# CLIMATE ACTION COMMITTEE MEETING
## OF THE VILLAGE OF LIONS BAY
## HELD ON MONDAY, OCTOBER 23, 2023 AT 7:00 PM
## COUNCIL CHAMBERS, 400 CENTRE ROAD, LIONS BAY
## AND VIA ZOOM VIDEO CONFERENCE

TO JOIN THE MEETING, CLICK HERE: https://us02web.zoom.us/j/2780145720
TO JOIN VIA PHONE, DIAL 778-907-2071 AND ENTER MEETING ID: 278 014 5720

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## AGENDA

**1. Call to Order**

**2. Appointment of Recorder and round table introductions**

**3. Approval of the Agenda**
THAT the agenda be approved as submitted.

**4. Public Questions & Comments**

**5. Approval of Minutes**

A. Climate Action Committee Meeting Minutes – September 25, 2023
THAT the Climate Action Committee Meeting Minutes of September 25, 2023 be approved as circulated.

**6. Business Arising from the Minutes**

A. Village Survey – update and next steps
   i. Inactive Survey Link https://volb.limesurvey.net/759534
B. Climate Action Awareness – update and next steps
C. R100 Diesel update
D. Climate 2050

**7. Unfinished Business**

A. Village Survey – update from Council meeting
B. Climate Action Awareness - update from Council meeting
C. BC Buildings Step Code Requirement
D. Renewable Diesel for Works Yard Equipment
   i. R100 use in hall heating.
E. Purchasing Policy - update from Council meeting
F. Other Past CAC Initiatives
   i. Climate Action Plan

ii. Natural Asset Inventory
iii. Climate Action Tool Kit
iv. OCP Amendment and Associated Targets
v. Transfer Station
vi. Solar Panel on Municipal Buildings
vii. EV Charger Initiative and Status
viii. Food Truck Power
ix. Beach Event Power
x. Baseline Village Data
xi. Village Actions to Date
xii. Communication/Education
xiii. Finance/Funding
xiv. Source Water Protection Plan
xv. Many Stakeholders
xvi. OCP Amendment and Associated Targets
xvii. Resident Survey

**8. New Business**

A. Metro 2050 Climate Report *(page 3)*

**9. Correspondence**

A. Jon Povill *(page 39)*
B. Christine Livingstone *(page 40)*

**10. Public Questions & Comments**

**11. Adjournment**

**12. Next Meeting – TBD**

# *Climate 2050*
# Annual Report
## 2022/2023

## Indigenous Territorial Recognition

Metro Vancouver acknowledges that the region's residents live, work, and learn on the shared territories of many Indigenous peoples, including 10 local First Nations: qícəý (Katzie), qʷɑ:ńx̌əń (Kwantlen), kʷikʷəx̌əm (Kwikwetlem), máthxwi (Matsqui), xʷməθkʷəýəm (Musqueam), qiqéyt (Qayqayt), se'mya'me (Semiahmoo), Sḵwx̱wú7mesh Úxwumixw (Squamish), scəẃaθən məsteyəxʷ (Tsawwassen), and sə́lílwətaʔɬ (Tsleil-Waututh).

Metro Vancouver respects the diverse and distinct histories, languages, and cultures of First Nations, Métis, and Inuit, which collectively enrich our lives and the region.

## About Metro Vancouver

Metro Vancouver is a federation of 21 municipalities, one electoral area and one treaty First Nation that collaboratively plans for and delivers regional-scale services. Metro Vancouver's core utility services include drinking water, sewage treatment, and solid waste management, along with regional services like regional parks, affordable housing, regional land use planning and air quality and climate action that help keep the region one of the most livable in the world.

4515 Central Boulevard, Burnaby, BC, V5H 0C6
**metrovancouver.org**
June 2023

# Contents

# *Climate 2050* Annual Report 2022/2023

Climate change is both a global and a local challenge, and it is already affecting our planet and our region in profound ways, making our summers hotter and drier, our winters warmer and wetter, and increasing the occurrence of extreme weather events. Recognizing the need for urgent and transformative action, Metro Vancouver takes an "action while planning" approach, implementing climate actions while at the same time progressing development of the Climate 2050 Roadmaps, which lay out the strategies and actions needed to reach a low carbon, resilient region.

The *Climate 2050 Annual Report* is intended to meet Metro Vancouver's commitment to regular and transparent reporting on *Climate 2050* progress, and progress towards Metro Vancouver's established climate commitments and targets. For each of the 10 Climate 2050 Roadmap issue areas, the *Climate 2050 Annual Report 2022/2023* highlights climate actions implemented by Metro Vancouver, and key performance indicators to help measure progress towards our targets. The report supports Metro Vancouver's objectives to build strong awareness and support for climate action from key stakeholders and the public in the region.

# *Climate 2050*

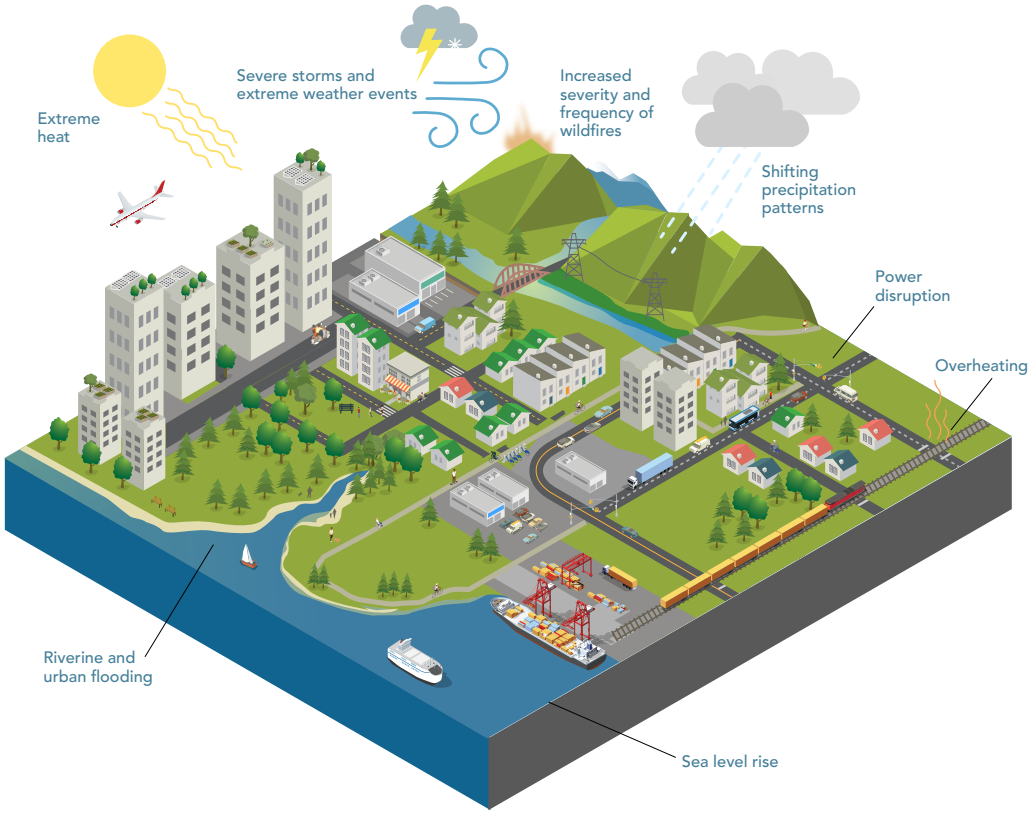
While Metro Vancouver and its 23 member jurisdictions have been taking action for over 20 years to address climate change mitigation and adaptation, we recognize the need to do more and move more quickly. In 2018, the Metro Vancouver Board of Directors adopted Climate 2050, a regional climate strategy. Climate 2050 commits to bold leadership to reduce greenhouse gas emissions and ensure that our infrastructure, ecosystems, and communities are resilient to the impacts of climate change. Climate 2050 includes the following commitments:

- Achieving a carbon neutral region by 2050
- Ensuring that infrastructure, ecosystems, and communities are resilient to the impacts of climate change
- Achieving an interim target of 45% reduction of GHG emissions from 2010 levels by 2030

Achieving a carbon neutral region by 2050 will require unprecedented greenhouse gas reductions across most sectors. Many sectors must become "zero emissions", and any remaining greenhouse gas emissions will need to be balanced with ecological and technological carbon removal approaches. Initial modeling as a part of Metro Vancouver's Carbon Neutral Modeling Study, and research across the international community shows us that the 2020s needs to be a decade of urgent action on climate solutions.

Climate change impacts are already evident in our region, and will become more marked in the near future. Metro Vancouver's Climate Projections Report provides details of the projected impacts of climate change in this region. Every fraction of a degree of warming avoided by taking collective action to reduce human-caused greenhouse gas emissions will save lives and avoid damage to infrastructure and ecosystems.

