk assessment Conduct a coastal flood risk assessment to update flood construction levels (FCLs) & establish a Coastal Development Permit Area.		N/A*	Short to long-term	Policy Planning

*This work is already underway with an approved budget to develop a Port Moody Coastal Flood Strategy.

INCENTIVE				
ACTION	**IMPACTS**	**BUDGET**	**TIMELINE**	**LEAD DEPT**
2.6. Top-ups for existing incentive programs Provide top-up incentives to complement existing federal, provincial, and non-governmental organization (NGO) programs to help support homeowners in installing electric heat pumps for space and water heating, as well as any necessary electric service upgrades. (e.g., $2,000 top-up for electric heat pumps for space heating, $1,000 for electric heat pumps for hot water, and/or $500 incentive for electric service upgrades). [xvii]		$$	Immediate	Policy Planning
2.7. Revitalization Tax Exemptions (RTES) Provide RTEs for low emission and/or resilient retrofits. RTEs allow for exemption from or reduction of property taxes for a specified amount of time, for buildings that take specific actions, which can include low carbon resilient retrofits.		$	Medium-term	Policy Planning
2.8. Review bylaws Review existing *City of Port Moody Sound Level Bylaw* and *City of Port Moody Building Bylaw* to identify and remove barriers to retrofits. Sound limits and setback requirements can limit and de-incentivize the use of heat pumps.		N/A	immediate	Building Bylaws and Licensing
2.9. Low carbon resilient incentives for rentals, with affordability covenants Provide rental properties with low carbon resilient retrofit loans or grants, with a required affordability covenant. The affordability covenant is an agreement to limit rent increases for a specific number of years following a project's completion to ensure retrofits are not exacerbating affordability issues.		$$$	Medium-term	Policy Planning
2.10. Concierge retrofit program for large and small buildings Design and implement a retrofit support program for large and small buildings. The program will provide no or low-cost support services to guide home and building owners through low emissions retrofit process, including energy and emissions audits, selecting energy conservation members,		$$$	Short-term	Policy Planning

finding qualified contractors, and accessing financing and incentives. Explore a partnership with the tri-cities.				

EDUCATE				
ACTION	**IMPACTS**	**BUDGET**	**TIMELINE**	**LEAD DEPT**
2.11. Public climate risk, energy, and emissions dashboard Create or consider working with an existing platform to publish a public-facing interactive dashboard with high-level building-specific data on climate risk, energy, and GHG emissions.		$$	Long-term	Policy Planning
2.12. Identify oil and propane-heated buildings Conduct research to identify buildings with primary sources of oil and propane heating in Port Moody and create an outreach plan to support the decarbonization of these buildings.		$	Short-term	Policy Planning
2.13. Industry capacity building opportunities Identify capacity building needs for industry in Port Moody, and leverage existing programs by: • Connecting Port Moody contractors and builders to existing training programs. • Explore opportunities to address capacity building gaps by partnering with other local governments, utilities, or education institutions to fund expanded training offerings.		$	Medium-term	Building Bylaws and Licensing
2.14 Pilot low carbon resilience audits Develop or promote an existing framework for assessing climate risk, energy and GHG emissions performance of existing homes and buildings.[xviii] For homes, the Federal government has committed to creating a Climate Adaptation Home Rating Program as a companion to EnerGuide Home Energy Audits which could be utilized in Port Moody.		$	Short-term	Policy Planning
2.15. Community outreach and engagement As needed, provide Port Moody education, for example, through challenge programs, peer-to-peer education (e.g. Empower Me), and spotlighting leadership.		$	Medium-term	Policy Planning

ADVOCATE	
ACTION	**IMPACTS**
Support Metro Vancouver's development of building performance standards	
Advocate to the Province for accelerated timelines for appliance/equipment standards (i.e., prior to 2030)	

Support the Province's plans to adopt a PACE Financing Program for carbon and resilience retrofits	
Support the Province's Home Energy Labelling program	
Work with real estate industry members to encourage voluntary labelling, home energy performance, and flood risk disclosure at the time of sale.	

3.5 MUNICIPAL BUILDINGS

The City of Port Moody owns and operates many buildings for operations, and the delivery of services within the community. The energy used at these civic facilities is responsible for 54% of the City's corporate GHG emissions. Most of this energy use is attributed to natural gas for heating and hot water in a few buildings: the Recreation Complex (42%), Westhill Centre Pool (12%), Rocky Point Park Pool (9%) and the Civic Centre (9%).[xix] Building and retrofitting civic facilities to be low carbon and resilient shows Port Moody's commitment to climate action through innovation and leadership, demonstration of technical and policy solutions, building industry capacity, creating jobs, and ensuring residents are safe and healthy in community buildings.

Port Moody has made progress on civic facilities through the following initiatives:

- In 2020 the City completed **significant repairs to** the Civic Centre, Recreation Complex, and Arts Centre **building envelopes**. Higher-performing building envelopes (with improvements to insulation, windows, and doors) prevent heated or cooled air from leaking out – this reduces the amount of energy needed to make indoor spaces comfortable.
- The City is currently performing **energy audits** on the top GHG emitting facilities and performing **climate risk and vulnerability assessments** that will prioritize retrofits required to reach targets.

CLIMATE TARGETS FOR MUNICIPAL BUILDINGS

To increase low-carbon resilience in municipal buildings, Port Moody has set the following targets and actions:

- 80% reduction in operational emissions by 2030

ACTION	IMPACTS	BUDGET	TIMELINE	LEAD DEPT
3.1. Corporate zero-emissions building policy Continue to apply the net zero-emissions standard to address operational emissions and include measurement and targets for embodied emissions.		N/A	Short-term	Policy Planning
3.2. Benchmark and disclose energy use/emissions Implement a policy for mandatory emissions and energy benchmarking for civic buildings on an annual basis.		$	Short-term	Facilities
3.3. Net-zero emissions plan for the municipal building portfolio • Create a net-zero emissions target for civic buildings to be achieved by 2040. • Implement measures to meet specified targets.		$$$$	Medium-long-term	Policy Planning
3.4. Detailed climate risk assessment Conduct a detailed climate risk assessment of critical or vulnerable municipal facilities and/or assets.		$$	Medium-term	Engineering & Facilities

3.5. Clean and cool air community shelters Identify opportunities to increase access to cool, clean air shelters with filtered air to support residents during air quality advisory and/or heat events.		$$$	Short-term	Policy Planning
3.6. Future climate data Use future climate data in building maintenance, renewal, and design to identify and address relevant hazards.		$-$$$$	Short-term	Facilities

4 IMPACTS

4.1 GREENHOUSE GAS EMISSIONS TRAJECTORIES

To model the impacts of the proposed policies, along with relevant supporting Provincial policies, the consultant team built a model of operational and embodied emissions for the building sector in Port Moody from 2019-2050.

Without any action, operational emissions are forecasted to increase by 62% by 2050 (from 51,000 to 83,000 tCO_2e) – this is referred to as the 'business as usual scenario'. However, implementing the outlined actions will put the City on a trajectory to a net-zero emissions building stock by 2050 (see Appendix A for modelled actions). The modelled actions are estimated to result in a 96% decrease in annual operational emissions by 2050 (down to 2,000 tCO_2e), relative to both 2018 and the business-as-usual scenario. By 2030, the modelled actions will reduce building sector emissions to 34,000 tCO_2e—a 34% reduction from baseline, and 46% reduction from the business-as-usual scenario. The emissions reductions ramp up after 2030, as result of the implementation of regulations in the late 2020's.

The embodied emissions actions will reduce embodied emissions in construction and renovation by 27% annually, avoiding 3,257 tCO_2e of embodied emissions each year. This is shy of the 40% reduction target by 2030, due to local governments' limited authority to regulate embodied emissions in new construction. Port Moody will enhance embodied emissions reductions to achieve the remaining 10% through the completion of actions 1.4 and 1.6 which will explore additional policy levers for Port Moody to regulate, encourage, and incentivize embodied emissions reductions. By 2050, virtually all emissions shown are embodied emissions (see Figure 11).

Looking at cumulative emissions over time, the implementation of the Plan will avoid 58% of the total cumulative emissions (both operational and embodied) that are forecasted to be emitted by the building sector in Port Moody between now and 2050 (In the BAU scenario, cumulative emissions between now and 2050 total 2,338,000 tCO_2e, while the plan would reduce cumulative emissions to 985,000 tCO_2e.)

These results are outlined in Figure 11, which shows "wedges" of the major actions modelled and their impact on annual operational and embodied emissions in Port Moody. Figure 12 shows the cumulative GHG emissions savings of all modelled operational and embodied emissions policies against the baseline. In both Figures (11 & 12), the top of the chart represents the business-as-usual projection, while the light grays show the operational and embodied emissions remaining after the policies are implemented. Figure 13 shows the breakdown of cumulative savings by action.[xx]

The major actions modelled are provided in the table below. More detail on assumptions for each action can be found in Appendix A. The key actions associated with each wedge are listed, and multiple actions are listed for each, as they are complementary. Modelling a single action is often impossible, but the expected cumulative impact of a set of policies can be estimated, to help guide policy development. In addition, two energy supply policies

from the Provincial government are included, to better capture anticipated improvements in the emissions intensity of electricity and gas in British Columbia.

From these findings, the two most impactful areas are accelerating implementation of low carbon energy through the Energy Step Code (i.e., a low carbon energy system pathways approach or GHGi as anticipated in the BC Building Code) and supporting fuel switching retrofits that move homes and businesses off fossil fuels such as natural gas. Embodied emissions actions are also critical, as under the policy scenario, annual embodied emissions exceed annual operational emissions by 2045.

Model Action & Description	% Of Cumulative GHG Reductions	Key Plan Actions
Fuel Switching Retrofits: Fuel switching away from fossil fuel burning equipment to electric and low-emissions solutions in homes and businesses, through targeted retrofit programs, regional building standards, and provincial equipment standards, targeting 3-4% of buildings per year in order to hit all budlings by 2050.	**37%** **(Residential: 32%, Commercial: 5%)**	2.1 2.6 2.10 2.12
Low Emissions New Construction: Accelerated implementation of BC Energy Step Code, along with a GHG-intensity (GHGi) requirement for new buildings subject to the BC Building code.	**27%** **(Residential 24%, Commercial: 3%)**	1.1 1.2 1.3
Clean Electricity: The *Clean Electricity Delivery Standard* mandated by the Province will ensure that all electricity supply for Port Moody comes from renewable sources by 2030.	**17%**	N/A: Provincial action
Renewable Natural Gas (RNG): A limited supply of renewable natural gas allows the reduction of emissions when fuel switching may prove more challenging, such as for industrial spaces.	**6%**	N/A: Provincial action
Embodied Emissions: Impact of lower embodied emissions construction methods for new buildings, with savings approach differing by building type: low-carbon construction of single-family homes, reduced garage, and parkade space (and the associated concrete) in multifamily buildings and offices, and low emissions concrete and/or mass-timber construction for commercial and multifamily buildings.	**5%**	1.2 1.4 1.6 1.7 1.8
Energy Efficiency Retrofits: Widespread energy efficiency retrofits of 1-2% of existing homes and buildings each year, not specifically targeting fuel switching (along with commercial benchmarking).	**5%** **(Residential 4%, Commercial: 1%)**	2.2 2.6 2.7 2.9
Municipal Building Policies: Deep energy efficiency and fuel switching retrofits to achieve net-zero emissions in municipal buildings and facilities, starting with benchmarking.	**2%**	3.1 3.2 3.3

Figure 11.: Annual Operational and Embodied GHG Emission Reductions due to policies

