

**METRO VANCOUVER REGIONAL DISTRICT
CLIMATE ACTION COMMITTEE**

REGULAR MEETING

Friday, September 10, 2021

1:00 p.m.

28th Floor Boardroom, 4730 Kingsway, Burnaby, British Columbia

A G E N D A¹

1. ADOPTION OF THE AGENDA

1.1 September 10, 2021 Regular Meeting Agenda

That the Climate Action Committee adopt the agenda for its regular meeting scheduled for September 10, 2021 as circulated.

2. ADOPTION OF THE MINUTES

2.1 July 16, 2021 Regular Meeting Minutes

That the Climate Action Committee adopt the minutes of its regular meeting held July 16, 2021 as circulated.

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3. DELEGATIONS

3.1 Anna Barford, Canada Shipping Campaigner, Stand.Earth

Subject: Heavy Fuel Oil and Exhaust Gas Cleaning Systems, Air and Water Pollution from Marine Vessels

4. INVITED PRESENTATIONS

4.1 Duncan Wilson, Vice President, Environment, Community and Government Affairs, Vancouver Fraser Port Authority

Subject: Vancouver Fraser Port Authority's Environmental Initiatives

¹ Note: Recommendation is shown under each item, where applicable.

5. REPORTS FROM COMMITTEE OR STAFF

5.1 Metro Vancouver's Clean Air Plan

pg. 11

That the MVRD Board:

- a) approve Metro Vancouver's *Clean Air Plan* as attached to the report dated July 21, 2021, titled "Metro Vancouver's *Clean Air Plan*";
- b) forward the Plan to member jurisdictions, the Provincial Minister of Environment and Climate Change Strategy, Federal Minister of Environment and Climate Change, the region's Chief Medical Health Officers, local First Nations, TransLink, the Vancouver Fraser Port Authority, the Fraser Valley Regional District, and other key partners indicating the Board's continuing interest in working with them to reduce regional greenhouse gas emissions and continuously improve air quality in the Lower Fraser Valley airshed; and
- c) direct staff to continue working with member jurisdictions and other partners to implement the actions in the *Clean Air Plan*.

5.2 2021 Update on Water Sustainability Innovation Fund Projects

pg. 93

That the Climate Action Committee receive for information the report dated July 8, 2021, titled "2021 Update on Water Sustainability Innovation Fund Projects."

5.3 Manager's Report

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That the Climate Action Committee receive for information the report dated August 30, 2021, titled "Manager's Report".

6. INFORMATION ITEMS

7. OTHER BUSINESS

8. BUSINESS ARISING FROM DELEGATIONS

9. RESOLUTION TO CLOSE MEETING

Note: The Committee must state by resolution the basis under section 90 of the Community Charter on which the meeting is being closed. If a member wishes to add an item, the basis must be included below.

10. ADJOURNMENT/CONCLUSION

That the Climate Action Committee adjourn/conclude its regular meeting of September 10, 2021.

Membership:

Carr, Adriane (C) - Vancouver
Dhaliwal, Sav (VC) - Burnaby
Arnason, Petrina - Langley Township
Baird, Ken - Tsawwassen First Nation
Dupont, Laura - Port Coquitlam

Hocking, David - Bowen Island
Kruger, Dylan - Delta
McCutcheon, Jen - Electoral Area A
McIlroy, Jessica - North Vancouver City
McLaughlin, Ron - Lions Bay

Patton, Allison - Surrey
Royer, Zoe - Port Moody
Steves, Harold - Richmond
Yousef, Ahmed - Maple Ridge

**METRO VANCOUVER REGIONAL DISTRICT
CLIMATE ACTION COMMITTEE**

Minutes of the Regular Meeting of the Metro Vancouver Regional District (MVRD) Climate Action Committee held at 1:02 p.m. on Friday, July 16, 2021 in the 28th Floor Boardroom, 4730 Kingsway, Burnaby, British Columbia.

MEMBERS PRESENT:

Chair, Councillor Adriane Carr, Vancouver
 Vice Chair, Councillor Sav Dhaliwal*, Burnaby
 Councillor Petrina Arnason*, Langley Township
 Chief Ken Baird*, Tsawwassen (arrived at 1:02 p.m.)
 Councillor David Hocking*, Bowen Island
 Councillor Jessica McIlroy*, North Vancouver City
 Mayor Ron McLaughlin*, Lions Bay
 Councillor Allison Patton*, Surrey (arrived at 1:04 p.m.)
 Councillor Zoe Royer*, Port Moody
 Councillor Harold Steves*, Richmond
 Councillor Ahmed Yousef*, Maple Ridge

MEMBERS ABSENT:

Councillor Laura Dupont, Port Coquitlam
 Councillor Dylan Kruger, Delta
 Director Jen McCutcheon, Electoral Area A

STAFF PRESENT:

Roger Quan, Director, Air Quality and Climate Change, Parks and Environment
 Katie Karn, Deputy Corporate Officer

1. ADOPTION OF THE AGENDA

1.1 July 16, 2021 Regular Meeting Agenda

It was MOVED and SECONDED

That the Climate Action Committee adopt the agenda for its regular meeting scheduled for July 16, 2021 as circulated.

CARRIED

*denotes electronic meeting participation as authorized by Section 3.6.2 of the *Procedure Bylaw*

2. ADOPTION OF THE MINUTES

2.1 June 11, 2021 Regular Meeting Minutes

It was MOVED and SECONDED

That the Climate Action Committee adopt the minutes of its regular meeting held June 11, 2021 as circulated.

CARRIED

3. DELEGATIONS

No items presented.

4. INVITED PRESENTATIONS

No items presented.

1:02 p.m. Chief Baird arrived at the meeting.

1:04 p.m. Councillor Patton arrived at the meeting.

5. REPORTS FROM COMMITTEE OR STAFF

5.1 Metro Vancouver's Achievement of Carbon Neutrality in 2020

Report dated June 22, 2021 from Nav Hundle, Policy Analyst, Parks and Environment, informing the Climate Action Committee of Metro Vancouver's achievement of carbon neutrality as an organization in 2020, as well as the implications for meeting the goal of a carbon neutral region by 2050.

It was MOVED and SECONDED

That the MVRD Board receive for information the report titled "Metro Vancouver's Achievement of Carbon Neutrality in 2020", dated June 22, 2021.

CARRIED

5.2 Modelling a Carbon Neutral Region: Project Report

Report dated June 24, 2021 from Morgan Braglewicz, Senior Policy and Planning Analyst, Parks and Environment, providing the Climate Action Committee with the final report from the Modelling a Carbon Neutral Region Project.

Members were provided a presentation on the modelling of a carbon neutral region, highlighting Metro Vancouver's target of reducing greenhouse gas emissions by 45% by 2030, and being a carbon neutral region by 2050, and were provided with a summary of the modelling project and its final results, key findings, challenges to deeper emissions reductions, and next steps.

Presentation material titled "Modeling a Carbon Neutral Region" is retained with the July 16, 2021 Climate Action Committee agenda.

It was MOVED and SECONDED

That the Climate Action Committee receive for information the report dated June 24, 2021, titled “Modelling a Carbon Neutral Region: Project Report”.

CARRIED

5.3 Highlights from Engagement on Draft *Clean Air Plan*

Report dated June 24, 2021 from Lucy Duso, Policy Coordinator, External Relations and Laura Taylor, Public Engagement Coordinator, Parks and Environment, providing the Climate Action Committee highlights of the engagement on the draft *Clean Air Plan*, and summarizing feedback received.

Members were provided a presentation on the draft *Clean Air Plan* engagement outcomes highlighting the engagement objectives, audience, overview of engagement events that were held, highlights of feedback on targets, goals and actions, feedback themes and next steps.

Presentation material titled “Draft *Clean Air Plan* Engagement Outcomes” is retained with the July 16, 2021 Climate Action Committee agenda.

It was MOVED and SECONDED

That the Climate Action Committee receive for information the report dated June 24, 2021, titled “Highlights from Engagement on Draft *Clean Air Plan*”.

CARRIED

5.4 2021 Update on Regional District Sustainability Innovation Fund Projects

Report dated May 31, 2021 from Roger Quan, Director, Air Quality and Climate Change and Megan Gerryts, Senior Advisor, Regional Economic Prosperity Service, updating the Climate Action Committee on projects funded under the Regional District Sustainability Innovation Fund.

Members were provided a presentation providing a 2021 update on the Sustainability Innovation Fund Projects, highlighting a review of completed, discontinued, and in-progress projects, as well as additional projects in regional parks, air quality, and housing.

Presentation material titled “2021 Sustainability Innovation Fund Projects” is retained with the July 16, 2021 Climate Action Committee agenda.

It was MOVED and SECONDED

That the Climate Action Committee receive for information the report dated May 31, 2021, titled “2021 Update on Regional District Sustainability Innovation Fund Projects.”

CARRIED

5.5 Proposed Updates to the Sustainability Innovation Fund Policies

Report dated June 25, 2021 from Roger Quan, Director, Air Quality and Climate Change and Megan Gerryts, Senior Advisor, Regional Economic Prosperity Service, seeking MVRD, GVS&DD and GVWD Board approval of revised policies related to Sustainability Innovation Funds for the respective districts.

It was MOVED and SECONDED

That the MVRD Board approve the proposed updates to the Regional District Sustainability Innovation Fund as presented in the report dated June 25, 2021, titled “Proposed Updates to the Sustainability Innovation Fund Policies”;

That the GVS&DD Board approve the proposed updates to the Liquid Waste Sustainability Innovation Fund as presented in the report dated June 25, 2021, titled “Proposed Updates to the Sustainability Innovation Fund Policies”; and

That the GVWD Board approve the proposed updates to the Water Sustainability Innovation Fund as presented in the report dated June 25, 2021, titled “Proposed Updates to the Sustainability Innovation Fund Policies”.

CARRIED

5.6 Next Phase of Engagement on a Cannabis Production and Processing Emission Regulation

Report dated June 22, 2021 from Arvind Saraswat, Senior Project Engineer, Esther Bérubé, Division Manager, Air Quality Bylaw and Regulation Development, and Laura Taylor, Public Engagement Coordinator, Parks and Environment, presenting feedback received during additional engagement on the proposed approach to regulate air emissions from cannabis production and processing, and seeking MVRD Board authorization to proceed with the next phase of engagement.

Members were provided a presentation on managing emissions from cannabis production and processing, highlighting health and environmental impacts, the regulation development process, modifications based on engagement, scope of the proposed regulation, and requirements, which include an Emission Management Plan, emission control requirements, and a Complaints and Officer Observation Response Plan.

Presentation material titled “Managing Emissions from Cannabis Projection and Processing” is retained with the July 16, 2021 Climate Action Committee agenda.

It was MOVED and SECONDED

That the MVRD Board authorize staff to proceed with the next phase of engagement on the proposed approach to regulating air emissions from cannabis production and processing using the draft discussion paper attached to the report titled “Next Phase of Engagement on a Cannabis Production and Processing Emission Regulation”, dated June 22, 2021.

CARRIED

5.7 Lower Fraser Valley Ambient Air Quality Monitoring Network Review 2021

Report dated June 22, 2021 from Ken Reid, Superintendent, Environmental Sampling and Monitoring and Kyle Howe, Air Quality Analyst, Parks and Environment, providing the Climate Action Committee with the findings of a consultant study, the Lower Fraser Valley Ambient Air Quality Monitoring Network Review, and outlining the future directions for the network and Metro Vancouver’s air quality monitoring capabilities.

It was MOVED and SECONDED

That the Climate Action Committee receive for information the report dated June 22, 2021, titled “Lower Fraser Valley Ambient Air Quality Monitoring Network Review 2021”.

CARRIED

5.8 Old Growth in the Metro Vancouver Region

Report dated June 29, 2021 from Roger Quan, Director, Air Quality and Climate Change and Neal Carley, General Manager, Parks and Environment, providing the Climate Action Committee with information on old growth forest within the Metro Vancouver region, and actions and initiatives to track and conserve old growth and associated climate benefits within the region.

It was MOVED and SECONDED

That the Climate Action Committee receive for information the report dated June 29, 2021, titled “Old Growth in the Metro Vancouver Region”, and refer the matter to the Mayors Committee for further assessment of advocacy on the part of Metro Vancouver, and the implications of the Metro Vancouver organization taking a position of opposition to old growth logging.

CARRIED

5.9 Board Appointment of Enforcement Officers

Report dated June 18, 2021 from Kathy Preston, Program Manager, Environmental Regulation and Enforcement, Parks and Environment, seeking the MVRD Board to appoint Metro Vancouver employees as Board-designated officers pursuant to the *Greater Vancouver Regional District Air Quality Management Bylaw 1082, 2008* and the *Environmental Management Act*.

It was MOVED and SECONDED

That the MVRD Board:

- a) pursuant to the *Greater Vancouver Regional District Air Quality Management Bylaw 1082, 2008* and the *Environmental Management Act*:
 - i. appoint Metro Vancouver employees Eugene Lee and Rei Van as officers;
and
- b) pursuant to section 28 of the *Offence Act*:
 - i. appoint Metro Vancouver employees Eugene Lee and Rei Van for the purpose of serving summons under section 28 of the *Offence Act* for

alleged violations under the *Greater Vancouver Regional District Air Quality Management Bylaw 1082, 2008*.

CARRIED

5.10 Manager's Report

Report dated July 5, 2021 from Roger Quan, Director, Air Quality and Climate Change, Parks and Environment, updating the Climate Action Committee on: the Committee's 2021 Work Plan; developing an approach to setting greenhouse gas emissions limits for existing large buildings in Metro Vancouver; BC Lung Association State of the Air 2021 Report; provincial air quality objectives for nitrogen dioxide; ground-level ozone air quality advisory during June heat wave; and Metro Vancouver's 2021 PNE activation "Together We Make Our Region Strong".

It was MOVED and SECONDED

That the Climate Action Committee receive for information the report dated July 5, 2021, titled "Manager's Report".

CARRIED

6. INFORMATION ITEMS

6.1 Correspondence dated June 7, 2021 addressed to Sav Dhaliwal, Metro Vancouver Board, from Bruce Ralston, Minister of Energy, Mines and Low Carbon Innovation, Josie Osborne, Minister of Municipal Affairs and George Heyman, Minister of Environment and Climate Change Strategy re Help Cities Lead Campaign

6.2 Report from Edward Nichol, Regional Planner, Regional Planning and Housing Services re Metro Vancouver Tree Regulations Toolkit dated May 14, 2021
Report dated May 14, 2021 from Edward Nichol, Regional Planner, Regional Planning and Housing Services, presented to the Regional Planning Committee at its meeting of June 9, 2021 and the MVRD Board at its meeting of June 25, 2021, regarding the completed Metro Vancouver Tree Regulations Toolkit.

7. OTHER BUSINESS

No items presented.

8. BUSINESS ARISING FROM DELEGATIONS

No items presented.

9. RESOLUTION TO CLOSE MEETING

No items presented.

11. ADJOURNMENT/CONCLUSION

It was MOVED and SECONDED

That the Climate Action Committee conclude its regular meeting of July 16, 2021.

CARRIED

(Time: 2:55 p.m.)

Katie Karn, Deputy Corporate Officer

Adriane Carr, Chair

To: Climate Action Committee

From: John Lindner, Air Quality Planner
Derek Jennejohn, Lead Senior Engineer
Parks and Environment Department

Date: July 21, 2021 Meeting Date: September 10, 2021

Subject: **Metro Vancouver's Clean Air Plan**

RECOMMENDATION

That the MVRD Board:

- a) approve Metro Vancouver's *Clean Air Plan* as attached to the report dated July 21, 2021, titled "Metro Vancouver's *Clean Air Plan*";
- b) forward the Plan to member jurisdictions, the Provincial Minister of Environment and Climate Change Strategy, Federal Minister of Environment and Climate Change, the region's Chief Medical Health Officers, local First Nations, TransLink, the Vancouver Fraser Port Authority, the Fraser Valley Regional District, and other key partners indicating the Board's continuing interest in working with them to reduce regional greenhouse gas emissions and continuously improve air quality in the Lower Fraser Valley airshed; and
- c) direct staff to continue working with member jurisdictions and other partners to implement the actions in the *Clean Air Plan*.

EXECUTIVE SUMMARY

The *Clean Air Plan* is Metro Vancouver's fourth 10 year management plan for regional air quality and greenhouse gas management. The *Clean Air Plan* is strongly linked to *Climate 2050*, Metro Vancouver's 30-year strategic framework for climate action. Urgent action is needed to accelerate greenhouse gas reductions to meet ambitious, science-based climate targets, while continuing to implement policies and programs to improve regional air quality. The Plan is intended to provide deep reductions in regional GHG emissions and yield air quality health benefits estimated at up to \$1.6 billion. It includes 29 foundational Big Moves that need to be started as soon as possible. The Plan is strongly aligned with actions and initiatives of others, and reflects feedback from engagement with residents, businesses and others in 2021. Feedback highlights, which were reported at the Committee's July meeting and considered in finalizing the *Clean Air Plan*, included comments on costs, duplication of other governments' initiatives, collaboration, and the ability of small businesses to adjust. This report seeks approval of the *Clean Air Plan* by the MVRD Board.

PURPOSE

This report presents the *Clean Air Plan*, seeking approval by the MVRD Board. The report also outlines how feedback on the draft *Clean Air Plan* was considered in finalizing the *Clean Air Plan*.

BACKGROUND

Metro Vancouver adopted its first regional air quality management plan in 1994, with subsequent plans adopted in 2005 and 2011. These management plans have guided continuous improvement in

regional air quality, addressing both common air contaminants and greenhouse gases (GHGs). The *Clean Air Plan* is strongly linked with the greenhouse gas actions in a number of the *Climate 2050 Roadmaps*, Metro Vancouver's long-term strategy to address climate change in the region.

At its March 2021 meeting, the Board authorized staff to proceed with engagement on the draft *Clean Air Plan*. The draft Plan was released for feedback from April 1 to June 15, 2021. Staff finalized the *Clean Air Plan* with consideration of the feedback received, and are seeking approval by the Board.

METRO VANCOUVER'S CLEAN AIR PLAN

The *Clean Air Plan* (Attachment 1) is Metro Vancouver's management plan to reduce air contaminant emissions and impacts, including GHGs, in our region over the next 10 years. The Plan has a vision that "Metro Vancouver is a carbon neutral region where residents experience healthy, clean and clear air."

Urgency for Action

The *Clean Air Plan* can help the region achieve deep reductions in GHG emissions. Initial modelling indicates that the Plan's actions could reduce regional GHGs by approximately 2 million tonnes by 2030 (2015 emissions were approximately 15 million tonnes). While significant, this estimated reduction is only one-third of the reduction needed to meet the 2030 target to reduce regional GHG emissions by 45%, relative to 2010 levels. This science-based target has already been adopted by the Board and aligns with the most current science, as summarized by the Intergovernmental Panel on Climate Change, on what is needed to limit global warming to 1.5 degrees Celsius.

Achieving the 2030 GHG target is a significant challenge that our region has committed to tackling. Metro Vancouver will need to use the full extent of its influence and authority, including innovative policy tools, partnering with other agencies and organizations, and may need to explore expanding that authority. Based on the feedback received, Metro Vancouver staff are confident that undertaking the actions in the *Clean Air Plan* represents the region's best chance of meeting the 2030 greenhouse gas target. The actions over the next nine years will evolve through the *Climate 2050 Roadmaps* and be updated in order to achieve the 2030 target. The *Clean Air Plan* also includes two 2030 regional targets on continuously improving air quality and visual air quality, to protect public health and the environment. Using data from Health Canada, the potential health benefits from the *Clean Air Plan* between 2020 and 2030 could be up to \$1.6 billion.

Given that there are only 9 years until 2030, work has already started on the foundational actions (called the "Big Moves") in the Plan, and full implementation of many actions must start as soon as possible. Metro Vancouver and its partners will continue to explore opportunities to further accelerate emission reductions during the detailed planning and implementation of the actions. Additional resources from Metro Vancouver and others will be needed to implement the Plan. Some actions in the *Clean Air Plan* would require public engagement prior to implementation; engagement could consider how benefits, costs and risks are shared between different groups.

Structure and Implementation

The actions in the *Clean Air Plan* will be implemented through Metro Vancouver's regulatory and planning authority, delivery of regional services, and its role as convener of and advocate for issues

of regional significance. The Plan also identifies actions for implementation by other governments and organizations. The GHG actions in the *Clean Air Plan* will also be included in the relevant *Climate 2050 Roadmaps*, such as the *Buildings* and *Transportation Roadmaps*. The guiding principles, goals and targets in the Plan will help guide decisions on implementing actions. The Plan also commits Metro Vancouver to consider equity in actions and work to reduce disproportionate impacts.

Metro Vancouver will work to implement the strategies and actions in the *Clean Air Plan*, reflecting them in annual work plans, budgets and long-term financial planning. Detailed work planning will focus on the priority Big Moves. Progress on achieving the *Clean Air Plan* goals and targets will be publicized through the annual Caring for the Air and air quality monitoring reports, regional emissions inventories, as well as online reporting for both *Metro 2050* and *Climate 2050*.

Big Moves in the *Clean Air Plan*

The *Clean Air Plan* identifies 29 Big Moves, which are foundational actions needed to achieve the goals and targets of the *Clean Air Plan*:

- Transportation:
 - Enhance and improve regional transit
 - Use pricing to reduce driving and emissions
 - Expand active transportation networks
 - Accelerate sales targets for new electric passenger vehicles
 - Develop regional emission requirements for passenger vehicles
 - Make electric vehicles more affordable
 - Regulate existing medium and heavy trucks
 - Require zero emission sales targets for new medium and heavy trucks
 - Accelerate emission reductions from marine vessels
- Buildings:
 - Greenhouse gas performance requirements for existing large buildings
 - Greenhouse gas performance requirements for existing homes and townhomes
 - New buildings are highly efficient and electric
 - Require greenhouse gas reductions during renovations
 - Building electrification mandate for BC Hydro
 - Expand incentives for low carbon upgrades
 - Online decision support tools for low carbon upgrades in buildings
 - Implement requirements for higher emitting wood burning appliances
 - Emission requirements for district energy systems
 - Incorporate embodied emissions into the BC Building Code
- Industry:
 - More stringent greenhouse gas requirements for large industrial emitters
 - Integrate greenhouse gas requirements into emission regulations and permits
 - Implement renewable gas content requirements
 - Tighten emission regulation for non-road diesel engines
 - Regional low carbon procurement
- Agriculture:
 - Reduce emissions from greenhouses
 - Reduce open-air burning

- Cross-cutting:
 - Develop long-term approach to equity in air quality and greenhouse gas management
 - Strengthen relationships with First Nations on air quality issues

CONSIDERING FEEDBACK AND FINALIZING THE *CLEAN AIR PLAN*

Metro Vancouver staff reported on feedback highlights at the July 16, 2021, meeting of the Climate Action Committee. Feedback letters from 23 organizations are included as Reference 1. From the report and letters, the key issues identified during engagement were costs, duplication of other governments' initiatives, collaboration, and ability of small businesses to adjust. Major changes made in finalizing the *Clean Air Plan* include the following:

- Additional context was provided on different **cost considerations for designing policy**, as well as the key benefits and costs for each sector (e.g., lower operating costs for electric vehicles, high purchase cost of electric vehicles and heat pumps).
- Various actions were updated to align with the initiatives being planned or implemented by other governments and agencies. Metro Vancouver staff are meeting with staff from **multiple provincial ministries** to discuss ways to align actions and targets, to avoid duplication with other government initiatives.
- Multiple actions were updated to identify **additional partners for implementation**, based on feedback on the desire for further collaboration (e.g., most industrial facilities who provided feedback want to participate in a regional industrial emissions working group).
- To **better identify the priority actions** for the Plan, the 42 "Major Regional Actions" in the draft *Clean Air Plan* were reduced to 29 Big Moves to highlight more clearly the most important and high impact actions.
- Based on feedback from health authorities, the 2030 regional air quality target was updated to **focus on continuous improvement in air quality**, given evidence that fine particulate matter and other contaminants have no known threshold for safe exposure levels.
- Transportation Strategy 1.2 (on reducing driving) was switched with Transportation Strategy 1.1 (on accelerating vehicle electrification) given the **multiple co-benefits of active transportation and transit**.
- Several new actions were added, including to continue implementation of Metro Vancouver's *Residential Indoor Wood Burning Regulation* and to develop a long-term trucking emissions strategy.