**EXPECTED CLIMATE CHANGE IMPACTS**



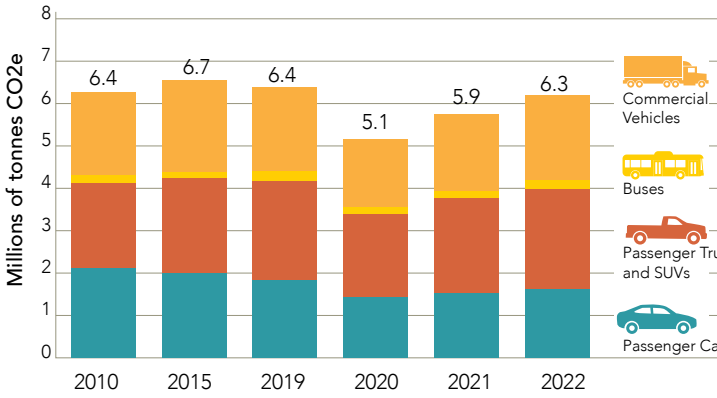
# Metro Vancouver Regional Emissions

Metro Vancouver has historically compiled a regional emission inventory every five years, covering greenhouse gas and other air contaminants emitted in the region. Metro Vancouver is moving towards an annual emissions inventory, which will improve our ability to track and measure the impacts of Climate 2050 and other climate actions taking place in the region. Metro Vancouver will be updating the 2019-2022 regional emission inventory throughout 2023. As of July 2023, Metro Vancouver has updated regional emissions inventories for on-road transportation and buildings. See the below figures for more information. As annual GHG inventories for other sectors are completed, results will be available through a publicly accessible platform.

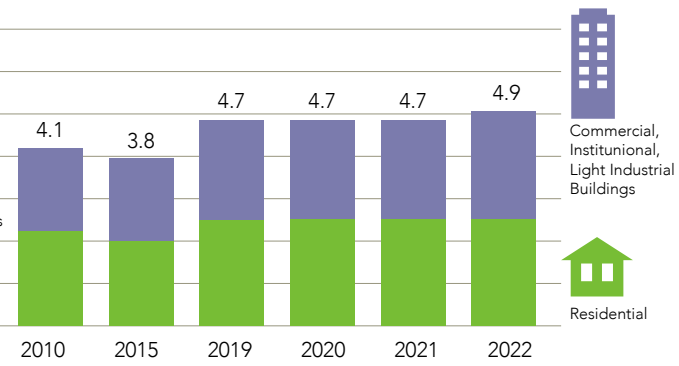
Regional GHG emissions from on-road transportation were 6.3 million tonnes carbon dioxide equivalent (Mt $CO_2e$) in 2022, which is relatively unchanged from 2010. Despite significant increases in both vehicle population (29% increase) and distance travelled (25% increase), regional GHG emissions have held steady, due to improvements in vehicle fuel efficiency and increasing uptake in zero emission technology. GHG emissions from buildings increased from 2010 to 2022, although emissions have been relatively constant from 2019 to 2022; these trends reflect the continued use of fossil fuels for heating and hot water in buildings.

These emissions are expected to decline in future years, as actions in the Climate 2050 Roadmaps are implemented and new policies and market shifts take effect, however, accelerated and expanded action will be needed to achieve the approved 2030 and 2050 climate commitments.

Onroad Emissions by Category




Buildings Emissions by Category



# Metro Vancouver Corporate GHG Emissions

Metro Vancouver is a diverse organization that plans for and delivers regional utility services, including water, sewers and wastewater treatment, and solid waste management. It also regulates air quality, plans for urban growth, manages a regional parks system and provides affordable housing. The delivery of these services generates emissions from the use of energy as well as process related emissions at our solid waste and liquid waste facilities. In addition to using purchased energy, Metro Vancouver generates energy itself. Most of the self-generated energy is used by Metro Vancouver (e.g. biogas at wastewater treatment plants) while some is sold to others (e.g. electricity generated at the Waste-to-Energy facility sold to BC Hydro, or renewable natural gas sold to Fortis). Metro Vancouver tracks GHG emissions resulting from generation and consumption of all of these forms of energy.

In 2022, Metro Vancouver's total corporate GHG emissions from all energy use was approximately 28,000 tonnes $CO_2e$. Metro Vancouver reports annually on corporate GHG emissions, with reporting for 2022 forthcoming in fall 2023.

In addition to GHG emissions originating from corporate energy use, Metro Vancouver's other GHG emissions include industrial process emissions of approximately 130,000 tonnes $CO_2e$ annually. This includes combustion of solid waste at the Waste-to-Energy Facility, the majority of which is plastics. Metro Vancouver is investigating methods for more accurately quantifying and reporting process emissions from its operations (e.g. emissions from wastewater treatment plants).

Metro Vancouver has a Corporate Energy Management Program aimed at reducing its operational carbon footprint through energy efficiency improvements, energy recovery initiatives, and transitioning to lower-carbon energy sources. Metro Vancouver is advancing a number of initiatives to reduce its corporate carbon footprint and provide renewable energy to the region, including:

- Providing clean, renewable energy to the region, including plans to provide waste heat from Metro Vancouver's sewer collections system, wastewater treatment plants, and the Waste-to-Energy facility to communities in the region, and production of renewable natural gas at our wastewater treatment plants.
- Electrification of Metro Vancouver fleet vehicles, and planning and deploying electric vehicle charging infrastructure at our operations to support this transition.
- Switching to lower-carbon fuel sources in our operations, including transitioning to renewable natural gas at our Parks, wastewater treatment plants, and Waste-to-Energy Facility.
- Implementing deep energy retrofits to Metro Vancouver Housing Corporation (MVHC) buildings, and designing new MVHC buildings to be fully electric, helping to reduce GHG emissions in these buildings by up to 98%.

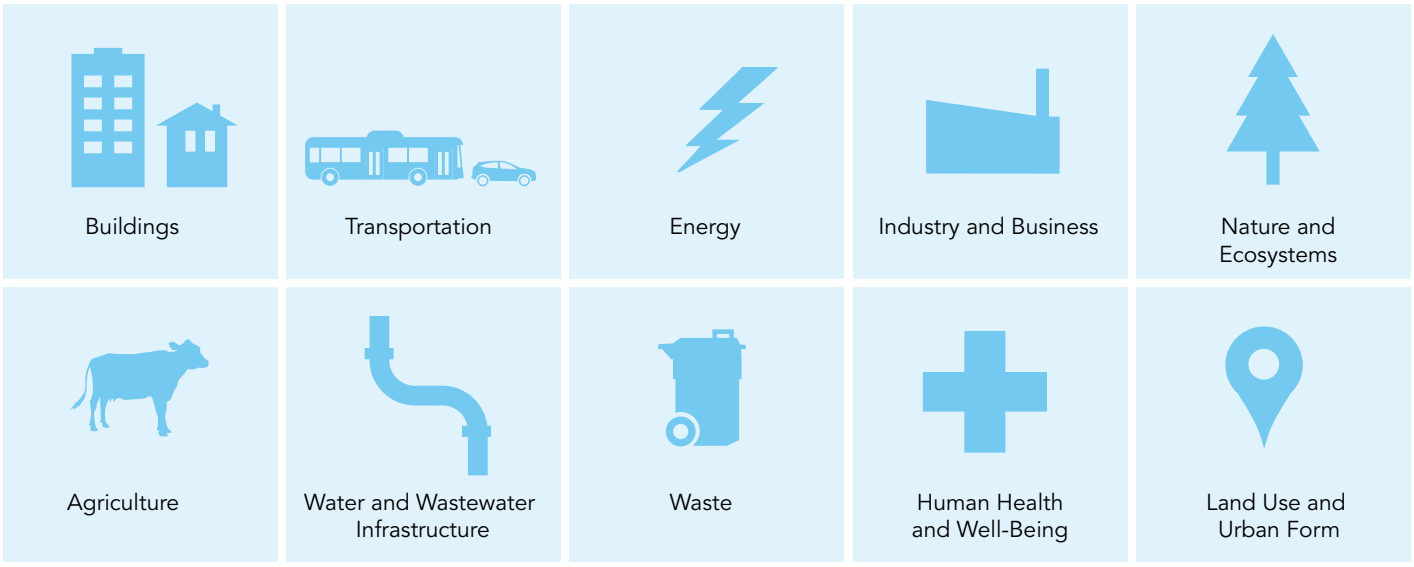
Metro Vancouver also implements a portfolio of non-energy related projects that have emissions reductions benefits, including avoided forest conversion, ecological area restoration, landfill gas capture, and solid waste reduction projects.

# *Climate 2050* Roadmaps

*Climate 2050* is organized around ten issue areas, intended to provide groupings of climate goals, targets, and actions. They reflect the functions and responsibilities under Metro Vancouver's mandate and the range of climate related challenges and initiatives affecting the region. For each issue area, Metro Vancouver is developing a *Climate 2050 Roadmap* that outlines regional and corporate goals, strategies, actions, and performance metrics. Together, these Roadmaps will provide a comprehensive view of the path towards a low carbon, resilient region.