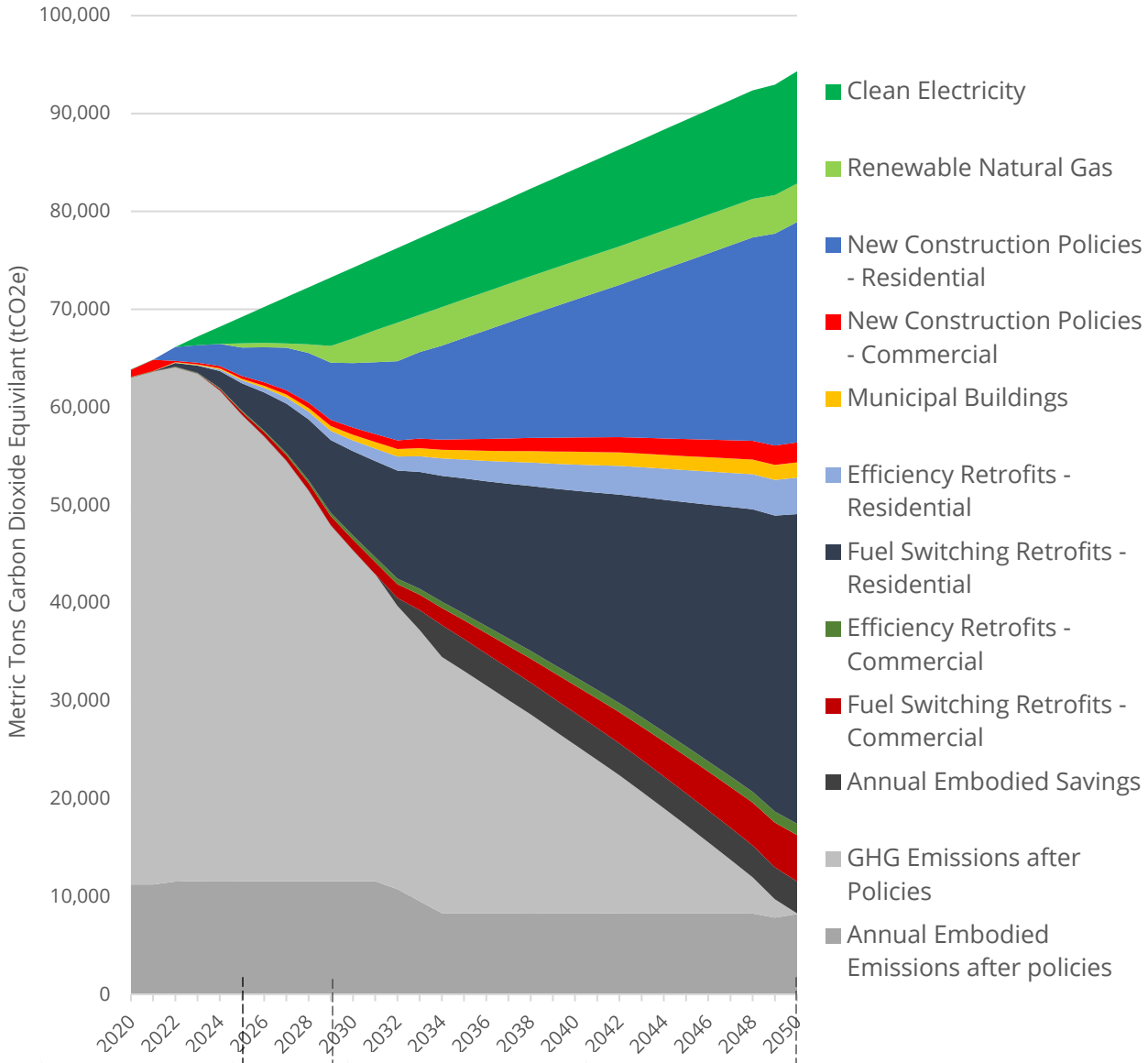


Figure 12: Cumulative Operational and Embodied GHG Emissions and Savings, 2022-2050

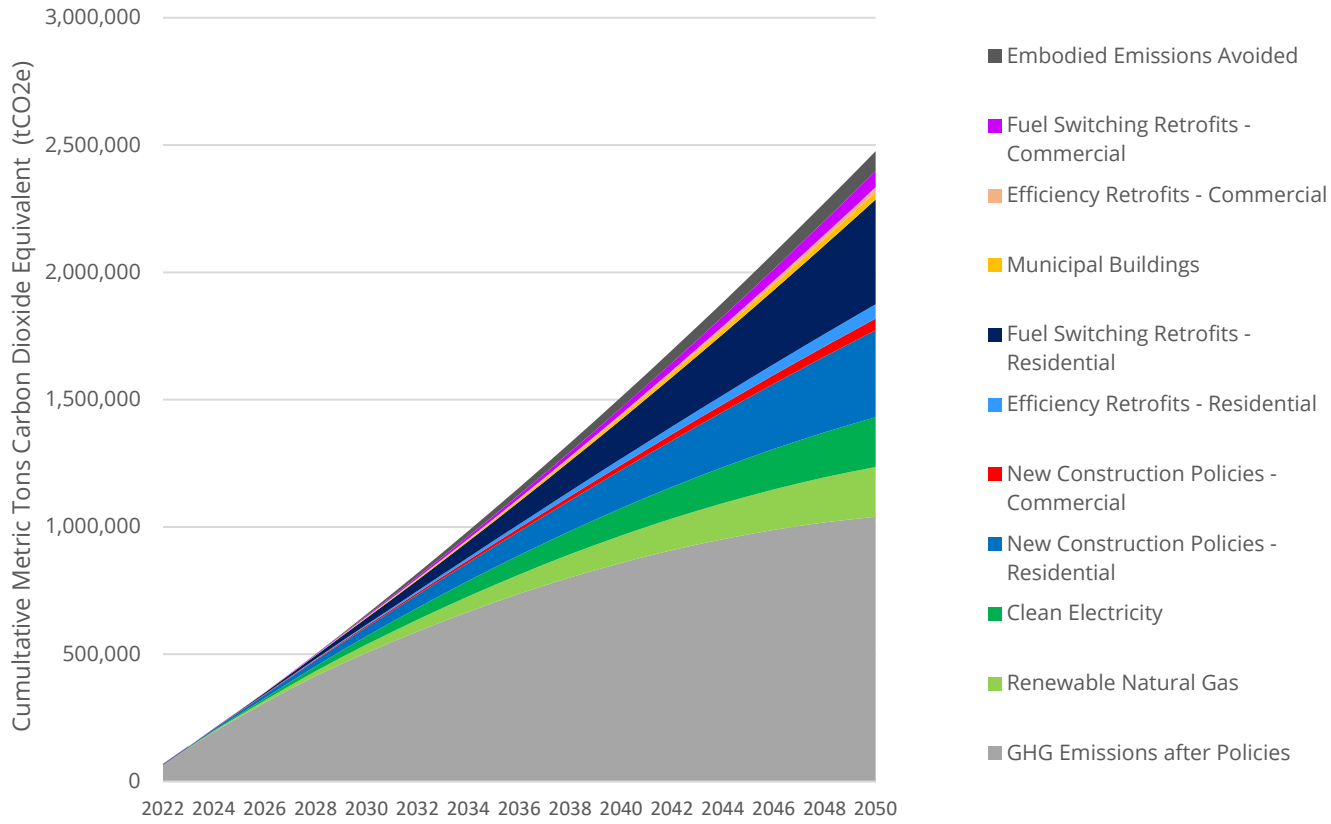
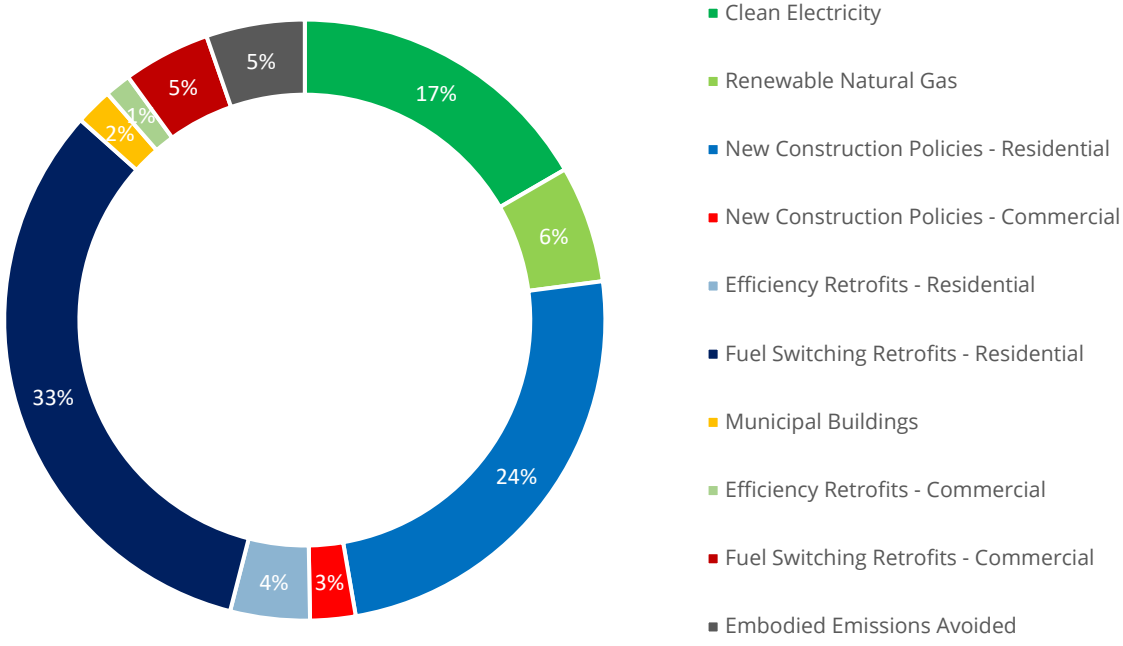


Figure 13: Percent of cumulative GHG emissions savings, 2022-2050, by action area



4.2 EQUITY IMPACTS

As noted throughout this Plan, climate change disproportionally impacts lower-income, socially marginalized populations, and those with existing health conditions. Those with less financial resources may have fewer options to protect themselves when major weather events occur and may have more difficulty recovering from impacts.

Using insights from the climate risk assessment and layering energy poverty data can help us understand how to support neighbourhoods with higher levels of vulnerability. Table 4 provides an overview of the key climate vulnerabilities by neighbourhood. April Road, Pleasantside, Moody Centre, Glenayre, Seaview and College Park, and Harbour Heights have been identified as higher priority neighbourhoods where the City and partners should focus supports to reduce vulnerability to climate risks. The climate hazards and vulnerabilities vary by neighbourhood; therefore, interventions and adaptation measures will need to be tailored to the specific neighbourhood context. Heritage Mountain, Twin Creeks, and Moody Centre have been identified as the neighbourhoods with the highest levels of energy poverty, with 13% to 14% of residents being affected (see Figure 14 below).[xxi]

This data provides important insights to ensure policies and programs to reduce GHG emissions and adapt to climate change do not exacerbate existing economic, social, or geographic disparities. However, it is also important to note that vulnerability is not contained within these neighbourhood boundaries. Port Moody residents throughout the community will experience increased susceptibility due to socio-economic factors, and creating a plan to target these individuals is also critical.

Fairness, equity, and affordability will be central considerations in the implementation of the *Climate Ready Homes and Buildings Plan.* While several actions explicitly target equity, others will need to incorporate equity through program design and implementation. For example, incentives can be income-tested, regulations can provide flexible compliance pathways for specific populations or building types, and education can target vulnerable communities. Using the information in Table 4, the City will have a better understanding of where to focus resources to support these neighbourhoods, better understand who in each neighbourhood may be affected and be able to tailor solutions to better address inequities in an efficient manner.

Table 4. Overview of neighbourhood level climate risk assessment. Risks are ranked from high to low vulnerability.