Attachment 2 provides more detail on how feedback was considered in finalizing the *Clean Air Plan*.

ALTERNATIVES

1. That the MVRD Board:
 - a. approve Metro Vancouver's *Clean Air Plan* as attached to the report dated July 21, 2021, titled "Metro Vancouver's *Clean Air Plan*";
 - b. forward the Plan to member jurisdictions, the Provincial Minister of Environment and Climate Change Strategy, Federal Minister of Environment and Climate Change, the region's Chief Medical Health Officers, local First Nations, TransLink, the Vancouver Fraser Port Authority, the Fraser Valley Regional District, and other key partners indicating the Board's continuing interest in working with them to reduce regional greenhouse gas emissions and continuously improve air quality in the Lower Fraser Valley airshed; and

-
- c. direct staff to continue working with member jurisdictions and other partners to implement the actions in the *Clean Air Plan*.
2. That the MVRD Board:
 - a. approve Metro Vancouver's *Clean Air Plan* as attached to the report dated July 21, 2021, titled "Metro Vancouver's *Clean Air Plan*", with the amendments proposed by the Climate Action Committee;
 - b. forward the Plan to member jurisdictions, the Provincial Minister of Environment and Climate Change Strategy, Federal Minister of Environment and Climate Change, the region's Chief Medical Health Officers, local First Nations, TransLink, the Vancouver Fraser Port Authority, the Fraser Valley Regional District, and other key partners indicating the Board's continuing interest in working with them to reduce regional greenhouse gas emissions and continuously improve air quality in the Lower Fraser Valley airshed; and
 - c. direct staff to continue working with member jurisdictions and other partners to implement the actions in the *Clean Air Plan*.
 3. That the MVRD Board receive the report dated July 21, 2021, titled "Metro Vancouver's *Clean Air Plan*" and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

The *Clean Air Plan* was developed under approved budgets. Under Alternative 1, resource and cost implications of the actions in the *Clean Air Plan* will be brought back to the Committee and Board as part of the annual and five-year budgeting and work planning processes. The 2022 annual budget will reflect the initial resource needs to begin implementation of the *Clean Air Plan*. A more detailed financial plan for implementation of the *Clean Air Plan* will be incorporated into the 2023 annual and five-year budgeting process for Board consideration.

CONCLUSION

Metro Vancouver's *Clean Air Plan* helps address the urgent need for regional climate action, while continuing to work to improve regional air quality. The Plan has been updated based on feedback received in 2021. It includes 29 Big Moves covering equity, transportation, buildings, industry, agriculture and health. The *Clean Air Plan* can help the region reduce regional greenhouse gas emissions by approximately 2 million tonnes by 2030 and provide air quality health benefits of up to \$1.6 billion. To achieve 2030 targets, Metro Vancouver needs to start on the Big Moves as soon as possible, using the full extent of its authority, while continuing to explore opportunities to further accelerate emission reductions. Staff recommend Alternative 1, to approve the *Clean Air Plan*.

Attachments

1. *Clean Air Plan*
2. Feedback Considered in Finalizing the *Clean Air Plan*

References

1. [Organization Submissions April to June 2021](#)

Clean Air Plan

2021

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: Katzie, Kwantlen, Kwikwetlem, Matsqui, Musqueam, Qayqayt, Semiahmoo, Squamish, Tsawwassen, and 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.

The goals and targets in Metro Vancouver's air quality and climate-related plans are a science-based priority. The interim target of a 45% reduction in greenhouse gas emissions below 2010 levels by 2030 has a time horizon of less than ten years. Pursuing a carbon neutral region by 2050 requires taking bold action now. The *Clean Air Plan* was prepared in winter 2020/2021, and introduced for public and stakeholder comment during the COVID-19 pandemic. Across the globe, the pandemic response has provided a glimpse of what is possible and what we can achieve with coordinated efforts and common goals.

Executive Summary

The *Clean Air Plan* is Metro Vancouver’s air quality and greenhouse gas management plan. Actions in the Plan will reduce air contaminant emissions and impacts, including greenhouse gases, over the next 10 years, and in doing so support the 30-year commitment to a carbon neutral region by 2050. This management plan also helps improve air quality for the region, to protect human health and the environment.

The *Clean Air Plan* focuses on actions that Metro Vancouver has the authority to implement, and also identifies actions for implementation by others. The Plan targets air contaminants that can harm human health, together with greenhouse gases, as many sources in the region emit both types of air contaminants. The *Clean Air Plan* was developed with input from across the region, and will be implemented through to 2030.

Challenge

Air quality impacts from health-harming air contaminants, such as fine particulate matter and nitrogen dioxide, have significant health costs, and have the most impact on children, the elderly, and residents with underlying health conditions. Climate change is already impacting our health and our environment (e.g., wildfires, heat waves), and those impacts will become more evident in coming years. Climate change and air quality impacts can harm some neighbourhoods, households and individuals more than others.

Metro Vancouver, together with its member jurisdictions, has been taking action on air quality and climate change for more than twenty years.

But governments, businesses and residents must accelerate actions to reduce our contributions to climate change and improve our regional air quality, both of which will protect human health and the environment.



Vision

Metro Vancouver is a carbon neutral region where residents experience healthy, clean and clear air.

Regional 2030 Targets

1. Reduce regional greenhouse gas emissions by 45% from 2010 levels.
2. Air quality in the region is continually improving, protecting human health and the environment, by ensuring that:
 - a. Ambient air quality meets or is better than the ambient air quality objectives and standards that are regularly updated by Metro Vancouver, the BC Government and the Government of Canada; and
 - b. The amount of time that visual air quality is classified as "excellent" is increasing.

The *Clean Air Plan* can help the region achieve deep reductions in regional greenhouse gas emissions. Achieving the 2030 greenhouse gas target is a significant challenge that our region is committed to tackling. The Plan can also help to continue to improve regional air quality, which will reduce the health care costs of health-harming air contaminants, among other benefits.

Guiding Principles

The following principles describe the fundamental values that guide the *Clean Air Plan*.

1. Ambitious
2. Evidence-based
3. Equitable
4. Inclusive & Collaborative
5. Preventative
6. Continuous Improvement
7. Prioritize Co-benefits
8. Dynamic
9. Transparent
10. Comprehensive & Integrated



Transportation

- Enhance and Improve Regional Transit (1.1.1)
- Use Pricing to Reduce Driving and Emissions (1.1.2)
- Expand Active Transportation Networks (1.1.3)
- Accelerate Sales Targets for New Electric Passenger Vehicles (1.2.1)
- Develop Regional Emission Requirements for Passenger Vehicles (1.2.2)
- Make Electric Vehicles More Affordable (1.2.3)
- Regulate Existing Medium and Heavy Trucks (1.3.1)
- Require Zero Emission Sales Targets for New Medium and Heavy Trucks (1.3.2)
- More Stringent Low Carbon Fuel Standards (1.3.3)
- Accelerate Emission Reductions from Marine Vessels (1.4.1)



Industry

- More Stringent Greenhouse Gas Requirements for Large Industrial Emitters (3.1.1)
- Integrate Greenhouse Gas Requirements into Emission Regulations and Permits (3.1.2)
- Implement Renewable Gas Content Requirements (3.1.3)
- Tighten Emission Regulation for Non-road Diesel Engines (3.2.1)
- Regional Low Carbon Procurement (3.3.1)





Buildings

- Greenhouse Gas Performance Requirements for Existing Large Buildings (2.1.1)
- Greenhouse Gas Performance Requirements for Existing Homes and Townhomes (2.1.2)
- New Buildings are Highly Efficient and Electric (2.1.3)
- Require Greenhouse Gas Reductions during Renovations (2.1.4)
- Building Electrification Mandate for BC Hydro (2.1.5)
- Expand Incentives for Low Carbon Upgrades (2.2.1)
- Online Decision Support Tools for Low Carbon Upgrades in Buildings (2.2.2)
- Implement Requirements for Higher Emitting Wood Burning Appliances (2.3.1)
- Emission Requirements for District Energy Systems (2.4.1)
- Incorporate Embodied Emissions into the BC Building Code (2.5.1)



Agriculture

- Reduce Emissions from Greenhouses (4.1.1)
- Reduce Open-Air Burning (4.1.2)



Cross-cutting

- Develop Long-Term Approach to Equity in Air Quality and Greenhouse Gas Management (Equity 1)
- Strengthen Relationships with First Nations on Air Quality Issues (5.1.1)

Issue Area 2030 Targets

Transportation Targets

- Passenger vehicles:
 - 65% reduction in greenhouse gas emissions, from 2010 levels
- Commercial vehicles, rail locomotives, marine vessels and aircraft:
 - 35% reduction in greenhouse gas emissions, from 2010 levels
- Passenger and commercial vehicles, rail locomotives, marine vessels and aircraft:
 - 25% reduction in diesel particulate matter emissions, from 2020 levels
 - 40% reduction in nitrogen oxides emissions, from 2020 levels

Buildings Targets

- All buildings:
 - 35% reduction in greenhouse gas emissions from buildings, from 2010 levels
 - 35% reduction in fine particulate matter emissions from buildings, from 2020 levels
 - 15% reduction in nitrogen oxides emissions from buildings, from 2020 levels
- New buildings:
 - All new buildings are zero emissions in their operations
 - All new buildings produce 40% less embodied emissions from construction



Industry Targets

- Industrial facilities:
 - 35% reduction in greenhouse gas emissions, from 2010 levels
 - 10% reduction in fine particulate matter emissions, from 2020 levels
 - 10% reduction in nitrogen oxides emissions, from 2020 levels
- Non-road equipment:
 - 35% reduction in greenhouse gas emissions, from 2010 levels
 - 50% reduction in diesel particulate matter emissions, from 2020 levels

Agriculture Targets

- 35% reduction in greenhouse gas emissions, from 2010 levels
- 10% reduction in fine particulate matter, from 2020 levels

Measure, Monitor and Regulate Target

- 98% reliability of ambient air quality monitoring network

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Metro Vancouver

Underlined words are key concepts defined in the [Glossary on Page 58](#).

Metro Vancouver is a federation of 21 municipalities, one Electoral Area and one Treaty First Nation, working collaboratively in planning and providing vital utility and local government services to 2.7 million people. Core 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.

Mission

Metro Vancouver’s mission is framed around three broad roles.

1. Serve as a Regional Federation

Serve as the main political forum for discussion of significant community issues at the regional level, and facilitate the collaboration of members in delivering the services best provided at the regional level.

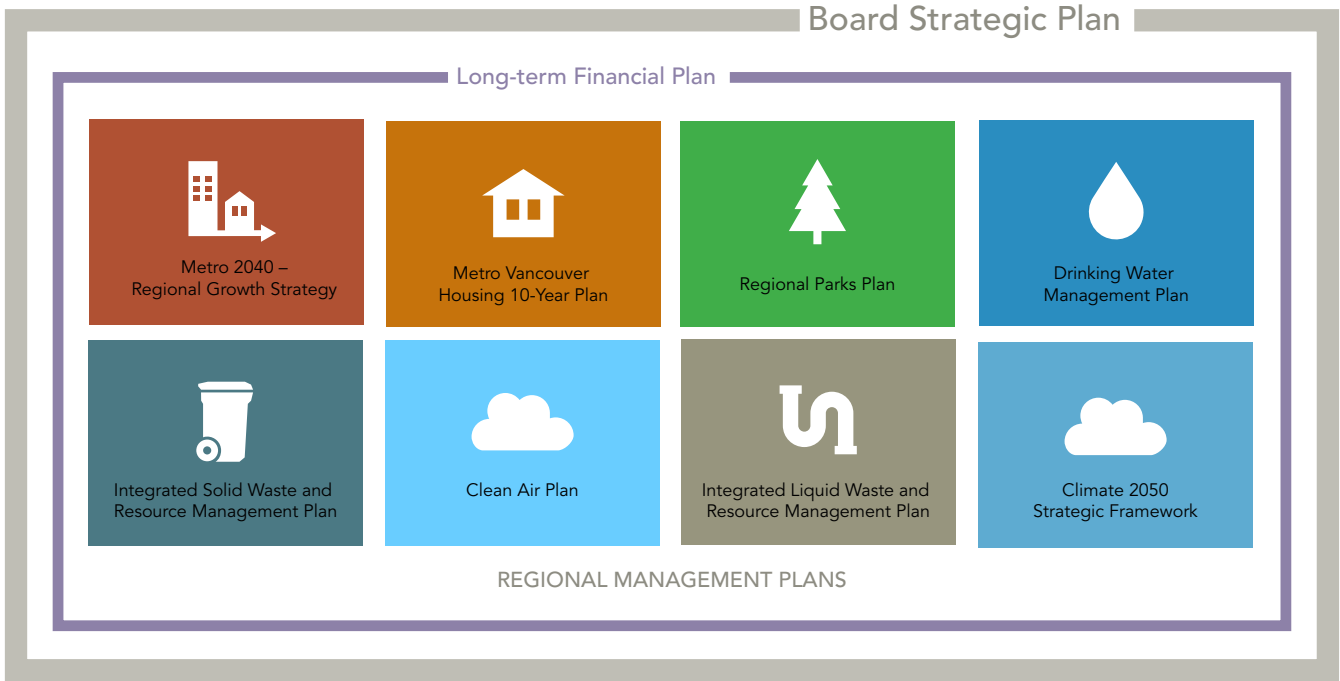
2. Deliver Core Services

Provide regional utility services related to drinking water, liquid waste and solid waste to members. Provide regional services, including parks and affordable housing, directly to residents and act as the local government for Electoral Area A.

3. Plan for the Region

Carry out planning and regulatory responsibilities related to the three utility services as well as air quality and climate action, regional planning, regional parks, Electoral Area A, affordable housing, labour relations, regional economic prosperity, and regional emergency management.





Building a Resilient Region

Building the resilience of the region is at the heart of Metro Vancouver’s work. Each of Metro Vancouver’s regional plans and strategies adopts a vision, guiding principles, goals, strategies, actions and key performance measures that will support a more resilient, low carbon and equitable future. Metro Vancouver’s interconnected plans and strategies are guided by the *Board Strategic Plan*, which provides strategic direction for each of Metro Vancouver’s

legislated areas of responsibility, and the Long-Term Financial Plan, which projects total expenditures for capital projects and operations that sustain important regional services and infrastructure. Together these documents outline Metro Vancouver’s policy commitments and specific contributions to achieving a resilient region.

Plan Context

Challenges and Opportunities

The air we breathe is mostly nitrogen and oxygen, and also contains air contaminants, some of which are damaging. Higher levels of air contaminants degrade air quality and cause climate change, with associated impacts on human health and the environment. The air contaminants with the most impact in the Metro Vancouver region are described below.

- Health-harming air contaminants damage air quality, harming human health and the environment. Some impact visual air quality, and others have odorous characteristics. Health-harming air contaminants include fine particulate matter, diesel particulate matter, ground-level ozone, nitrogen dioxide, sulphur dioxide, volatile organic compounds, and hazardous air pollutants.
- Greenhouse gases trap heat and are the cause of climate change. Greenhouse gases include carbon dioxide, methane, nitrous oxide, halocarbons (e.g., refrigerants), black carbon and ground-level ozone.

Air Quality: Residents in the region generally experience good air quality today, due to air quality management efforts by Metro Vancouver and others in recent decades. Air quality monitoring by Metro Vancouver shows that most health-harming air contaminant levels have been improving, even while the region's population has grown.

Greenhouse Gases: Greenhouse gas emissions have both local and global impacts and we all have a shared responsibility to take local climate action. Climate change projections for the region for 2050 include longer, hotter and drier summers, warmer and wetter fall and winter seasons with decreased snowpack, and more extreme weather events.

How degraded air quality and climate change can harm residents in Metro Vancouver

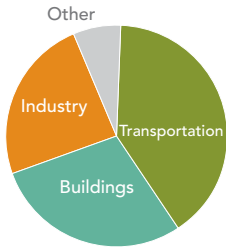
Higher levels of health-harming air contaminants can cause heart and lung disease and cancer, and increase the risk of hospitalization, asthma and bronchitis. These impacts increase costs to our health care system. Children, the elderly, people who are active outdoors, and those with pre-existing health conditions are at higher risk from air quality impacts. The most harmful air contaminants in the region are fine particulate matter (including diesel particulate matter), ground-level ozone and nitrogen dioxide. Health researchers have demonstrated that there are no known safe levels for fine particulate matter, ground-level ozone and nitrogen dioxide. Health Canada estimates that at least 1,900 British Columbians die prematurely every year due to those three contaminants and many more live with the associated health effects.

As the climate changes, wildfires are expected to become more intense and more frequent, impacting residents with harmful smoke. Sea level rise, increased storm surge and more extreme rainfall all increase the risk of flooding in Metro Vancouver communities, which can hurt residents, their homes and businesses. More extreme heat can cause heat stress in vulnerable populations. Some households are better able to prepare for and protect themselves from climate change and air quality impacts.

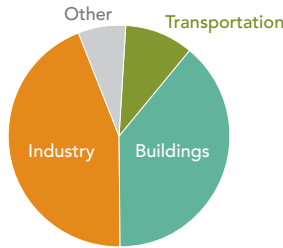
Regional Emission Sources: Emissions in the Metro Vancouver region are primarily from burning fossil fuels such as gasoline, diesel, natural gas and coal, as well as burning renewable fuels such as wood. The major sources of regional emissions are transportation, buildings and industry, as shown in the graphics on [Page 13](#), with smaller contributions from agriculture, waste management and other sources.

Regional Emissions by Air Contaminant and Issue Area

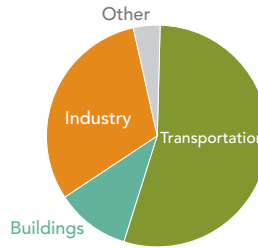
GREENHOUSE GASES



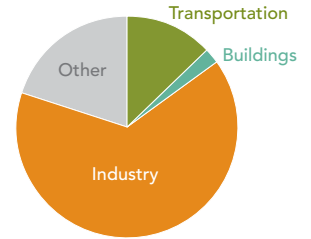
FINE PARTICULATE MATTER



NITROGEN OXIDES



VOLATILE ORGANIC COMPOUNDS



Metro Vancouver, together with its member jurisdictions, has been taking action on air quality and climate change for decades. **But governments, businesses and residents need to do more to reduce our contributions to climate change, improve our regional air quality, and protect human health and the environment.**

The *Clean Air Plan* is Metro Vancouver's fourth regional air quality and greenhouse gas management plan. The Plan is developed with input from across the region, and will be implemented through to 2030.

Roles and Responsibilities

Metro Vancouver is responsible for managing and regulating air contaminants in the region under authority delegated by the BC Government in the *Environmental Management Act*. Under that authority, the discharge of air contaminants, in the course of conducting an industry, trade or business, is prohibited unless conducted in compliance with a Metro Vancouver bylaw, permit, order or approval. Vancouver's management program includes developing plans, strategies and regulations (i.e., bylaws); promoting compliance with permits and regulations; monitoring air quality; and delivering awareness and incentive programs (see Issue Area 6 for more details).

Metro Vancouver also coordinates with other governments and regional partners on air quality and greenhouse gas management. Coordination will be essential to achieving the Plan's regional air

quality and greenhouse gas targets because some key actions will be led by others. The roles and responsibilities of Metro Vancouver's key partners are described below.

- The **Government of Canada** sets emission standards for on-road vehicles, non-road equipment, rail locomotives, home heating appliances, fuels, and some industrial sources. The Government of Canada coordinates the national Air Quality Management System to improve air quality in Canada, and regulates federal undertakings such as ports and airports.
- The **BC Government** sets emission standards for fuels and other emission sources, and manages air quality in BC for areas outside of Metro Vancouver, including adjacent regional districts.
- **First Nations** in the Metro Vancouver region provide services to their communities. For example, Tsawwassen First Nation, as a Treaty First Nation and Metro Vancouver member jurisdiction, has similar authorities and powers as other member jurisdictions with respect to climate change. In addition, many non-treaty First Nations in the region have operational Land Codes (similar to municipal land-use plans), which empower Indigenous governments to address environmental management and sustainability issues. Beyond providing services to their communities, in-region First Nations also have a stewardship obligation to protect the lands, waters and wildlife within their respective territories.

- **Member jurisdictions** (i.e., local municipalities) are responsible for land-use policy and enforcing building codes. Many member jurisdictions have adopted climate action and environmental plans, and are implementing actions to reduce emissions within their jurisdictions.
- **TransLink** plans, finances and operates public transit in the region, and shares responsibility for the major road and regional cycling networks with municipalities and the BC Government. The Government of Canada and the BC Government also fund transit and transportation projects.
- The **Vancouver Fraser Port Authority** oversees federal port lands in the region. It protects the environment, considers local communities and safely facilitates Canada’s trade objectives.
- The **Fraser Valley Regional District** shares the Canadian Lower Fraser Valley airshed with Metro Vancouver. The Fraser Valley Regional District has air quality planning authority and operates air quality programs.
- **Health authorities** provide research and information on the health impacts of air contaminants to support air quality management.
- **Energy utilities** such as BC Hydro and FortisBC supply energy for residents and businesses, as well as provide incentives to owners to reduce emissions and energy consumption.

Other partners include the public, businesses and associations, community groups, and non-governmental and labour organizations.

Relationship of Clean Air Plan to other Metro Vancouver Roles and Strategic Plans

The *Clean Air Plan* supports the vision of *Climate 2050*, Metro Vancouver’s strategy to transition the region to a low carbon and resilient future, increasing the health, wellbeing and prosperity of Metro Vancouver residents. The *Clean Air Plan* identifies







the initial actions needed to meet the region’s 2030 greenhouse gas target – a 45% reduction in regional greenhouse gas emissions from 2010 levels. Achieving the 45% target sets the foundation for moving the region towards the *Climate 2050* commitment to a carbon neutral region by 2050. A series of dynamic *Climate 2050 Roadmaps* will describe the current opportunities and best approaches to reach climate targets for the region.

Land-use and growth management supports emission reductions

Metro Vancouver, in partnership with its member jurisdictions, manages regional land-use and growth through the *Regional Growth Strategy (Metro Vancouver 2040: Shaping our Future)*. The Strategy outlines a vision for a compact region with a network of complete communities well connected by public transit, and protected agricultural and natural areas. Strong regional land-use policies are foundational to achieving the targets in the *Clean Air Plan*. Building compact, mixed-used communities that connect homes, jobs and recreation with walking, cycling and public transit will reduce driving emissions and will support the protection of important lands such as agricultural and industrial lands, and natural areas. Protecting natural areas allows them to absorb and store carbon dioxide (known as natural carbon sequestration). Higher density communities also reduce emissions from buildings. The Strategy also establishes greenhouse gas targets for the region.



The *Clean Air Plan* also supports and is supported by actions by other Metro Vancouver services. The table below outlines the links between the *Clean Air Plan* and actions and plans under other Metro Vancouver services.

METRO VANCOUVER SERVICE	LINKS WITH AIR QUALITY AND GREENHOUSE GAS MANAGEMENT
 Regional Planning	<ul style="list-style-type: none"> • See “land-use and growth management supports emission reductions” info box on previous page.
 Water Services	<ul style="list-style-type: none"> • Contamination of water resources is minimized by reducing air contaminant emissions. • Natural areas in the watersheds help sequester carbon. • Management of natural areas and a wildfire suppression program reduce wildfire risks, which protects air quality.
 Housing	<ul style="list-style-type: none"> • The <i>Metro Vancouver Housing 10-Year Plan</i> sets targets to reduce energy consumption by 25% for major rehabilitation and new construction, and reduce greenhouse gas emissions in the housing portfolio by 45% by 2030 through electrification.
 Regional Parks	<ul style="list-style-type: none"> • Regional greenways help reduce traffic emissions. • Natural areas in regional parks help sequester carbon. • Park land acquisition protects green spaces and bolsters carbon sequestration. • Management of natural areas and a wildfire suppression program reduce wildfire risks, which protects air quality.
 Liquid Waste Services	<ul style="list-style-type: none"> • Pursuing opportunities to create low carbon energy from liquid waste streams and residuals, to help displace fossil fuel use. • Biosolids used for land reclamation and restoration help sequester carbon in soil. • Odour control systems reduce odours from the sewer system and wastewater treatment plants. • Increasing energy efficiency and switching to clean, renewable energy both reduce emissions.
 Solid Waste Services	<ul style="list-style-type: none"> • Diversion and circular economy processes minimize the generation of solid waste, which reduces emissions of greenhouse gases and other air contaminants. • Landfill gas management reduces emissions of methane, a powerful greenhouse gas. • Pursuing opportunities to create low carbon energy from solid waste streams, to help displace fossil use.