The Climate 2050 Roadmaps are being developed by Metro Vancouver with input from governments, partner organizations and residents and business across the region. The Roadmaps include a call to action for other jurisdictions and key partners across the region including: member jurisdictions, residents, businesses, academic institutions, First Nations and others. Metro Vancouver will take a strategic approach to assessing fairness, equity and affordability in the *Climate 2050 Roadmaps*.

Many of the goals, targets, and actions in the Climate 2050 Roadmaps are also reflected in other Metro Vancouver management plans, including the *Clean Air Plan* and *Metro 2050*, and are being developed to align with other municipal, regional, provincial and federal climate policies.



# Progress Towards Targets

Local governments have taken action on climate for many years, but we need to do more. Cumulatively, the actions across the Climate 2050 Roadmaps represent a substantial reduction compared to current policies. This includes actions from senior governments. However, they are not sufficient to meet the 2030 and 2050 targets. Expanded action will be needed at all levels of government, in collaboration with partner organizations.

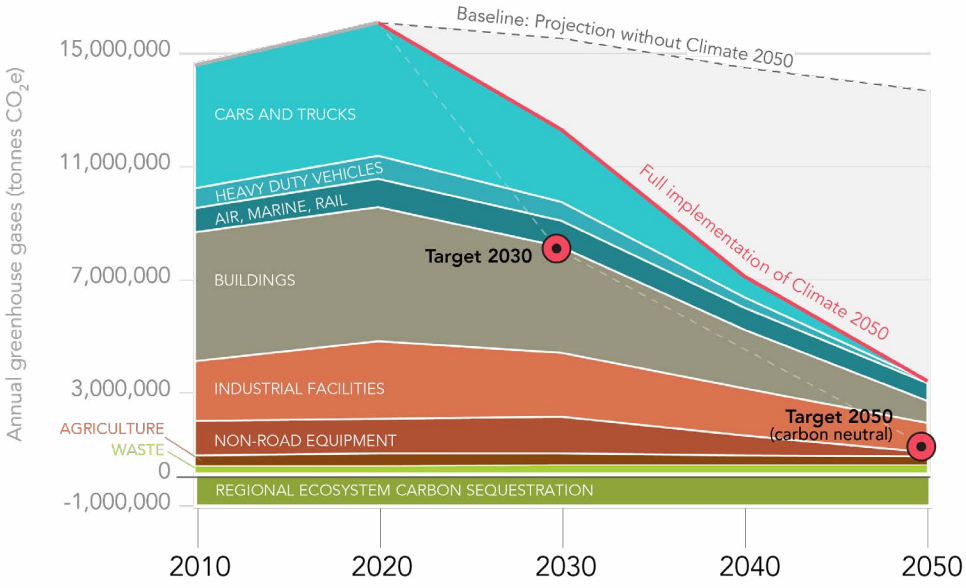
The transition to a low carbon future is likely to be accelerated by;

- technological advancements such as solar energy, batteries and heat pumps;
- electrification across many sectors including vehicles, buildings and industry; and,
- societal shifts such as the rise of micromobility (e.g e-bikes and e-scooters) supported by strong action by local governments to build protected cycling networks; and improvements in land use planning and consumption patterns.

Conversely, challenges include; expansion and subsidies for fossil fuel industries, a divisive political climate, and low climate literacy and/or misinformation.

The Climate 2050 Roadmaps reflect current knowledge and technology. Meeting the targets will depend on advancing the actions in the roadmaps as quickly as possible, while continuing to expand and collaborate with partner organizations.

Climate 2050 Roadmaps: **GHG Emissions Reductions (2021 estimate)**



# *Climate 2050* Implementation Update- 2022/2023

Achieving a carbon neutral, resilient region will require urgent and coordinated action on the part of Metro Vancouver, its member jurisdictions, and other governments and partners. Metro Vancouver has a long history of working with other governments and partners towards common goals. Reflecting this need for collaboration, the *Climate 2050 Roadmaps* include actions which Metro Vancouver will lead, as well as actions where Metro Vancouver's role is to support other organizations leading an action, or advocate to other governments and partners for an action or policy change to take place.

For each of the ten *Climate 2050* issue areas, the *Climate 2050 Annual Progress Report* includes highlights on: 1) Roadmap development and 2) implementation of Roadmap actions and other climate action projects.

The icons below indicate the outcomes supported by these actions:

| | |
|---|---|
| BIG Move | Actions that are foundational to achieving the 2030 targets set out in *Climate 2050*, and which should lead to the most significant emission reductions or significant progress on resilience and adaptation |
| GHG | Actions that reduce greenhouse gas (GHG) emissions |
| | Actions that will support adaption and resilience in a changing climate |
| Corporate LEADERSHIP | Actions implemented by Metro Vancouver in its corporate operations to demonstrate leadership and support regional actions |

## Climate 2050 Roadmap Status

| ***Climate 2050*** Under Development | ***Climate 2050*** Draft Roadmaps | ***Climate 2050*** Board endorsed Roadmaps | |
|---|---|---|---|
| Waste | Agriculture | Transportation | Carbon Neutral Region by 2050 |
| Water & Wastewater Infrastructure | | Buildings | |
| Land Use and Urban Form | | Industry & Business | |
| Human Health & Well-being | | Energy | |
| | | Nature & Ecosystems | |

# Measuring Our Progress

## *Climate 2050* Action Status

Each *Climate 2050 roadmap* includes a timeline for implementation of actions. The *Climate 2050 Annual Report* reflects the status of that implementation. For each roadmap, action status is provided as an indicator of implementation progress. As implementation of the *Climate 2050 roadmaps* require collaboration and ambitious action across organizations and governments, many actions will remain 'in-progress' until the *Climate 2050* targets are achieved. Similarly, Metro Vancouver will continue to advance work related to many actions after they are marked 'complete'.

| **Climate 2050 Roadmap Action Status- Q2 2023 (Board-endorsed Roadmaps)** | |
|---|---|
| Complete | **5** |
| In Progress | **73** |
| Not Started [1] | **43** |
| Planned for Future Years [2] | **64** |

1 Denotes actions that are expected to start by 2023.

2 Denotes actions that are expected to start in 2024 or later.

## Key Performance Indicators:

**6.3 million tonnes $CO_2e$:** Total regional on-road transportation emissions (2022)

**4.9 million tonnes $CO_2e$:** Total regional buildings emissions (2022) [3]

For each issue area, Metro Vancouver will be developing Key Performance Indicators (KPIs) to help us track progress on implementation of the *Climate 2050 Roadmaps*, and progress towards our targets of a carbon neutral, resilient region by 2050. Metro Vancouver will develop KPIs to measure progress at a corporate level and at a regional level to measure the impacts of actions by Metro Vancouver, other governments, and partners, towards achieving our regional targets. KPIs will be refined and added as data becomes available.

3 Includes buildings emissions from natural gas heating only; does not include residential fuel oil or wood heating emissions, which make up less than 1% of building emissions.

## 2022/2023 Implementation:

| | |
|---|---|
| Complete | 3 |
| In Progress | 15 |
| Not Started | 18 |
| Planned for Future Years | 2 |

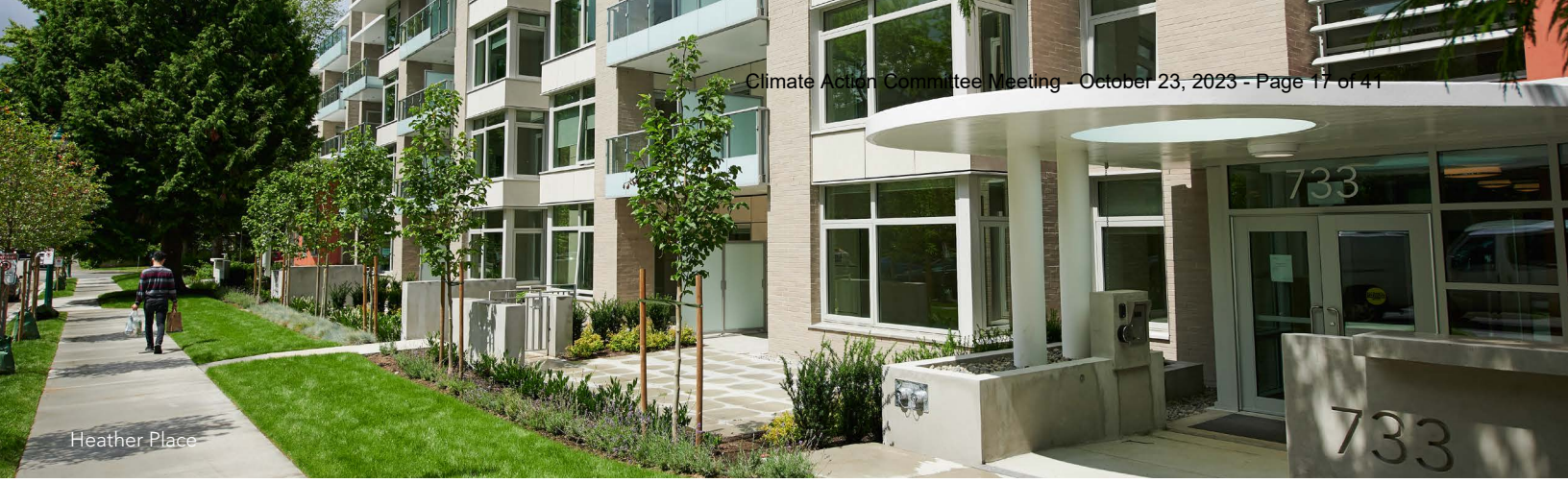
# Buildings

Buildings will shape our low-carbon future by using clean and renewable energy, becoming highly energy efficient, and improving human health through design and retrofits.