Criteria	Ioco and Northwest Port Moody	April Road and Pleasantside	Heritage Mountain and Twin Creeks Heritage Woods	Noons Creek and Mountain Meadows	Coronation Park	Inlet Centre	Moody Centre	Glenayre, Seaview, College Park , and Harbour Heights
Coastal flooding and erosion	Low	High	Low	Low	Low	Medium	High	Low
Stormwater flooding	Medium	Medium	Low	Medium	Low	Medium	High	Medium
Landslide	Low	High	Medium	High	Low	Low	High	High
Wildfire	Medium	High	High	High	Low	Low	Medium	Medium
Extreme heat/ heatwaves	Medium	Medium	Medium	High	Medium	High	Medium	High
Air quality	Medium	High	High	High	Medium	High	High	High
Drought	Low	High	Medium	Medium	Low	Low	Medium	High
Combined events	Medium	High	High	High	Low	Medium	High	High
Structure	High	Medium	Low	Medium	Low	Medium	Medium	High
People	Low	Low	Low	Low	Low	Medium	High	High
Durability of existing buildings	Low	Medium	Medium	Medium	Low	Medium	Low	Medium

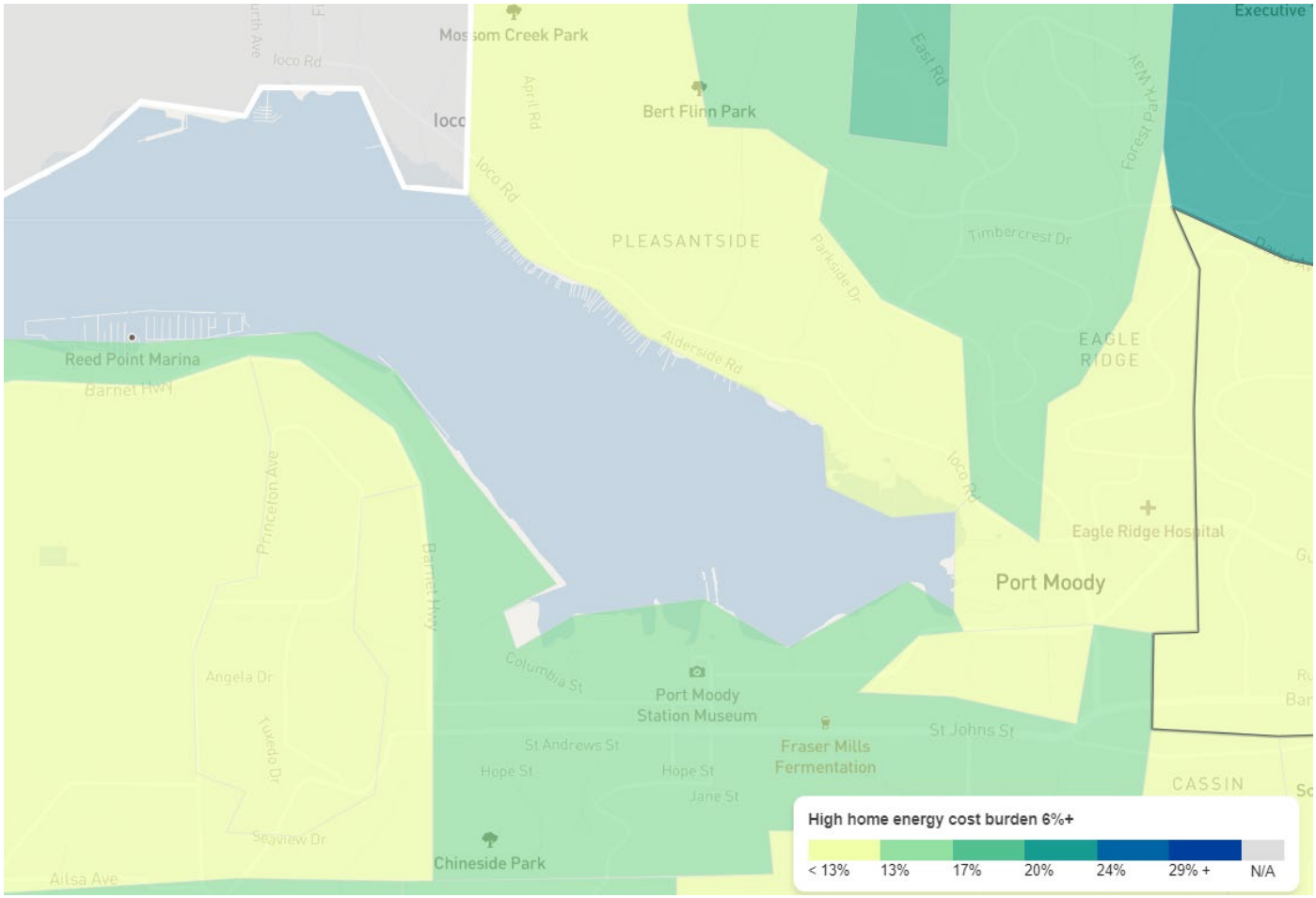


Figure 14. Portion of Port Moody residents impacted by energy poverty (Source: CUSP, Energy Poverty Calculator, 2019) [xxii]

5 IMPLEMENTING THE PLAN

The City's Policy Planning Division will lead the implementation of this Plan. Each action has been assigned a lead and supporting department(s), who will be responsible for the implementation and regular reporting on the status of the action(s). The Policy Planning Division will integrate the immediate actions identified through this Plan into implementation phases of the Climate Action Plan, beginning in Phase 2 of the Climate Action Implementation process (Years 2023-2024).

An implementation document, including performance metrics, timelines, lead departments, staff and financial resources needed, has been developed to guide the next steps in implementing actions from this plan. A number of the identified actions require further research, consultation, and refinement before being implemented; whereas others can be easily implemented or are currently underway. Actions will be selected for implementation based on the following criteria. These criteria may change over time, but includes:

- Level of impact on GHG reductions and climate resilience;
- Access to resources and funding;
- Alignment with other Port Moody priorities; and
- Integration with existing departmental work plans and priorities.

5.1 ALIGNMENT WITH OTHER JURISDICTIONS

The *Climate Ready Homes and Buildings Plan* is a living document that will continue to evolve with City policies and priorities. The policy ecosystem for buildings will continue to evolve regionally, provincially, and nationally. The actions in this plan may evolve to avoid duplication or redundancy as policies are implemented through senior levels of governments, to incorporate best practices and emerging technologies, or to increase the level of action to better align with climate action goals and targets.

5.2 ONGOING MONITORING AND REPORTING

The *Climate Ready Homes and Buildings Plan* includes actions that outline one path to resilient, carbon neutral buildings. The City of Port Moody is committed to achieving its vision of a low carbon and resilient community through sustained implementation of these actions. Ongoing monitoring and evaluation of actions being implemented will be integrated into the Climate Action Plan Implementation process, which is designed to track progress in meeting GHG emission reduction and resilience goals and targets, and to flag when actions may be redundant or require changes. The City of Port Moody will review the status of the Plan's implementation and present updates annually through the annual Climate Action Implementation Report. The annual updates are a concise summary that will:

- Provide a snapshot of progress on the goals of the *Climate Ready Homes and Buildings Plan*;
- Identify areas for improvement or future work/study;
- Renew and revise financial and resourcing needs as required; and

- Demonstrate overall progress on implementation of the Plan's actions.

Implementation of the *Climate Ready Homes and Buildings Plan* will be iterative and continuously reviewed. The City will review the Plan's goals, targets, and actions during an update of the Climate Action Plan, planned for 2025. During this Plan update period no new actions will be initiated, however, actions from both the *Climate Action Plan* and *Climate Ready Homes and Buildings Plan* already underway will continue to be implemented.

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[ii] Port Moody, *Climate Action Plan,* (2020). https://www.portmoody.ca/common/Services/eDocs.ashx?docnumber=511721

[iii] Metro Vancouver, *Metro Vancouver Regional Consumption-Based Emissions Inventory,* (2021). www.metrovancouver.org/services/air-quality/AirQualityPublications/MetroVancouverConsumption-BasedEmissionsInventory.pdf

[iv] Metro Vancouver, *Climate 2050 Roadmap: Buildings A Pathways to Zero Emissions and Resilient Buildings,* (October 2021). http://www.metrovancouver.org/services/air-quality/climate-action/climate2050/Climate2050Docs/Climate2050BuildingsRoadmap_Final_October2021_old.pdf

[v] IPCC, *Climate Change 2022: Impacts, Adaptation, and Vulnerability,* (WMO and UNEP, 2022). https://www.ipcc.ch/report/ar6/wg2/

[vi] CUSP, *Energy Poverty and Equity Explorer,* (2019). https://energypoverty.ca/mappingtool/

[vii] CUSP, *Energy Poverty and Equity Explorer,* (2019). https://energypoverty.ca/mappingtool/

[viii] Port Moody, *Housing Needs Report*, (2021). https://www.portmoody.ca/en/city-hall/resources/Documents/Reports-and-Publications/City%20of%20Port%20Moody%20-%20Housing%20Needs%20Report%20-%20Final.pdf

[ix] Metro Vancouver, *Climate Projections for Metro Vancouver*. http://www.metrovancouver.org/services/air-quality/AirQualityPublications/ClimateProjectionsForMetroVancouver.pdf

[x] Metro Vancouver, Climate Projections for Metro Vancouver.

[xi] Metro Vancouver, Climate Projections for Metro Vancouver. http://www.metrovancouver.org/services/air-quality/AirQualityPublications/ClimateProjectionsForMetroVancouver.pdf

[xii] IPCC, *Special Report: Special Report on The Ocean and Cryosphere In A Changing Climate Summary For Policy Makers, (Cambridge University Press, 2019).* https://www.ipcc.ch/srocc/chapter/summary-for-policymakers/

[xiii] Hazardous land DPA currently includes additional requirements for land susceptibility to: soil liquefaction in the event of an earthquake; land slippage due to soil erosion on steep land sediments and sloping sites; flooding and debris flow during abnormal storm events.

[xiv] Module A captures emissions from products and construction process (i.e. raw material supply, transport, manufacturing, and construction installation processes), module B captures emissions from the building use (i.e. the maintenance, repair, replacement and refurbishment of building systems), module C captures end of life emissions (i.e. de-construction and demolition, transport, waste processing and disposal, and module D: captures beyond the life cycle of the building (i.e. reuse, recovery and recycling potential). Source: O.P. Gibbons and J.J Orr, How to Calculate Embodied Carbon, (The Institute of Structural Engineers, 2020). https://www.istructe.org/IStructE/media/Public/Resources/istructe-how-to-calculate-embodied-carbon.pdf

[xv] The City of Vancouver is granted additional authority over buildings through the *Vancouver Charter.*

[xvi] Based on a study by the City of Vancouver, commercial buildings typically have a relatively high diversion rate (approximately 80%), whereas single-family homes have a diversion rate lower than 50%. Source: City of Vancouver, Green Demolition By-law Update, (2018). https://council.vancouver.ca/20180516/documents/pspc2c.pdf

[xvii] Based on top-ups in other municipalities. Source: CleanBC Better Homes, *Municipal Top-ups*. https://betterhomesbc.ca/municipal-offers/

[xviii] Government of Canada, *Preparing for Climate Change: Canada's National Adaptation Strategy (Discussion Paper - May 2022).* Phttps://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/national-adaptation-strategy/preparing-discussion-paper-may-2022.html

[xix] City of Port Moody Corporate energy and GHG emissions inventory, 2016

[xx] In all three charts, "municipal" represents buildings owned and operated by the City of Port Coquitlam, "residential" includes both single-family and multi-family buildings, and "commercial" includes office, retail, and other commercial buildings, along with industrial buildings, and institutional buildings not owned by the City of Port Moody (e.g., schools, healthcare, public sector organizations).

[xxi] CUSP, *Energy Poverty and Equity Explorer, (2019).* https://energypoverty.ca/mappingtool/. Note: The CUSP Energy Poverty Explorer relies on census data and has some limitations. It may overestimate energy poverty for seniors living on fixed incomes in very large, detached homes, who report low incomes, without accounting for other assets.

[xxii] CUSP, Energy Poverty and Equity Explorer, (2019).

[xxiii]

Appendices

APPENDIX A: MODELLING TECHNICAL ASSUMPTIONS

A.1 Baseline and BAU Calculations

A.1.1: Existing Building Stock

The technical analysis that supported this plan was conducted by Integral Group, in line with approaches used for broader, citywide plans. First, the consultant team analyzed BC Assessment Tax Data to determine the floor area for each major type of building.

Table 5: Building Stock

Building Type	Floor Area (ft^2)	Percent of Floor Area
Residential	**23,094,376**	**87.2%**
Single Family Detached	14,045,284	53.0%
Attached Single Family Residential	4,153,251	15.7%
Low-Rise Multifamily Residential	4,223,140	15.9%
High-Rise Multifamily Residential	672,701	2.5%
Institutional and Government	**579,755**	**2.2%**
Recreational	155,689	0.6%
Institutional	263,035	1.0%
Municipal (non-recreational)	161,031	0.6%
Commercial	**2,805,695**	**10.6%**
Office	401,170	1.5%
Commercial	429,213	1.6%
Retail	489,467	1.8%
Industrial	1,485,845	5.6%
Embodied		
Total	26,479,826	

To apportion energy use between the 10 building categories, the consultants used reference data and then adjusted the totals to align with GHG inventory totals. The average energy use intensity (EUI) figures from U.S. Energy Information Administration (EIA's) Commercial Buildings Energy Consumption Survey (CBECS) and Residential Energy Consumption Survey (RECS) tables for the Pacific/West region were used to approximate expected performance for each building category. CBECS 2012 tables C19 and C29[xxiv] (Pacific) provided preliminary electricity and natural gas EUIs for all non-residential building categories. Residential Energy Consumption Survey (RECS) 2015 Table CE2.5[xxv] (West) combined with RECS 2015 Table HC10.13[xxvi] (West) provided preliminary electricity and natural gas EUIs for all residential building categories. (The Statistics Canada Survey of Commercial and Institutional Energy Use (SCIEU) was also reviewed, as a reference check against the more detailed EIA data.[xxvii]) The energy use ratio between building categories was maintained and applied to actual energy usage for the City to adjust and create estimated average EUIs for electricity, natural gas, and fuel oil for each modelled building category.