Clean Air Plan

The *Clean Air Plan* is Metro Vancouver's fourth regional air quality and greenhouse gas management plan. Actions in the Plan will reduce air contaminant emissions and impacts, including greenhouse gases, in our region over the next 10 years, and in doing so support the 30-year commitment to a carbon neutral region by 2050. These actions will improve air quality in the region, protecting human health and the environment.

Vision

Metro Vancouver is a carbon neutral region where residents experience healthy, clean and clear air.

Regional 2030 Targets

The regional 2030 targets are quantitative measures that help to describe when we have achieved the vision.

1. Reduce regional greenhouse gas emissions by 45% from 2010 levels.
2. Air quality in the region is continually improving, protecting human health and the environment, by ensuring that:
 - a. Ambient air quality meets or is better than the ambient air quality objectives and standards that are regularly updated by Metro Vancouver, the BC Government and the Government of Canada; and
 - b. The amount of time that visual air quality is classified as "excellent" is increasing.

Visual air quality

Visual air quality is how clear the air looks to the average observer. Visual air quality is another way of tracking air quality. In general, the more air contaminants there are in the air, the hazier the view. Improving air quality generally improves visual air quality. Improving visual air quality can improve the economy (through increased tourism, etc.) and the wellbeing of residents, including local First Nations.

Guiding Principles

The *Clean Air Plan* was written considering the following Guiding Principles, which describe the fundamental values that guide the Plan. These principles will also guide implementation of the actions in the Plan. The Guiding Principles were adapted from the United Nations Habitat principles for local climate action.

1. **Ambitious** – Demonstrate global and local leadership in tackling local climate change and air quality challenges.
2. **Evidence-based** – Inform decision-making with the most current science and local conditions, including cost impacts, and understand and consider Indigenous knowledge.
3. **Equitable** – Consider equity in all actions to address climate change and air quality. This includes sharing the costs and benefits, considering affordability and a responsibility to future generations.
4. **Inclusive & Collaborative** – Involve all voices in planning and implementation.
5. **Preventative** – Prioritize actions that minimize air contaminant emissions through design or efficiency approaches, rather than remedial efforts such as emission controls.
6. **Continuous Improvement** – Continually reduce emissions and air quality impacts.
7. **Prioritize Co-benefits**: Prioritize actions that both improve air quality and reduce greenhouse gas emissions, while considering trade-offs and minimizing negative or unintended consequences.
8. **Dynamic** – Support innovation, leverage new information and explore emerging opportunities.
9. **Transparent** – Follow an open decision-making process, and set goals and targets that can be measured, reported, verified, and evaluated.
10. **Comprehensive & Integrated** – Implement air quality and climate change actions across all sectors and communities, integrating and aligning efforts with other governments.

Equity

Metro Vancouver's air quality and greenhouse gas management program has historically focused on the sources with the largest impacts in the region as a whole. These impacts are strongly linked to the amount and harm potential of air contaminants emitted by key sources. However, management programs have expanded beyond a regional focus to a community level, recognizing that climate change and degraded air quality impact some neighbourhoods, households and individuals more than others.

Equity is the promotion of fairness, justice and the removal of structural barriers that may cause or aggravate disparities experienced by different groups of people. The *Clean Air Plan* was developed based on a set of principles that includes "equity", which is a commitment that Metro Vancouver will consider equity in actions to address climate change and improve air quality, and will work to reduce disproportionate impacts. **Actions that reduce emissions must also support an equitable distribution of benefits and avoid an inequitable distribution of costs.**

Integrating equity into Metro Vancouver's air quality and climate change programs is a work in progress. The *Clean Air Plan* includes six actions to support that work, recognizing that more will be needed in the future.

These actions will help Metro Vancouver further understand the impacts and benefits of air quality and climate change actions on all communities. The actions can clarify where inequities in air quality and climate change exist in the region, consider how equity can be better integrated into actions, and develop tools to address gaps.

Equity Actions



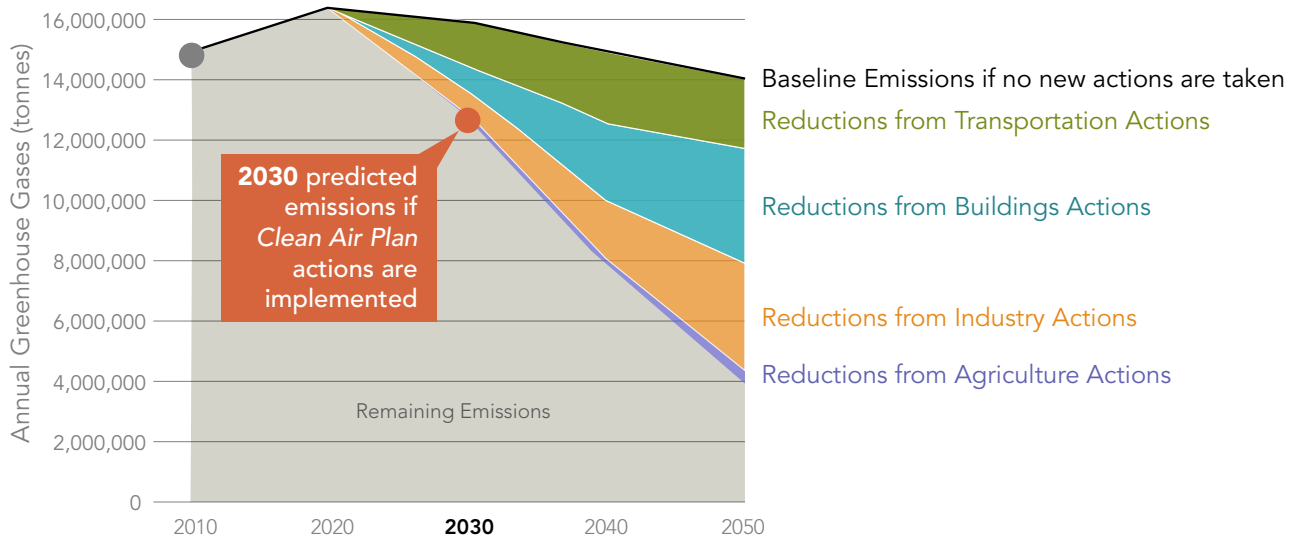
1. **Long-Term Approach for Equity.** Develop a long-term approach to evaluate and address equity in the design and implementation of air quality and greenhouse gas management programs, policies and regulations. The results of any equity analysis, both positive and negative, would be communicated to the public, including any disproportionate burdens that may be experienced by specific groups.
2. **Equity Community Input Process.** Develop a community input process to review equity impacts in the design and implementation of programs, policies and regulations, working with community partners.
3. **Air Quality Inequities Tool.** Develop a publicly accessible tool to highlight and track existing inequities experienced in air quality impacts across the region (e.g., due to underlying health conditions, or proximity to large emission sources or major roads), working with health authorities and community partners. The tool could support similar work on disproportionate climate impacts in the region.
4. **Equity Metrics and Targets.** Develop metrics and targets to measure progress on equity in the region as it relates to air quality and greenhouse gas management.
5. **Share Equity Best Practices with Other Organizations.** Work with health authorities, member jurisdictions, the BC Government and other regional partners to integrate equity best practices into the design and implementation of air quality and greenhouse gas policies, programs and regulations across the region.
6. **Equity-Building Air Quality Pilot.** Develop and pilot at least one air quality project focused on equity-building, working with health authorities and community partners.

Potential Emission Impacts of Clean Air Plan

The actions in the *Clean Air Plan* were modelled to estimate their impact on regional emissions. This modelling suggests that with bold actions by all governments and broad adoption by the public and local businesses, emissions in the Metro Vancouver region can be significantly reduced over the next 30 years. The graph below shows the potential reduction in greenhouse gas emissions by 2050 by implementing an aggressive and achievable suite of actions, starting with the actions outlined in the *Clean Air Plan*.

Metro Vancouver’s initial modelling of the actions in the *Clean Air Plan* indicates that **if all the actions in the Plan were implemented, regional greenhouse gas emissions could be reduced by approximately 2 million tonnes by 2030**, or 15% below the 2010 regional total. Starting implementation on the actions in the *Clean Air Plan* is critical to achieve these emission reductions.

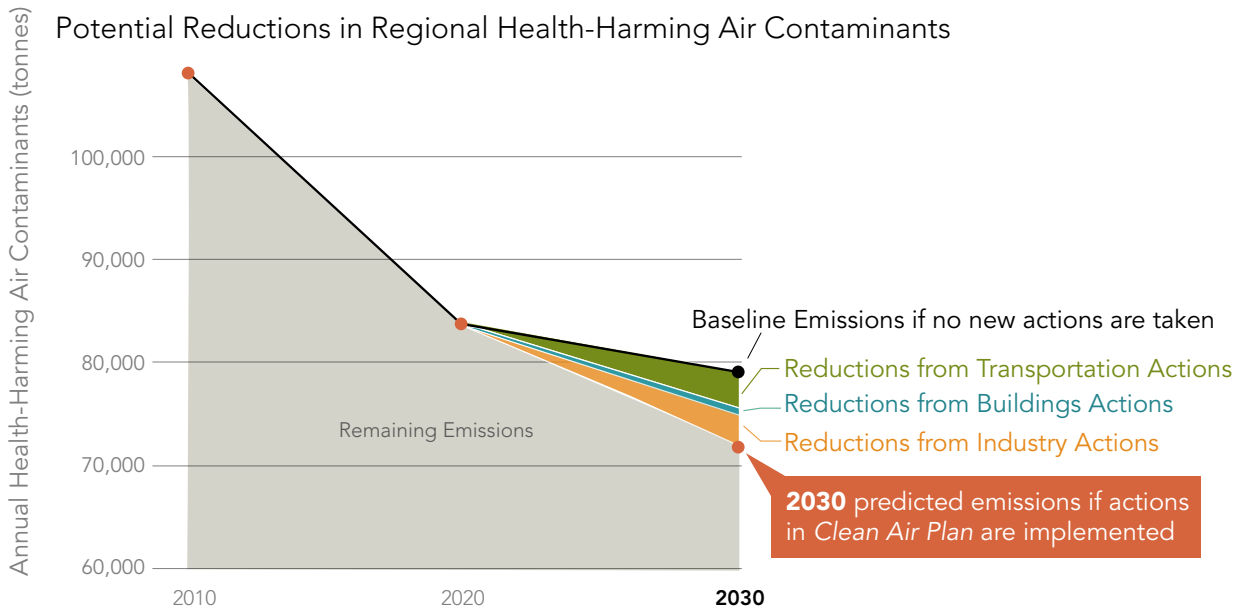
Potential Reductions in Regional Greenhouse Gases



These potential emission reductions are significant but do not achieve the 2030 target to reduce regional greenhouse gas emissions by 45% from 2010 levels. Metro Vancouver will continue to work with residents, businesses and governments to accelerate these actions even further. Additional climate actions to help transition the region to carbon neutrality will be identified in the *Climate 2050 Roadmaps*.

To support these actions, 2030 greenhouse gas targets were established by issue area based on technological readiness and economic considerations of the different sectors. The issue area targets combine to align with the 2030 regional target.

The suite of actions in the *Clean Air Plan* are also expected to lead to significant improvements in regional air quality and public health. The graph below shows the impact of the Plan on the combined emissions of four key health-harming air contaminants: fine particulate matter, nitrogen oxides, sulphur oxides and volatile organic compounds. The steep drop in emissions between 2010 and 2020 is primarily due to cleaner engines in passenger vehicles, medium and heavy duty vehicles, and non-road equipment. By 2030, the actions in the Plan could reduce annual regional emissions of fine particulate matter by 700 tonnes, nitrogen oxides by 3,800 tonnes, and volatile organic compounds by 3,000 tonnes. The expected impact of these emission reductions on public health are described on the following page.



Costs of Action, Costs of Inaction

A 45% reduction in greenhouse gas emissions by 2030 is an ambitious target and requires an investment in our future. The science is clear as is recent experience, climate change is already having an impact on our health, communities, the economy and ecosystems. More extreme weather events and sea level rise have financial, health and environmental costs including wildfire damage, negative impacts on human health and wellbeing, damage to buildings and infrastructure, changes to local food production, threats to nature and ecosystems, and more. The cost of reducing regional and global greenhouse gas emissions as well as the costs of adaptation will only grow, the best cost option is to take action now.

The *Clean Air Plan* identifies actions needed to transition this region to a low carbon and resilient future. This will involve new investments; from residents who invest in electric vehicles and retrofits to businesses that invest in a range of emission reduction technologies. Governments have a critical role in this transition first in setting out the targets and timelines to reducing emissions as well as incentivizing (and, in some cases, requiring) consumers and businesses to adopt solutions that will reduce emissions.

Governments can enable the switch to clean, renewable energy as well as stimulate innovations that accelerate the transition to a carbon neutral region by 2050. In this environment entrepreneurs will recognize the economic opportunities associated with low carbon and zero emission solutions.

Higher levels of health-harming air contaminants also have costs to society, including increased medical treatments, lost productivity, and the health and lifespan of residents. Assigning a value to the health benefits of the air quality actions in the *Clean Air Plan* depends on a variety of factors, including the health impacts of different health-harming air contaminants.

Using data from Health Canada, Metro Vancouver assessed that the potential regional health benefits from the *Clean Air Plan* between 2020 and 2030 could be up to \$1.6 billion.

While traditional cost-benefit analysis is oriented to the present, many of the costs of climate inaction will be borne by future generations. This is an equity issue that must be addressed in the analysis. As a society we must consider how the benefits, costs and risks of climate and air quality actions are shared now and into the future.



Structure and Implementation

The *Clean Air Plan* focuses on actions that Metro Vancouver can implement under our delegated authority. The Plan also identifies where other governments and partner agencies need to take action to help achieve our regional vision and 2030 targets.

Actions in the *Clean Air Plan* include guidance, incentives, awareness and outreach programs, standards, policies, programs and regulations. Most of the greenhouse gas actions in the *Clean Air Plan* will be included in the relevant *Climate 2050 Roadmaps*. Actions related to [climate adaptation](#) (i.e., climate resiliency) will also be identified in the relevant *Climate 2050 Roadmaps* and are not included in the *Clean Air Plan*.

The *Clean Air Plan* is organized around six issue areas:

1. Transportation;
2. Buildings;
3. Industry;
4. Agriculture;
5. Health; and
6. Measure, Monitor and Regulate.

How nature can help reduce emissions and improve public health

The Metro Vancouver region's rich and diverse [ecosystems](#) are vital to the people and wildlife who live here. Nature provides public benefits called ecosystem services. Some ecosystem services help address climate change and improve regional air quality; examples include natural carbon sequestration, shading (by urban trees), stormwater management (by green roofs) and more. Human activities, including urban development and climate change, are resulting in ecosystem changes and losses which reduce the ability of nature and ecosystems to provide climate-related benefits, now and in the future.

The challenges and opportunities with protecting and restoring nature and ecosystems will be described in the *Climate 2050 Nature & Ecosystems Roadmap* and are not included in the *Clean Air Plan*.

Transitioning to Clean, Renewable Energy






Achieving our 2030 air quality and greenhouse gas targets will require a region-wide transition from fossil fuels to [clean, renewable energy](#). Clean, renewable energy is low or [zero emission](#) energy that is replenished over days or years. In British Columbia, electricity is produced primarily from hydro power, a clean, renewable source of energy that produces significantly less emissions than fossil fuels. Therefore, electrification is a primary pathway to cleaner air and lower greenhouse gas emissions. Other renewable fuels will also be needed, particularly for sectors that are more expensive or complicated to electrify. However, most renewable fuels (e.g., wood, [renewable natural gas](#)) still produce health-harming air contaminants, which harm air quality, human health and the environment. The *Climate 2050 Energy Roadmap* will describe the opportunities and challenges in transitioning the regional energy system to clean, renewable energy. This transition will require expansions in the supply and distribution capacity for both electricity and renewable natural gas.

Metro Vancouver will work to implement the strategies and actions in the *Clean Air Plan*, reflecting them in annual work plans and budgets. Strategies and actions will be implemented following the Guiding Principles on [Page 16](#). Progress on achieving the *Clean Air Plan* goals and targets will be publicized through the annual Caring for the Air and air quality monitoring reports, regional emission inventories, as well as online reporting for *Climate 2050* and related initiatives.

Some actions in the *Clean Air Plan* may require a public engagement process prior to implementation, including new air emission regulations or significant changes to existing air emission regulations. Metro Vancouver values public feedback and will continue to seek feedback from the full range of voices and communities in the region. Feedback will be reflected in the design and implementation of actions.

Strategies and Actions

Key to reading the strategies and actions

<p>Long-term Goals</p>	<p>Long-term goals frame the bright green future we want in the region around 2050, for each issue area.</p>
<p>2030 Targets</p>	<p>Targets help measure progress toward the long-term goals of the issue areas. Emission targets account for potential impacts of the issue area strategies, as well as emission impacts due to previously implemented policies.</p>
<p>Potential Impacts of Strategy in 2030</p>	<p>The highest potential emission reductions due to all actions in the strategy, relative to the expected baseline emissions in 2030. Greenhouse gas estimates include carbon dioxide, methane and nitrous oxide. Health-harming air contaminant estimates include the sum of fine particulate matter, nitrogen oxides, sulphur oxides and volatile organic compounds. The potential impacts reflect the emissions modelling described on Pages 18 and 19.</p>
<p>BIG MOVES</p>	<p> Big Moves are foundational to achieving the 2030 targets, and should lead to the most significant emission reductions.</p>
<p>CORPORATE LEADERSHIP</p>	<p> Corporate Leadership actions are ones Metro Vancouver will implement in its corporate operations to demonstrate leadership and support regional actions.</p>
<p>Lead Agency(ies)</p>	<p>Agency(ies) with the largest role(s) in completing the action. The lead agency(ies) could be Metro Vancouver, others or a combination.</p>
<p>Potential Impacts of Action</p>	<p> The action does/does not have the potential to reduce greenhouse gas emissions.</p> <p> The action does/does not have the potential to improve regional air quality.</p> <p> The action does/does not have the potential to improve regional visual air quality.</p>
<p>Start Year(s)</p>	<p>Year(s) when Lead Agency(ies) would start development on the action.</p>



Issue Area 1: Transportation

The transportation system serves and shapes our region's communities and economy. Roads, rail lines, shipping lanes, flight paths, transit networks, and bike paths link us with our destinations, but burning fuels to travel these routes can worsen air quality and contribute to climate change. As the region grows and changes, we need a transportation system that will keep us connected and goods moving while also reducing emissions.

Transportation emissions

Transportation generates about half of regional emissions. Within transportation, passenger vehicles are the primary contributors of greenhouse gases and volatile organic compounds, while marine vessels, medium and heavy duty vehicles, and rail locomotives are most responsible for harmful emissions from diesel use, including fine particulate matter.

The strategies to reduce emissions of these air contaminants align with best practices from around the world. They include reducing driving; more compact, complete communities; shifting to lower emission modes of transportation (e.g., cycling, walking, transit, high-speed rail); electrification; and cleaner fuels and engines. More information on climate change and transportation will be included in the *Climate 2050 Transportation Roadmap*.

Long-term Goals

1. All personal travel within the region is made by active transportation or using zero emission technologies powered by clean, renewable energy.
2. All medium and heavy duty vehicles, and rail locomotives operating within the region use zero emission technologies powered by clean, renewable energy.
3. All aircraft and marine vessels operating within the region use low emission and zero carbon technologies powered by clean, renewable energy.

2030 Targets

- Passenger vehicles:
 - 65% reduction in greenhouse gas emissions, from 2010 levels
- Medium and heavy duty vehicles, rail locomotives, marine vessels and aircraft:
 - 35% reduction in greenhouse gas emissions, from 2010 levels
- Passenger and medium and heavy duty vehicles, rail locomotives, marine vessels and aircraft:
 - 25% reduction in diesel particulate matter emissions, from 2020 levels
 - 40% reduction in nitrogen oxides emissions, from 2020 levels

Key Benefits of Accelerating Emission Reductions from Transportation

- Reduced climate change and air quality impacts
- Driving less can reduce traffic congestion and road maintenance
- More active transportation can improve public health and, along with more public transit, can increase transportation options for all residents
- Electric and other zero emission vehicles generally have lower maintenance and energy costs

Key Costs of Accelerating Emission Reductions from Transportation

- Public investments in active transportation and public transit
- Capital costs for electric and other zero emission vehicles
- Premium for renewable diesel and other renewable fuels
- Public and private investments to build zero carbon refueling infrastructure
- Research costs to develop zero carbon marine vessels, aircraft and rail locomotives



Potential to reduce greenhouse gas emissions



Potential to improve regional air quality



Potential to improve regional visual air quality

Strategies and Actions

Strategy 1.1 Reduce Driving through Active Transportation and Public Transit.

Transportation emissions at the community scale are driven by where people live, work, learn and play. The Metro Vancouver *Regional Growth Strategy* (see Info Box on [Page 14](#)) and the TransLink *Regional Transportation Strategy* both outline policies to help create communities that are complete, compact, and transit oriented. When people live closer to where they work, learn and play, more trips can happen by active transportation (e.g., walking, cycling) and public transit. Public transit can effectively move people medium and long distances, while active transportation is better for short and medium distances. Reducing the amount of driving in the region will significantly contribute to achieving the 2030 transportation targets for greenhouse gases and nitrogen oxides. Active transportation, in particular, also has important co-benefits such as improved physical health. However, helping residents and businesses to drive less is a long-term transition, so significant funding is needed to expand public transit and active transportation options. Pricing driving can also help reduce emissions.

Potential Impacts of Strategy in 2030

- Reduce annual greenhouse gases by up to **280,000** tonnes
- Reduce annual health-harming air contaminants by up to **400** tonnes

Key Partners

- Member jurisdictions
- TransLink
- BC Government
- Government of Canada

**BIG
Move**

1.1.1 Enhance and Improve Regional Transit. Advocate to TransLink to increase public transit in the region, significantly shifting trips from passenger vehicles to public transit. TransLink should increase transit frequency in key areas, transition to using clean, renewable energy, and implement other related air quality and climate actions outlined in the *Regional Transportation Strategy*. Regional emission reductions should be prioritized in transit expansion and service decisions, while ensuring that all residents have access to transportation options in a connected region.

Lead Agency TransLink



Ongoing

**BIG
Move**

1.1.2 Use Pricing to Reduce Driving and Emissions. Work with the BC Government, TransLink, member jurisdictions and other regional partners to develop and implement a policy that puts a price on driving in the region, to help reduce emissions. The program could include **mobility pricing**, transportation pricing, usage-based insurance, fuel taxes, etc. Any program should prioritize fairness and equity and be supported by transit expansion (Action 1.1.1). Any program should align with any low or zero emission zones in the region (see Actions 1.2.2 and 1.3.2).

Lead Agencies BC Government, TransLink, member jurisdictions, Metro Vancouver



Ongoing

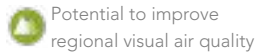
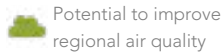
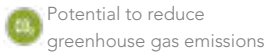
**BIG
Move**

1.1.3 Expand Active Transportation Networks. Advocate to member jurisdictions to expand regional and local active transportation networks so it's the most convenient choice for most shorter trips. The networks should be well-connected, comfortable for most, and integrated with public transit. Network expansion should prioritize under-served areas to ensure all residents have access to active transportation options in a connected region. Network elements should include walking and cycling paths, regional greenways, separated bike lanes, and end-of-trip facilities. The facilities should be suitable for all bike and mobility types, and include charging for electric bikes, electric scooters and other similar electric mobility devices.