## *Climate 2050* Roadmap Development:

Final ***Climate 2050* Buildings Roadmap** endorsed by the Metro Vancouver Board in November 2021

| IN-PROGRESS & COMPLETE ACTIONS | STATUS |
|---|---|
| New Buildings are Highly Efficient and Electric | Complete |
| Building Electrification Mandate for BC Hydro | Complete |
| Building Decarbonization Coalition | Complete |
| High Performance Heating and Cooling Equipment Import and Sale Standards | In progress |
| GHG Requirements for Existing Large Buildings | In progress |
| GHG Performance Requirements for Existing Houses and Townhomes | In progress |
| Require Greenhouse Gas Reductions During Renovations | In progress |
| Energy Labels for Homes and Buildings | In progress |
| Energy Advisor Services for Homes and Large Buildings | In progress |
| Make Electricity Upgrades Faster and Cheaper | In progress |
| Share Lessons from Transitioning Metro Vancouver Corporate Buildings to Zero Emissions | In progress |
| Low Carbon District Energy Policies | In progress |
| Strengthen Metro Vancouver's Corporate Sustainable Design Requirements | In progress |
| Broaden Applications of Non-Potable Water Use in Buildings | In progress |
| Support Capacity Building of Non-Potable Water Use Applications on Building Sites | In progress |
| Require Cooling Measures in New Buildings and Major Retrofits | In progress |
| Expand the Network of Public Buildings that can serve as Cool, Clean Air Centres | In progress |
| Understand Climate Risk and Resilience for Public Buildings Across the Region | In progress |



Heather Place

## 2022/2023 Project Highlights

### Zero Carbon Step Code

In May 2023, the Government of BC enacted the Zero Carbon Step Code, which provides tools for local governments to set lower or zero emissions requirements for new buildings. Changes were also introduced to require 20% better energy efficiency in most new homes and buildings in BC as part of the **BC Energy Step Code**. The changes meet commitments in the *CleanBC Roadmap to 2030* to gradually lower emissions from buildings until all new buildings are zero carbon by 2030 and are net-zero energy ready by 2032. Metro Vancouver with its member jurisdictions strongly advocated for the establishment of GHG requirements for new buildings, including enabling local governments to voluntarily establish zero emission targets earlier than the BC-wide requirements, which will come into force in 2030. GHG requirements to make new buildings highly efficient and electric is a Big Move in the Buildings Roadmap and this action is now complete.

### Building 2 Electrification Coalition

In 2022, Metro Vancouver joined the **Building 2 Electrification Coalition** (B2E), Canada's first building electrification coalition, based in British Columbia. B2E brings together industry, housing providers, researchers, policy makers, electric utilities and other stakeholders, to identify and address barriers to electrification and take actions that contribute to a meaningful market shift to low carbon building electrification. B2E aims to build demand for building electrification technologies, and support the transformation of policy, workforce, and supply chains to deploy these technologies widely across BC. B2E is a program area of the Zero Emissions Building Exchange (ZEBx), and part of the **Metro Vancouver Zero Emissions Innovation Centre** (ZEIC), an independent non-profit and charitable organization that is part of the Low Carbon Cities Canada (LC3) network.

### Metro Vancouver's Approach to Managing Emission from Large Buildings

In 2022, Metro Vancouver completed engagement on an **approach to manage GHG emissions from large buildings over 25,000 ft²**. In 2023, Metro Vancouver is developing more detailed GHG reporting and performance requirements for existing large buildings, and will be seeking feedback on this proposal in late 2023 and into 2024.

### Transitioning Metro Vancouver Housing Buildings to Zero Emissions

Metro Vancouver Housing (MVH) buildings are being retrofit to reduce GHG emissions by up to 98%, with some new MVH buildings designed to be fully electric. In 2022, Metro Vancouver Housing also progressed the **Reframed Initiative**, a multi-partner project to undertake deep energy retrofits on existing multi-unit residential buildings (MURBs) to reduce both energy use and GHG emissions. These projects demonstrate the feasibility of electric buildings today, and illustrate the benefits of low carbon buildings such as reduced GHG emissions, reduced energy use and costs, and increased resilience to extreme weather.

## Key Performance Indicators

4.9 million tonnes $tCO_2e$ – total regional GHG emissions from buildings [4]

1,957 new residential heat pumps installed in region through the CleanBC Better Homes Program (2022) replacing natural gas systems

Total corporate GHG emissions from buildings in 2022 ($tCO_2e$)- data forthcoming in 2023.

4 Includes buildings emissions from natural gas heating only; does not include residential fuel oil or wood heating emissions, which make up less than 1% of building emissions.

## 2022/2023 Implementation:

| | |
|---|---|
| Complete | 1 |
| In Progress | 18 |
| Not Started | 25 |
| Planned for Future Years | 8 |

# Transportation

Transportation will help shape our low-carbon future by prioritizing zero-emission vehicles, increasing active and public transportation, and making improvements that increase system resilience.

## *Climate 2050* Roadmap Development:

Final ***Climate 2050* Transportation Roadmap** endorsed by the Metro Vancouver Board in November 2021.

| | IN-PROGRESS & COMPLETE ACTIONS | STATUS |
|---|---|---|
| BIG Move | Accelerate Sales Targets for New Electric Passenger Vehicles | Complete |
| | More Stable Infrastructure Funding for Regional Active Transportation Networks | In progress |
| | More Stable Funding for Regional Transit | In progress |
| | Support Residents and Businesses in Active Transportation | In progress |
| BIG Move | Enhance and Improve Regional Transit | In progress |
| BIG Move | Use Pricing to Reduce Driving and Emissions | In progress |
| | Regional Parking Strategy to Reduce Driving | In progress |
| Corporate LEADERSHIP | Support Low Emissions Commuting by Staff | In progress |
| BIG Move | Develop Regional Emission Requirements for Passenger Vehicles | In progress |
| BIG Move | Make Electric Vehicles More Affordable | In progress |
| | Regional Electric Vehicle Charging Strategy | In progress |
| | Electric Vehicle Outreach Programs | In progress |
| Corporate LEADERSHIP | Transition the Corporate Fleet to Zero Emissions | In progress |
| BIG Move | Regulate Existing Medium and Heavy Trucks | In progress |
| BIG Move | Require Zero Emission Sales Targets for New Medium and Heavy Trucks | In progress |
| BIG Move | More Stringent Low Carbon Fuel Standards | In progress |
| | Long-term Emissions Strategy for Medium and Heavy Trucks | In progress |
| | Reduce Refuse Trucks Emissions | In progress |
| | Identify Regional Climate Hazards, Risks, and Vulnerabilities Impacting Transportation Networks | In progress |

## 2022/2023 Project Highlights

### Strengthening the BC Zero Emissions Vehicle Act

In 2022, the BC Government consulted on proposed regulatory changes to the *BC Zero Emissions Vehicles Act* (ZEVA), to come into effect in 2023. The accelerated sales targets in ZEVA will require 26% of light-duty vehicle sales to be zero-emission by 2026, 90% by 2030, and 100% by 2035. Previously, the ZEVA had required sales to reach 100% zero-emission by 2040. The changes to BC's ZEVA will help accelerate the transition to a low-carbon transportation system, and improve availability of electric vehicles to British Columbians. Metro Vancouver and its member jurisdictions provided input and advocated for the ZEVA to be strengthened, and continues to advocate for similar requirements at the federal level. Accelerating the Sales Targets for new electric passenger vehicles is a Big Move in the Transportation Roadmap and is now complete.