Heating oil, propane, and wood are only used in residential properties. The model applies fuel oil only to the single family detached category. Because the model applies these EUIs evenly across a building type, this fuel oil EUI appears very low, since it represents the total fuel oil use divided by the total single family detached stock.

Table 6: Building Average EUI Assumptions

Building Type	Total EUI (kWh/m^2)	Electric EUI (kWh/m^2)	Natural Gas EUI (kWh/m^2)	Fuel Oil (kWh/m^2)
Residential	**145.4**	**53.3**	**84.8**	**7.4**
Single Family Detached	140.7	48.7	79.8	12.2
Attached Single Family Residential	137.2	48.9	88.4	-
Low-Rise Multifamily Residential	168.6	71.2	97.5	-
High-Rise Multifamily Residential	150.7	63.6	87.1	-
Institutional and Government	**314.4**	**120.2**	**194.1**	**-**
Recreational	374.8	116.3	258.5	-
Institutional	292.2	121.7	170.5	-
Municipal (non-recreational)	292.2	121.7	170.5	-
Commercial	**243.6**	**88.4**	**155.1**	**-**
Office	277.4	155.7	121.7	-
Commercial	418.1	160.8	257.4	-
Retail	221.4	86.7	134.7	-
Industrial	191.3	50.0	141.4	-
Total				

A.1.2: New Construction

For the purposes of developing a model to predict potential future increases in residential and commercial floor area, current working population and employment projections generated by staff were used. These projections indicate the potential for the City's population to grow from 34,000 to nearly 66,000 by 2050 – an annual potential growth rate of 2.21%. Potential job increases during this same period are projected to increase by about two-thirds from 11,500 to nearly 19,500 – an average potential growth rate of 1.71%. Using these growth rate assumptions, the modelling predicted that residential and municipal building floor area would grow at a rate of **2.21%** per year, and commercial floor area would grow at a rate of **1.71%** per year. Industrial floor area was not expected to grow.

To estimate baseline/business as usual (BAU) embodied emissions, Integral drew on its own lifecycle assessment studies of major commercial and multifamily building projects in the Metro Vancouver region. For single-family housing, Integral used a study by the Carbon Leadership Forum of residential single-family embodied carbon performance in Canada.[xxviii]

Embodied emissions calculations divide the lifecycle down into stages, A1-A5, B1-B7, and C1-C4, as shown in the figure below, following the EN 15978 standard. Embodied emissions footprints were estimated for most of these (though B1, B3, and B7 were excluded are these are either captured in operational emissions or not applicable). Table 7 shows the major archetypes where embodied emission data was

available, and Table 8 shows the embodied emissions estimates, along with the embodied emissions intensity.

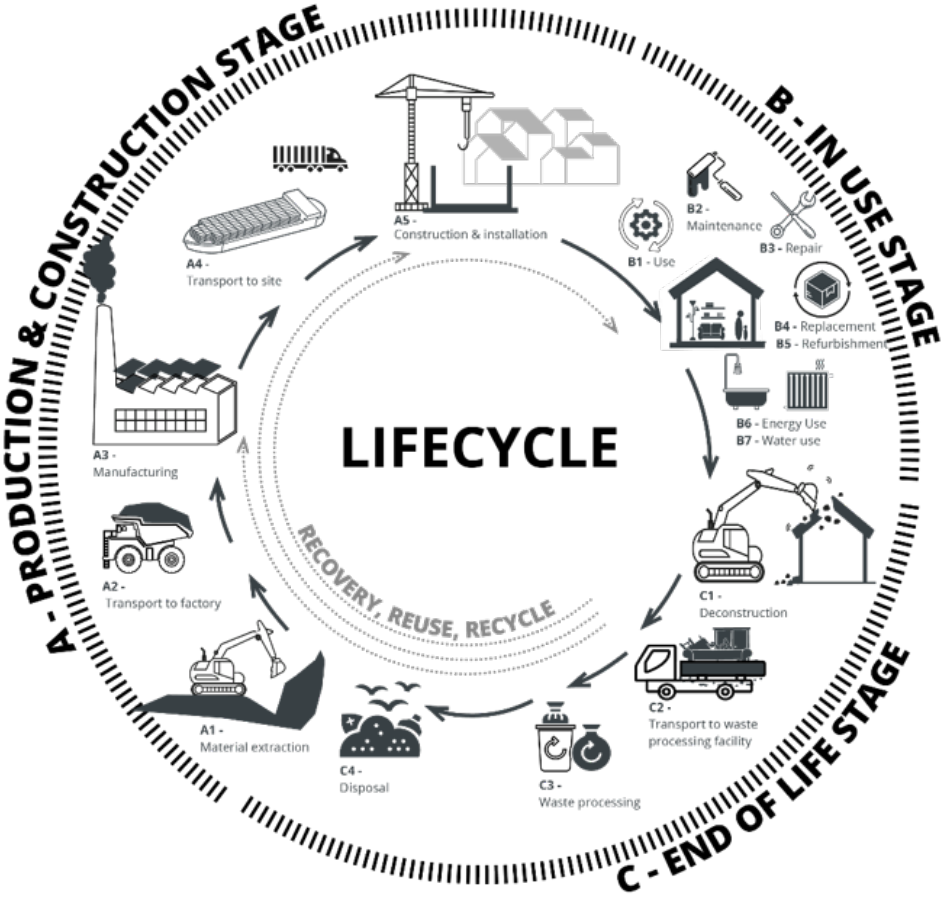


Figure 4: The sources of embodied emissions from buildings (source: Integral Group)

Table 7: Embodied Emissions Analysis Archetypes

Model Archetype	Reference Archetype	Stories	Structural Type	Parkade
Single Family Detached	Part 9 SFD	2	Wood	at-grade parking driveway
Single Family Attached	Part 9 Townhome	3	wood with wooden garage at-grade	wooden single-user garage above slab
Low-Rise Multifamily	Part 9 Apartment	3	wood apartment	at-grade parking lot
Low-Rise Multifamily	Part 3 Residential Wood	6	wood apt w/ BG	concrete parkade
High-Rise Multifamily	Part 3 Residential Concrete	10	concrete high-rise (100% residential	concrete parkade (Multilevel)
Industrial/Retail	Part 3 Commercial Industrial	1	Concrete Tilt-up (Industrial Park Style)	at-grade parking lot
Office/Commercial	Part 3 Commercial Office	4	Concrete Frame	concrete parkade
Institutional	Institutional – Middle/ High School	4	Steel Frame with Concrete Slab	at-grade parking lot
Municipal	Institutional - Elementary School	1	Wood Frame with Concrete Slab	at-grade parking lot
Recreational	Recreational Center	3	Steel Frame with Concrete Slab	at-grade parking lot

Table 8: Embodied Emissions Baselines for Reference Studies

Reference Building Type	A1-A3 ($kgCO_2e$)	A4+A5 ($kgCO_2e$)	B2, B4-B6 ($kgCO_2e$)	C1-C4 ($kgCO_2e$)	Total ($kgCO_2e$)	Reference GFA (m^2)	EC Intensity ($kgCO_2e/m^2$)
Part 9 SFD	22,060	2,221	2,197	1,309	27,787	234	119
Part 9 Townhome	19,009	1,913	1,894	1,128	23,944	148	162
Part 9 Apartment	318,000	32,011	31,677	18,867	400,554	2,601	154
Part 3 Residential Wood	1,017,795	102,454	101,385	60,385	1,282,020	5,574	230
Part 3 Residential Concrete	3,908,222	429,707	406,098	216,070	4,960,098	8,929	555
Part 3 Commercial Industrial	3,261,151	392,393	316,043	202,707	4,172,294	18,795	222
Part 3 Commercial Office	21,709,380	2,292,672	1,235,024	1,491,852	26,728,927	56,298	475
Institutional (Middle/High Schools)	4,659,082	443,176	546,498	185,372	5,834,128	16,136	362

Institutional (Elementary Schools)	227,615	21,326	19,942	12,896	281,779	1,134	248
Recreational (Rec Centers)	2,615,027	207,102	358,298	192,633	3,373,060	9,901	341

To calculate the BAU of embodied emissions, embodied emissions intensities for A-C were applied to each major building type, for the estimated floor area that would be built each year, at the growth rate assumed for that sector. In addition, B-stage embodied emissions were applied to retrofit floor area each year, and C-stage embodied emissions were applied to demolitions assumed each year.

For example, Table 9 shows the embodied emissions estimated to occur in 2022, based on the above assumptions:

Table 9: Embodied Emissions BAU totals, 2022

Sector	BAU total EC, 2022 (tCO_2e)	A-stage, 2022 (tCO_2e)	B-stage, 2022 (tCO_2e)	C-stage, 2022 (tCO_2e)	% of total
Residential	**9,902.9**	**9,468.2**	**66.5**	**88.5**	**86%**
Single Family Detached	4,508.0	4,289.5	30.0	40.4	39%
Attached Single Family Residential	1,814.7	1,726.8	12.1	16.3	16%
Low-Rise Multifamily Residential	2,585.3	2,492.8	17.4	23.5	22%
High-Rise Multifamily Residential	994.8	959.0	6.9	8.4	9%
Institutional and Government	**554.8**	**521.2**	**10.2**	**4.9**	**5%**
Recreational	150.3	136.1	1.3	*1.6*	1%
Institutional	198.1	188.9	8.1	*1.2*	2%
Government	206.3	196.2	0.8	*2.2*	2%
Commercial	**1,069.0**	**998.7**	**59.9**	**10.8**	**9%**
Office	398.4	378.2	16.1	*4.2*	3%
Commercial	426.2	404.7	17.2	*4.5*	4%
Retail	232.8	215.8	15.0	*2.1*	2%
Industrial	11.6	0.0	11.6	*0.0*	0%
Total	**11,526.7**	**10,988.0**	**136.6**	**104.3**	**100%**

A.1.3 Emissions Distribution

Emission Intensities for energy sources were sourced from the BC Climate Action Secretariat. Applying the above EUI assumptions, standard emission intensities, and embodied emission baselines, we can estimate the percent of energy and emissions for each sector. This table is the source data for Figure 5 in the report.

Table 10: Distribution of energy and emissions across Port Moody building stock

Building Type	GHG Emissions (tCO_2e)	Percent of Energy Use (operational)	Percent of Emissions (operational)	Percent of Emissions (operational + embodied)
Residential	**40,146**	**79.5%**	**80%**	**65%**
Single Family Detached	25,283	46.8%	50%	41%
Attached Single Family Residential	6,877	13.5%	14%	11%
Low-Rise Multifamily Residential	7,986	16.9%	16%	13%
High-Rise Multifamily Residential	1,137	2.4%	2%	2%
Institutional and Government	**2,137**	**4.3%**	**4%**	**3%**
Recreational	739	1.4%	1%	1%
Institutional	867	1.8%	2%	1%
Municipal (non-recreational)	531	1.1%	1%	1%
Commercial	**8,184**	**16.2%**	**16%**	**13%**
Office	1,047	2.6%	2%	2%
Commercial	2,100	4.2%	4%	3%
Retail	1,258	2.6%	2%	2%
Industrial	3,780	6.7%	7%	6%
Total Embodied	**11,577**			18.7%
Total Operational	**50,467**			
Total Operational + Embodied	**62,044**			

A.2 Policy Forecast Modelling Assumptions:

Clean Electricity:

Policy Assumption: The Clean Electricity Delivery Standard mandated by the Province and implemented by BC Hydro will ensure that all electricity supply to buildings and vehicles in BC comes from renewable sources by 2030.

Modelling Approach: The model reduces the GHG intensity of electricity from 11 tCO2e/GWh in 2020, and then linearly by 99% to 0.1 tCO2e/GWh in 2030.

Renewable Natural Gas:

Policy Assumption: The Province has signalled that the natural gas supply will include a minimum of 15% renewable natural gas (RNG) by 2030. The new Clean BC Roadmap to 2030 additionally calls for a total cap on GHG emissions from natural gas province-wide of ~6 Mt CO2e by 2030, approximately 47% lower than 2007 levels. However, the details of how that cap will be achieved remain unclear and are subject to regulatory filings with the BC Utilities Commission. Therefore, the modelling for this Plan still used the assumption of 10% RNG by 2030, with RNG meeting a greater portion of demand over time.

Modelling Approach: RNG use increases linearly from 0% of natural gas in 2020 to 10% of natural gas by 2028, or 22 million kWh. As natural gas use decreases, RNG can meet a greater portion of the supply. From 2028-2050, RNG is purchase is assumed to be equivalent to the 2028 RNG volume, or the total natural gas demand, whichever is greater. RNG use thus increases to 20% of gas demand in 2031, 52% in 2048, and 100% by 2050, mostly for industry.