Lead Agency Member jurisdictions



Ongoing



<p>1.1.4 More Stable Infrastructure Funding for Regional Active Transportation Networks. Advocate to the BC Government and the Government of Canada to expand stable funding for comprehensive regional and local active transportation networks, to enable Action 1.1.3.</p> <p>Lead Agencies BC Government, Government of Canada</p>		<p>Start Years 2022 – 2023</p>
<p>1.1.5 More Stable Funding for Regional Transit. Advocate to the BC Government and the Government of Canada to expand stable funding for the regional public transit system to cover both operations and capital investments, to enable Action 1.1.1.</p> <p>Lead Agencies BC Government, Government of Canada</p>		<p>Start Years 2022 – 2023</p>
<p>1.1.6 Regional Parking Strategy to Reduce Driving. Develop a Regional Parking Strategy to prioritize active transportation and other low emission transportation options, coordinating with member jurisdictions and TransLink. The strategy could include replacing building parking minimums with maximums, establishing parking minimums for bicycles, implementing dynamic parking pricing and reducing free parking spaces. The strategy could also support uptake of electric and car-share vehicles by establishing electric vehicle charging requirements for parkades, and enhancing preferential parking rates and spaces for electric and car-share vehicles.</p> <p>Lead Agencies Metro Vancouver, member jurisdictions</p>		<p>Start Years 2023 – 2024</p>
<p>1.1.7 Support Residents and Businesses in Active Transportation. Advocate to the BC Government and the Government of Canada to provide funding (e.g., incentives, tax credits) to residents and businesses to support active transportation, including for buying, renting or sharing all bike and mobility types. Funding should prioritize groups who generally cannot access these transportation options, such as low income residents and households.</p> <p>Lead Agencies BC Government, Government of Canada</p>		<p>Start Years 2022 – 2023</p>
<p>1.1.8 Communicate the Benefits of Walking, Cycling and Public Transit. Support outreach campaigns led by TransLink, member jurisdictions and health authorities that show the benefits of walking, cycling (including electric bikes) and public transit, including the associated improvements to regional air quality and greenhouse gas emissions.</p> <p>Lead Agencies TransLink, member jurisdictions</p>		<p>Ongoing</p>
<p>1.1.9 Implement Trip Reduction Programs. Advocate to the BC Government to require large employers and major trip generators (e.g., shopping malls) to implement trip reduction programs. Such programs could require large employers and other major trip generators to measure staff or customer driving habits and take action to reduce driving. These programs should consider availability of lower emission alternatives and opportunities for remote and flexible work options.</p> <p>Lead Agency BC Government</p>		<p>Start Years 2024 – 2025</p>
<p>1.1.10 Regional Bike- and Car-Sharing Strategy. Develop a regional strategy to support the increased use of bike- and car-sharing services, coordinating with member jurisdictions, TransLink and other regional partners. These services have been shown to reduce total driving distances among users.</p> <p>Lead Agency Metro Vancouver</p>		<p>Start Years 2024 – 2025</p>
<p>1.1.11 Support Low Emissions Commuting by Staff. Develop and implement a Metro Vancouver corporate commuting strategy to reduce driving emissions. The strategy would encourage more commuting by active transportation, public transit and car-pooling. The strategy could also review parking policies, explore distributed and remote work options where operationally feasible, and recommend additional electric vehicle chargers at work sites.</p> <p>Lead Agency Metro Vancouver</p>		<p>Start Years 2022 – 2023</p>





Potential to reduce greenhouse gas emissions



Potential to improve regional air quality



Potential to improve regional visual air quality

Strategy 1.2 Accelerate Transition of the Passenger Vehicle Fleet to Electric Vehicles.

The 1.5 million passenger vehicles registered in the region are our largest source of greenhouse gases, contributing almost a third of emissions. Electrifying passenger vehicles is a critical way to significantly reduce these emissions. The BC *Zero Emission Vehicles Act* provides a pathway to 100% electric vehicle sales by 2040, but this timeline should be accelerated to get more electric vehicles on the road faster. Electrifying passenger vehicles will also improve regional air quality, though work is needed to ensure that electric vehicles and charging infrastructure are reasonably accessible to everyone, including lower income households.

Potential Impacts of Strategy in 2030

- Reduce annual greenhouse gases by up to **710,000** tonnes
- Reduce annual health-harming air contaminants by up to **1,400** tonnes

Key Partners

- Member jurisdictions
- BC Government
- BC Hydro

BIG
Move

1.2.1 Accelerate Sales Targets for New Electric Passenger Vehicles. Advocate to the BC Government to accelerate the sales targets in the *Zero Emission Vehicles Act* to reach 100% zero emission vehicle sales by 2030 (instead of the current 2040 target). The BC Government should also modify the Act to prioritize 100% electric vehicles. Advocate to the Government of Canada to establish sales targets for zero emission passenger vehicles, reaching 100% by 2030 (instead of the current 2035 target).

Lead Agencies BC Government, Government of Canada



Start Years 2022 – 2023

BIG
Move

1.2.2 Develop Regional Emission Requirements for Passenger Vehicles. Develop regulatory emission requirements for existing passenger vehicles, to be implemented by the BC Government or Metro Vancouver. Requirements could include low or zero emission zones, or a vehicle emissions levy with rebates for replacing older vehicles. Requirements should target both health-harming air contaminants and greenhouse gases. Any regulatory program must consider equity and be coordinated with member jurisdictions. Any program could also support actions focused on reducing total driving distances, including Action 1.1.2 on pricing driving.

Lead Agencies BC Government, Metro Vancouver



Start Years 2023 – 2024

BIG
Move

1.2.3 Make Electric Vehicles More Affordable. Advocate to the BC Government, the Government of Canada and other regional partners to continue providing funding (e.g., incentives, loans, tax credits) for the purchase of new and used electric vehicles. Funding should be available for personal and business purchases and should prioritize groups who generally cannot afford these vehicles without funding programs, such as low and middle income households.

Lead Agencies BC Government, Government of Canada



Start Years 2022 – 2023

1.2.4 Regional Electric Vehicle Charging Strategy. Develop a long-term regional strategy for electric vehicle charging infrastructure, coordinating with member jurisdictions, energy utilities, TransLink, industry, and other regional partners. A strategy would identify where additional publicly accessible electric vehicle chargers are needed to ensure equitable access, as well as provide guidance on user fees, design and siting. The strategy should align with similar actions for medium and heavy duty vehicles, and non-road equipment (Actions 1.3.7 and 3.2.4).

Lead Agency Metro Vancouver



Start Years 2022 – 2023

1.2.5 Make New Passenger Vehicles Cleaner. Advocate to the Government of Canada to establish more stringent fuel economy and emission standards for new passenger vehicles, prioritizing greenhouse gas reductions. New quality standards should also be established to reduce non-tailpipe emissions, such as particulate matter emissions from brake and tire wear.

Lead Agency Government of Canada



Start Years 2024 – 2025

Potential to reduce greenhouse gas emissions

Potential to improve regional air quality

Potential to improve regional visual air quality

1.2.6 Expand Electric Vehicle Charging in Buildings. Work with member jurisdictions, the BC Government, BC Hydro and the Government of Canada to expand access to electric vehicle charging in buildings. This should include adoption of provincial “Right-to-Charge” legislation as well as code requirements that new or substantially renovated buildings are wired for electric vehicle chargers. Expanding access should also include increased support and funding (e.g., incentives, loans, tax credits) for electric vehicle charging in existing buildings. Funding should prioritize groups who generally would not have access to chargers, such as residents living in rental buildings, strata buildings, non-market housing or secondary suites.

Lead Agencies BC Government, member jurisdictions



Start Years 2022 – 2023

1.2.7 Electric Vehicle Outreach Programs. Enhance existing and deliver new public outreach programs about the benefits of electric vehicles and how to install electric vehicle chargers at workplaces and multi-family buildings, working with member jurisdictions and other regional partners.

Lead Agency Metro Vancouver



Ongoing

1.2.8 Electrification Targets for Ride-Hailing Services. Advocate to the BC Government to establish vehicle electrification targets for ride-hailing and taxi fleets.

Lead Agency BC Government



Start Years 2024 – 2025

1.2.9 Eliminate Tampering with Vehicle Emission Controls. Work with the BC Government and the Government of Canada to reduce the air quality impacts from tampering with emission control systems in passenger vehicles, and medium and heavy duty vehicles. This could include banning the sale or import of tampering devices, and improving enforcement of tampering in vehicles and by automotive repair shops.

Lead Agencies BC Government, Government of Canada, Metro Vancouver



Start Years 2022 – 2023

1.2.10 Reduce Vehicle Idling Emissions. Advocate to member jurisdictions to adopt Metro Vancouver’s model anti-idling bylaw, enforce existing anti-idling requirements and educate residents about the human health and environmental impacts of idling.

Lead Agency Member jurisdictions



Start Years 2025 – 2026

1.2.11 Transition the Corporate Fleet to Zero Emissions. Transition Metro Vancouver’s corporate on-road fleet to zero carbon emission between 2035 and 2040, and zero emission by 2050. The transition would include both passenger and medium and heavy duty vehicles (see Action 3.2.7 for related action on corporate non-road fleet).

Lead Agency Metro Vancouver



Ongoing

Corporate LEADERSHIP





Potential to reduce greenhouse gas emissions



Potential to improve regional air quality



Potential to improve regional visual air quality

Strategy 1.3 Reduce Medium and Heavy Truck Emissions and Support Early Adoption of Zero Emission Trucks.

As our economy grows, goods movement in the region will continue to grow. The 40,000 medium and heavy duty vehicles registered in the region (plus the trucks that travel in and out of the region) generate 5% of regional greenhouse gas emissions and 10% of regional diesel particulate matter. Federal emission standards ensure new trucks are cleaner, and provincial clean fuel standards have reduced the carbon intensity of diesel, the main fuel used by medium and heavy duty vehicles. Programs that target high emitting medium and heavy duty vehicles will help achieve the 2030 transportation targets for diesel particulate matter and nitrogen oxides. Sales targets, incentives and a regional zero carbon refueling strategy will accelerate the long-term transition to zero emission medium and heavy duty vehicles, reducing greenhouse gases and improving regional and local air quality.

Potential Impacts of Strategy in 2030

- Reduce annual greenhouse gases by up to **170,000** tonnes
- Reduce annual health-harming air contaminants by up to **200** tonnes

Key Partners

- BC Government
- Vancouver Fraser Port Authority
- Member jurisdictions
- Trucking industry

BIG
Move

1.3.1 Regulate Existing Medium and Heavy Trucks. Develop regulatory requirements for existing medium and heavy duty vehicles, to be implemented by the BC Government or Metro Vancouver. Regulatory approaches to reduce emissions could include an inspection and maintenance program that requires repairs on higher emitting trucks, registration requirements targeting older trucks, a regional smoking vehicle hotline, and low or zero emission zones (aligned with Action 1.2.2). Requirements should be developed in coordination with member jurisdictions, the Vancouver Fraser Port Authority and other regional partners. Requirements would align with TransLink’s transition to clean, renewable energy in Action 1.1.1. Requirements would initially target health-harming air contaminants but should eventually include greenhouse gas emissions.

Lead Agencies Metro Vancouver, BC Government, member jurisdictions



Start Years 2022 – 2023

BIG
Move

1.3.2 Require Zero Emission Sales Targets for New Medium and Heavy Trucks. Advocate to the BC Government to set mandatory zero emission vehicle sales targets for new medium and heavy duty vehicles. For medium duty vehicles, the zero emission sales target should reach 100% by 2050. For heavy duty vehicles, the zero emission sales target should reach 100% before 2060.

Lead Agency BC Government



Start Years 2023 – 2024

BIG
Move

1.3.3 More Stringent Low Carbon Fuel Standards. Advocate to the BC Government to further increase the stringency of the BC *Low Carbon Fuel Standard* to reduce the carbon intensity of transportation fuels, primarily through increasing use of renewable diesel and ethanol. Advocate to the Government of Canada to further tighten the federal *Clean Fuel Standard* to include more stringent carbon intensity targets for all transportation fuels (see Actions 1.4.1, 1.4.2, 1.5.1 and 1.5.2).

Lead Agencies BC Government, Government of Canada



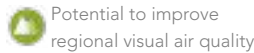
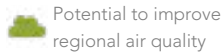
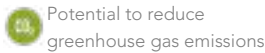
Start Years 2025 – 2026

1.3.4 Long-term Emissions Strategy for Medium and Heavy Trucks. Work with the BC Government and partners to develop a long-term province-wide emissions strategy for medium and heavy duty vehicles. The strategy should identify a phased timeline to implement a suite of policies and programs (including the other actions under Strategy 1.3) that would accelerate fleet turnover to cleaner vehicles while preparing for the longer term transition to zero emission vehicles. The strategy should target both greenhouse gas emissions and health-harming air contaminants, while providing a level-playing field and minimizing stranded assets.

Lead Agency BC Government



Start Years 2022 – 2023



1.3.5 Make Low and Zero Emission Medium and Heavy Trucks More Affordable. Advocate to the BC Government, the Government of Canada and other regional partners to enhance funding (e.g., incentives, loans, tax credits, joint financing) for the purchase of low and zero emission medium and heavy duty vehicles. Any program should consider whether funds should be targeted to groups less able to afford low and zero emission medium and heavy duty vehicles.

Lead Agencies BC Government, Government of Canada



Start Years 2023 – 2024

1.3.6 Regulate Fuel Economy and Emissions for Medium and Heavy Trucks. Advocate to the Government of Canada to establish more stringent fuel economy and emission standards for medium and heavy duty vehicles, prioritizing greenhouse gas reductions. Cleaner trucks will improve regional air quality in the short term and support the long-term transition to zero emission vehicles.

Lead Agency Government of Canada



Start Years 2023 – 2024

1.3.7 Zero Carbon Refueling Strategy for Medium and Heavy Trucks. Develop a long-term regional zero carbon refueling strategy for medium and heavy duty vehicles, coordinating with member jurisdictions, energy utilities, the Vancouver Fraser Port Authority, TransLink, fuels industry and other regional partners. The strategy would identify where refueling stations are needed for different fuels including electricity, hydrogen, renewable diesel and others. The strategy could identify pilot projects and should also consider opportunities to leverage public investment in electric bus charging infrastructure for commercial vehicle use. This strategy should align with similar strategies for passenger vehicles and non-road equipment (Actions 1.2.4 and 3.2.4, respectively).

Lead Agency Metro Vancouver



Start Years 2025 – 2026

1.3.8 Funding for Zero Carbon Refueling Infrastructure for Medium and Heavy Trucks. Advocate to the BC Government, the Government of Canada, and energy utilities to increase funding (e.g., incentives, loans, tax credits) for zero carbon refueling infrastructure for medium and heavy duty vehicles. This infrastructure would support early adoption of low and zero emission medium and heavy duty vehicles, prior to wider commercialization.

Lead Agencies BC Government, Government of Canada



Start Years 2025 – 2026

1.3.9 Large Fleets to Adopt “ZEV-First” Procurement. Develop and support implementation of “ZEV-first” fleet procurement policies to transition large fleets to zero emission vehicles by the late 2040s, coordinating with member jurisdictions and large fleet operators in the region. The policies would be supported by regularly updated information on the availability of zero emission medium and heavy duty vehicles and passenger vehicles. The policies could also include guidance on right-sizing fleets, calculating total lifetime costs of zero emission vehicles, and could support regional coordination of purchases (i.e., bulk buy) of zero emission vehicles for fleets to help reduce costs.

Lead Agencies Metro Vancouver, BC Government, Vancouver Fraser Port Authority



Start Years 2023 – 2024

1.3.10 Reduce Delivery Emissions. Work with member jurisdictions, delivery industry, and other regional partners to implement programs to reduce delivery emissions. Programs should prioritize transitioning delivery fleets to zero emissions (aligned with Actions 1.3.7 to 1.3.9) and could also include off-peak deliveries, small urban consolidation centres (“microHubs”), and cargo bike deliveries. This should include exploring the emissions impact of growing online deliveries, along with any potential solutions.

Lead Agencies Member jurisdictions, delivery companies



Start Years 2023 – 2024

1.3.11 Reduce Refuse Trucks Emissions. Work with member jurisdictions and other regional partners to accelerate the transition to zero emission refuse trucks. Opportunities could include contracting, procurement, charging infrastructure, and regional coordination of purchases (i.e., bulk buy).

Lead Agencies Member jurisdictions, Metro Vancouver



Start Years 2023 – 2024

1.3.12 Support Innovation in Zero Emission Technology for Medium and Heavy Trucks. Advocate to industry, academic institutions and other governments to accelerate innovation in low and zero emission technologies for medium and heavy duty vehicles, including supporting pilot projects.

Lead Agencies BC Government, Government of Canada



Start Years 2022 – 2023

1.3.13 Use Business Licences to Support Emission Reductions. Work with member jurisdictions to explore whether business licences can be used to accelerate adoption of low and zero emission medium and heavy duty vehicles.

Lead Agency Member jurisdictions



Start Years 2025 – 2026



Potential to reduce greenhouse gas emissions



Potential to improve regional air quality



Potential to improve regional visual air quality

Strategy 1.4 Reduce Marine and Rail Emissions.

Around 150 million tonnes of cargo are handled at port terminals in the region every year, supporting the regional economy. This cargo movement is the main driver of marine vessel and rail locomotive emissions in the region, causing 5% of greenhouse gas and 40% of diesel particulate matter emissions. Passenger ferries and rail are also a source of emissions. The Vancouver Fraser Port Authority is working to reduce greenhouse gas and health-harming air contaminant emissions associated with shipping in the region. Achieving significant emission reductions in the marine and rail sectors is challenging; significant progress will depend on efforts by the Government of Canada and the BC Government to develop and implement strategies to advance cleaner fuels and engine technologies. For marine emissions, the Government of Canada also needs to advocate to international organizations such as the International Maritime Organization to accelerate the implementation of more stringent standards.

Potential Impacts of Strategy in 2030

- Reduce annual greenhouse gases by up to **240,000** tonnes
- Reduce annual health-harming air contaminants by up to **2,000** tonnes

Key Partners

- Vancouver Fraser Port Authority
- Government of Canada
- BC Government



1.4.1 Accelerate Emission Reductions from Marine Vessels. Advocate to the Government of Canada and the BC Government to develop and implement long-term strategies to accelerate emission reductions from ocean-going marine vessels, harbour vessels and passenger ferries in the region. Different strategies may be needed for domestic and international vessels. In the short term, the strategies should prioritize cleaner engines, more renewable fuels and more shore power, particularly for vessels operating in areas that are most impacted by marine emissions. In the long term, the strategies should establish more stringent greenhouse gas emission targets, standards and regulations, to achieve a carbon neutral marine sector by 2050. The strategies should also consider efficiency improvements, as well as the design and funding needs for regional refueling infrastructure for zero carbon marine vessels, aligned with Actions 1.2.4, 1.3.7, 1.4.2 and 3.2.7.

Lead Agencies Government of Canada, BC Government



Start Years 2023 – 2024

1.4.2 Accelerate Emission Reductions from Rail Locomotives. Advocate to the Government of Canada and the BC Government to continue development and implementation of long-term strategies to accelerate emission reductions from rail locomotives in the region. Different strategies may be needed for local and long-haul locomotives. In the short term, the strategies should prioritize cleaner locomotives, particularly those operating near neighbourhoods that are most impacted by rail emissions, as well as fugitive emissions from rail cars. In the long term, the strategies should establish more stringent greenhouse gas emission targets, standards and regulations for long-haul, switch and local locomotives, to achieve a carbon neutral rail sector by 2050. The strategies should also consider efficiency improvements, as well as the design and funding needs for regional refueling infrastructure for zero carbon locomotives, aligned with Actions 1.2.4, 1.3.7, 1.4.1 and 3.2.7.

Lead Agencies Government of Canada, BC Government



Start Years 2023 – 2024

1.4.3 Support Emissions Reduction Actions at Vancouver Fraser Port Authority. Work with the Vancouver Fraser Port Authority to implement actions that reduce port-related greenhouse gas emissions and minimize air quality impacts on port-adjacent neighbourhoods. Areas of collaboration include phasing out older higher emitting equipment, increasing the availability of renewable fuels, developing infrastructure for zero emission equipment (e.g., shore power), and accelerating the adoption of zero emission solutions. Other opportunities include pilot or demonstration projects, and short-sea shipping.

Lead Agency Vancouver Fraser Port Authority



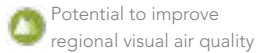
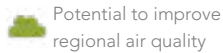
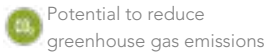
Ongoing

1.4.4 Support Innovation in Low and Zero Emission Marine and Rail Technologies. Advocate to the BC Government and the Government of Canada to help accelerate innovation in low and zero emission technologies for marine vessels, harbour tugs, passenger ferries and rail locomotives, including supporting pilot projects. Emerging engine technologies include hybrid, battery-electric and hydrogen fuel cells. This should include coordination with the Vancouver Fraser Port Authority, BC Ferries, rail companies, governments and other regional partners.

Lead Agencies BC Government, Government of Canada



Start Years 2023 – 2024



Strategy 1.5 Reduce Aviation Emissions.
















Airports in the region handle 25 million passengers per year; these aircraft generate 2% of regional greenhouse gas emissions and under 10% of regional emissions of sulphur oxides. International standards have improved fuel economy from aircraft and the Vancouver International Airport Authority is aggressively electrifying airport operations. While electrification of small aircraft is progressing, achieving significant emission reductions for large aircraft is challenging. In the short term, increasing the availability of sustainable aviation fuel (i.e., renewable jet fuel) will reduce net greenhouse gases from aviation. In the long term, the Government of Canada needs to develop a national strategy to transition to a carbon neutral aviation sector. This likely would include advocacy to international organizations such as the International Civil Aviation Organization.

Potential Impacts of Strategy in 2030

- Reduce annual greenhouse gases by up to **3,000 tonnes**
- Reduce annual health-harming air contaminants by up to **20 tonnes**

Key Partners

- Government of Canada
- Vancouver International Airport Authority
- Airlines

<p>1.5.1 Carbon Neutral Aviation Sector. Advocate to the Government of Canada to develop and implement a long-term strategy to accelerate greenhouse gas emission reductions from the aviation sector. The strategy should include more stringent fuel economy and emission standards for aircraft, to achieve a carbon neutral aviation sector by 2050. The strategy should also increase the availability of sustainable aviation fuel, and could include mandatory carbon offsets or carbon taxes for air travel.</p> <p>Lead Agency Government of Canada</p>	  	<p>Start Years 2023 – 2024</p>
<p>1.5.2 Develop Local Sources of Sustainable Aviation Fuel. Support airlines at the Vancouver International Airport and other regional partners in increasing local availability of sustainable aviation fuel.</p> <p>Lead Agencies Airlines, Vancouver International Airport Authority</p>	  	<p>Start Years 2022 – 2023</p>
<p>1.5.3 Technologies for Zero Emission Aircraft. Advocate to the Government of Canada and BC Government to support development of zero emission aircraft, including electrification of small aircraft.</p> <p>Lead Agencies Government of Canada, BC Government</p>	  	<p>Start Years 2023 – 2024</p>
<p>1.5.4 Stringent Fuel Sulphur Requirements. Advocate to the Government of Canada to establish more stringent sulphur content requirements for aviation fuel. Fuels with less sulphur generate lower emissions of sulphur oxides.</p> <p>Lead Agency Government of Canada</p>	  	<p>Start Years 2025 – 2026</p>
<p>1.5.5 Support Low Carbon Corporate Business Travel. Update and establish corporate business travel policies to reduce emissions, including air travel considerations, corporate carbon offsets, and remote attendance.</p> <p>Lead Agency Metro Vancouver</p>	  	<p>Start Years 2022 – 2023</p>





Issue Area 2: Buildings

Buildings provide spaces for shelter, comfort, productivity and recreation—this is where we spend most of our time. Yet, heating our homes, businesses, schools, hospitals, and other buildings in the region emits greenhouse gases and health-harming air contaminants.

Building emissions

The nearly 500,000 buildings in the region generate approximately 25% of regional greenhouse gas emissions, primarily from natural gas heating. Buildings also generate more than 35% of regional fine particulate matter emissions, primarily from wood burning in homes. Emissions are higher from buildings with less insulation and older windows or heating equipment.

Buildings can last a long time—50 years or more—so how we design, build and retrofit them in the next ten years will determine their emissions for decades. Improving building energy efficiency and heating buildings mostly with electricity are the most

effective ways to reduce emissions from buildings. Better insulated and sealed buildings are also more comfortable, healthier, quieter, and protect better against wildfire smoke and heat waves. Multi-family buildings (e.g., townhomes, apartments) need less energy per occupant to heat and cool, so the *Regional Growth Strategy's* policies on more compact communities will also reduce emissions. More information on climate change and buildings will be included in the *Climate 2050 Buildings Roadmap*.