### Driving Down Emissions: Developing a Policy Bundle to Reduce Light Duty Vehicle Emissions

Light-duty vehicles (e.g., cars, light trucks, SUVs) are the largest source of GHG emissions in the region, at about 35%. Solutions exist to reduce these emissions, including supporting low or zero emission modes of transport (e.g., walking, rolling, biking and public transit), switching to zero emission vehicles, and building complete, compact communities to support reduced driving. The Driving Down Emissions project, which is being undertaken in partnership with TransLink, aims to develop recommendations for policies to reduce GHG emissions from light-duty vehicles, targeting a 65% reduction by 2030, from 2010 levels. Currently, the project team is conducting technical research and analysis of a list of policy options, and researching public attitudes towards those policies. This project advances several actions in the Transportation Roadmap.

### Regional Electric Vehicle Charging Strategy and Guidance Document

This project aims to determine what electric vehicle (EV) charging infrastructure is needed in the Metro Vancouver region to support charging needs for the rapid uptake of light-duty EVs over the next 30 years. The final deliverable for this project will be a publicly available regional EV charging guidance document, as well as regional EV uptake projections. This work will support investments in the regional EV charging network by key EV charging providers including local governments, utilities, private companies, and other governments and public sector organizations by developing recommendations and guidance on charging locations, costs, and policy. The project is being undertaken in partnership with BC Hydro and TransLink.

### Transition the Corporate Fleet to Zero Emissions

Metro Vancouver Fleet Climate Action Strategy will support a goal of transitioning Metro Vancouver's corporate on-road fleet to use only zero emission or low carbon fuels between 2035 and 2040, and to be fully zero emission by 2050. In 2022, progress included the acquisition of 10 EV pickup trucks and cargo vans; deployment of fleet EV charging infrastructure at our facilities, continuing to conduct a feasibility studies for EV infrastructure upgrades, and assessing the use of renewable fuels for Fleet vehicles. From 2016 to 2021, the size of the corporate fleet increased by 13% while the percentage of vehicles fueled only by fossil fuels decreased by 7%. Total emissions from the corporate fleet decreased by 14% during this time.

### Key Performance Indicators

6.3 million tonnes $tCO_2e$ – total annual regional GHG emissions from on-road vehicles (2022)

22.5% – new passenger vehicles sold in region that are electric (2022)

2,177 publicly available EV Chargers in region[5] (cumulative as of 2023)

68 – Annual public transit journeys per capita in region (2022)

2,349 $tCO_2e$- total corporate GHG emissions from vehicles (2021). Note: 2022 data forthcoming in 2023

5 Cumulative regional total as of June 2023: 2,177 EV chargers; includes 1,904 level 2 chargers and 273 DCFC (Fast Chargers).

## 2022/2023 Implementation:

| | |
|---|---|
| Complete | 0 |
| In Progress | 11 |
| Not Started | 21 |
| Planned for Future Years | 4 |

# Energy

Energy will help shape our low-carbon future through reduced energy use, enhanced energy efficiency and transitioning to clean, renewable energy.

### *Climate 2050* Roadmap Development:

Final ***Climate 2050* Energy Roadmap** endorsed by the Metro Vancouver Board in April 2023.

| | IN-PROGRESS & COMPLETE ACTIONS | STATUS |
|---|---|---|
| | Regional Climate Action in Energy Utility Regulatory Processes | In progress |
| | Implement Tracking, Verification, and Reporting Requirements for Renewable Natural Gas Supply | In progress |
| Corporate LEADERSHIP | Transition Corporate Energy Use to 100% Clean, Renewable Energy | In progress |
| BIG Move | Electrification Rates | In progress |
| | High Performance Heating and Cooling Equipment Import and Sale Standards | In progress |
| BIG Move | More Stringent Low Carbon Fuel Standards | In progress |
| | Regional Hydrogen Hub | In progress |
| | Regional Sources of Liquid Biofuels | In progress |
| Corporate LEADERSHIP | Metro Vancouver as a Regional Clean, Renewable Energy Provider | In progress |
| Corporate LEADERSHIP | Innovative Research on Optimizing Energy Recovery from Waste Streams | In progress |
| | Eliminate Subsidies and Public Financing for Fossil Fuels | In progress |

Lulu Island Renewable Natural Gas Facility

## 2022/2023 Project Highlights

### Participating in Energy Utility Regulatory Processes

Metro Vancouver is participating as an intervener in three BC Utilities Commission proceedings related to renewable natural gas rate design and FortisBC's long term gas resource plan, and BC Hydro's Integrated Resource Plan. These proceedings will have a significant role in guiding the transition away from fossil natural gas, and planning for the transition to clean, renewable sources of energy.

### Metro Vancouver as a Regional Clean, Renewable Energy Provider

Metro Vancouver is developing a **Waste-to-Energy Facility District Energy system** to supply heat and hot water to up to 30,000 homes in Vancouver, Burnaby and potentially New Westminster. As of 2023, Metro Vancouver is in the early design phase of this project. Construction is expected to take place from 2024 to 2026, in multiple phases. See more on this initiative in the Waste Roadmap section of this report.

### Turning Wastewater into Renewable Natural Gas

Metro Vancouver's wastewater treatment plants produce biogas as part of their treatment processes. Biogas is a valuable resource that can be used instead of conventional natural gas, reducing greenhouse gas emissions. See more on this initiative in the Water and Wastewater Infrastructure Roadmap section of this report.

### Using Sewage for Heating and Cooling

There is enough excess heat in Metro Vancouver's wastewater to heat about 700 high rises. Recovering heat from sewage can provide renewable, fossil fuel-free heat to residents and businesses in the region, reducing greenhouse gas emissions. Several projects to recover heat from wastewater are currently under design or in construction:

- The new North Shore wastewater treatment plant, currently under construction, will recover 5 MW of heat and sell it to the nearby Lonsdale Energy Corporation, which is owned by the City of North Vancouver.
- In Richmond, a project is being designed to recover heat that can be used by residents and businesses in the Richmond Oval area.
- Metro Vancouver is helping to invest in fund a project within the City of New Westminster that will recover heat and use it at the Royal Columbia Hospital and in the Sapperton District.
- In Surrey, Metro Vancouver is also investing in a project that will recover heat to service the expansion of district energy in Surrey City Centre.
- The Effluent Heat for RNG project at Lulu Island wastewater treatment plant, currently in detailed design, will utilize heat pump technology to recover heat from the Plant's effluent which will be used for process heating, thus allowing additional quantities of biogas to be cleaned and sold to FortisBC.

### Preliminary Feasibility Study of Green Hydrogen Production from Hydropower at Cleveland Dam

In 2023, Metro Vancouver initiated a project to assess the feasibility of producing hydrogen from electrolysis at the Cleveland Dam, located in the Capilano watershed. The project will also explore the market potential for green hydrogen in the region.

## Key Performance Indicators

KPI's for this issue area are under consideration for future reporting. This might include clean energy provided by Metro Vancouver to the region (MW).

## 2022/2023 Implementation:

| | |
|---|---|
| Complete | 1 |
| In Progress | 5 |
| Not Started | 10 |
| Planned for Future Years | 12 |

# Industry & Business

Industry will help shape our low-carbon future by reducing emissions with better technology, using clean and renewable energy, and setting high standards for products and their manufacturing processes

## *Climate 2050* Roadmap Development:

***Climate 2050* Industry & Business Roadmap** endorsed by Metro Vancouver Board in June 2023.

| IN-PROGRESS & COMPLETE ACTIONS | STATUS |
|---|---|
| Tighten Emissions Regulation for Non-Road Diesel Engines | Complete |
| Integrate Greenhouse Gases into Emission Regulations and Permits | In progress |
| Develop Sector-Specific Regulations | In progress |
| Emission Standards for New Non-Road Equipment | In progress |
| Encourage Cleaner Non-Road Equipment through Municipal Approvals | In progress |
| Carbon Capture in Metro Vancouver Region | In progress |

## 2022/2023 Project Highlights

### Tighten Emissions Regulation for Non-Road Diesel Engines

Diesel particulate matter (DPM) contributes to climate change and reduced visibility and is associated with both short and long-term health effects, including asthma, heart and respiratory diseases and cancer. To further reduce DPM emissions and address harmful nitrogen oxides (NOx) produced by all tiers of non-road diesel engines, in October 2021 the Metro Vancouver Board adopted MVRD Non-Road Diesel Engine Emission Regulation Bylaw No. 1329. The new Bylaw includes provisions to eliminate operation of Tier 0 and Tier 1 engines within 100 meters of hospitals, elementary schools, and other community care facilities, and includes registration and labelling requirements for Tier 2, 3, and 4 non-road diesel engines, starting in 2023.

### Assessment of Carbon Capture Technology in the Metro Vancouver Region

Industrial facilities contribute approximately 17% of the 15 million tonnes of greenhouse gas emissions in the Metro Vancouver region, next to buildings and transportation emissions. With support from the Government of BC, UBC Clean Energy Research Center, and Metro Vancouver's Solid Waste Services, this project aims to evaluate technological approaches for capturing carbon dioxide ($CO_2$) from flue gas streams in large industrial facilities in the region, and storing the collected $CO_2$ in a way that prevents its release into the atmosphere. The project involves assessing carbon capture, utilization, and storage (CCUS) systems that may play a role in decarbonizing industrial sources of $CO_2$ emissions in the region. It also includes identifying risks and opportunities as well as a review of the policy and regulatory landscape associated with CCUS that may be relevant to the region.