Low Carbon New Construction:

Policy Assumption: An ambitious BC Energy Step Code (BCESC) adoption schedule has been assumed for the policy model. Assumptions for low-GHGI new construction were layered on top.

Modelling Approach: For all building types other than industrial, the BCES with a low-GHGI or zero fossil fuel requirement is assumed by 2025. This results in a 35-60% reduction in electricity use and 100% reduction in fossil fuel use, relative to the EUI baselines presented above. Implementation lags the adoption year by 2 years for Part 9 buildings and by 3 years for Part 3 buildings, to reflect the construction of projects permitted under a prior code.

Municipal Building Policies:

Policy Assumption: Deep energy efficiency and fuel switching retrofits to achieve net-zero emissions in municipal buildings and facilities, including recreation facilities. Energy Step Code savings for new municipal buildings are also incorporated here.

Modelling Approach:

- For new construction, buildings are assumed to be all electric, and built to BC Energy Step Code Step 4, by 2025, with implementation lagging by 2 years.

- For existing building efficiency and fuel switching, all municipal buildings floor area is retrofit between 2024 to 2040. Retrofits occurring in 2024-2027 are assumed to reduce energy use by 30%, and retrofits occurring in 2027-2040 are assumed to save 50%, with natural gas use reduced to near-zero. Annual penetration rate for the retrofits is 6% per year, but this is just a modelling average--in reality, the City owns and operates less than 30 buildings of wildly varying sizes.

Efficiency Retrofits:

Policy Assumption: Widespread energy efficiency retrofits of existing homes and buildings, reducing energy use by 30% to 50% in 1% to 2% of buildings, depending on building type.

Modelling Approach:

Table 11: Efficiency Retrofit Assumptions

Building Type	Attribute	2022-2023	2024-2030	2031-2050
RESIDENTIAL				
Single Family Detached	% Energy Use Reduction	40.0%	40.0%	50.0%
	Penetration	0.3%	1.5%	1.5%
Attached Single Family Residential	% Energy Use Reduction	40.0%	40.0%	50.0%
	Penetration	0.3%	1.5%	1.5%
Low-Rise Multifamily Residential	% Energy Use Reduction	40.0%	40.0%	50.0%
	Penetration	0.3%	1.0%	1.5%
High-Rise Multifamily Residential	% Energy Use Reduction	40.0%	40.0%	50.0%
	Penetration	0.3%	1.0%	1.5%
COMMERCIAL				
Institutional	% Energy Use Reduction	10.0%	10.0%	50.0%
	Penetration	1.0%	1.0%	2.0%
Office	% Energy Use Reduction	40.0%	40.0%	50.0%
	Penetration	2.0%	2.0%	2.0%
Commercial	% Energy Use Reduction	40.0%	40.0%	50.0%
	Penetration	2.0%	2.0%	2.0%
Retail	% Energy Use Reduction	40.0%	40.0%	50.0%
	Penetration	2.0%	2.0%	2.0%
Industrial	% Energy Use Reduction	40.0%	40.0%	50.0%
	Penetration	0.5%	0.5%	0.5%

Fuel Switching Retrofits:

Policy Assumption: Fuel switching away from fossil fuel burning equipment to electric and low-carbon solutions in homes and businesses, through targeted retrofit programs, regional building standards, and provincial equipment standards. Specifically, most space heating and hot water loads move to electric heat pumps.

Modelling Approach:

All single-family residential buildings using fuel oil are converted to all-electric by 2030.

All non-industrial buildings not replaced through a major renovation or demolition are fuel-switched between 2023 and 2050. Industrial buildings are handled through efficiency and renewable natural gas policies.

The increase in electricity use resulting from the fuel switching is calculated through system efficiency assumptions. Space heating and domestic hot water are assumed to be serviced with heat pumps that have an effective COP of 2.0 (200% efficient), while cooking and other loads are assumed to be 100% efficient. 10% of residential space heating, and 35% of industrial loads, are assumed to remain on natural gas. Only 50% of single-family and low-rise multifamily homes are assumed to give up gas-fired cooking equipment or gas-fired decorative fireplaces. A 10% uncertainty parameter is applied to assumptions related to fuel-switching. This results in the following fuel switch factors. The efficiency factor is the amount of electricity use increase related to the removed fossil fuel—for example, 0.4 factor means that for every kWh of natural gas eliminated, 0.4 kWh of electricity use is added.

Table 12: Fuel Switching Efficiencies

Building Type	Natural Gas to Electricity efficiency factor	Remaining Natural Gas	Fuel Oil to Electricity efficiency factor	Remaining Fuel Oil
Single Family Detached	0.426	13%	0.484	0%
Attached Single Family Residential	0.426	13%	0.484	0%
Low-Rise Multifamily Residential	0.460	10%	N/A	N/A
High-Rise Multifamily Residential	0.460	10%	N/A	N/A
Recreational	0.470	0%	N/A	N/A
Institutional	0.497	11%	N/A	N/A
Government	0.497	0%	N/A	N/A
Office	0.499	0%	N/A	N/A
Commercial	0.421	0%	N/A	N/A
Retail	0.830	0%	N/A	N/A
Industrial	0.846	21%	N/A	N/A

Embodied Emissions:

Policy Assumptions: All new construction buildings must undergo a life cycle assessment (LCA) and disclose their embodied emissions, and some buildings will be required to reduce their embodied emissions. We estimated the impact of applying lower embodied emissions construction methods to 80%-90% of new buildings, using the following implementation approaches:

- *Low-Carbon Home Construction:* Reduction in embodied emissions by 51%, the midpoint between current practice and the best possible performance allowable by code.
- *Underground Parking Limitations:* Reducing underground and parkade parking by 40% for offices and high-rise residential, resulting in a 24% reduction in embodied emissions for the buildings.
- *Mass Timber:* Utilizing mass-timber construction for new low-rise multifamily and institutional buildings.
- *Low-Carbon Concrete:* Utilizing low-carbon concrete in the construction of recreational, retail, and commercial buildings.

Modelling Approach:

The policies were applied to all new construction buildings as follows. Because the interactive effects of multiple embodied emissions reduction measures were not studied, only one measure was applied to

each building type (however, there are clear ways these measures could reinforce each other, such as underground parking limitations plus low-carbon concrete).

As with the Energy Step Code, implementation was assumed to lag the start year by two years for Part 9 buildings and 3 years for Part 3 buildings. Thereafter, implementation phased over two to three years. (Industrial buildings have a 0% penetration rate because the model does not assume the construction of any significant amount of new industrial buildings).

Table 13: Embodied Emission Policy Assumptions

Building Type	Applied Embodied Carbon Measure	EC Stage A Reduction	Penetration Rate	Start Year	Lag	Phase
Single Family Detached	Low Carbon Home Construction	51%	80%	2025	2	3
Attached Single Family Residential	Low Carbon Home Construction	51%	80%	2025	2	3
Low-Rise Multifamily Residential	Mass Timber	25%	90%	2025	3	2
High-Rise Multifamily Residential	Underground Parking Limitations	24%	90%	2025	3	2
Recreational	Low Carbon Concrete	13%	80%	2025	3	2
Institutional	Mass Timber	25%	90%	2025	3	2
Government	Mass Timber	25%	90%	2025	3	2
Office	Underground Parking Limitations	24%	90%	2025	3	2
Commercial	Low Carbon Concrete	13%	80%	2025	3	2
Retail	Low Carbon Concrete	13%	80%	2025	3	2
Industrial	Low Carbon Concrete	13%	0%	2025	3	2

No measures were applied for reducing the embodied emissions from Stage B (retrofits) or Stage C (demolition).

As noted in the report, embodied emissions of new construction only reduced by 27% annually relative to BAU by 2030 and thereafter. Improving the range of options and aggressiveness of the assumptions in this area could have a significant impact.

APPENDIX B: CLIMATE RISK ASSESSMENT

Table 5 describes the criteria used for the climate risk assessment. Table 6 summarizes the results of the assessment for each neighbourhood in Port Moody.

Table 14. Criteria used for the Climate Risk Assessment

Category	Criteria Description
Coastal flooding and erosion	Portion of developed area is below or near Port Moody's flood protection level (4.5m above MSL).
Stormwater flooding	High proportion of impermeable surfaces, presence of deficient/vulnerable storm/water/sanitary pipes, location near rivers/creeks with a history of flooding, and has experienced surface pooling or flooding in the past.
Landslide	Portion of developed area is located on or near steep slopes and/or geohazard areas.
Wildfire	Portion of the developed area is located at or near a wildland-urban interface.
Extreme heat/heatwaves	Unlikely to include air conditioning or other thermal comfort strategies (building age as proxy).
Air quality	Unlikely to include enhanced air filtration systems (e.g., MERV, HEPA) (building type and age as proxy).
Drought	Areas with a large proportion of landscaped areas requiring irrigation (e.g., private property, city/institutional buildings, high-value landscapes, slope stability landscaping).
Combined events	Areas facing two or more hazards (a proxy for potential compound events and compound impacts).
Structure	Buildings or major components are nearing the end of their expected useful life and/or are in need of major renewal/upgrades.
People	High proportion of lower-income residents, under-housed populations, older demographic, or new Canadians/non-English speakers.
Durability of existing buildings	Plans are not currently in place to enhance structural resilience and recovery of the building(s) or neighbourhood.

APPENDIX C: CRITERIA USED TO ASSESS ACTIONS

The following criteria were used to assess actions for new, existing, and municipal buildings.

Criteria	Metric	Definition
Impacts		Operational emissions
		Resilience
		Embodied emissions
Magnitude of Impacts GHG	**Low**	No affect GHG emissions
	Medium	moderate GHG emissions reductions
	High	Moderate to substantial GHG emissions reductions
Magnitude Impacts Resilience	**Low**	Improves resilience little to not at all
	Medium	Moderately improves resilience
	High	Significantly improves build resilience
Equity	**Low**	Exacerbate affordability or existing inequities
	Medium	No impact
	High	Improved affordability or equity for vulnerable populations
Ease of Implementation	**Low**	Would not be easy to implement
	Medium	Implementation would be comparable to core city services
	High	Would be easy to implement
Anticipated Budget	**N/A**	Cost is covered by existing budgets and/or staff capacity
	$	$0 - $20,000
	$$	$20,000 - $50,000
	$$$	$50,000 - $200,000
	$$$$	$200,000 +
Timeline	**Immediate**	1 year or less
	Short-term	1-2 years
	Medium-term	3-5 years
	Long-term	5 -10+ years

APPENDIX D: GLOSSARY OF TERMS

- **Adaptation:** refers to the actions taken to manage the unavoidable impacts of climate change. Adapting successfully leads to improved resilience.
- **Climate Change:** refers to long-term shifts in temperatures and weather patterns. These shifts may be natural, but since the 1800s, human activities have been the main driver of climate change, primarily due to the burning of fossil fuels (like coal, oil, and gas), which produces heat-trapping gases.
- **Climate Risk:** refers to the potential for consequences where something of human value is at stake and where the outcome is uncertain. The risk results from a combination of hazard exposure, sensitivity to impact, and adaptive capacity.
- **Climate Ready:** buildings are near-zero carbon, and safe and comfortable for occupants in a changing climate.
- **Embodied Emissions:** the carbon dioxide (CO_2) emissions associated with materials and construction processes throughout the whole lifecycle of a building or infrastructure.
- **Fuel switching:** describes the replacement of an end-use customer-facing technology (such as a home's natural gas heating system) with one that consumes a different fuel (such as an all-electric air-source heat pump).
- **Greenhouse gases** (**GHGs)**: certain gases (both natural and human-made) in the atmosphere (e.g., water vapour, carbon dioxide, nitrous oxide, and methane) that trap energy from the sun. The trapped energy causes the Earth's temperature to rise – this is called the greenhouse effect. Without greenhouse gases, heat would escape back into space, and Earth's average temperature would be -18°C. Human activities over the last 150 years, however, have led to an increase in greenhouse gas emissions, a rise in global temperatures (global warming), and climate change.
- **Market transformation:** both a policy objective and a program strategy to promote the value and self-sustaining presence of energy-efficient and low-carbon technologies in the marketplace.
- **Mitigation:** efforts to reduce or prevent the emission of greenhouse gases. This may include new technologies and renewable energies, or energy-efficient equipment. It may also encompass attempts to remove greenhouse gases from the atmosphere
- **Part 3 buildings:** are buildings exceeding 600 m^2 in building area or exceeding three storeys in building height and have major occupancies (i.e., office tower, shopping mall, large multi-unit residential building).
- **Part 9 buildings:** are buildings include houses and certain other small buildings that are less than three stories high and 600 m^2.
- **Resilience:** the ability to prepare for, recover from and adapt to the impacts of climate change