Issue Area 2 focuses on reducing emissions from heating buildings; actions related to the construction and demolition of buildings are covered in Strategy 3.2 since most of the emissions from those activities come from non-road equipment.

Long-term Goal

1. All buildings are zero emissions from heating and cooling.

2030 Targets

- All buildings:
 - 35% reduction in greenhouse gas emissions, from 2010 levels
 - 35% reduction in fine particulate matter emissions, from 2020 levels
 - 15% reduction in nitrogen oxides emissions, from 2020 levels
- New buildings:
 - All new buildings are zero emissions in their operations
 - All new buildings produce 40% less embodied emissions from construction

Low carbon upgrades for buildings

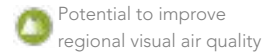
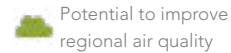
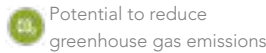
Also known as “deep carbon retrofits”, [low carbon upgrades](#) for buildings include upgrading building insulation and windows, sealing out drafts and switching to electric heating and cooling. These upgrades can significantly reduce energy consumption and emissions.

Key Benefits of Accelerating Emission Reductions from Buildings

- Reduced climate change and air quality impacts
- Low carbon upgrades reduce energy costs and improve health and comfort of occupants
- Increased cooling in buildings reduces the impacts of heat waves
- Better ventilation systems reduce the impacts of wildfire smoke
- Upgrading the existing buildings in the region will create construction jobs

Key Costs of Accelerating Emission Reductions from Buildings

- Public investments in funding low carbon upgrades
- Capital costs for heat pumps and low carbon upgrades in buildings
- Premiums for electricity and renewable natural gas
- Capital costs for low emission wood burning appliances



Strategies and Actions

Strategy 2.1 Signal the Transition to Zero Emission Buildings through Requirements and Standards.

Natural gas use in buildings contributes approximately 25% of greenhouse gas and approximately 10% of nitrogen oxides emissions in the region. The BC *Energy Step Code* and upcoming BC Retrofit Code will improve the energy performance of new and renovated buildings, and both should require that most heating and cooling uses clean electricity. Emission requirements for existing homes and other buildings will also help achieve the 2030 buildings targets for reducing greenhouse gases and nitrogen oxides. A clearer mandate for BC Hydro will support electrification of buildings; equipment efficiency standards and the climate impacts of refrigerants must also be addressed.

Potential Impacts of Strategy in 2030

- Reduce annual greenhouse gases by up to **650,000** tonnes
- Reduce annual health-harming air contaminants by up to **500** tonnes

Key Partners

- BC Government
- Member jurisdictions
- BC Hydro
- Government of Canada

BIG
Move

2.1.1 Greenhouse Gas Performance Requirements for Existing Large Buildings. Develop regulatory requirements for existing large buildings to meet greenhouse gas emission performance targets, which would reach zero carbon emissions before 2050. Requirements would apply to all existing commercial and large residential buildings, and would include energy consumption benchmarking, reporting and performance requirements, in coordination with BC Government regulatory requirements. Any regulation should also require that emissions from large buildings would not lead to local air quality that exceeds Metro Vancouver's ambient air quality objectives, when also considering background levels. The requirements should align with Strategy 2.4 on district energy systems and could be developed with member jurisdictions. Public sector organizations could play a leadership role by establishing zero emission targets for their own existing buildings earlier.

Lead Agency Metro Vancouver



Ongoing

BIG
Move

2.1.2 Greenhouse Gas Performance Requirements for Existing Homes and Townhomes. Develop regulatory requirements for existing homes and townhomes to meet greenhouse gas emission performance targets, which would reach zero carbon emissions before 2050, in coordination with the BC Government regulatory requirements. These requirements could be developed with member jurisdictions, and would also help with achieving Metro Vancouver's ambient air quality objectives.

Lead Agency Metro Vancouver



Start Years 2022 – 2023

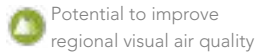
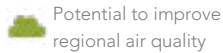
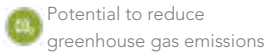
BIG
Move

2.1.3 New Buildings are Highly Efficient and Electric. Work with the BC Government to establish greenhouse gas performance requirements for new buildings, through the BC *Energy Step Code* or other legislation, reaching zero emissions (i.e., electric heating and cooling) by 2030. These requirements should allow local governments to voluntarily establish zero emission targets earlier. These requirements would apply to new homes, townhomes, commercial buildings, and large residential buildings. Public sector organizations should play a leadership role by establishing zero emission targets for their own new buildings in advance of provincial requirements.

Lead Agency BC Government



Ongoing



BIG
Move

2.1.4 Require Greenhouse Gas Reductions during Renovations. Advocate to the BC Government to establish the BC Retrofit Code with increasingly stringent greenhouse gas performance requirements for buildings undergoing significant renovations.

Lead Agency BC Government



Ongoing

BIG
Move

2.1.5 Building Electrification Mandate for BC Hydro. Advocate to the BC Government to direct BC Hydro and the BC Utilities Commission to promote and accelerate building electrification and to reduce emissions from buildings. A clear mandate could also support the development of electricity rates for residents who wish to switch to electricity.

Lead Agency BC Government



Start Years 2022 – 2023

2.1.6 Energy Labels for Homes and Buildings. Work with the BC Government to require every building and home in the region to obtain an energy and greenhouse gas emissions label. The label must be disclosed publicly when a property is constructed or listed for sale, rental or lease. This should include outreach and training with real estate agents, property assessors, insurance providers and other related professions. Such labels would provide information to accelerate low carbon updates for buildings.

Lead Agency BC Government



Ongoing

2.1.7 High Performance Heating and Cooling Equipment Import and Sale Standards. Advocate to the Government of Canada and the BC Government to establish energy efficiency standards for new and imported heating and cooling equipment. The standards should require a rated energy performance of 100% or more, and greenhouse gas requirements for refrigerants, both by 2030. The standards would help buildings conserve energy while reducing emissions.

Lead Agencies Government of Canada, BC Government



Start Years 2022 – 2023

2.1.8 Locate Exhausts to Minimize Local Air Quality Impacts. Work with member jurisdictions, the BC Government and health authorities to establish more stringent exhaust requirements for building boilers and heaters, and restaurants. This would include updating municipal development and building permits, and the BC Building Code so that exhausts are located to minimize impacts on local air quality and human health.

Lead Agencies Member jurisdictions, BC Government



Start Years 2023 – 2024

2.1.9 Significantly Reduce Refrigerant Leaks in Building Equipment. Advocate to the BC Government to improve compliance with the requirements of the BC *Ozone Depleting Substances and other Halocarbons Regulation*. This is expected to involve enhanced outreach to help safely reduce refrigerant leaks and ensure effective refrigerant management in heating and cooling systems in buildings.

Lead Agency BC Government



Start Years 2022 – 2023

2.1.10 Accurately Value Zero Emission and Resilient Buildings. Work with the BC Government and the Government of Canada to establish guidelines for the valuation of low and zero emission, and resilient buildings. This would support lenders, appraisers and insurers in providing competitive products for low and zero emission, and resilient buildings, such as “Green Mortgages” and “Green Loans”.

Lead Agencies BC Government, Government of Canada



Start Years 2022 – 2023



Potential to reduce greenhouse gas emissions



Potential to improve regional air quality



Potential to improve regional visual air quality

Strategy 2.2 Accelerate Demand for Zero Emission Buildings through Incentives, Education and Research.

Many technologies, like heat pumps and heat recovery systems, exist today to electrify most buildings that currently use natural gas for heating. Current technical support programs and incentives help home and building owners adopt these technologies, as well as improve the energy performance of homes and buildings. A regional Building Decarbonization Coalition will help significantly expand existing programs so more home and building owners can reduce their buildings emissions. These programs must work directly with community partners to identify how to involve more communities in the region so everyone can benefit from zero emission buildings. These approaches will help achieve the 2030 buildings targets for reducing emissions of greenhouse gases and nitrogen oxides.

Potential Impacts of Strategy in 2030

- Reduce annual greenhouse gases by up to **110,000** tonnes
- Reduce annual health-harming air contaminants by up to **100** tonnes

Key Partners

- Government of Canada
- BC Government
- Member jurisdictions
- BC Hydro

BIG
Move

2.2.1 Expand Incentives for Low Carbon Upgrades. Advocate to the BC Government and the Government of Canada to increase funding for fuel-switching and energy efficiency incentives, to the scale required to transition to zero emission buildings in the region and the province. The funding (e.g., incentives, tax credits) should support more building electrification solutions for older homes and buildings, and should complement financing tools under Action 2.2.3. Specific incentives should also support rental and non-market housing building owners to conduct low carbon upgrades while avoiding increased evictions or significant cost increases for renters.

Lead Agencies BC Government, Government of Canada, energy utilities



Start Years 2022 – 2023

BIG
Move

2.2.2 Online Decision Support Tools for Low Carbon Upgrades in Buildings. Work with the BC Government, the Government of Canada and member jurisdictions to develop innovative online decision support tools to help significantly increase public awareness of low carbon solutions. These tools would help home and building owners choose these solutions by simplifying the planning, financing and execution of low carbon upgrades in buildings. These tools would be supported by energy advisor services under Action 2.2.5.

Lead Agencies Metro Vancouver, BC Government



Ongoing

2.2.3 New Financing Tools for Low Carbon Upgrades. Work with the BC Government, the Government of Canada, member jurisdictions, energy utilities and other partners to develop strategic financing tools for home and building owners to accelerate low carbon upgrades in buildings. These tools allow owners to spread the cost of upgrades over a longer period, making them more affordable. Examples include Property Assessed Clean Energy (PACE) financing, on-bill financing and other related mechanisms. The tools should be available for homes, townhomes, commercial buildings, and large residential buildings, and would complement incentives under Action 2.2.1.

Lead Agencies BC Government, Government of Canada, energy utilities



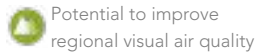
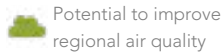
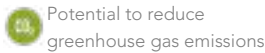
Start Years 2022 – 2023

2.2.4 Building Decarbonization Coalition. Work with governments, energy utilities, construction industry, academic institutions, non-governmental organizations and other regional partners to develop a Building Decarbonization Coalition. The Coalition would collaborate to address major barriers (e.g., supply constraints for zero emission building equipment) and create opportunities to accelerate the transition to zero emission homes and buildings. The Coalition would also align with the regional working group focused on reducing embodied emissions in new and existing buildings (see Action 2.5.4).

Lead Agency Metro Vancouver



Start Years 2022 – 2023



<p>2.2.5 Energy Advisor Services for Homes and Buildings. Work with the BC Government and the buildings industry to enhance energy advisor services for home and building owners. The expansion would help simplify the customer journey for home and building owners considering retrofits, so they can more easily access technical support and financial incentives through Action 2.2.3.</p>		Ongoing	
<p>2.2.6 Make Electricity Upgrades Faster and Cheaper. Advocate to BC Hydro to work with member jurisdictions, trade associations and other regional partners to streamline electricity service upgrades, to reduce costs and installation timelines.</p>		Start Years 2022 – 2023	
<p>2.2.7 Increase Public Awareness of the Benefits of Zero Emission Buildings. Work with member jurisdictions, the BC Government, health authorities, and other partners to deliver awareness and educational programs that encourage home and building owners to choose zero emission building solutions. These programs would highlight how health is improved by reducing emissions of indoor air contaminants; the benefits of using qualified installers; permitting requirements for heating, cooling and ventilation systems; and the consumer protections provided by municipal permits.</p>		Start Years 2022 – 2023	
<p>2.2.8 Training and Education in Zero Emission Buildings. Work with industry stakeholders and other governments to ensure industry training and certification meets the growing market demand for zero emission building design, technology, installation and operation, for both new buildings and retrofits of existing buildings.</p>		Start Years 2022 – 2023	
<p>Corporate LEADERSHIP</p>	<p>2.2.9 Share Lessons from Transitioning Metro Vancouver Corporate Buildings to Zero Emissions. Develop and promote case studies about low carbon upgrades completed in Metro Vancouver corporate buildings, including Metro Vancouver Housing buildings, to show the benefits and feasibility of electric and resilient buildings.</p>		Start Years 2023 – 2024
<p>Corporate LEADERSHIP</p>	<p>2.2.10 Test New Zero Emission Building Technologies. Test new zero emission building technologies in Metro Vancouver corporate buildings, including Metro Vancouver Housing buildings. These pilot projects would include the installation, use and monitoring of building technologies that are not yet widely used in the region.</p>		Start Years 2022 – 2023



Potential to reduce greenhouse gas emissions



Potential to improve regional air quality



Potential to improve regional visual air quality

Strategy 2.3 Make Wood Heating Systems Cleaner.

Residential indoor wood burning is responsible for more than 25% of fine particulate matter emissions in the region – more than any other single source. Since heating generally occurs in the fall and winter, wood smoke can contribute even more to fine particulate matter levels in the air that residents breathe during those times of the year. In more densely populated areas, the smoke from a single chimney can impact many more neighbours, compared to rural areas. Continuing with the implementation of Metro Vancouver’s *Residential Indoor Wood Burning Emission Regulation*, along with enhancing wood stove exchange and education programs, will help achieve the 2030 buildings target for fine particulate matter.

Potential Impacts of Strategy in 2030

- No greenhouse gas reductions are expected
- Reduce annual health-harming air contaminants by up to **600** tonnes

Key Partners

- BC Government



2.3.1 Implement Requirements for Higher Emitting Wood Burning Appliances. Continue with implementation of Metro Vancouver’s residential indoor wood burning regulation. The regulation requires that, by 2025, most residents in urban areas may only burn wood in an appliance that meets performance standards to ensure fine particulate matter emissions are low. Additional regulatory requirements come into effect in 2022. Actions 2.3.2 to 2.3.4 will support the regulation, along with ongoing outreach to the public.

Lead Agency Metro Vancouver



Ongoing

2.3.2 Enhance Wood Stove Exchange Program. Advocate to the BC Government, the Government of Canada, energy utilities and other regional partners to increase funding for wood stove exchange incentives, aligned with the Metro Vancouver’s residential indoor wood burning regulation. Larger incentives should be available for low income households that use wood stoves as a primary heating source, and for households switching to electric heating.

Lead Agencies BC Government, Government of Canada



Start Years 2023 – 2024

2.3.3 Enhance Wood Burning Education. Enhance existing awareness and educational programs about regulatory requirements and how to reduce emissions from residential indoor wood burning.

Lead Agency Metro Vancouver




Start Years 2023 – 2024


2.3.4 All Wood Stoves Are Certified. Advocate to the BC Government and the Government of Canada to require that new wood burning stoves and devices imported into BC, as well as existing stoves and devices sold in BC, are certified by the Canadian Standards Association or the US Environmental Protection Agency. This should include enforcement mechanisms to limit the private sales of uncertified devices.


Lead Agency BC Government



Start Years 2024 – 2025

 Potential to reduce greenhouse gas emissions

 Potential to improve regional air quality

 Potential to improve regional visual air quality

Strategy 2.4 Shift to Zero Carbon District Energy Systems.

District energy systems provide heating and cooling to a network of residential and commercial buildings more efficiently, and generally with lower emissions, than individual building heating and cooling systems. There are currently 18 district energy systems in the region, running on natural gas, recovered heat and biomass, and more systems are under development. Developing a long-term emissions pathway to transition district energy systems to clean, renewable energy will help achieve the 2030 buildings targets for greenhouse gases, nitrogen oxides and fine particulate matter. Metro Vancouver is currently exploring opportunities to provide clean, renewable energy to these systems; more information will be available in the *Climate 2050 Roadmaps*.

Potential Impacts of Strategy in 2030

- Reduce annual greenhouse gases by up to **80,000** tonnes
- Reduce annual health-harming air contaminants by up to **20** tonnes

Key Partners

- Member jurisdictions
- Energy utilities

BIG
Move

2.4.1 Emission Requirements for District Energy Systems. Develop a regulatory pathway to achieve zero carbon district energy systems by 2050, working with member jurisdictions, the BC Government and energy utilities. Any regulation should also require that emissions from district energy systems would not lead to local air quality that exceeds Metro Vancouver's ambient air quality objectives, when also considering background levels. These requirements should align with Action 2.1.1 on large buildings.

Lead Agency Metro Vancouver



Start Years 2023 – 2024

2.4.2 Low Carbon District Energy Policies. Work with member jurisdictions with district energy systems to assess the feasibility of using sewer heat and biogas generation from Metro Vancouver and other member jurisdictions.

Lead Agency Metro Vancouver



Start Years 2023 – 2024





Potential to reduce greenhouse gas emissions



Potential to improve regional air quality



Potential to improve regional visual air quality

Strategy 2.5 Accelerate the Transition to Lower Embodied Emissions in Buildings.

Embodied emissions are the greenhouse gas emissions associated with the resource extraction, manufacturing and distribution of products. Using construction materials with lower embodied emissions will reduce global emissions of greenhouse gases. Local governments in the region are establishing requirements for embodied emissions of construction materials. Convening a regional embodied emissions working group, and setting embodied emissions requirements in the building code and for new public buildings, will help accelerate the transition to lower embodied emissions in buildings.

Potential Impacts of Strategy in 2030

- Greenhouse gas impacts to be developed during implementation
- No regional air quality impacts are expected

Key Partners

- Member jurisdictions
- BC Government
- Construction/renovation industry

Buildings and the circular economy

Constructing, retrofitting and demolishing buildings generates emissions, as well as waste. Currently, most demolition materials are too damaged to re-use in new construction. Salvaging more demolition materials by thinking of buildings as “material banks” will help the region transition to a circular economy that keeps building materials circulating at their highest potential value. This will be explored in more detail in the *Climate 2050 Buildings Roadmap*.

BIG
Move

2.5.1 Incorporate Embodied Emissions into the BC Building Code. Advocate to the BC Government that future BC Building Code and Retrofit Code updates should include stringent embodied emissions performance targets for new construction and retrofits, and would incentivize the use of materials with low embodied emissions through consideration of cost and material availability.

Lead Agency BC Government



Start Years 2023 – 2024

2.5.2 Use Building Materials with Low Embodied Emissions. Work with the BC Government and member jurisdictions to update or create policies (e.g., procurement, design guidelines, zoning) to prioritize the use of building materials with low embodied emissions, including BC forest products. This should include development and maintenance of widely-supported standard calculations for the life cycle emissions of common building products.

Lead Agencies BC Government, member jurisdictions



Start Years 2022 – 2023

2.5.3 New Public Buildings set Embodied Emission Reduction Targets. Advocate to public sector organizations in the region to establish embodied emission reduction targets for new construction projects, ahead of BC Building Code and Retrofit Code changes.

Lead Agency Member jurisdictions



Start Years 2023 – 2024

2.5.4 Regional Working Group to Reduce Embodied Emissions in Buildings. Work with member jurisdictions, the BC Government, construction industry and other regional partners to develop a regional working group focused on reducing the embodied emissions in new construction and building retrofits. The working group should support accelerated policy development, establish a regional baseline for embodied emissions, and would also align with the Building Decarbonization Coalition (see Action 2.2.4).

Lead Agency Metro Vancouver



Start Years 2022 – 2023

2.5.5 Strengthen Metro Vancouver's Corporate Sustainable Design Requirements. Update Metro Vancouver's Sustainable Infrastructure and Buildings Policy to include increasingly stringent embodied emissions requirements and greenhouse gas performance limits. These requirements should align with the corporate low carbon procurement policies in Action 3.3.4.

Lead Agency Metro Vancouver



Start Years 2023 – 2024

Corporate
LEADERSHIP



Issue Area 3: Industry

The region's diverse industrial facilities and businesses contribute to our local economy, providing jobs to residents and products to supply chains and consumers. Industry refers to a broad range of industrial, commercial and business operations. Actions in the "Industry" Issue Area focus on industrial facilities, non-road equipment, building construction and demolition, and supporting the broader transition to the low carbon regional economy.

Industry emissions

Regional industrial operations generate 25% of greenhouse gases and 65% of volatile organic compounds. Industrial facilities generate 15% of regional fine particulate matter and non-road equipment generates over 40% of regional diesel particulate matter. These emissions come from burning fuel, chemical and other manufacturing processes, product off-gassing, wind-blown particulate matter, and fugitive leaks from process equipment and piping. Some industrial and business activities create odorous air contaminants.

Industrial facilities are innovating to support clean technology solutions. Opportunities to reduce emissions from industry include transitioning to clean, renewable energy; adopting more low and zero emission technologies; replacing older non-road equipment; and supporting low and zero emission solutions for small and medium businesses. More information on climate change and industry will be included in the *Climate 2050 Industry Roadmap*.

Long-term Goals

1. The industrial sector is carbon neutral.
2. All industrial operations minimize air contaminant emissions using lowest achievable emission technologies.

2030 Targets

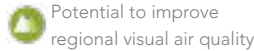
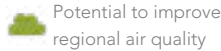
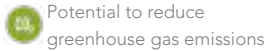
- Industrial facilities:
 - 35% reduction in greenhouse gas emissions, from 2010 levels
 - 10% reduction in fine particulate matter emissions, from 2020 levels
 - 10% reduction in nitrogen oxides emissions, from 2020 levels
- Non-road equipment:
 - 35% reduction in greenhouse gas emissions, from 2010 levels
 - 50% reduction in diesel particulate matter emissions, from 2020 levels

Key Benefits of Accelerating Emission Reductions from Industry

- Reduced climate change and air quality impacts
- Energy efficiency projects reduce operating costs
- Zero emission non-road equipment generally have lower maintenance and energy costs, and are quieter
- Increasing regional production of renewable fuels and other low carbon products could support jobs in regional businesses
- Regional development of carbon capture technologies could support jobs in regional businesses
- Businesses in the region with lower climate-related risks can attract investments

Key Costs of Accelerating Emission Reductions from Industry

- Public investments to support emission reductions at facilities
- Capital costs for emission controls and energy efficiency projects
- Premiums for renewable natural gas and other renewable energy sources
- Capital costs for low and zero emission non-road equipment
- Public and private investments to build zero carbon refueling infrastructure for non-road equipment
- Development costs for technological carbon capture and storage



Strategies and Actions

Strategy 3.1 Accelerate Emission Reductions from Industrial Facilities.

Over 1,000 industrial facilities and related commercial operations operate under Metro Vancouver permits and regulations, which have historically focused on emissions of health-harming air contaminants. These operations make cement, concrete, and forest products; refine petroleum; distribute gasoline; paint vehicles; and more. There are significant technical challenges to decarbonizing some large industrial facilities, particularly the high heat requirements in some manufacturing processes. Integrating greenhouse gas requirements into Metro Vancouver’s permits and regulations, along with cleaner fuels and more stringent emission requirements, will help achieve the 2030 emission targets for industrial facilities.

Potential Impacts of Strategy in 2030

- Reduce annual greenhouse gases by up to **520,000** tonnes
- Reduce annual health-harming air contaminants by up to **2,100** tonnes

Key Partners

- BC Government
- Government of Canada
- Industrial facilities

**BIG
Move**

3.1.1 More Stringent Greenhouse Gas Requirements for Large Industrial Emitters. Advocate to the BC Government to implement more stringent requirements for BC-based industrial facilities with significant greenhouse gas emissions. This could include increases to or expansion of the carbon tax, as well as mandatory carbon offsets. Requirements would be supported by incentives under Action 3.1.4.

Lead Agency BC Government



Start Years 2022 – 2023

**BIG
Move**

3.1.2 Integrate Greenhouse Gases into Emission Regulations and Permits. Develop and implement processes to integrate greenhouse gas reduction requirements into new emission regulations, amendments of existing emission regulations, new permits, and permit amendments. Integration would consider greenhouse gas regulations implemented by the BC Government, as well as the benefits and trade-offs of reducing greenhouse gases versus improving regional air quality. Integration could include greenhouse gas emission limits and fees, and could require permitted industrial facilities to evaluate opportunities to transition to clean, renewable energy, better utilize waste heat, or to phase out the use of some fossil fuels.