Kennedy Newton Water Main Construction

**Lights, Camera, Climate Action!**

This project aims to explore alternative solutions to portable diesel generators which are extensively used in the film industry, with the aims of reducing GHG emissions, improving air quality, and reducing ambient noise while continuing to meet film production needs. The initial phase of the project includes a report that makes several recommendations for Metro Vancouver and member jurisdictions to promote the use of clean power alternatives. A second phase of the project will include the installation of a permanent clean power kiosk at a Metro Vancouver regional park site to demonstrate the benefits of clean power use by the film industry.

## Key Performance Indicators

Total regional emissions from industrial sector in 2022 ($tCO_2e$) – Data forthcoming in 2023

## 2022/2023 Implementation:

| | |
|---|---|
| Complete | 0 |
| In Progress | 24 |
| Not Started | 2 |
| Planned for Future Years | 5 |

# Nature & Ecosystems

Nature and ecosystems will help shape our low-carbon future by capturing carbon, cooling our streets, and enhancing livability.

## *Climate 2050* Roadmap Development:

***Climate 2050* Nature & Ecosystems Roadmap** endorsed by Metro Vancouver Board in June 2023.

| IN-PROGRESS & COMPLETE ACTIONS | STATUS |
|---|---|
| Protect an Additional 10% of the Region for Nature | In progress |
| Protect, Restore, and Enhance Natural Areas at the Regional Scale | In progress |
| Protect, Restore, and Enhance Nature at the Local Scale | In progress |
| Support Ecosystem Protection, Enhancement, and Restoration | In progress |
| Manage invasive species | In progress |
| Develop a Regional Green Infrastructure Network | In progress |
| Green Urban Areas | In progress |
| Green the Regional Greenways Network | In progress |
| Minimize Ecosystem Fragmentation | In progress |
| Develop Data and Resources to Support Ecosystem Connectivity | In progress |
| Incorporate Natural Assets into Asset Management and Financial Planning | In progress |
| Integrate Ecosystems and their Services into the Design of Major Infrastructure | In progress |
| Consider Ecosystems and their Services in Major Development Decisions | In progress |
| Support Natural Asset Management at the Local Level | In progress |
| Achieve 40% Tree Canopy Cover Within the Region's Urban Areas | In progress |
| Provide Data and Resources to Support Urban Forest Management | In progress |
| Improve Local Regulations and Management Practices | In progress |
| Convene Partners on Urban Forestry Issues | In progress |
| Consider Equity and Human Health in Urban Forestry Planning | In progress |
| Explore Innovative Funding and Incentive Programs | In progress |

| | |
|---|---|
| Support the Implementation of Nature-based Solutions | In progress |
| Manage Forests in the Context of a Changing Climate | In progress |
| Advance Nature-Based Solutions to Address Flood Hazards | In progress |
| Partner with Others to Address Climate Change Issues in Coastal and Marine Ecosystems | In progress |

## 2022/2023 Project Highlights

### Develop a Regional Green Infrastructure Network

To support the implementation of Metro 2050, Metro Vancouver is collaboratively planning for a regional green infrastructure network, a network of habitat hubs and corridors that supports the movement of species across the landscape, maximizes resilience, biodiversity and human health benefits. Key work streams will include First Nations engagement, collaborative network identification, mapping, research and design, and the development of Metro 2050 guidelines to support member jurisdictions in implementation the network.

### Provide Data and Resources to Support Urban Forest Management

To support member jurisdictions in identifying and achieving local tree canopy cover targets, Metro Vancouver is updating the regional tree canopy cover and impervious surfaces database. Work is also underway to update the Metro Vancouver Tree Regulations Toolkit, which provides regulatory guidance and best practices for member jurisdictions to retain trees and increase tree canopy cover. The update will provide information on the land-use-focused sections of the document.

### Protect, Restore, and Enhance Natural Areas at the Regional Scale

In 2022, Metro Vancouver protected over 21 hectares of new regional parkland, resulting in over 7,300 Tonnes $CO_2e$ of avoided emissions as a result of newly protected forested land. In 2023, Metro Vancouver completed the acquisition of 97 hectares of land at Cape Roger Curtis on Bowen Island for the purpose of establishing a new regional park. The proposed park would preserve a large area of ecologically important and sensitive forest and dry coastal bluff ecosystem and provide opportunities for residents of the region and the Bowen Island community to connect with nature. Protecting these ecosystems also results in over 40,000 tonnes $CO_2e$ of avoided emissions.

In 2022, Metro Vancouver implemented 27 restoration projects in 15 regional parks including riparian and wetland enhancement at Crippen, Capilano River, and ƛ̓éxətəm (pronounced tla-hut-um) regional parks, coastline restoration and wetland habitat creation at Pacific Spirit Regional Park, and dune protection at Boundary Bay Regional Park. In total, over 11,765 native trees and plants were planted in regional parks in 2022.

### Burns Bog Ecological Restoration

In partnership with the City of Delta, Metro Vancouver has been working to restore the Burns Bog Ecological Conservation Area (BBECA) to its former condition as an open heath raised bog ecosystem, after decades of industrial peat extraction and human disturbance. The BBECA is a globally significant bog ecosystem, and an important carbon sink in the region. The main objective of the restoration work is to raise the water table to be similar to typical healthy bog conditions. This work includes blockage of drainage ditches, construction of peat berms along unpaved service roads, and tree and seedling removal, and monitoring of water levels utilizing a network of piezometers to observe and quantify the effectiveness of measures taken. Since measurement of GHG emissions reductions started in 2008, restoration of the Bog has led to over 120,000 tonnes $CO_2e$ of avoided emissions.

### Key Performance Indicators:

21 – hectares protected for regional parkland by Metro Vancouver in 2022

32% – proportion of region/urban containment boundary with tree canopy cover

11,765 – native trees and plants planted in regional parks in 2022, to support restoration work

# Agriculture

Agriculture will help shape our low-carbon future by using clean and renewable energy and using regenerative farming practices. We all need to protect agricultural land for future food production and carbon storage.

## *Climate 2050* Roadmap Development:

**Draft *Climate 2050* Agriculture Roadmap** published October 2021.

## 2022/2023 Project Highlights – Action While Planning:

**Ecosystem Services on Agricultural Lands Study**

A study was conducted to identify ecosystem types on agricultural land and determine the benefits residents and the agricultural community receive from them. The study also examined ways in which the region can continue to benefit from these ecosystem services in the long-run including through policy and regulation and through a payment for ecosystem services program. The study was completed in January 2023, endorsed by the Board in May, and is now proceeding to a white paper phase to support additional research of the study's final recommendations.

**Protecting and Strengthening the resilience of Agricultural Land in Metro 2050**

Adopted by the MVRD Board in February 2023, Metro 2050, the regional growth strategy, supports the on-going protection of agricultural land in the region to ensure the on-going viability and resilience of farming within Metro Vancouver. It includes policies to prioritize the protection of farm land for food production, encourage land management practices that reduce GHG emissions, maintain ecosystem services from agricultural land, and support climate change adaptation and resilience.

**Agricultural Land Use Inventory (ALUI)**

The most comprehensive land use analysis for agriculture in the region. The ALUI is completed every five years, in partnership with the Ministry of Agriculture, and identifies changes in use including crop types, construction, and natural areas. The ALUI is an invaluable data source that is used to prepare agriculture land protection policies and used to determine sector diversification. The ALUI has been under preparation since 2022 and is expected to be completed by end of 2023.

Westham Island, Delta

**Agricultural Industry Efforts Showcase**

Many stakeholders and participants in the agriculture sector are engaged in direct action that helps to reduce agriculture-sourced GHG emissions, increase resilience and transition farming to the next generation. Some of these efforts are highlighted as follows:

- **Dairy Farmers of Canada Net-Zero by 2050 Campaign** – actions initiated by this association are also reflected in the actions within the Roadmap including expanding the use of anaerobic digestions, reducing methane outputs from animals, and implementing cover crop use.
- **Young Agrarians** – supports a BC land matching program that connects agricultural land owners with farmers looking for land helping to reduce the high and costly barrier new farmers experience trying to access land for farming in the region.
- **Farmland Advantage and Delta Farm & Wildlife Trust** – provide support to the farming community by restoring ecosystems, creating projects that use cover crops, and providing payment for ecosystem services programs. These programs work directly with the farming community to increase their resilience against the impacts of climate change such as increased flooding and a reduction in pollinators.

## Key Performance Indicators:

Total regional emissions from agricultural sector in 2022 ($tCO_2e$) – Data forthcoming in 2023

# Water and Wastewater Infrastructure

Water and wastewater infrastructure will help shape our low-carbon future by protecting and conserving water resources, generating low-carbon energy, and planning for resilience across the region.