APPENDIX E: STAKEHOLDER ENGAGEMENT SUMMARY

Port Moody – Climate Ready Homes and Buildings

Stakeholder Workshop

February 1, 2022

ATTENDANCE:

- **Consultant Team:** Integral Group
- **City Team:** Policy Planning, Development Planning, Building Bylaws and Licencing
- **Participant List**: Urban Development Institute (UDI), City of Coquitlam, Province of British Columbia, Building Owners and Managers Association of BC (BOMA BC), RDC Fine Homes, Home Builders Association of Vancouver (HAVAN), Suncor Energy Port Moody, Fraser Health Authority, City of Port Coquitlam, Wesgroup, Village of Belcarra, School District 43, Metro Vancouver, Zero Emission Building Exchange (ZEBx)

SUMMARY OF FEEDBACK – NEW BUILDINGS

**Notes comments that were raised several times.*

Question	Policy	Notes
New Buildings Policy Feedback	**#1. Accelerate Adoption of the B.C. Energy Step Code**	• **Focus on carbon targets:** there is less of an impact on design and costs* • **Embodied Carbon:** Advocate for Step Code to include embodied carbon. o For Part 9 buildings achieving Step 3 to 4 is the optimal level to balance embodied carbon impacts. * o Explore the creation of a comprehensive carbon metric for buildings (embodied and operational carbon) Embodied carbon in deconstruction should be considered in a new development - what is happening to the old building? • **Cooling Metric (CEDI) in Step Code:** This is becoming an issue with higher-performing envelopes. * • LCES pathway step down approach with LCES something to consider. More flexibility for builders. • **Industry readiness** o Studies show that costs associated with different levels can be similar; many examples of this being successful; industry is ready o The balance between achieving a mandate and what's realistic for industry o There is an industry capacity issue. My members are still understanding the highest steps of the ESC, and now there will be operational targets for carbon. I am concerned about adding a new embodied carbon system on top of this. In addition, we are already facing rapidly increasing construction costs (unrelated to the ESC). We have to be careful about affordability

		• **Cost:** Could be a disincentive for development in Port Moody if the requirements are too stringent. Aligning with neighbouring municipalities is critical to managing this impact. Consider who is going to be most impacted by additional costs homeowners? developers?
	#2. Create Design Guidelines for Flood Risk **#4. Create Development Restrictions to Address Flooding**	• **Aligning with other municipalities:** Are there opportunities to align with other metro van municipalities /regional approaches on these design guidelines?
	#5. Explore The Use of Restrictive Covenants	• **Delays:** Covenants could add delays if adding legal requirements for each project.
	#6. Review Development Permit (DP) Form & Character Guidelines	• **Align with Step Code requirements:** Essential if moving forward with #1 (Accelerated Adoption of the B.C. Energy Step Code)
	#7. Expand Hazardous Land Development Permit Areas (DPA)	• **Provide advanced notice:** If there are any potential changes to development rights due to climate resilience, we need notice as soon as possible, and I like the idea of density transfers
	#8. Reduce Parking Requirements to Reduce Embodied Emissions from Parkades	• **Priority action:** Agree this is a priority, reduce and eliminate requirements if done carefully to avoid spillover effects. * • **Complementary policies:** o Combine with paid street parking o Could be combined with car sharing o Consider how this could also help address the urban heat island effect. There are often limitations to parking trees because of parking requirements. • **Barriers:** o This could be more controversial because there is more need for parking in tri-cities. o Review underground and other parking requirements; tied to affordability; PM has 2 transit stops so focus on these areas o Benefits of wood frame versus concrete, noting both require concrete parkades. • **Example of a similar approach:** East Village Calgary – No minimum parking requirements
	#9. Create DPAs for Emissions Reductions	• Set a target and provide incentives. Must balance financial feasibility with pace. • I don't quite understand this one. What's the connection between DPAs and carbon redux?
	#10. Require Embodied Emissions Disclosure with DP	• **Upcoming Provincial Policy:** Province is doing modelling currently, will be integrated into the ESC at some point* o Be careful in terms of how this is measured; could result in delays; Province is looking at public sector disclosure; may warrant a provincial/ fed approach
	#11. Waive or Reduce Development Cost	• **Affordability:** Waiving CACs seems like robbing Peter to pay Paul. It could have negative effects on affordable housing funds and

	Charges (DCCs) Or Community Amenity Charges (CACs)	community benefits from development. It seems to needlessly pit green building against affordability and social equity. * o CAC's are important for offsetting density. What is the community amenity that we are valuing? These are critical for achieving community goals. • **Benefits:** o DCC and CAC could be beneficial for incentivizing low-carbon buildings o There is an opportunity for Port Moody to make development more desirable, by reducing DCC and CACs, permit fast-tracking, and reducing parking requirements. • **Implantation Challenges:** o May not be able to remove DCCs? Calcs are meant to be on the actual impact of development on drainage, infra, etc. o Density bonusing, CACs (and DCCs) this comes down to priorities and how realistic our asks are for a new project;
	#12. Implement Permit Fast-Tracking	• **Implantation Challenges:** o We always get asked about this. Main questions are around who gets fast tracked (e.g. affordable housing, environmental enhancement projects, heritage, etc.) and the capacity to do this. It would help if we had a very detailed standardized process spelt out that would then allow for this. o We have found that fast-tracking has not occurred. Sometimes fast-tracked proposals take longer to review because LGs want to ensure that objectives are met. Maybe remove steps from the process - such as UDP. • **Benefits**: Permit fast-tracking is a strong non-financial incentive for developers and building owners.
	#15. Expand Financial Incentives	• **Prioritize use of LG funds**: Good provincial/federal actions already out there; may not be the best use of ltd LG funds; may need to focus more on education
	#16. Create a Stormwater Utility	• **Earmark revenue:** Can the revenue be directed to support other climate action priorities
	#17. Create Building Design Guidelines	• **Alignment:** Seek alignment with other/ neighbouring municipalities; best addressed regionally or provincially
	#20. Create Public Education and Outreach Plan	• **Health Focus:** Education campaigns focusing on the health implications of NG. Informing people on where NG comes from (e.g. what is made of?) • **Capacity building for City staff**: There is also a capacity issue for building departments; there is a concern about BP delays
Additional Policies for New Buildings	**Resilience**	• Hard to quantify resilience, need for goals/targets
		• Good that there is a lot of flood risk
		• Asking for new developments to calculate CEDI to inform future CEDI requirements (cooling energy demand intensity) Look to Vancouver for methodology
	Fuel Source (decarbonization)	• What is POMO's RNG approach going to be?
		• Development/ requirements for connection to DES as decarb solution?
	Embodied Carbon	• Allow offsets to ESC step if embodied carbon is reduced (maybe in the near team, to incent embodied carbon reduction).

		• Supporting deconstruction and re-use of materials, circular economy o Think about demolition potential in these areas. If you are concerned about durable materials - ensure that you are zoning for the long term, so buildings do not get redeveloped in only a few decades.
		• Squamish - achieving a certain level of recycling from demo material; get a certain portion of your permit fees back. • What is being torn down to allow for new development (e.g. greenfield site (trees); single-family housing; three of four-storey walk-up (wood frame); four to six-storey wood-frame building over parkade; concrete tower over parkade) noting that at this point Port Moody does not likely have many of the two last examples. This though does raise the question in the long-term what is the life expectancy of the buildings we are building now?
		• Vancouver and Victoria green demolition bylaws as a sample
		• Performance limit for refrigerant GHGI
		• Embodied emissions targets for building archetypes to be included in new construction requirements
	Density	• Upzone some zones to encourage CLT construction - 6 to 12 stories; if allow more zones with higher density and height, would encourage more CLT
		• Increasing density to address/reflect anticipated or projected growth
	Other	• Broader Public Sector Leadership. Government entities should implement policies for their own new/existing bldgs. before requirements are imposed.
		• Impacts of different factors. As an example, for development along Murray, we are looking at acoustic issues that deals with the train line, the developer provides an analysis based on windows being closed at all times, but have no air-con/heat pump, so we ask for a thermal comfort analysis. The developer proposes having a duct in the wall to allow a resident to buy an air-con unit and plug it in (rather than have a hose hanging out of the window), then at the end of this process they determine it can't be done because of step code.
		• Don't forget that according to CleanBC, 50% of emissions could be cut through land use
		• Buyers may demand greener homes. could there be incentives for reduced rates for climate-friendly buildings (e.g. tax credit)? Could relate to advocacy for tax incentives. Climate-friendly buildings cost more. Similar to EVs, they cost more, but operational costs are less.
		• Review DP guidelines to make sure there isn't any conflict between what individual DPA guidelines are trying to achieve

SUMMARY OF FEEDBACK - EXISTING BUILDINGS

Question	Policy	Notes
Existing Buildings Policy Feedback	**#1. Develop a Thermal Conditioning Permit**	• **Quality control improvements**: There are a lot of issues with retrofit quality for part 9. This could help ensure that heat pumps are functioning in the way that we expect them to and start addressing climate resilience.

		○ This would be helpful to ensure better installation (e.g., heat pumps) • **Permitting delays:** Delays: worried about building dept. capacity and delays in permitting • **Limitations of permitting**: How to get ahead of passively waiting for the permit process? ○ How do we get people to proactively make changes without adding to the onerousness of rules and permits. • **Example:** 1- DNV has had a heat permit in place for a number of years requiring heat loss calculations, etc., but has not been reviewed recently. Vancouver recently published an info guide to reduce Heat Pump noise: https://vancouver.ca/files/cov/heat-pump-noise-guide.pdf
	#2. Implement Mandatory Building Energy Benchmarking	• **Alignment:** Look at what else is happening in the region: Benchmarking and BPS. Making sure there is alignment. This is really important for building owners and may result in not wanting to invest in region. ○ Would recommend participating in the Building Benchmarking BC Pilot underway –if PM is not already. • **Limitations:** Disclosure of energy benchmarking can have consequences; doesn't always result in more energy efficient behaviors because of benchmarking ○ Energy benchmarking doesn't necessarily result in energy or GHG savings
	#4. Adjust Rate Structure for Water	• **Consider sewer credit program:** If Port Moody goes down this path, it might want to consider a sewer credit program (like Vancouver). Cooling towers evaporate water and there should be a way to recognize that when a building needs to pay a premium for water consumption. • **Barriers:** Water metering may also have consequences for tenants; related to RTA comments (see below)
	#5. Assess PoMo's Authority for Implementing Building Performance Standards (BPS)	• **Alignment:** Potential with BPS for alteration codes and equipment standards; if adopting earlier than 2030, think about how this could be aligned ○ Concerned with multiple layers of regulation; serious risk of confusion; replication (time, energy); a more single approach would make sense rather than municipal specific different regs; seems like a duplication and extra expense; many unintended consequences ○ Municipal regs need to align with BC Housing and CMHC regs and guidelines look to senior levels or MV to develop policies; more efficient. • **Equity** Additional or more stringent regulatory requirements don't become additional costs and exacerbate existing equity and affordability issues.
	#6. Provide Top-ups for Existing Incentive Programs	• **Envelope:** How can we also incentivize envelope work with heat pumps? * • **Heat pumps:** Consider focusing top-up incentives on fuel-switching (gas to heat pump, $2K) • **New technology:** Ensure incentives are aligned with new technologies as they come available