Lead Agency Metro Vancouver



Start Years 2022 – 2023

**BIG
Move**

3.1.3 Implement Renewable Gas Content Requirements. Advocate to the BC Government to establish content requirements for renewable gas, in line with targets in the provincial *CleanBC* plan. Renewable gas includes renewable natural gas, which has a lower carbon intensity than natural gas from fossil fuels.

Lead Agency BC Government



Ongoing

3.1.4 Industrial Emission Reduction Incentives. Advocate to the BC Government and the Government of Canada to enhance or develop incentives for industrial facilities to reduce emissions of greenhouse gases and other air contaminants. Incentives could include rebates on carbon tax or energy efficiency upgrades, tax credits, and innovative financing mechanisms. Incentives should be based on emission reductions that meet or exceed relevant industrial emission benchmarks.

Lead Agencies BC Government, Government of Canada



Start Years 2022 – 2023



Potential to reduce greenhouse gas emissions



Potential to improve regional air quality



Potential to improve regional visual air quality

3.1.5 Develop Sector-Specific Regulations. Develop and update sector-specific regulations to accelerate emission reductions from specific industrial, commercial or business sectors. Sectors targeted would be based on air quality and climate change impacts, emission reduction potential, emerging issues and other factors.

Lead Agency Metro Vancouver



Ongoing

3.1.6 Provincial and Federal Industrial Emission Standards. Advocate to the Government of Canada and the BC Government to continue developing stringent emission standards for industrial facilities to help improve air quality. Industrial sectors could include chemicals, petroleum refining, pipelines, shipping of bulk goods, and wood products.

Lead Agencies Government of Canada, BC Government



Start Years 2023 – 2024

3.1.7 Carbon Tariffs. Advocate to the Government of Canada and the BC Government to establish carbon tariffs or carbon border tax adjustments for imported industrial, manufactured and agricultural goods. This will help industrial facilities and businesses in the region to compete fairly against imported goods with higher carbon content.

Lead Agencies Government of Canada, BC Government



Start Years 2022 – 2023

3.1.8 Regional Industrial Emissions Working Group. Work with the BC Government, local First Nations, regional industry, business associations, academic institutions, port terminals and other partners to explore the opportunities for establishing a regional industrial emissions working group. If established, the working group would collectively identify the best opportunities to both minimize air quality impacts from industrial facilities and reduce industrial greenhouse gas emissions. The working group could help accelerate emission control innovation at industrial facilities, including supporting pilot projects.

Lead Agency Metro Vancouver



Start Years 2022 – 2023

3.1.9 Improve Volatile Organic Compound Content Limits. Advocate to the Government of Canada to implement more stringent volatile organic compound content limits for architectural and automotive paints, household products, industrial chemical products and other products that contribute to the formation of ground-level ozone.

Lead Agency Government of Canada



Ongoing

3.1.10 Reduce Air Quality Impacts from Odorous Air Contaminants. Continue to develop and implement a regional odour management framework, including measures to prevent, collect, control and disperse odorous air contaminants from industries and businesses. Odorous air contaminants are made up of many different compounds, some of which are immediately harmful to human health. This could include development of an emission regulation for organics processing facilities, which can be a source of odorous air contaminants.

Lead Agency Metro Vancouver



Ongoing

3.1.11 Phase out High Global Warming Refrigerants. Advocate to the Government of Canada to accelerate the phase out of halocarbons that have a high global warming potential, including refrigerants and blowing agents. The accelerated phase out should include coordination with technical and industry associations on certification and solutions for businesses. This would support Action 2.1.9 on enhancing compliance with existing halocarbon regulations.

Lead Agency Government of Canada



Start Years 2024 – 2025

3.1.12 Improved Emission Controls at Petroleum Storage and Loading Facilities. Work with the Government of Canada and the BC Government to explore any opportunities to reduce volatile organic compound emissions at federally and provincially regulated land- and marine-based facilities for storing and distributing petroleum products.

Lead Agencies Government of Canada, BC Government



Start Years 2025 – 2026

Strategy 3.2 Reduce Non-Road Emissions and Support Early Adoption of Zero Emission Non-Road Equipment.

Almost 850,000 non-road equipment units are used in the region, primarily for construction and commercial operations, cargo handling, and lawn and garden maintenance. They are a regional source of harmful diesel particulate matter, nitrogen oxides and greenhouse gases. Metro Vancouver's *Non-Road Diesel Engine Emission Regulation* (and the Vancouver Fraser Port Authority's related program) are helping to manage emissions from older, higher-emitting non-road diesel engines. More stringent emission requirements for new and existing non-road engines will help achieve the 2030 non-road targets for greenhouse gases and diesel particulate matter. The BC Government and Government of Canada should support development and commercialization of zero emission non-road engines, which would reduce air contaminant emissions over the long term.

Potential Impacts of Strategy in 2030

- Reduce annual greenhouse gases by up to **220,000** tonnes
- Reduce annual health-harming air contaminants by up to **200** tonnes

Key Partners

- BC Government
- Government of Canada
- Vancouver Fraser Port Authority

BIG
Move

3.2.1 Tighten Emission Regulation for Non-Road Diesel Engines. Update Metro Vancouver's emission regulation for non-road diesel engines with more stringent requirements that could cover additional air contaminants, equipment types, fuels and engine sizes. These updates should incentivize the early adoption of zero emission non-road equipment. Any updates should be coordinated with the Vancouver Fraser Port Authority to align requirements as much as possible.

Lead Agency Metro Vancouver



Ongoing

3.2.2 Emission Standards for New Non-Road Equipment. Advocate to the Government of Canada to establish more stringent fuel economy and emission standards for new non-road equipment. Cleaner non-road equipment standards will improve regional and local air quality and increase the availability of low and zero emission non-road equipment.

Lead Agency Government of Canada



Start Years 2022 – 2023

3.2.3 Funding for Cleaner Non-Road Equipment. Advocate to the BC Government and the Government of Canada to enhance funding (e.g., incentives, loans, tax credits) to replace or retrofit existing non-road equipment, to reduce emissions of health-harming air contaminants and greenhouse gases. Higher incentives should be available for zero emission equipment and if old equipment is scrapped. (Action 4.1.5 advocates for funding for cleaner agricultural non-road equipment.)

Lead Agencies BC Government, Government of Canada



Start Years 2022 – 2023

3.2.4 Identify Infrastructure Needs for Zero Emission Non-Road Equipment. Work with energy utilities, member jurisdictions, the Vancouver Fraser Port Authority, industry and other regional partners to identify the regional infrastructure needs to support a long-term transition to zero emission non-road equipment. This would consider the refueling and charging needs for different types of non-road equipment, funding requirements, potential pilot projects, and should align with similar actions for passenger vehicles and medium and heavy duty vehicles (Actions 1.2.4 and 1.3.7).

Lead Agencies Energy utilities, Metro Vancouver, member jurisdictions



Start Years 2025 – 2026

3.2.5 Encourage Cleaner Non-Road Equipment through Municipal Approvals. Advocate to member jurisdictions to encourage the use of low or zero emission non-road equipment for construction, film and other sectors. For example, builders and developers using cleaner non-road equipment could receive development benefits such as lower building permit fees.

Lead Agency Member jurisdictions



Start Years 2023 – 2024



Potential to reduce greenhouse gas emissions



Potential to improve regional air quality



Potential to improve regional visual air quality

3.2.6 Awareness Program on Zero Emission Non-Road Equipment. Develop and implement an awareness and outreach program for residents and businesses about the benefits of zero emission non-road equipment, working with member jurisdictions and other regional partners. The program would include regularly updated information on the availability of zero emission equipment and guidance on right-sizing non-road fleets, as well as supporting regional coordination of purchases (i.e., bulk buy) to help reduce costs.

Lead Agencies Metro Vancouver, member jurisdictions



Start Years 2023 – 2024

3.2.7 Transition Corporate Non-Road Fleet to Zero Emissions. Transition Metro Vancouver's corporate non-road fleet to zero carbon emissions by 2040, and zero emissions by 2050. (Action 1.2.11 includes similar targets for Metro Vancouver's corporate on-road fleet.)

Lead Agency Metro Vancouver



Ongoing



Strategy 3.3 Reduce Emissions through Procurement and from Small and Medium Businesses.

Businesses in the region have been helping to improve regional air quality, as well as reduce their greenhouse gas emissions. Additional technical support and guidance will help businesses adopt cleaner operating practices. Developing regional guidance on buying low carbon products will help reduce the embodied greenhouse gas emissions of goods and services. These steps will help achieve the 2030 regional targets to improve air quality and reduce greenhouse gas emissions. Key partners for this strategy include member jurisdictions, local businesses, the Government of Canada and the BC Government.



3.3.1 Regional Low Carbon Procurement. Work with member jurisdictions, industry and business groups, and other regional partners to develop and implement regional guidance on procurement to prioritize low carbon products, equipment and services for construction and other projects. The guidance could outline best practices, available certifications, methods for life cycle emission calculations, circular economy considerations (e.g., disposal), greenhouse gas targets and emission disclosure requirements. Products covered by the guidance could include, for example, low carbon cement and concrete products. The guidance should align with Strategy 2.5 on reducing embodied emissions in buildings, as well as Action 3.3.4.

Lead Agencies Metro Vancouver, member jurisdictions



Start Years 2023 – 2024

3.3.2 Air Quality Best Management Practices for Businesses and Organizations. Develop and promote a best practices guide for small and medium businesses and similar organizations about how they can help improve regional air quality. The guide would fill gaps identified in coordination with local businesses and other regional partners. The guide would also reflect practices identified in Metro Vancouver's corporate guidance (Action 3.3.5).

Lead Agency Metro Vancouver



Start Years 2025 – 2026

3.3.3 Integrate Climate Considerations into Standard Business Practices. Advocate to the Government of Canada and the BC Government to integrate climate considerations into financial reporting and other standard business practices. Integration could include public disclosure of business carbon footprints and climate-related risks, as well as changes to legislation or accounting standards. These practices would push businesses and industrial facilities to prioritize management of climate risks in operations and practices.

Lead Agencies Government of Canada, BC Government



Start Years 2023 – 2024

3.3.4 Low Carbon Corporate Procurement. Establish low carbon procurement guidance as a Metro Vancouver corporate standard, in alignment with Action 3.3.1. Products covered by the guidance could include, for example, low carbon cement and concrete products. This would show how procurement can support low carbon (and resilient) buildings, infrastructure and services. This action aligns with Action 2.5.5 on updates to Metro Vancouver's Sustainable Infrastructure and Buildings Policy.

Lead Agency Metro Vancouver



Start Years 2022 – 2023

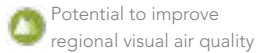
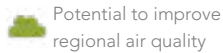
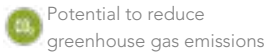
3.3.5 Corporate Opportunities to Reduce Emissions of Health-harming Air Contaminants. Explore and develop Metro Vancouver guidance to reduce corporate impacts on regional air quality. The guidance could identify practices that reduce emissions of health-harming air contaminants from activities such as construction, demolition, solvent use, painting and surface coating, road asphalt and more.

Lead Agency Metro Vancouver



Start Years 2025 – 2026





Strategy 3.4 Explore Opportunities for Technological Carbon Capture

Long-term modelling of regional greenhouse gas emissions indicates that climate actions focusing only on reducing emissions are likely insufficient for the Metro Vancouver region to reach carbon neutrality by 2050. Additional removal of carbon dioxide from the atmosphere is expected to be necessary, to avoid the worst impacts of climate change. While natural carbon sequestration can be increased in the region, any increase is expected to have limited impact on regional greenhouse gas levels, compared to the regional greenhouse gas targets. (This will be described in more detail in the *Climate 2050 Nature & Ecosystems Roadmap*.) As such, technological carbon capture will be needed. Initial research on the opportunities for these technologies in the region will support the 2030 greenhouse gas target for industrial facilities.

Potential Impacts of Strategy in 2030

- Reduce annual greenhouse gases by up to **50,000 tonnes**
- No regional air quality impacts are expected

Key Partners

- BC Government
- Industrial facilities
- Academic Institutions

3.4.1 Carbon Capture in Metro Vancouver Region. Work with industry, academia and other regional partners to explore the potential opportunities for carbon capture technologies in the region, including pilot projects and uses of captured carbon dioxide.

Lead Agency Metro Vancouver



Ongoing

3.4.2 Develop Carbon Capture Standards. Advocate to the BC Government to develop technical standards for carbon capture technologies.

Lead Agency BC Government



Start Years 2023 – 2024



Issue Area 4: Agriculture

Agriculture contributes to the regional economy and provides fresh, healthy food for local consumption and export. The agricultural sector faces challenges such as expensive land, fluctuating commodity prices and crop losses due to a changing climate. Agricultural land supports regional food security and provides ecosystem services. Ecosystem services help farmers adapt to the effects of climate change and also provide public benefits that include flood management, carbon sequestration and wildlife habitat. Agricultural activities also generate emissions of greenhouse gases and other air contaminants.

Agriculture emissions

Agricultural activities generate 4% of regional greenhouse gas emissions, primarily from heaters and boilers in greenhouses, agricultural equipment, and livestock. Some agricultural activities cause emissions of ammonia, fine particulate matter and volatile organic compounds, which impact regional air quality, visual air quality, and human health. The main sources of these emissions are poultry and cattle manure, ammonia fertilizers, fuel combustion, open-air burning, wind erosion of soils, and fugitive dust.

Odours can come from normal farm practices such as manure application. Some agricultural practices generate odorous air contaminants, which are generally more challenging to manage than nuisance odours.

Additional information on climate change and agriculture will be outlined in the *Climate 2050 Agriculture Roadmap*, including opportunities on climate adaptation and enhancing carbon sequestration on agricultural lands.

Long-term Goals

1. The agricultural sector is carbon neutral and maximizes carbon sequestration.
2. All agricultural operations minimize air contaminant emissions using best available management practices and technologies, and are powered by clean, renewable energy.

2030 Targets

- 35% reduction in agriculture greenhouse gas emissions, from 2010 levels
- 10% reduction in agriculture fine particulate matter emissions, from 2020 levels

Key Benefits of Accelerating Emission Reductions from Agriculture

- Reduced climate change and air quality impacts, including reduced crop losses related to droughts
- Some newer agricultural practices (e.g., regenerative agriculture) can increase crop yields while reducing emissions
- Energy efficiency projects reduce energy costs
- Zero emission agricultural equipment generally have lower maintenance and energy costs
- Expanding local agriculture can support agricultural jobs in the region

Key Costs of Accelerating Emission Reductions from Agriculture

- Public investments in Environmental Farm Plans
- Capital costs for lower emission farming practices and energy efficiency projects
- Premiums for renewable natural gas and other renewable energy sources
- Capital costs for low and zero emission agricultural equipment



Strategies and Actions

Strategy 4.1 Reduce Emissions from the Agricultural Sector.

The BC Government and the Government of Canada support emission reductions in agriculture through Environmental Farm Plans and Beneficial Management Practices. Improving energy efficiency in greenhouses and switching to clean, renewable energy for greenhouses and agricultural equipment will help achieve the 2030 agriculture emission targets for greenhouse gases and fine particulate matter. Alternatives to burning agricultural vegetative waste and enhanced Beneficial Management Practices will help achieve 2030 targets for greenhouse gases and fine particulate matter. Increasing the production of renewable natural gas through anaerobic digestion of agricultural and other waste will help to displace natural gas from fossil fuels in sectors where zero emission solutions are more challenging.

Potential Impacts of Strategy in 2030

- Reduce annual greenhouse gases by up to **100,000** tonnes
- Reduce annual health-harming air contaminants by up to **50** tonnes

Key Partners

- BC Government
- Agriculture community
- Member jurisdictions

	<p>4.1.1 Reduce Emissions from Greenhouses. Work with the BC Government, the BC Agriculture Council, the BC Greenhouse Growers Association and member jurisdictions to explore opportunities to reduce emissions from greenhouses. Opportunities could include improving energy performance and transitioning to using more clean, renewable energy, while considering the need for supplemental carbon dioxide in greenhouses to support plant growth.</p> <p>Lead Agencies BC Government, Metro Vancouver, member jurisdictions</p> <p>   Start Years 2024 – 2025</p>
	<p>4.1.2 Reduce Open-Air Burning. Work with agricultural producers to accelerate adoption of alternatives to open-air burning of agricultural vegetative waste. These alternatives would complement open-air burning regulatory requirements.</p> <p>Lead Agency Metro Vancouver</p> <p>   Ongoing</p>
	<p>4.1.3 Outreach Program on Reducing Agricultural Emissions. Develop and implement an awareness and outreach program on reducing agricultural emissions. The program would be developed with the agriculture community, member jurisdictions and the BC Government, and would supplement existing agricultural outreach and support programs.</p> <p>Lead Agencies Metro Vancouver, member jurisdictions</p> <p>   Start Years 2025 – 2026</p>
	<p>4.1.4 Enhance Funding for Environmental Farm Plans. Advocate to the Government of Canada and the BC Government to enhance the funding for developing and implementing Environmental Farm Plans. This program helps agricultural operations reduce emissions of particulate matter, ammonia, nitrous oxide, methane and odorous air contaminants. This should include continued development and promotion of Beneficial Management Practices, as well as providing reliable incentives and technical guidance to farms to support adoption of low emission practices and technologies.</p> <p>Lead Agencies Government of Canada, BC Government</p> <p>   Start Years 2023 – 2024</p>

<p>4.1.5 Incentives for Farmers to Transition to Lower Emission Equipment. Advocate to the BC Government and the Government of Canada to enhance or develop funding supports for cleaner agricultural equipment (e.g., incentives, tax credits, loans). This would help accelerate the transition to lower emission equipment (e.g., a harvester with better emission controls) or encourage the installation of improved emission controls on existing equipment (e.g., diesel particulate filters). Higher incentives should be available if old equipment is scrapped and for zero emission equipment to increase their adoption. (Action 3.2.3 advocates for incentives for cleaner non-road equipment for non-agricultural uses.)</p>		<p>Start Year 2023 – 2024</p>
<p>4.1.6 Pilot Study with Zero Emission Agricultural Equipment. Work with the BC Government and the agriculture community to develop a pilot study for zero emission agriculture equipment such as an electric tractor. The study could identify the long-term pathways for wider adoption of zero emission agricultural equipment, including charging and related infrastructure requirements.</p>		<p>Start Years 2026 – 2027</p>
<p>4.1.7 Regulatory Requirements for Cannabis Industry. Develop an emission regulation to reduce air quality impacts from the cannabis industry. Regulatory requirements would be based on air quality impacts, emission reduction potential, and other factors.</p>		<p>Ongoing</p>
<p>4.1.8 Streamline Emission Requirements for Anaerobic Digestion Facilities. Develop an emission regulation for anaerobic digestion of manure, other agricultural waste and commercial food waste. The regulation would maintain equivalent protections for regional air quality and human health as the existing permit process, and would provide a simpler path to regulatory compliance.</p>		<p>Start Years 2023 – 2024</p>
<p>4.1.9 Expand Anaerobic Digestion of Agricultural Waste. Advocate to the BC Government, the Government of Canada, energy utilities and member jurisdictions to expand development of anaerobic digestion facilities to process manure, other agricultural waste and commercial food waste. This could include funding (e.g., incentives, tax credits, loans) and removal of barriers in existing regulations. Any expansion should avoid the loss of agricultural land in the Metro Vancouver region.</p>		<p>Start Years 2022 – 2023</p>
<p>4.1.10 Encourage Local Agriculture. Advocate to member jurisdictions and other regional partners to continue encouraging more local food production, prioritizing agricultural practices that reduce emissions or help maintain or sequester carbon.</p>		<p>Ongoing</p>



Issue Area 5: Health

Emissions are the air contaminants that emission sources release into the air; they are most concentrated near the source and are dispersed over time and distance. Exposure refers to the air contaminants that residents breathe where they live, learn, play and work. Managing exposure to health-harming air contaminants reduces their impacts on residents and communities in the Metro Vancouver region.

Indoor air quality

Metro Vancouver will continue to work with the BC Government, health authorities and member jurisdictions to improve indoor air quality. Building owners and managers are responsible for managing indoor air quality, following guidance provided by health authorities and related agencies. Areas of concern include the impact of airtight buildings, infiltration of air contaminants from outdoors, and the impact of indoor sources such as gas stoves, wood burning, and consumer products.

Long-term Goal

1. Residents in the region do not experience disproportionate impacts from air quality and climate change.

2030 Targets

- *Under development*

Strategies and Actions

Strategy 5.1 Reduce Residents' Exposure to Harmful Air Contaminants.

Managing exposure to health-harming air contaminants reduces their impacts on residents and communities in the Metro Vancouver region. Strengthening relationships with First Nations can help reduce air quality impacts in their communities. Integrating health impact assessments and protecting indoor air quality can reduce the amount of air contaminants residents breathe from medium and heavy duty vehicles, wildfires and other sources. The key partners for this strategy include health authorities, member jurisdictions and the BC Government.



5.1.1 Strengthen Relationships with First Nations on Air Quality Issues. Work to strengthen relationships with local First Nations to improve understanding of air quality concerns in First Nations communities in the region (e.g., transportation and industrial emissions), along with potential solutions.

Lead Agency Metro Vancouver



Ongoing

5.1.2 Integrate Health Impact Assessments into Major Projects. Work with member jurisdictions, health authorities, the BC Government and the Government of Canada to develop a process to integrate health impact assessments into reviews for major transportation, development and industrial projects. Integration would be supported by guidance on how to reduce residents' exposure to harmful air contaminants, such as from medium and heavy duty vehicles. Guidance could include recommendations for assessment thresholds, urban form and land-use, infrastructure and ventilation design, and siting of emission sources.

Lead Agencies Metro Vancouver, health authorities



Start Years 2024 – 2025

5.1.3 Protect against Wildfire Smoke Impacts. Work with health authorities, member jurisdictions and other regional partners to further protect against smoke from wildfires. Protections should prioritize vulnerable populations and could include actions to prevent wildfires, more "clean air" shelters in public buildings (e.g., community centres, libraries), resources to help residents and businesses manage indoor air quality (e.g., with portable air cleaners), and providing high quality information to the public during air quality advisories.

Lead Agencies Metro Vancouver, health authorities



Start Years 2022 – 2023

5.1.4 Health and Air Quality Awareness. Work with health authorities and other health partners to develop awareness and outreach activities to inform residents and businesses about the links between air quality and personal and public health, including impacts on vulnerable populations. Outreach should ensure information reaches the populations who are most vulnerable to air quality impacts.

Lead Agencies Health authorities, Metro Vancouver



Start Years 2022 – 2023

5.1.5 Enhance Social Support Programs to Consider Air Quality Impacts. Advocate to the BC Government and the Government of Canada to enhance social support programs to consider air quality impacts. Enhancements should support residents that are at higher risk from exposure to air contaminants, such as through poor building ventilation and heating systems.

Lead Agencies BC Government, Government of Canada



Start Years 2022 – 2023



Issue Area 6: Measure, Monitor and Regulate

Metro Vancouver drives continuous improvement in air quality and greenhouse gas management through a fair, efficient and effective management program. Measuring emissions and monitoring ambient air quality provide the foundation for Metro Vancouver's air quality and greenhouse gas management program. Metro Vancouver authorizes emissions through permits and regulations, and promotes compliance through various mechanisms. Public communication ensures that residents and businesses are aware of and understand air quality and climate change issues. Metro Vancouver adapts its methods as needed to respond to technological advances, changing regulatory regimes and emerging issues.

This issue area outlines how Metro Vancouver currently operates as an air quality and greenhouse gas authority, as well as identifying future directions. The actions associated with measurement, monitoring and regulation cut across Issue Areas 1 to 5; many of the strategies and actions in those issue areas will require measurement or tracking on an individual issue area basis.

Long-term Goals

1. Metro Vancouver implements world-leading and innovative air quality and greenhouse gas management services and solutions.
2. Metro Vancouver residents and organizations have a high awareness and accurate understanding of climate change and air quality issues, and can identify opportunities to take action through behaviour change, purchasing decisions and citizen advocacy.

2030 Target

- 98% reliability of ambient air quality monitoring network

Strategy 6.1 Implement Leading Management Practices to Continually Improve Regional Air Quality and Reduce Greenhouse Gas Emissions.

Emerging and innovative technologies such as low cost sensors, big data and machine learning are creating opportunities to extend the reach of our existing monitoring network, and improve management of local impacts. Continuing to improve management practices and processes could streamline emission authorizations and reviews for regulated entities. Enhancing communications with the public will help achieve the public awareness goal.