## *Climate 2050* Roadmap Development:

***Climate 2050* Water & Wastewater Discussion Paper** approved for engagement in January 2021.
Draft Roadmap under development in 2023.

Metro Vancouver takes an "action while planning" approach, implementing actions to reduce greenhouse gas emissions and increase resilience, while progressing development of the roadmaps. Development of the roadmaps is being coordinated with ongoing updates to the Drinking Water and Integrated Liquid Waste Management Plans, which are the overarching strategic plans for the regional water and wastewater utilities.

## 2022/2023 Project Highlights – Action While Planning:

### Using Sewage for Heating and Cooling

There is enough excess heat in Metro Vancouver's wastewater to heat about 700 high rises. Recovering heat from sewage can provide renewable, fossil fuel-free heat to residents and businesses in the region, reducing greenhouse gas emissions. Several projects to recover heat from wastewater are currently under design or in construction:

- The new North Shore wastewater treatment plant, currently under construction, will recover 5 MW of heat and sell it to the nearby Lonsdale Energy Corporation, which is owned by the City of North Vancouver.
- In Richmond, a project is being designed to recover heat that can be used by residents and businesses in the Richmond Oval area.
- Metro Vancouver is helping to invest in fund a project within the City of New Westminster that will recover heat and use it at the Royal Columbia Hospital and in the Sapperton District.
- In Surrey, Metro Vancouver is also investing in a project that will recover heat to service the expansion of district energy in Surrey City Centre.
- The Effluent Heat for RNG project at Lulu Island wastewater treatment plant, currently in detailed design, will utilize heat pump technology to recover heat from the Plant's effluent which will be used for process heating, thus allowing additional quantitiesof biogas to be cleaned and sold to FortisBC.

### Turning Wastewater into Renewable Natural Gas

Metro Vancouver's wastewater treatment plants produce biogas as part of their treatment processes. Biogas is a valuable resource that can be used instead of conventional natural gas, reducing greenhouse gas emissions. Biogas is currently used at our wastewater treatment plants in a range of ways:

- At the Annacis Island and Iona Wastewater Treatment Plants, the biogas is used to produce both heat and electricity ("co-generation") that is used at the plants. The new North Shore Wastewater Treatment Plant will do this as well.
- At the Lulu Island Wastewater Treatment plant, the biogas is used to generate all plant heating needs. A facility was installed at the Lulu Island Wastewater Treatment Plant in 2021 to clean up excess biogas and sell the resulting renewable natural gas to Fortis BC.
- Metro Vancouver is assessing how best to use the biogas at its other facilities, including the upgraded Northwest Langley and Iona Island Wastewater Treatment Plants.

Snowpack Monitoring

### Hydrothermal Liquefaction to Produce Low-Carbon Fuels from Wastewater

In 2022, detailed design progressed for the world's first hydrothermal liquefaction facility to process sewage sludge at Metro Vancouver's Annacis Island Wastewater Treatment Plant. Hydrothermal liquefaction uses temperature and pressure to convert wastewater sludge into biocrude, which can be refined into low-carbon transportation fuels. The biocrude from the demonstration facility will be sent to project partner Parkland's nearby refinery for processing.

### Next Generation Snowpack Monitoring – Phase 3

This project involves reviewing and applying new technologies to measure snow in the watersheds and quantify the amount of stored water in the seasonal snowpack. Metro Vancouver has historically used helicopters to transport crews to manually collect snowpack measurements throughout the year. This involves flying to three sites at least eight times per year. This project aims to reduce Water Service's GHG emissions by replacing the conventional fossil fuel-intensive methods historically used to complete the snowpack monitoring with new technologies such as satellite imagery and machine learning/artificial intelligence algorithms.

### Hydrodynamic Modelling of Sewer Outflows

Building on previous hydrodynamic models generated for the Burrard Inlet and the Fraser River, modelling will be performed to evaluate potential management options for the region's sewer network to reduce environmental and human health impacts of storm events on regional wastewater management. Options such as opening and closing of storm gates will be tested within the model, improve the region's storm and flooding resilience.

### Biorock for Shore Protection, Habitat Creation and Carbon Sequestration

Biorock is an innovative underwater building material formed by running a mild electric current through a submerged metal frame, which causes naturally occurring ingredients in sea water to accumulate a concrete-like material. In 2022, Metro Vancouver began to evaluate the feasibility of using biorock for shore protection, habitat creation and carbon sequestration near our coastal infrastructure.

### Climate Change Monitoring

Metro Vancouver manages a robust climate monitoring network with streamflow and snowpack datasets dating back to the early 1900s. Monitoring conditions in the water supply areas, including the use of remote sensing tools such as satellites and aerial LiDAR surveys, tells a clear story of how our climate is rapidly changing, presenting increasing challenges for the utilities in drought, fire conditions, record high temperatures and extreme precipitation events.

### Pilot Digestion Optimization Facility to Improve Biogas Production

The recently commissioned Pilot Digestion Optimization Facility at the Lulu Island Wastewater Treatment Plant consists of three small digesters that allow testing of different operating parameters for improving biogas production without disrupting the plant's full-scale digesters. The facility's modular design also allows pilot testing of emerging technologies including Metro Vancouver's patented SEED Reactor, which promotes the growth of specific microbes to produce additional biomethane that can be used as renewable natural gas. In addition, this facility will test the production of green hydrogen from ammonia in wastewater effluent.

## Key Performance Indicators:

8,339 $tCO_2e$- Total corporate energy-related GHG emissions from Liquid Waste Services (2021)

2,074 $tCO_2e$- Total corporate energy-related GHG emissions from Water Services (2021)

Note: 2022 data forthcoming in 2023.

# Waste

Waste management will help shape our low-carbon future by reducing and diverting waste, promoting a circular economy, and generating low-carbon energy.

## *Climate 2050* Roadmap Development:

***Climate 2050* Waste Discussion Paper** approved for engagement in June 2020.
Draft Roadmap under development

Metro Vancouver takes an "action while planning" approach, implementing actions to reduce greenhouse gas emissions and increase resilience, while progressing development of the Roadmaps.

## 2022/2023 Project Highlights – Action While Planning:

**Opened two new Recycling and Waste Centres in Surrey and Coquitlam**

In 2022, Metro Vancouver opened the Central Surrey and the United Boulevard Recycling and Waste Centres. These facilities will make waste management and recycling more convenient for residents and play an important role in achieving the region's waste reduction goals. The new facilities use energy efficient lighting and heating systems, and offer electric vehicle charging opportunities on-site. The Central Surrey Recycling and Waste Centre will reduce travel distances by about two million kilometers per year and in turn reduce greenhouse gas emissions by about 500 tonnes $CO_2e$.

**Waste-to-Energy District Energy System**

Metro Vancouver is developing a Waste-to-Energy Facility District Energy system to supply heat and hot water to up to 30,000 homes in Vancouver, Burnaby and potentially New Westminster. Metro Vancouver is in the early design phase of this project. Construction is expected to take place from 2024 to 2026, in multiple phases. The first phase will be the construction of an approximately 6 km heat transmission piping system from the Waste-to-Energy Facility to the River District community in Vancouver. The energy centre and piping systems will be sized to support future district energy systems in Burnaby and potentially other municipalities.

**Coquitlam Landfill Gas Capture**

Since 2012, Metro Vancouver has implemented a project to capture and reduce methane emissions from the closed Coquitlam Landfill, which Metro Vancouver manages. By flaring the captured methane instead of letting it be released to atmosphere, the project reduces greenhouse gas emissions by approximately 1,000 tonnes $CO_2e$ annually.

**Non-Ferrous Metals Recovery**

Metro Vancouver also works to advance the region's zero waste goals, through projects such as the Non-Ferrous Metals Recovery project at the Waste-to-Energy Facility. The project uses magnetic separators and an eddy current separator to recover valuable non-ferrous metals such as aluminum and copper from bottom ash collected at the Waste-to-Energy Facility. Greenhouse gas emissions are reduced by allowing these materials to stay in use. In 2022, this project recovered 286 tonnes of non-ferrous metals.

Central Surrey Recycling and Waste Centre

### Construction and Demolition Waste Reduction and Recycling Toolkit

In 2021, about a third of the 1.3 million tonnes of waste disposed in the region came from the construction and demolition sector. 79% percent of the construction and demolition waste generated is recycled. With the recently updated Construction and Demolition Waste Reduction and Recycling Toolkit, Metro Vancouver is helping boost reuse and recycling of building materials such as wood. This toolkit provides practical information for contractors, designers and homeowners on the reuse and recycling of building materials, including a contact directory of service providers and facilities. It also highlights the benefits of alternative demolition methods such as home relocation and deconstruction, which can salvage and redistribute up to 95% of building materials for reuse or recycling. Almost 50% of the carbon emissions of new construction are embodied carbon while the other half is operational carbon. Restoration, reuse and salvage could play a big part in reducing embodied carbon from buildings.