		• **Equity:** Important to ensure incentives target gaps in the market, e.g. rental tenants; landlords; need to explicitly consider affordability • **Limitations:** Every year the old building stock gets older; incentives will never be enough for all purpose-built rental owners to make improvements; gets down to redevelopment and incentives like density bonusing.
	#7. Incentivize Retrofits Through Revitalization Tax Exemptions (RTEs)	• **Example**: District of Saanich is looking at potential RTEs for deep energy retrofits
	#8. Review Bylaws and Remove Barriers to Retrofits	• **Existing bylaw barriers**: Like removing bylaw barriers; thicker walls, heat pump noise; placement within a yard (hp)
	#9. Design Rental Efficiency Incentives with Affordability Covenants	• **Align with incentives:** This is good, perhaps creating an equity-based approach to increase the incentives from #6/#7. A whole equity package so to speak.
	#10. Create a Concierge Retrofit Programs for Large and Small Buildings	• **Program scope:** o The concierge could be a pre-screening for permitting. This could result in a permitting fast track and make the permitting easier. o The concierge can provide information, checklists, project management, contractor selection, and support o Time and capacity are an issue for organizations in retrofits. Providing resources for project management is valuable. • **Align with existing programs**: There are a number of concierge programs underway o Creating consistency across municipalities. Similar regulations and coordination of programs and incentives. • **Example:** DNV partnered with City Green to support virtual energy assessment.
	#14. Target Oil and Propane-Heated Buildings	• **Example:** See Victoria's Door-to-door program
	#17. Support Industry Capacity Building	• **Ongoing support**: Ensure support is consistent for the industry as a wide range of materials is currently available. • **Contractor licensing:** Requirement for licensing of renovated professionals. Lobbying Province for licensing requirements.
	Other Considerations	• **Residential Tenancy Act Barriers** – a significant investment in existing stock like electrification, notion of submetering becomes important (each unit paying for energy); RTA now doesn't allow this to change mid tenancy; could be an advocacy opportunity o The Residential Tenancy Branch has to decide Above the Guideline increases; need coordination with building dept
Additional Policies	**Regulation**	• Requirements for commissioning, re-commissioning, and retro-commissioning
	Embodied Emissions	• Refrigerant GHGI limit for existing buildings retrofit

for Existing Buildings		• That the greenest building is the one already built, how has/can this be factored into this? (are the ways to encourage additional density on slightly undeveloped sites? – this would likely tie in with parking reductions bullet below). Take Woodland Park as one example, rather than the development now being proposed, it would have been possible to add additional infill density on the site.
	Incentives	• Don't consider incentives right now because of the incentive rich environment now; federal, provincial, and utility incentives; focus $ in more targeted ways that aren't covered by these programs
		• Look at advocating for provincial property tax reductions in addition to municipal property tax
	Leverage Existing Training Programs	• Education - do not duplicate efforts; leverage partnership; ZEBx, etc; don't try to do alone; leverage what is there and invite your constituents into this; local gov value is in connecting with constituents; don't reinvent the wheel.
		• Leverage community partnerships through organizations like ZEBx/B2E - working with existing committees to test out proposed policies and training opportunities

SUMMARY RESULTS FROM VOTING EXCERCISE

New Building Policy	Votes
Implement permit fast-tracking	6
Reduce parking requirements	6
Revise rezoning requirements to encourage low-carbon resilience	5
Expand financial incentives	4
Density bonusing	4
Accelerate adoption of the BC Energy Step Code	3
Require Embodied carbon disclosure	3
Remove bylaw barriers to low-carbon buildings	3
Create a stormwater utility	2
Explore the use of restrictive covenants through rezoning, subdivision, or development permit approvals	2
Create public education and outreach plan	1
Review development permit form & character guidelines	1
Waive or reduce DCCs or CACs	1
Expand hazardous land development permit areas to increase resilience requirements and/or coverage	1
Create building design guidelines	1

Existing Buildings	Votes
Incentivize Retrofits through RTE Exemptions	10
Review Bylaw to Remove Barriers to Retrofits	9
Create Concierge Retrofit Programs for Large and Small Buildings	7
Provide Top-Ups for Existing Incentive Programs	4
Assess Port Moody's Authority for implementing BPS	3
Develop a thermal conditioning permit	2

Implement mandatory building energy benchmarking	3
Design rental efficiency incentives with affordability covenants	2
Spotlight leadership	1
Set up a challenging program	1
Adjust rate structure for water	1
Support industry capacity building	1
Support demonstration projects	1

Appendix F: Community Surveys Summary

Port Moody – Climate Ready Homes and Buildings

Resident Survey

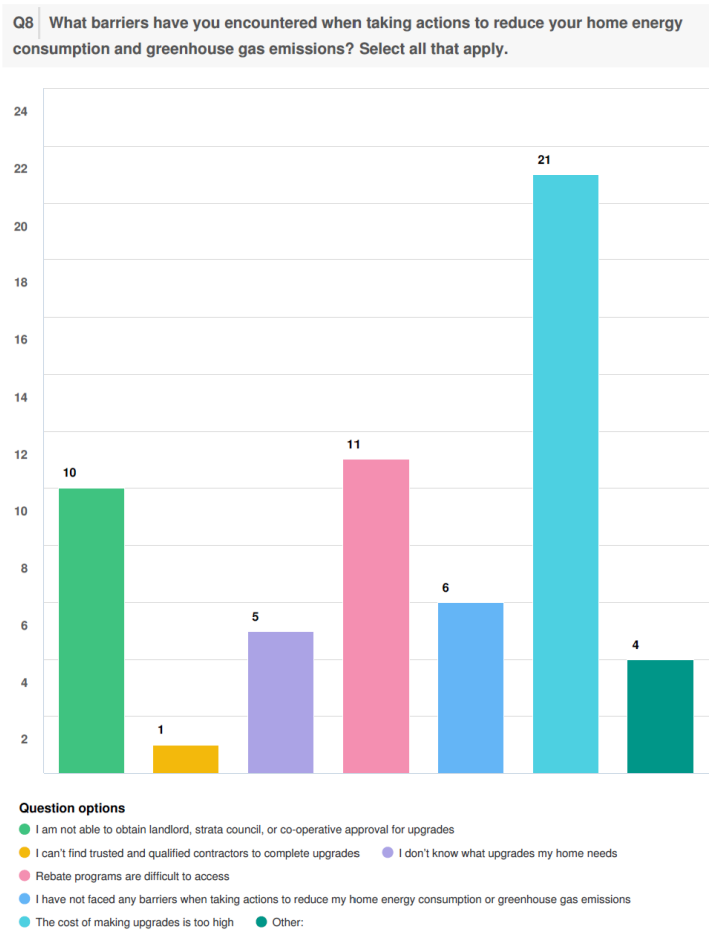
October 15 2021 – January 4, 2022

SUMMARY OF RESPONDENTS

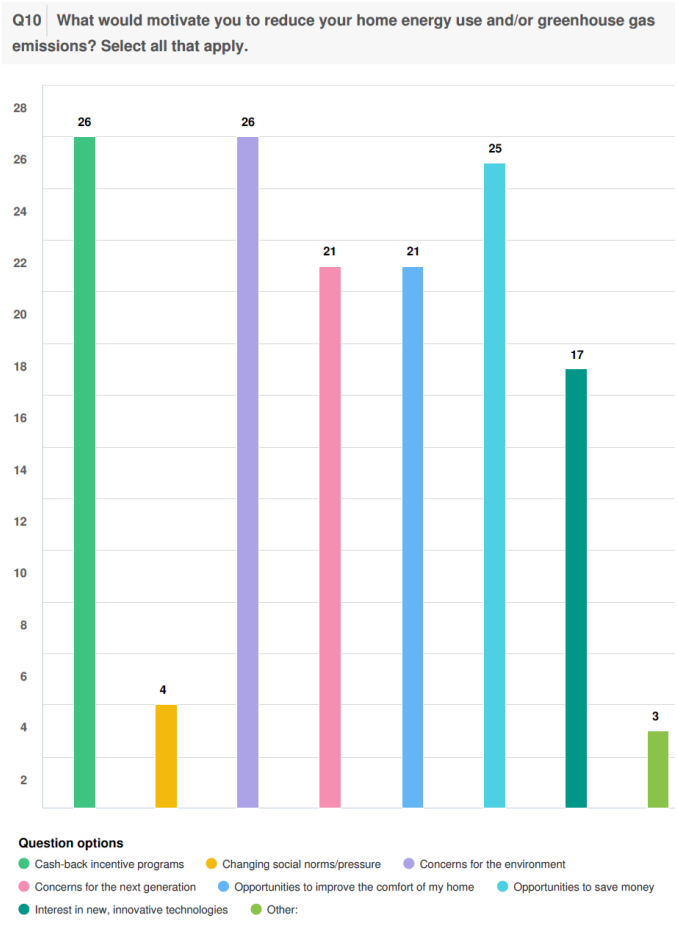
- 35 responses received;
- Most respondents own a strata unit (54%) followed by owning a non-strata home (28%), or rent (14%); and
- Most respondents live in a townhome or row home (43%), single family detached home (34%), or unit in a low-rise multi-family building (20%).

SUMMARY OF FEEDBACK

Barriers to Low Carbon Homes

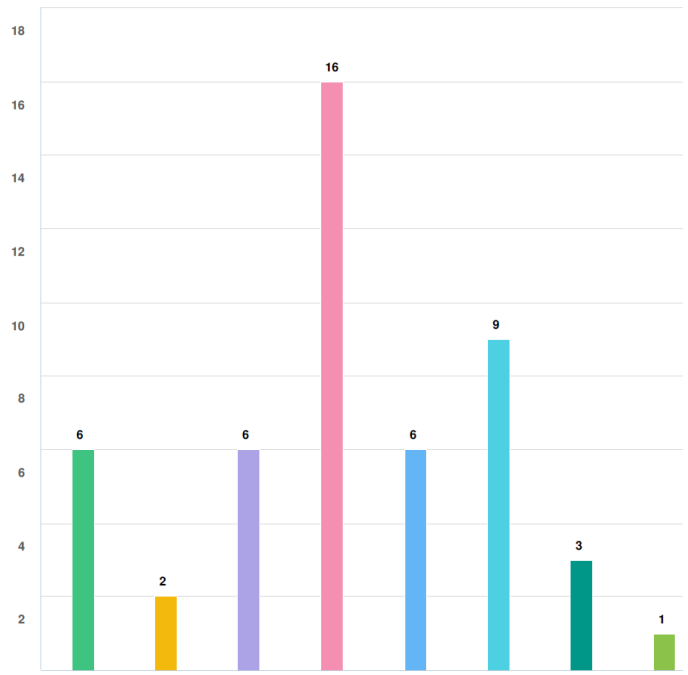


Motivations to Reduce Home GHG Emissions



Barriers to Climate Resilient Homes

Q14 What barriers have you encountered when putting in place strategies to manage clim risks such as extreme heat, air pollution, drought, wildfire, and flooding?

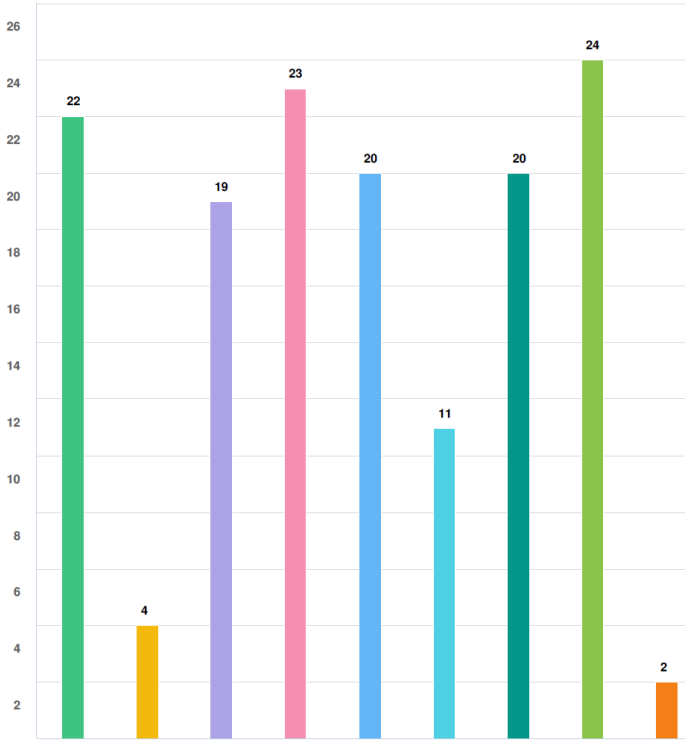


Question options

- I am not able to obtain landlord, strata council, or co-operative approval for upgrades
- I can't find trusted and qualified contractors to complete upgrades
- I don't know what upgrades my home might need to manage climate risks
- The cost of making upgrades is too high
- I have not put in place any strategies to manage climate risks
- I have not encountered any barriers when putting in place strategies to manage climate risks
- I do not consider managing climate risks a priority for my home
- Other:

Motivations to Increase Home Resilience

Q15 What would motivate you to manage climate risks? Select all that apply.