Up to date information on any of the actions or directions in this strategy are available on Metro Vancouver’s website (www.metrovancouver.org, search “air quality and climate change”).

CURRENT ACTIONS	FUTURE DIRECTIONS
<p>6.1.1 Air Quality and Greenhouse Gas Management. Work with member jurisdictions, health authorities, the BC Government and other partners on air quality, visual air quality and greenhouse gas management. Approaches include strategic planning, guidance, tools, dispersion modelling guidelines, public reporting, industrial proposal reviews, etc.</p>	<ul style="list-style-type: none"> • Explore the adoption of service establishment bylaws to support regional climate change programs. • Pursue legislative changes to enable non-regulatory approaches to support emission reductions from businesses. • Explore and implement innovative technologies and approaches to improve air quality and greenhouse gas management, such as machine learning. • Explore the benefits of establishing regional carbon budgets to guide climate planning. • Continue to update <i>Climate 2050 Roadmaps</i> in response to changing science, technology, public opinion and partnership opportunities. • Continue to develop and implement tools to assess costs and benefits for policies, programs and regulations.
<p>6.1.2 Ground-Level Ozone Management. Implement targeted actions under existing <i>Regional Ground Level Ozone Strategy</i> to minimize ground-level ozone impacts in the Lower Fraser Valley, working with regional partners.</p>	<ul style="list-style-type: none"> • Update <i>Regional Ground-Level Ozone Strategy</i> and continue to implement targeted actions to reduce impacts of ground-level ozone on regional air quality. • Continue to improve understanding of climate impacts on ozone formation, including from increasing temperatures and wildfires, along with potential solutions.
<p>6.1.3 Odour Management. Implement existing regional odour management framework. Framework addresses key sources of odorous air contaminants, odour monitoring, complaint management and public outreach.</p>	<ul style="list-style-type: none"> • Continue development of sector-specific regulations that address air contaminants, including odorous air contaminants. • Develop odour monitoring capacity within the region.
<p>6.1.4 Visual Air Quality Management. Implement existing visual air quality management program for the Lower Fraser Valley, working with regional partners.</p>	<ul style="list-style-type: none"> • Continue to develop and implement policies and programs to improve visual air quality in the Lower Fraser Valley.
<p>6.1.5 Complaint Management. Review and respond to air quality complaints. Responding can include communication with the alleged source, site visits, air quality monitoring and compliance or enforcement actions.</p>	<ul style="list-style-type: none"> • Streamline complaint response process to identify and resolve new air quality issues.
<p>6.1.6 Emissions Inventories and Related Data Sets. Track and forecast regional emissions of air contaminants, including greenhouse gases, to measure performance, track progress towards goals and targets, and guide policy and regulatory development. The primary inventory is the Lower Fraser Valley emissions inventory developed every 5 years; specialized approaches include inventories of hazardous air pollutants, and additional tracking of greenhouse gases.</p>	<ul style="list-style-type: none"> • Track regional greenhouse gas emissions on annual basis. • Continue to improve the consumption-based emissions inventory for greenhouse gases. • Improve understanding of emissions from refrigerants and halocarbons, natural volatile organic compounds, large sources of fugitive particulate matter, methane leakage, and automated vehicles. • Continue to work with member jurisdictions and other regional partners on developing, aligning, and sharing regional data sets. • Continue to improve corporate emissions inventories, to help guide corporate actions.

<p>6.1.7 Air Quality Monitoring. Measure levels of key air contaminants and visual air quality across the region, working with regional partners. Monitoring includes fixed and temporary sites, as well as specialized monitoring studies. Review monitoring network every 5-10 years to respond to regional changes, emerging issues and help protect human health and the environment.</p>	<ul style="list-style-type: none"> • Enhance monitoring network with low cost and portable sensors, near-road and community monitoring, and carbon dioxide monitoring. • Measure the changing climate and the impacts to air quality, including visual air quality. • Develop and implement a user-friendly open data portal, so the public and researchers can more easily access and use data collected by Metro Vancouver. • Explore options to improve rapid monitoring capabilities during air quality emergencies.
<p>6.1.8 Ambient Air Quality Objectives. Develop and update ambient air quality objectives, establishing acceptable thresholds for concentrations of air contaminants. Measured ambient concentrations of air contaminants are compared to objectives to determine achievement of the objectives.</p>	<ul style="list-style-type: none"> • Develop new and updated objectives based on current health research and best practices. • Explore expected impact of <i>Clean Air Plan</i> actions on achievement of ambient air quality objectives.
<p>6.1.9 Air Quality Advisories. Develop and issue air quality advisories and bulletins to inform the public during periods of degraded air quality, working with regional partners.</p>	<ul style="list-style-type: none"> • Continue to work with regional partners on managing air quality advisories and bulletins, and enhancing public awareness.
<p>6.1.10 Bylaw and Regulation Development. Develop and amend bylaws and emission regulations to protect human health and the environment. Regulatory development uses best available evidence and includes engagement with the public, stakeholders and other governments.</p>	<ul style="list-style-type: none"> • Continue to develop and implement tools to assess costs and benefits for new or significantly modified emission regulations. • Introduce expanded regulatory requirements for greenhouse gas emissions (Action 3.1.2).
<p>6.1.11 Regulatory Authorizations and Compliance. Authorize emissions through regulations and air permits. Promote compliance with regulatory requirements through inspections, report reviews and, where necessary, issuing notices of violation, tickets or orders. Identify opportunities in permits and regulations to reduce emissions and impacts, and work to address emerging air quality issues through existing regulatory tools.</p>	<ul style="list-style-type: none"> • Develop a framework for issuing administrative penalties.
<p>6.1.12 Public Communication. Communicate with the public, stakeholders and other governments about local and regional air quality and climate change issues, and provide resources to support emission reductions. Some current approaches include the annual Caring for the Air report, Air Quality Health Index, annual Air Quality Monitoring Reports, www.AirMap.ca, www.ClearAirBC.ca, public opinion research, and others.</p>	<ul style="list-style-type: none"> • Improve online air quality and climate change communication tools. • Develop and promote a climate literacy online learning tool to support citizen advocacy and personal choices. • Develop metrics to track public awareness of air quality and climate change issues.
<p>6.1.13 Environmental Assessments. Provide technical feedback and mitigation recommendations to environmental and impact assessments for major projects conducted under provincial and federal regulations, and through inter-agency referrals.</p>	<ul style="list-style-type: none"> • Advocate that environmental assessments improve consideration of upstream and downstream emissions, and recognize Metro Vancouver's recommended conditions.
<p>6.1.14 Specialized Studies. Conduct specialized studies on emerging areas of concern in local and regional air quality and climate change, such as air quality near major roads and regional climate projections.</p>	<ul style="list-style-type: none"> • Improve understanding of the impacts and interactions between air contaminants and the region's natural environment (working with researchers), as well as the potential impacts of microplastics on air quality and health.

Glossary

Active transportation includes self-powered modes of transportation such as walking, cycling, skateboarding, in-line skating/rollerblading, jogging and running, wheel chairing, snowshoeing and cross-country skiing.

Air contaminant means any substance that is emitted into the air and that (a) injures or is capable of injuring the health or safety of a person; (b) injures or is capable of injuring property or any life form; (c) interferes or is capable of interfering with visibility; (d) interferes or is capable of interfering with the normal conduct of business; (e) causes or is capable of causing material physical discomfort to a person; or (f) damages or is capable of damaging the environment.

Ambient air quality objectives and standards are health-based targets which define the acceptable outdoor concentration of key air contaminants. Metro Vancouver, the BC Government and Government of Canada adopt objectives and standards that become more stringent over time, to drive continuous improvement in air quality.

Anaerobic digestion breaks down waste products in the absence of oxygen to create biogas, which can be converted into renewable natural gas.

Carbon dioxide (CO₂) is the primary driver of climate change, and is produced mainly by burning fossil fuels.

Carbon neutral region means that the region generates no net greenhouse gas emissions. This is achieved through the deepest greenhouse gas emission reductions possible across all economic sectors, and any remaining emissions are balanced out by the carbon dioxide that the plants, trees, and soil of the region remove from the atmosphere, or potentially through technological means.

Carbon sequestration is the removal of carbon dioxide from the air and the long-term storage of that carbon to mitigate climate change.

Clean, renewable energy is low or zero emission energy that is replenished over days or years. In Metro Vancouver, clean, renewable energy is primarily electricity from renewable sources such as hydro or solar.

Climate change adaptation means anticipating, planning for and responding to the adverse effects of climate change and taking appropriate action to prevent or minimize the damage it can cause, or taking advantage of opportunities that may arise. It has been shown that well planned, early adaptation action saves money and lives later.

Diesel particulate matter (DPM) is a form of fine particulate matter from diesel engines that is classified as carcinogenic.

District energy systems provide heating and cooling to a network of residential and commercial buildings more efficiently, and generally with lower emissions than individual building heating and cooling systems.

Ecosystems are all the plants and animals that live in a particular area together with the relationships between them and their environment.

Embodied emissions are greenhouse gas emissions associated with the construction of goods and products, including the raw materials and the transport of the good or product to where it is sold.

Equity is the promotion of fairness, justice and the removal of structural barriers that may cause or aggravate disparities experienced by different groups of people.

Fine particulate matter (PM_{2.5}) is made up of tiny solid or liquid particles that float in the air and can penetrate deep into the lungs and even into the bloodstream. Fine particulate matter can damage people's health by aggravating existing lung and heart diseases, increasing the risk of cancer and reducing life expectancy.

Greenhouse gases are air contaminants that trap heat and are the cause of climate change. Greenhouse gases include carbon dioxide, methane, nitrous oxide, halocarbons, black carbon and ozone. Limiting or preventing greenhouse gas emissions and removing these gases from the atmosphere (sometimes referred to as “climate change mitigation”) is critical to avoiding catastrophic climate change.

Ground-level ozone (O₃) can have harmful impacts on everyone, especially children, the elderly, and people with lung and heart conditions. It is primarily formed when nitrogen oxides and volatile organic compounds react in the air on hot and sunny days.

Hazardous air pollutants (HAP) can damage people's health through effects such as cancer, neurological effects, reproductive effects, and developmental effects. HAPs include volatile and semi-volatile organic compounds, polycyclic aromatic hydrocarbons, heavy metals and carbonyl compounds.

Health-harming air contaminants are air contaminants that can harm public health and reduce residents' quality of life and life expectancy by causing heart and lung diseases, cancer, asthma, and other impacts. Health-harming air contaminants include fine and coarse particulate matter, diesel particulate matter, ground-level ozone, nitrogen dioxide, sulphur dioxide, volatile organic compounds and ammonia.

Low carbon building upgrades include upgrading building insulation and windows, sealing out drafts and switching to electric heating and cooling. These upgrades can significantly reduce energy consumption and emissions.

Marine vessels include ocean-going marine vessels (e.g., container, bulk, tanker, fishing, cruise, and other specialty vessels), harbour vessels and passenger ferries.

Medium and heavy duty vehicles are mostly freight vehicles such as long-haul trucks and cube vans, and also include buses and refuse trucks.

Methane (CH₄) is a short-lived greenhouse gas and is 25 times more effective than carbon dioxide at trapping heat in the atmosphere.

Mobility pricing refers to how we pay to get around. Some types of mobility pricing (e.g., decongestion charging, low emission zones) are used to manage demand for roads and reduce emissions.

Nitrogen dioxide (NO₂) can damage people's health by aggravating existing lung diseases like asthma and bronchitis and reducing immunity to lung infections. It is formed during high-temperature fuel combustion.

Nitrogen oxides (NO_x) are a group of gases, which includes nitrogen dioxide, that are produced during high-temperature fuel combustion, and can contribute to the formation of ground-level ozone and fine particulate matter.

Nitrous oxide (N₂O) is a long-lived greenhouse gas, and is about 300 times more effective than carbon dioxide at trapping heat in the atmosphere.

Non-road equipment is any machine with an internal combustion engine that is not used or intended for transportation on public roads. Examples include stationary or mobile equipment such as loaders, cranes, generators, tractors, and lawn mowers.

Passenger vehicles include cars, SUVs, minivans, light trucks, and motorcycles. Transit buses, though used for passengers, are classified as medium and heavy duty vehicles.

Renewable natural gas is a renewable form of natural gas with a low carbon intensity. Sources of renewable natural gas include landfill gas and organic waste.

Right-sizing fleets means aligning the type and number of fleet vehicles to the true needs of the fleet. Right-sizing fleets reduces costs and emissions.

Sulphur dioxide (SO₂) is emitted during the combustion of sulphur-containing fuels. Exposure to high levels of sulphur dioxide can damage people's health by aggravating asthma and increasing respiratory symptoms.

Sulphur oxides (SO_x) are a group of gases, which includes sulphur dioxide, that are emitted during the combustion of sulphur-containing fuels. They can also react with other substances in the air to form particulate matter.

Visual air quality is how clear the air looks to the average observer. Metro Vancouver and its partners measure visual air quality on a scale from “very poor” to “excellent” at five sites in the Lower Fraser Valley.

Volatile organic compounds (VOC) are compounds that readily become vapours or gases; they are emitted during fuel combustion and from many consumer, commercial and industrial products. They have direct and indirect impacts on human health and contribute to the formation of ground-level ozone.

Zero carbon or **zero carbon emissions** are emissions that generate no net greenhouse gas emissions at the point of use. A zero carbon fuel source either produces no greenhouse gas emissions or any greenhouse gas emissions produced are offset by renewable energy (either generated on-site or purchased).

Zero emission means no greenhouse gases or other air contaminants are generated at the point of use. Zero emission includes zero carbon (see above) and also eliminates emissions of health-harming air contaminants (e.g., fine particulate matter and nitrogen oxides).

Zero emission vehicles (ZEVs) release no air contaminants from their tailpipes. Electric vehicles are the most common type of zero emission vehicle; others include hydrogen fuel cell vehicles.

ZEV-first is a procurement policy where priority is given to purchasing zero emission vehicles, if they are available.

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. Its core services are drinking water, wastewater treatment and solid waste management. Metro Vancouver also regulates air quality, plans for urban growth, manages a regional parks system and provides affordable housing. The regional district is governed by a Board of Directors of elected officials from each local authority.

Member jurisdictions of Metro Vancouver include:

- Village of Anmore
- Village of Belcarra
- Bowen Island Municipality
- City of Burnaby
- City of Coquitlam
- City of Delta
- Electoral Area A
- City of Langley
- Township of Langley
- Village of Lions Bay
- City of Maple Ridge
- City of New Westminister
- City of North Vancouver
- District of North Vancouver
- City of Pitt Meadows
- City of Port Coquitlam
- City of Port Moody
- City of Richmond
- City of Surrey
- Tsawwassen First Nation
- City of Vancouver
- District of West Vancouver
- City of White Rock

Climate Action Committee members:

- Carr, Adriane (Chair) - City of Vancouver
- Dhaliwal, Sav (Vice Chair) - City of Burnaby
- Arnason, Petrina - Township of Langley
- Baird, Ken - Tsawwassen First Nation
- Dupont, Laura - City of Port Coquitlam
- Hocking, David - Bowen Island Municipality
- Kruger, Dylan - City of Delta
- McCutcheon, Jen - Electoral Area A
- McIlroy, Jessica - City of North Vancouver
- McLaughlin, Ron - Village of Lions Bay
- Patton, Allison - City of Surrey
- Royer, Zoë - City of Port Moody
- Steves, Harold - City of Richmond
- Yousef, Ahmed - City of Maple Ridge



Feedback Considered in Finalizing the *Clean Air Plan*

<i>Clean Air Plan</i> Section/Topic	Feedback on Section/Topic	How Feedback Was Considered in Finalizing the <i>Clean Air Plan</i>
GENERAL		
Regional 2030 Targets	Given the well-established literature on the health impacts of air pollution, the continually expanding evidence on the health impacts from exposure to even low concentrations, and the widespread population exposures in Metro Vancouver, the 2030 air quality target should strive for continual improvements in air quality, well beyond the current air quality objectives.	The 2030 air quality target was updated to reflect the need for continuous improvement, and now reads: "Air quality in the region is continually improving, protecting human health and the environment, by ensuring that: a. Ambient air quality meets or is better than the ambient air quality objectives and standards that are regularly updated by Metro Vancouver, the BC Government and the Government of Canada; and b. The amount of time that visual air quality is classified as "excellent" is increasing."
Issue Area 2030 Targets	The issue area targets are too aggressive and could lead to unintended consequences. The targets should be consistent with the targets from the BC Government.	The issue area targets were established considering the regional greenhouse gas targets and the results from initial carbon neutral modelling. The targets are specific to the emissions profiles of different issue areas (i.e., emission sectors) in the Metro Vancouver region, which differ from the rest of the Province, and were based on the technological readiness and economic considerations for different sectors. If the issue area targets for 2030 are achieved, regional emission reductions would achieve the regional 45% reduction target, which was established to align with the science-based target to limit warming to 1.5 degrees Celsius.
Issue Area 2030 Targets	Given the relative wealth of developed countries like Canada, greenhouse gas emission targets should be even more stringent.	Setting even more stringent greenhouse gas targets was not considered achievable at this time, given the current technologies and solutions available to sectors such as industry, non-road and freight.

<i>Clean Air Plan</i> Section/Topic	Feedback on Section/Topic	How Feedback Was Considered in Finalizing the <i>Clean Air Plan</i>
Challenges and Opportunities (Air Contaminants)	The four key health-harming air contaminants read as equally important. If these contaminants are “not all treated equal,” then this should be made clear.	The wording was changed to clarify which contaminants have the greatest impact in the region.
Zero emissions definition	The <i>Clean Air Plan</i> defines zero emissions as being at point of use. Energy sources such as electrification have emissions upstream from point of use, which should be acknowledged.	Metro Vancouver recognizes that there are also upstream emissions associated with different energy sources, which should be considered as actions are implemented. Given that Metro Vancouver’s authority is regional, the <i>Clean Air Plan</i> is focused on reducing emissions within our region. Upstream emissions are, however, considered in Strategies 2.5 (Accelerate the Transition to Lower Embodied Emissions in Buildings) and 3.3 (Reduce Emissions through Procurement and from Small and Medium Businesses).
Big Moves	There are so many actions in the draft <i>Clean Air Plan</i> that it is unclear which are the most important.	The Plan was re-organized to better highlight the “Big Moves” that are foundational to accelerate emission reductions.
Costs of Action, Costs of Inaction	The <i>Clean Air Plan</i> should include cost as a guiding principle and provide estimates of the cost of the actions in the Plan.	A new section on “Costs of Action, Costs of Inaction” was added to the Plan, and cost and benefit discussions were also added to the first four issue areas. Cost was added as a component of the “Evidence-Based” guiding principle. Metro Vancouver is currently working to understand the high level cost impacts of various actions in the <i>Clean Air Plan</i> , which would be publicly reported. As actions are implemented, Metro Vancouver will develop an improved understanding of cost and benefits as part of detailed policy and regulatory design.
Carbon Neutral Modelling (supporting analysis)	The <i>Clean Air Plan</i> should include the modelling assumptions that supported the development of the Plan.	The carbon neutral modelling project results, which partly supported the development of the Plan, is available on Metro Vancouver’s website by searching for “modelling a carbon neutral region”.

<i>Clean Air Plan</i> Section/Topic	Feedback on Section/Topic	How Feedback Was Considered in Finalizing the <i>Clean Air Plan</i>
Transitioning to Clean, Renewable Energy	The draft <i>Clean Air Plan</i> assumes constraints on renewable gas supply, but not necessarily electricity supply.	The wording was changed to note that the energy transition “will require expansions in the supply and distribution capacity for both electricity and renewable natural gas.”
Transitioning to Clean, Renewable Energy	Electrification should not be the primary pathway to carbon neutrality. Renewable natural gas is an affordable, drop-in renewable energy with a low carbon intensity. All renewable fuels should be treated equally, which allows for a more equitable and affordable approach.	Metro Vancouver recognizes that renewable natural gas will play a critical role in reaching the region’s greenhouse gas reduction target. The cost of clean, renewable energy will be a key factor that Metro Vancouver will consider as it implements actions in the <i>Clean Air Plan</i> , along with the impacts on air quality and net greenhouse gas emissions. In British Columbia, electricity is produced primarily from hydro power, a clean, renewable source of energy that produces significantly less emissions than fossil fuels. Most other renewable fuels (e.g., wood, renewable natural gas) still produce health-harming air contaminants, which harm air quality, human health and the environment.
Indigenous Knowledge and First Nations Stewardship	“Indigenous knowledge” is preferred to “traditional knowledge”. Beyond providing services to their communities, local First Nations have a stewardship obligation to protect the lands, waters and wildlife.	The wording was changed in the “Guiding Principles” and “Roles and Responsibilities” sections to update the language in response to this feedback.
Roles and Responsibilities	The roles and responsibilities for businesses and residents should also be highlighted.	The wording was changed in the “Roles and Responsibilities” section to reflect this feedback. The wording in multiple actions was changed to highlight greater involvement from industry and other partners.
Reporting on Progress	Metro Vancouver should commit to publicly and regularly report on the progress towards <i>Clean Air Plan</i> actions and emission goals.	The wording was changed in the “Structure and Implementation” section to reflect this feedback, clarifying how reporting will be undertaken.

Clean Air Plan Section/Topic	Feedback on Section/Topic	How Feedback Was Considered in Finalizing the Clean Air Plan
Equity Actions	The Plan should provide more focused language around the concept of what current or anticipated actions or mechanisms would benefit from equitable implementation; it is currently too broad and provides insufficient direction.	Implementation of Equity actions 1 to 6 will provide more direction on integrating equity in air quality and greenhouse gas management actions.
General	The <i>Clean Air Plan</i> should focus on areas of direct influence within Metro Vancouver's authority.	As a regional district, Metro Vancouver has a convener role to work with others to identify solutions that Metro Vancouver might not be in the best position to implement. Previous air quality and greenhouse gas management plans have included actions for others to implement.
General	Concerned about potential for conflict between Metro Vancouver requirements and requirements set by the provincial and federal governments, as well as having requirements that don't apply in the rest of BC.	Metro Vancouver is actively working with other governments to identify areas for alignment and collaboration, and how to minimize conflicting requirements. As part of its delegation of authority for air quality, Metro Vancouver may establish different prohibitions, regulations, conditions, requirements and exemptions within the region.
General	There should be a larger discussion of wind and solar power in the Plan.	The <i>Clean Air Plan</i> is focused on emission reductions within the region, rather than the sources of electricity. The <i>Climate 2050 Energy Roadmap</i> will consider where future clean energy could come from, including from wind and solar sources.
TRANSPORTATION		
Transportation Goals	The first goal should emphasize the advantages of shared mobility since an electric vehicle uses just as much road space as a fossil fuel vehicle.	Shared mobility will likely have some impact on emissions and is supported in multiple actions, including Actions 1.1.6 (Regional Parking Strategy to Reduce Driving) and 1.1.10 (Regional Bike- and Car-Sharing Strategy). TransLink's <i>Transport 2050</i> includes a key focus on the importance and multiple benefits of shared mobility and autonomous vehicles.

<i>Clean Air Plan</i> Section/Topic	Feedback on Section/Topic	How Feedback Was Considered in Finalizing the <i>Clean Air Plan</i>
Transportation 2030 Targets	The draft <i>Clean Air Plan</i> proposes emission reductions in terms of absolute quantities, rather than intensities. Cargo volumes are increasing due to economic activity so absolute reductions will be hard to achieve until net zero technologies become commercially available.	Reducing absolute emissions in a growing economy is a challenge, but absolute reductions are needed to limit global warming to 1.5 degrees Celsius. Achieving absolute reductions will require the advancement of zero emission technologies in specific sectors such as the heavy freight sector (see Action 1.4.4).
Transportation Strategy 1.1 (Reduce Driving through Active Transportation and Public Transit)	There should be a greater focus on the hierarchy of actions in transportation, where the order of actions matters, reducing driving, mode shifting, efficiency improvements then electric vehicles and renewable fuels. Active transportation and public transit have more co-benefits than vehicle electrification.	Strategy “Reduce Driving through Active Transportation and Public Transit” is now the first strategy under the Transportation section.
Transportation Action 1.1.2 (Use Pricing to Reduce Driving and Emissions)	There are options to reduce driving beyond “mobility pricing”, including distance-based insurance (ICBC) and City of Vancouver’s transportation pricing.	The wording of the action was broadened to note that different pricing mechanisms could reduce driving.
Transportation Action 1.1.3 (Expand Active Transportation Networks)	The role of local governments should be larger for active transportation networks – the quality of the networks depends on them.	The original action (More Stable Infrastructure Funding for Regional Active Transportation Networks) was split into two actions, one on funding for regional active transportation networks (1.1.4), and one on implementation by local governments (1.1.3).
Transportation Action 1.1.9 (Implement Trip Reduction Programs)	Concerned about mandating trip reduction programs from large employers/trip generators. Single occupancy vehicle trip reductions are best accomplished by mobility pricing, instituting on-street parking requirements and reducing off-street parking minimums.	Trip reduction programs have proven successful in other jurisdictions, as part of a suite of tools that can reduce total driving distance (and emissions).