## Key Performance Indicators:

2,351,848 tonnes of waste diverted from landfill in the region (2021) [6]

79% – Diversion rate of construction and demolition waste in the region (2021) [6]

70,383 tonnes of reduced $CO_2e$ emissions in 2022 as a result of municipal household organic waste programs in the region

160,150 MWh of electricity generated at Waste to Energy Facility in 2022

10,685 $tCO_2e$ - total corporate energy-related GHG emissions from Solid Waste Services (2021). Note: 2022 data forthcoming in 2023.

6 **Metro Vancouver Recycling and Solid Waste Management 2021 Report**

# Human Health & Well-Being

Anticipating and preparing for climate change impacts including storms, flooding, heat waves, and wildfires, protects our health and safety.

## *Climate 2050* Roadmap Development:

*Climate 2050 Human Health & Wellbeing Roadmap* under development in 2023.

Metro Vancouver takes an "action while planning" approach, implementing actions to reduce greenhouse gas emissions and increase resilience, while progressing development of the Roadmaps.

## 2022/2023 Project Highlights – Action While Planning:

**Expand the Network of Public Buildings that can serve as Cool, Clean Air Centres**

To prepare for and respond to the increased risk of extreme heat and air quality events in the region, Metro Vancouver is working to develop a guidance document for municipalities to identify, select, implement, and expand availability to cooler and cleaner air centres in their communities to protect residents during these events with a focus on vulnerable and equity-denied residents.

**Improved Climate Resilience of Metro Vancouver Housing buildings**

Completed full building envelope renewals in 2022 to Metro Vancouver Housing (MVH) buildings, including improvements to building insulation, and addition of electric air-source heat pumps to provide heating and cooling. These upgrades lead to reduced GHG emissions of up to 51%, and are important for health & well-being as we anticipate more extreme heat events in the region.

### Key Performance Indicators:

22 Air Quality Advisory Days in Fraser Valley Airshed (2022)

Coneflowers in Urban Garden

# Land Use & Urban Form

The location of new homes and businesses strongly influences both GHG emissions and exposure to risks associated with climate change.

## *Climate 2050* Roadmap Development:

*Climate 2050 Land Use & Urban Form Roadmap* under development in 2023. Metro Vancouver takes an "action while planning" approach, implementing actions to reduce greenhouse gas emissions and increase resilience, while progressing development of the Roadmaps. ***Metro 2050*** is the regional growth strategy and the primary land use plan for the region, and is supported by *Climate 2050*.

## 2022/2023 Project Highlights – Action While Planning:

**Regional Parking Strategy**

Metro Vancouver is collaborating with TransLink and member jurisdictions to jointly develop a regional parking strategy to right-size the supply of parking, reduce the number of vehicles, and improve efficiency in land use. All of these have greenhouse gas benefits, from the construction stage (using less concrete for underground parking) through to Transportation Demand Management (enabling residents to use active transportation, transit and other alternative modes). The strategy will take the form of guidance to inform municipal parking requirements (e.g. eliminating parking minimums or introducing maximums) and will include complementary on-street parking management approaches. *The Regional Parking Strategy* is identified as an action in the *Transportation Roadmap*, and also supports priorities related to *Land Use and Urban Form*.

**Natural Hazard Data Inventory and Multi-Hazard Mapping**

In 2022, Metro Vancouver developed a Natural Hazard Data Inventory, which provides a high-level desktop analysis of available natural hazard and climate change impact data across the region. This project can inform future work on climate adaptation and resilience, in alignment with the regional growth strategy. In 2023, Metro Vancouver will build on the results of the inventory to develop regional multi-hazard mapping. Metro Vancouver is also working to incorporate natural hazard data into its land use model, which forecasts land use change in the region annually from 2020 to 2050. Incorporating the hazard data into the growth model is a first step in developing the Metro Vancouver Hazard Model, which will be developed in future years.

**Enhancing Climate Policy in Metro 2050**

*Metro 2050*, the updated regional growth strategy, was adopted by the Metro Vancouver Board in February 2023. *Metro 2050* contains stronger climate policy than the previous iteration of the regional growth strategy, including new climate actions throughout each Goal area. Building on this work, Metro Vancouver has initiated a *Metro 2050* Climate Policy Enhancement Study to identify additional opportunities for stronger climate action policies in *Metro 2050*.

### Key Performance Indicators:

98% of Regional growth within the Urban Containment Boundary (2021)

40% of dwelling unit growth in Urban Centres and 27% of dwelling unit growth to frequent transit corridors (2021)

68 – Public transit journeys per capita in region in 2022

King Tide West Vancouver Seawall

# Conclusion

The *Climate 2050 Annual Report 2022/2023* provides an overview of *Climate 2050* Roadmap development and implementation in 2022 and 2023 year-to-date, including updates on key actions and projects that support progress towards the *Climate 2050* objective of a carbon neutral, resilient region. As work on *Climate 2050* continues to shift from roadmap development to implementation, the Climate 2050 Annual Report will report progress on action implementation along with corporate and regional indicators of progress towards the targets in the various Roadmaps.

The *Climate 2050* Roadmaps reflect current knowledge and technology. Meeting the targets will depend on advancing the actions in the roadmaps as quickly as possible, while continuing to expand and collaborate with partner organizations.

Burnaby Lake Regional Park

**From:** Neville Abbott
**To:** Marina Blagodarov
**Cc:** [redacted]
**Subject:** FW: Easier than Ice Stupas?
**Date:** Friday, October 20, 2023 10:10:35 AM

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Please, add to CAC agenda in correspondence.

**Neville Abbott**
*Councillor*
**The Village of Lions Bay**
Cell: (604) 363-2667

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**From:** Jon Povill [redacted]
**Sent:** Monday, October 2, 2023 10:40 PM
**To:** Neville Abbott <councillor.abbott@lionsbay.ca>; Jaime Cunliffe <councillor.cunliffe@lionsbay.ca>; Greg Weary [redacted] Clara George [redacted]
**Subject:** Easier than Ice Stupas?

Hi all,

Well, maybe not all, but I'm guessing that the four of you are still on the Climate Action Committee and will remember my flirtation with "ice stupa" construction as a way to potentially deal with our water shortage issues during the dry season. This article describes an alternative desalination approach that might be cheap enough to scale up for use by the village. It's solar powered, self-sustaining and doesn't produce a brine sludge requiring removal/disposal. The trickiest issue that occurs to me would be the need to pump the produced water up to our storage tanks. I don't think this solution could provide sufficient water for 100% of the needs of the Village, but I think it could provide a substantial supplement at a relatively low initial cost and almost no ongoing costs once it was installed. Anyway, though I'm no longer on the CAC, the issue of making sure the Village continues to have adequate water supplies through increasingly unpredictable weather cycles remains very important to me, so I thought I'd pass the article along in case any of you wanted to keep up with the technology for potential future application.

All the best,
Jon

**From:** Neville Abbott
**To:** Marina Blagodarov
**Cc:** [redacted]
**Subject:** FW: Rainwater harvesting rebate proposal
**Date:** Friday, October 20, 2023 10:12:00 AM

Please, add to CAC agenda in correspondence.

**Neville Abbott**
*Councillor*
**The Village of Lions Bay**
Cell: (604) 363-2667

**From:** Christine Livingstone [redacted]
**Sent:** Sunday, October 8, 2023 3:42 PM
**To:** Council <council@lionsbay.ca>
**Subject:** Re: Rainwater harvesting rebate proposal

Hi council, I haven't heard back from anyone and would welcome a response.

On Thu, Jun 15, 2023, 7:02 p.m. Christine Livingstone [redacted] wrote:

> Dear Council,
>
> I'd like to propose that Lions Bay implement a modest rebate on rain barrels and rain storage tanks.
>
> Rainwater harvesting reduces stress on stretched water sources, and can help us prevent reversion to "draconian" outdoor water use restrictions - a challenge we all know will only get worse. Using rainwater for plants and gardens reduces average household water use significantly. It also supports the many residents whose quality of life is greatly enhanced by their gardening hobbies.
>
> Benefits to the village of reduced household water use are extensive. It can prevent or mitigate:
> - water shortages
> - increased concentration of pollutants when water levels are low
> - costly expansion of water infrastructure
> - increased energy consumption of pumping and treating water
> - environmental impact of stormwater run-off
>
> Many local districts realize the benefits and are offering similar rebates, including:
> - Sunshine Coast ($1000)
> - Nanaimo ($450)
> - Victoria ($450)
> - Salt Spring ($250)

- Parksville ($50 towards barrels)
- Cranbrook  ($50 towards barrels)

It's not an exhaustive list, but it's clear that amid environmental uncertainty and global warming, having a secondary water source is good for individuals, and good for the village. I look forward to council's response.

Regards,
Christine Livingstone