Question options

- Cash-back incentive programs
- Changing social norms/pressure
- Concern for the next generation
- Concern for the environment
- Financial risks of not taking action
- Interest in new, innovative technologies
- Opportunities to save money
- Improving the safety and comfort of my home
- Other:

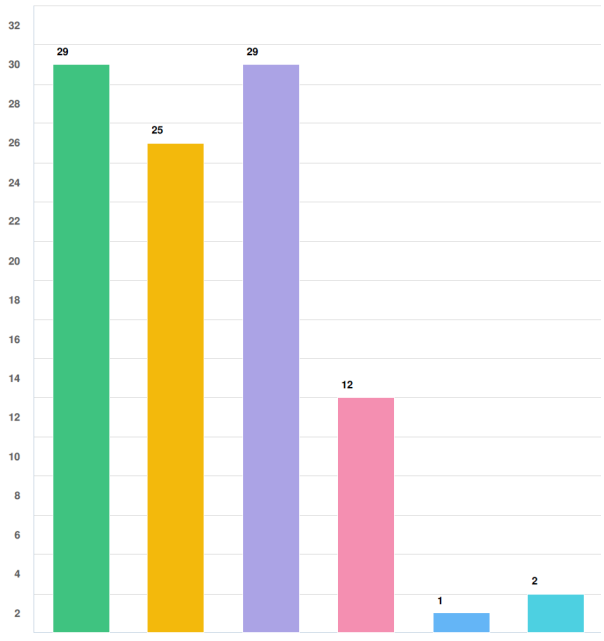
Importance of Principles

Q16 How important to you are the principles listed below when it comes to designing and implementing climate ready policies and programs? Please rank in order of importance (1= most important and 6= least important)?

OPTIONS	AVG. RANK
Effectiveness in reducing emissions/meeting climate targets –policies and programs reduce carbon emissions in line with local and provincial climate targets	2.24
Affordability –policies and programs do not exacerbate existing affordability issues.	2.42
Equity – develop policies and programs that help create equal outcomes for all community members including low-income, marginalized, and racialized communities.	3.32
Flexible – policies and programs allow for flexibility to enable homeowners to use different approaches to improving the resilience and carbon performance of their buildings	3.78
Minimal burden to residents – policies and programs require minimal action from residents.	4.29
Innovative/industry leadership – policies and programs demonstrate Port Moody's leadership in low-carbon resilient buildings	4.55

Preference of Prioritization

Q18 What types of policies or programs should Port Moody prioritize to help the community achieve climate ready buildings? Select all that apply.



Question options

- Incentives and financing (e.g. rebates, income-qualified programs, tax credits)
- Regulation and requirements (e.g. building code, bylaws, zoning)
- Information and education for Port Moody residents
- Industry training and resources
- I don't have enough information to answer this question
- Other:

Business Survey

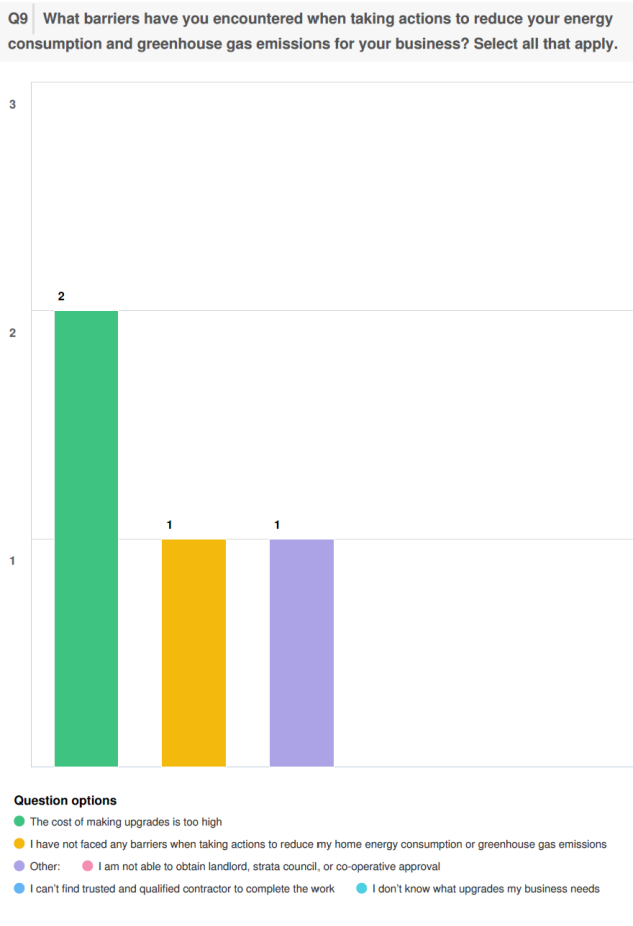
October 15 2021 – January 4, 2022

SUMMARY OF RESPONDENTS

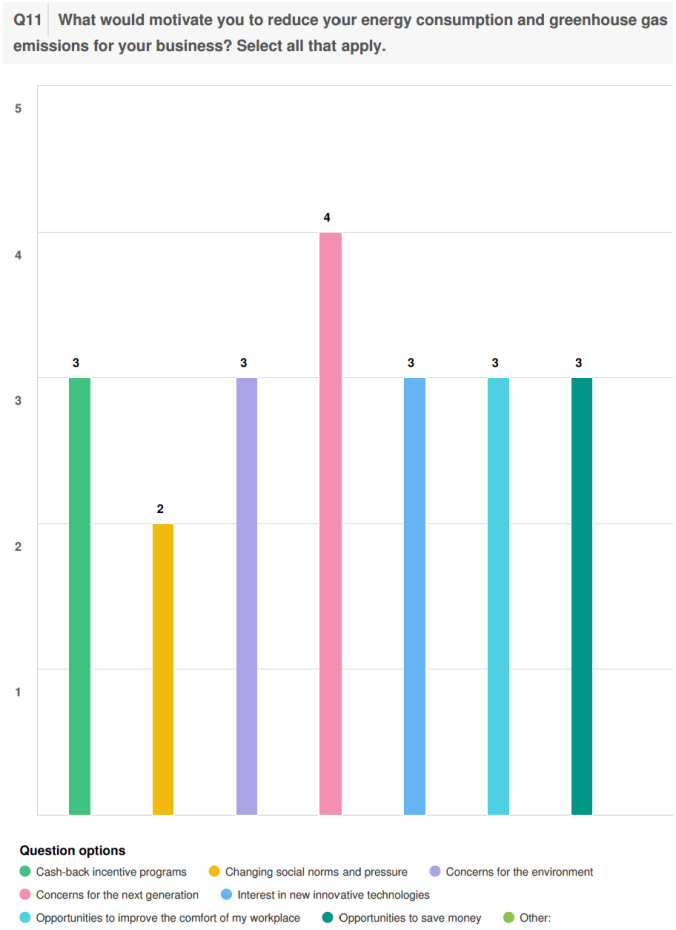
- 4 responses received;
- Most respondents businesses are located in retail mixed use building, home office, or other building structure *(Other building structures were not provided in responses); and*
- Most respondents have between 1-10 employees or 100-500 employees.

SUMMARY OF FEEDBACK

Barriers to Low Carbon Buildings

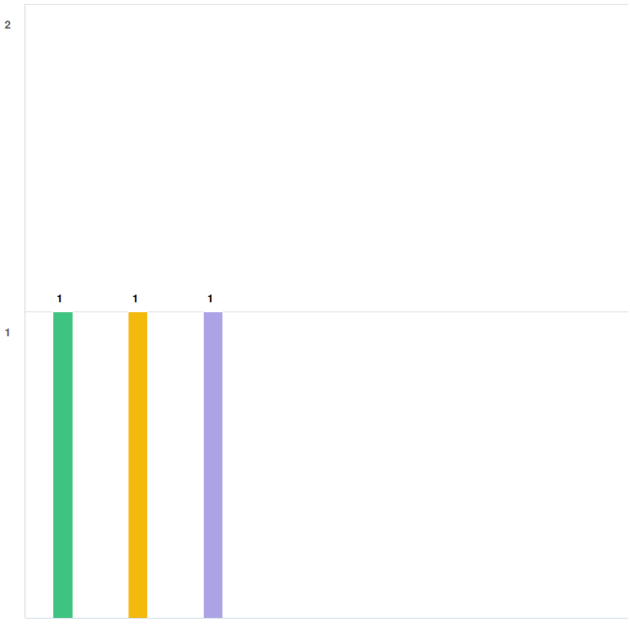


Motivations to Reduce Building GHG emissions



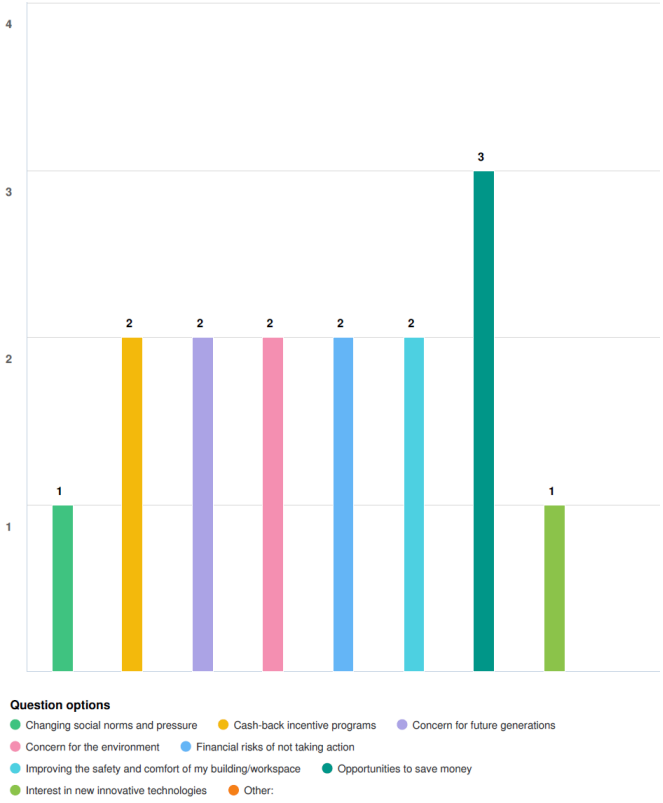
Barriers to Resilient Buildings

Q14 What barriers have you encountered when putting in place strategies to manage climate risks in your building/workspace? Select all that apply.



Motivations to Increase Building Resilience

Q15 What would motivate you to take actions to manage climate risks? Select all that apply.



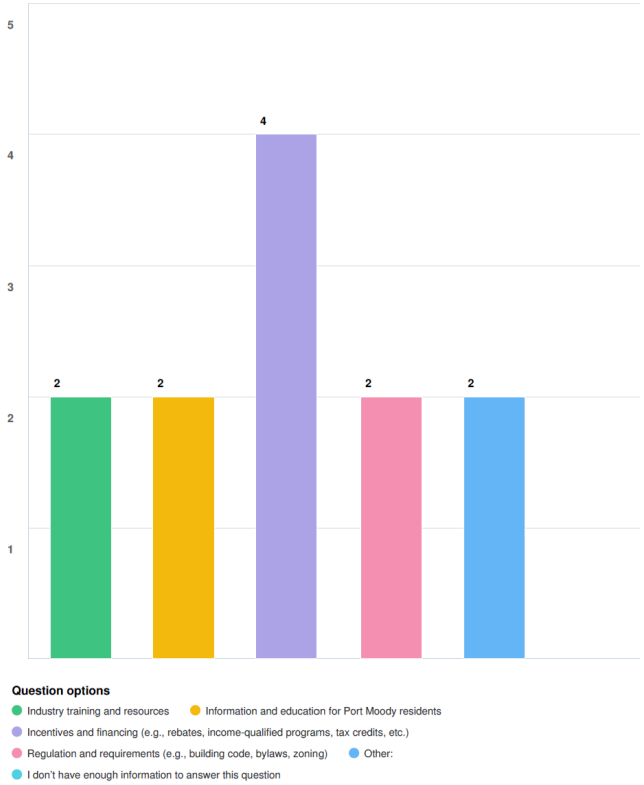
Importance of Principles

Q16 How important to you are the principles listed below when it comes to designing and implementing climate ready policies and programs? Please rank in order of importance (1= most important and 6= least important)?

OPTIONS	AVG. RANK
Affordability –policies and programs do not exacerbate existing affordability issues.	2.25
Effectiveness in reducing emissions/meeting climate –policies and programs that substantially reduce carbon emissions in line with local and provincial climate targets	2.25
Flexible – policies and programs allow for flexibility to enable homeowners to use different approaches to improving the resilience and carbon performance of their buildings	3.50
Innovative/industry leading – policies and programs demonstrate Port Moody's leadership in low-carbon resilient buildings	3.75
Minimal burden to residents – policies and programs require minimal action from residents.	4.50
Equity – policies and programs help create equal outcomes for all community members by targeting low-income, marginalized, and racialized communities.	4.75

Preference of Prioritization

Q18 What types of policies and programs should Port Moody prioritize to help businesses achieve climate ready buildings? Select all that apply.



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