Clean Air Plan Section/Topic	Feedback on Section/Topic	How Feedback Was Considered in Finalizing the Clean Air Plan
Transportation Action 1.2.1 (Accelerate Sales Targets for New Electric Passenger Vehicles)	Do not include action to accelerate the zero emission sales targets for passenger vehicles. The existing provincial regulation is already the most aggressive in Canada; low carbon liquid fuels will remain a critical and viable pathway for decades to come.	Regional emissions modelling suggests that accelerating the transition to electric vehicles is critical to achieving regional greenhouse gas targets, particularly the 2030 target. Renewable liquid fuels will be important to decarbonize the freight sector, amongst others.
Transportation Action 1.2.3 (Make Electric Vehicles More Affordable)	Car-share companies can only access a limited lifetime number of electric vehicle incentives, which will slow uptake.	This could be advocated for as part of implementation of this action.
Transportation Action 1.2.6 (Expand Electric Vehicle Charging in Buildings)	We recommend that Metro Vancouver advocate that the BC government amend the <i>Strata Property Act</i> to remove barriers for homeowners and strata boards wishing to install electric vehicle charging stations in stratas.	This could be considered as part of implementation of this action.
Transportation Strategy 1.3 (Reduce Medium and Heavy Truck Emissions and Support Early Adoption of Zero Emission Trucks)	Uncertain whether reasonably priced zero emission dump trucks and cement mixers are available.	The sales targets in Action 1.3.2 (Require Zero Emission Sales Targets for New Medium and Heavy Trucks) were set to reflect the current limited availability of zero emission dump trucks and cement mixers.
Transportation Strategy 1.3	Trucking related policies need to be integrated to accelerate fleet turnover and the transition to zero emission vehicles, while minimizing unintended consequences.	New Action 1.3.4 (Long-term Emissions Strategy for Medium and Heavy Trucks) was developed to reflect this feedback.
Transportation Strategy 1.3	Policies are needed to reduce pollution from garbage and refuse trucks.	New Action 1.3.11 (Reduce Refuse Truck Emissions) was developed to reflect this feedback.
Transportation Action 1.3.2 (Require Zero Emission Sales Targets for New Medium and Heavy Trucks)	The proposed sales targets could be made more aggressive.	The sales targets were developed based on ongoing work in California, as well as the results from initial carbon neutral modelling. The sales targets should be reconsidered as more zero emission vehicles become available.

Clean Air Plan Section/Topic	Feedback on Section/Topic	How Feedback Was Considered in Finalizing the <i>Clean Air Plan</i>
Transportation Action 1.3.3 (More Stringent Low Carbon Fuel Standards)	This action is unnecessary because the BC <i>Low Carbon Fuel Standard</i> was just tightened. Most investment is going to renewable diesel.	The action was retained because additional stringency will be needed to continue reducing the carbon intensity of liquid fuels post-2030. The wording of the action was changed to reflect the recent regulatory changes and now includes an increased focus on renewable diesel, as well as ethanol.
Transportation Action 1.3.6 (Regulate Fuel Economy and Emissions for Medium and Heavy Trucks)	Previous truck emission standards resulted in engines with lower reliability and increased fuel consumption, which encouraged tampering of emission controls.	The wording of this action was changed to prioritize greenhouse gas reductions in the development of any new truck emission standards.
Transportation Action 1.3.9 (Large Fleets to Adopt “ZEV-First” Procurement)	Businesses need information on the total cost of ownership of zero emission trucks versus regular diesel ones.	The wording of this action was changed to note the need for additional cost tools.
Transportation Action 1.3.9 (Reduce Delivery Emissions)	Switching to smaller freight trucks will create congestion and increase emissions, as it will require more vehicles on the road. Increased trucking emissions are being driven by the growth of online deliveries – there should be behaviour change campaigns to address this.	The wording of the action (previously about efficient goods movement) was changed to focus more on emissions associated with deliveries, including from online deliveries.
Transportation Action 1.3.13 (Use Business Licences to Support Emission Reductions)	Concerned about expanding the use of the municipal business licensing power to regulate truck emissions, which could result in costly and confusing requirements for businesses across the region.	Metro Vancouver would work with member jurisdictions in the implementation of this action to align requirements to the degree possible.
Transportation Action 1.4.2 (Accelerate Emission Reductions from Rail Locomotives)	The Railway Association of Canada and the Government of Canada are already collaborating on a long-term strategy for decarbonizing the rail sector, the <i>Rail Pathways Initiative</i> .	The wording of the action was changed to reflect ongoing work.

Clean Air Plan Section/Topic	Feedback on Section/Topic	How Feedback Was Considered in Finalizing the Clean Air Plan
Transportation Action 1.4.3 (Support Emissions Reduction Actions at Vancouver Fraser Port Authority)	The <i>Northwest Ports Clean Air Strategy</i> has been adopted, which will guide actions by the Port of Vancouver and related partners.	The wording of the action was changed to reflect these recent developments.
BUILDINGS		
Buildings Goals	Is the <i>Clean Air Plan</i> only targeting heating and cooling systems, or is the entire building operations included (i.e. fireplaces, cooking equipment, electrical loads)?	Heating and cooling are responsible for the vast majority of emissions associated with buildings. The zero emissions Buildings goal focuses on heating and cooling systems, which includes fireplaces.
Buildings 2030 Targets	The embodied emissions target cannot be achieved because of capacity issues in the sector – this will require additional training and capacity building.	Metro Vancouver will work with its member jurisdictions and others to help build industry capacity in conjunction with any standards or requirements.
Buildings Strategies 2.1 (Signal the Transition to Zero Emission Buildings through Requirements and Standards) and 2.2 (Accelerate Demand for Zero Emission Buildings through Incentives, Education and Research)	There should be a greater focus on energy conservation before fuel switching.	Both are important and will be considered in the design and implementation of the actions. The <i>Climate 2050 Buildings Roadmap</i> discusses the importance of energy conservation in more detail.

Clean Air Plan Section/Topic	Feedback on Section/Topic	How Feedback Was Considered in Finalizing the <i>Clean Air Plan</i>
Buildings Strategies 2.1 and 2.2	Concerned about the additional costs that are being downloaded onto non-profits and tenants.	Equity is a key focus of the <i>Clean Air Plan</i> and will continue to be considered during implementation of actions. Action 2.2.1 (Expand Incentives for Low Carbon Upgrades) notes that the BC Government and the Government of Canada should create targeted incentives for owners of rental and non-market housing, to minimize financial costs for these groups.
Buildings Strategies 2.1 and 2.2	Rather than focusing on electrification, an alternative is to utilize locally produced low carbon intensity hydrogen for blending into the natural gas pipeline for delivery into buildings.	Regional emissions modelling assumed that renewable hydrogen will be added to natural gas pipelines in the future. Metro Vancouver's understanding is that FortisBC is investigating hydrogen injection and that the BC Government is exploring a regulatory framework for safe hydrogen injection into the natural gas distribution system.
Buildings Strategies 2.1 and 2.2	To make these strategies more effective, additional training and outreach is needed to multiple building-related sectors.	The wording in Actions 2.1.5 (Building Electrification Mandate for BC Hydro) and 2.1.9 (Significantly Reduce Refrigerant Leaks in Building Equipment) were updated to reflect this feedback. Actions 2.2.7 (Increase Public Awareness of the Benefits of Zero Emission Buildings) and 2.2.8 (Training and Education in Zero Emission Buildings) also include wording on training and outreach.
Buildings Strategies 2.1 and 2.2	Municipal permit processes are too slow and are a barrier to building upgrades that could reduce emissions.	Metro Vancouver and its member jurisdictions are working to speed up permit processes. Actions in these strategies will consider this during policy design and implementation.
Buildings Action 2.1.1 (Greenhouse Gas Performance Requirements for Existing Large Buildings)	Public sector organizations could play a leadership role by establishing zero emission targets for their own existing buildings.	The wording in this action was changed in response to this feedback.

Clean Air Plan Section/Topic	Feedback on Section/Topic	How Feedback Was Considered in Finalizing the <i>Clean Air Plan</i>
Buildings Actions 2.1.1 and 2.1.2 (Greenhouse Gas Performance Requirements for Existing Homes and Townhomes)	Why is Metro Vancouver proposing to regulate greenhouse gas requirements in existing buildings if the BC Government is developing greenhouse gas requirements for renovations?	Any Metro Vancouver requirement would be coordinated with the Province. The Province is considering greenhouse gas requirements at time of renovation. Metro Vancouver is exploring other tools to accelerate emissions reductions and ensure reductions persist over time.
Buildings Action 2.1.10 (Accurately Value Zero Emission and Resilient Buildings)	Better professional guidelines and standards are needed for property appraisers and insurance professionals. For energy labels to be effective, the benefits of low carbon upgrades need to be reflected in the assessed value of homes and buildings.	The wording of this action was changed to reflect this feedback.
Buildings Action 2.2.5 (Energy Advisor Services for Homes and Buildings)	Trade associations and buildings industry has experience and programs that can support this action.	The wording of this actions was changed to reflect this feedback.
Buildings Strategy 2.3 (Make Wood Heating Systems Cleaner)	Metro Vancouver’s residential wood burning regulation should be included as an action.	New Action 2.3.1 (Implement Requirements for Higher Emitting Wood Burning Appliances) was added to reflect this feedback. Including this action also impacted the health benefit estimates for the <i>Clean Air Plan</i> , which increased from \$1 billion to \$1.6 billion.
Buildings Strategy 2.5 (Accelerate the Transition to Lower Embodied Emissions in Buildings)	Embodied carbon policy and regulations should be closely tied with circular economy approaches, such as design for disassembly and “buildings as materials bank” frameworks.	The wording of this strategy was changed to reflect this feedback.
Buildings Action 2.5.2 (Use Building Materials with Low Embodied Emissions)	Metro Vancouver should work with development and building officials at its member municipalities to require that builders, specifiers, architects and engineers be required to use life-cycle assessments (LCA) and specifically, industry-accepted LCA tools, to fairly assess and choose building materials on the basis of their greenhouse gas impacts.	The wording of this action was changed to reflect the need for widely supported LCA tools.

<i>Clean Air Plan</i> Section/Topic	Feedback on Section/Topic	How Feedback Was Considered in Finalizing the <i>Clean Air Plan</i>
Buildings Action 2.5.2	Local governments could also offer incentives, such as density increases, if builders use wood products or lower carbon cement in their projects, or can demonstrate substantial reductions in the percentage of demolition waste going to landfill.	The wording in this action was changed to reflect this feedback.
INDUSTRY		
Industry Goals	Do not require Lowest Achievable Emission Rate technologies as an industry requirement for emission controls – these technologies are only required for areas with poor air quality.	The Industry Goal 2 (All industrial operations minimize air contaminant emissions using lowest achievable emission technologies) is an aspirational goal for achievement around 2050. The goal recognizes that health science has demonstrated that there are continued health impacts from air contaminants, even at low concentrations. The more critical targets are the 2030 targets for fine particulate matter and nitrogen oxides for industrial facilities. Permit decisions will continue to be made on a facility by facility basis.
Industry Strategy 3.1 (Accelerate Emission Reductions from Industrial Facilities)	The <i>Clean Air Plan</i> needs to acknowledge tradeoffs between improving air quality and reducing greenhouse gas emissions.	These tradeoffs are considered on a facility by facility basis. The District Director considers multiple factors when deciding on air permit conditions that are advisable for the protection of the environment. Reduced greenhouse gas emissions could be one of the factors.
Industry Strategy 3.1	Metro Vancouver should consider the air quality impacts across multiple facilities owned by one entity, rather than by individual facilities.	Information on air quality impacts across multiple facilities owned by one entity can be provided to Metro Vancouver for the District Director to consider, amongst other factors such as site-specific impacts, when determining what permit conditions are advisable for the protection of the environment for those facilities.

<i>Clean Air Plan</i> Section/Topic	Feedback on Section/Topic	How Feedback Was Considered in Finalizing the <i>Clean Air Plan</i>
Industry Strategy 3.1	Metro Vancouver should demonstrate that it has reduced its own costs as much as reasonably possible before seeking to recover costs from industrial facilities, including embracing non-adversarial dispute resolution.	<p>Metro Vancouver seeks to manage and recover regulatory program costs in an effective, fair, and efficient manner, while taking a non-adversarial approach to permitting. Permit applicants are given an opportunity to provide comment on at least one draft permit and those comments are considered by staff, who usually make modifications to the draft permit prior to recommending that it be issued by the District Director. This is typically an iterative process with applicants being given the opportunity to comment on several drafts. Any outstanding comments from the applicant are provided to the District Director for consideration when deciding on permit requirements.</p> <p>The permitting decision-making process is intended to be procedurally fair and consistent with the principles of natural justice. Procedural fairness and natural justice require that both the applicant and concerned persons are given the opportunity to be “heard” such that their concerns and respective positions on issues are made known to the decision maker. All parties would need to be involved in any dispute resolution process.</p>
Industry Strategy 3.1	Metro Vancouver should divert municipal solid waste for use as a fuel in industrial facilities, to reduce net greenhouse gas emissions.	Consideration of waste as a fuel in industrial facilities will be addressed in Metro Vancouver’s new solid waste and liquid waste management plans, which are under development.

<i>Clean Air Plan</i> Section/Topic	Feedback on Section/Topic	How Feedback Was Considered in Finalizing the <i>Clean Air Plan</i>
Industry Strategy 3.1	Additional greenhouse gas requirements on industrial facilities increase the risk of industrial facilities “leaking” carbon emissions elsewhere, if stringent climate regulations in one jurisdiction push businesses to move to a jurisdiction with weaker climate regulations.	Metro Vancouver recognizes that carbon leakage moves emissions to other jurisdictions and could potentially increase global greenhouse gas emissions. The movement of industries outside the region could also impact the regional economy. The <i>Clean Air Plan</i> includes Action 3.1.7 on Carbon Tariffs, which could help industrial facilities and businesses in the region to compete fairly against imported goods with higher carbon content. Metro Vancouver will consider the implications of carbon leakage in the design and implementation of actions in the <i>Clean Air Plan</i> .
Industry Action 3.1.2 (Integrate Greenhouse Gases into Emission Regulations and Permits)	Metro Vancouver should not integrate greenhouse gas requirements into industrial facility permits – leave it to the provincial and federal governments.	Action 3.1.2 was retained. The <i>Clean Air Plan</i> is a 10-year strategic plan so Metro Vancouver needs to keep options open to enable action over that period, depending on what programs and policies are adopted by other governments. Metro Vancouver staff are communicating with the BC Government about provincial greenhouse gas requirements that may be implemented for industrial facilities. Metro Vancouver’s direction would depend on any new requirements that are set by the BC Government. Any integration of greenhouse gas requirements into permits would build on existing processes and would include engagement with stakeholders, including industrial facilities, the BC Government and others.
Industry Action 3.1.2	Adding greenhouse gas requirements only to facilities that operate under Metro Vancouver air permit is an unfair burden, since other sectors and activities would not be subject to equivalent requirements or standards.	The <i>Clean Air Plan</i> includes emission reduction actions for all other major regional sectors, using policy and regulatory tools appropriate for those activities.

Clean Air Plan Section/Topic	Feedback on Section/Topic	How Feedback Was Considered in Finalizing the Clean Air Plan
Industry Action 3.1.12 (Improved Emission Controls at Petroleum Storage and Loading Facilities)	This action is unnecessary, since work is underway. Metro Vancouver should participate in the development of proposed federal regulations (which are ongoing) to avoid duplicative or misaligned requirements.	The wording of this action was changed to reflect this feedback.
Industry Strategy 3.2 (Reduce Non-Road Emissions and Support Early Adoption of Zero Emission Non-Road Equipment)	Concerned that requirements for low emission non-road equipment (including agricultural equipment) could push older higher emitting equipment to the Fraser Valley Regional District and other surrounding regions.	Wording was added to Actions 3.2.3 (Funding for Cleaner Non-Road Equipment) and 4.1.5 (Incentives for Farmers to Transition to Lower Emission Equipment) to reflect this feedback.
Industry Action 3.2.1 (Tighten Emission Regulation for Non-Road Diesel Engines)	Viable and cost-effective zero emission non-road equipment must be available to businesses before zero emission requirements are included in Metro Vancouver regulations.	The availability of zero emission non-road equipment would be considered when developing any regulatory updates.
Industry Action 3.2.4 (Identify Infrastructure Needs for Zero Emission Non-Road Equipment)	This action should apply to more than just the construction industry.	The wording of this action was changed to reflect this feedback.
Industry Action 3.3.1 (Regional Low Carbon Procurement)	This action should include private sector.	The wording of this action was changed to reflect this feedback.
Industry Action 3.3.4 (Low Carbon Corporate Procurement)	Metro Vancouver should require the use of lower carbon intensity cement in all of its projects to drive a decrease of at least 30% in global warming potential.	The wording of this action was changed to reflect this feedback. Metro Vancouver is currently exploring how to use more low carbon cement and concrete products in corporate projects.
Industry Strategy 3.4 (Explore Opportunities for Technological Carbon Capture)	Metro Vancouver should support local industries in exploring and developing carbon capture, utilization and storage systems in the region.	Metro Vancouver has initiated a project to explore technological carbon capture opportunities in the region, working with local industrial facilities.
AGRICULTURE		
Agriculture Strategy 4.1 (Reduce Emissions from Agriculture)	The Plan should encourage “carbon farming” via agroforestry and other regenerative agricultural practices.	Opportunities to increase the carbon stored in soil will be discussed in the <i>Climate 2050 Agriculture Roadmap</i> .

<i>Clean Air Plan</i> Section/Topic	Feedback on Section/Topic	How Feedback Was Considered in Finalizing the <i>Clean Air Plan</i>
Agriculture Action 4.1.1 (Reduce Emissions from Greenhouses)	Greenhouses need supplemental carbon dioxide to support plant growth through photosynthesis.	The wording of this action was changed to reflect this feedback.
Agriculture Action 4.1.4 (Enhance Funding for Environmental Farm Plans)	Incentives for farmers need to be sustainable and reliable.	The wording of this action was changed to reflect this feedback.
HEALTH		
Health Action 5.1.3 (Protect Against Wildfire Smoke Impacts)	Protections against wildfire smoke should prioritize vulnerable populations	The wording of this action was changed to reflect this feedback.
MEASURE, MONITOR AND REGULATE		
Measure, Monitor and Regulate Goal	Expand the scope of who needs to be informed and motivated beyond “residents” and “the public” to include organizations.	The wording of Goal 2 was changed to reflect this feedback.
Measure, Monitor and Regulate Action 6.1.11 (Regulatory Authorizations and Compliance)	Any implementation of administrative penalties should include consultation with impacted sectors.	Any implementation of administrative penalties would include engagement.
Measure, Monitor and Regulate Action 6.1.14 (Specialized Studies)	The Plan needs to consider microplastics.	The wording of this action was changed to identify the need to understand the potential impacts of microplastics on regional air quality and health.

To: Climate Action Committee

From: Lucas Pitts, Acting Director, Policy, Planning and Analysis – Water Services

Date: July 8, 2021 Meeting Date: September 10, 2021

Subject: **2021 Update on Water Sustainability Innovation Fund Projects**

RECOMMENDATION

That the Climate Action Committee receive for information the report dated July 8, 2021, titled “2021 Update on Water Sustainability Innovation Fund Projects.”

EXECUTIVE SUMMARY

This report provides an update on six projects that were approved for funding in 2018 through to 2020 under the Sustainability Innovation Fund. Of the six projects, the first phase of the Next Generation Snowpack Monitoring is now complete, all other projects are ongoing.

PURPOSE

This report provides an update on progress of active projects funded under the Water Sustainability Innovation Fund.

BACKGROUND

The Water Sustainability Innovation Fund was created by the Board in 2004 to provide financial support to Water projects that contribute to the region’s sustainability. The GVWD Board adopted the *Water Sustainability Innovation Fund Policy* on June 27, 2014, with further amendments in 2016, to guide the use and management of the fund. The policy requires that the Climate Action Committee be updated on an annual basis on the deliverables, outcomes and measurable benefits of the projects receiving funding.

This report presents an update on projects that have not yet been reported as complete to the Climate Action Committee, including status, amount spent, and project outcomes.

STATUS OF WATER SUSTAINABILITY INNOVATION PROJECTS (APPROVAL YEARS: 2018 – 2020)

Project	Approval Year	Amount Approved	Status
Greywater Reuse and Rainwater Harvesting Demonstration	2018	\$350,000	In Progress
Next Generation Snowpack Monitoring – Phase 1	2019	\$160,000	Complete
Treating Emerging Contaminants at the Seymour Capilano Filtration Plant	2019	\$300,000	In Progress
UV Transmittance Analyzers for Continuous Monitoring of Disinfection By-Products	2020	\$500,000	In Progress
Earthquake Early Warning and Strategic Response System Pilot	2020	\$270,000	In Progress
Enhancing the Data Processing of the Water Flow Metering Network	2020	\$180,000	In Progress

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

The projects summarized in this report had funding approved by the GVWD Board from 2018 - 2020. The disbursements were made following the applicable *Water Sustainability Innovation Fund Policy* that governs the use and management of the Funds.

The table below outlines the funding approved and the amount spent to date for each project. Any unspent funds for completed projects remain in the Water Sustainability Innovation Fund reserve.

Project	Total Amount of Funding Approved	Amount Spent (as of June 30, 2021)
2018 Approval Year		
Greywater Reuse and Rainwater Harvesting Demonstration	\$350,000	\$102,540
2019 Approval Year		
Next Generation Snowpack Monitoring – Phase 1	\$160,000	\$126,775
Treating Emerging Contaminants at the Seymour Capilano Filtration Plant	\$300,000	\$16,498
2020 Approval Year		
UV Transmittance Analyzers for Continuous Monitoring of Disinfection By-Products	\$500,000	0*
Earthquake Early Warning and Strategic Response System Pilot	\$270,000	\$107,817
Enhancing the Data Processing of the Water Flow Metering Network	\$180,000	0**

* Consultant procurement complete; project is behind schedule

** Consultant procurement complete; project is on schedule

The balance in the Water Sustainability Innovation Fund at December 31, 2020 was \$12.61 million.

CONCLUSION

This report has presented an update on six projects funded under the Water Sustainability Innovation Fund. The Sustainability Innovation Funds were created by the Board in 2004 to provide financial support to utility or Regional District projects that contribute to the region’s sustainability.

Attachment:

2021 Update on Water Sustainability Innovation Fund Projects

2021 UPDATE ON WATER SUSTAINABILITY INNOVATION FUND PROJECTS

Greywater Reuse and Rainwater Harvesting Demonstration: In Progress

Metro Vancouver has undertaken an initiative to support the uptake of non-potable water systems in the region. The project aims to advance non-potable water use through research, education, capacity building, and by convening relevant stakeholders into a process to identify and address barriers to the broader adoption of these systems.

The project will culminate in two key deliverables:

- A **Guidebook** for onsite non-potable water use systems that shares lessons learned and offers practical recommendations for navigating the regulatory, implementation, and operational requirements for these systems, and
- A **Roadmap** that identifies barriers and opportunities to address identified barriers – supporting broader adoption of non-potable water systems in the region.

The project consultant is actively working on developing the Guidebook with content drafted and reviewed by Metro Vancouver by the end of 2021. The last of three Roadmap workshops is scheduled to take place in the fall of 2021, the content of which is expected to be included in the final Guidebook.

Next Generation Snowpack Monitoring (NGSM): Phase 1 Complete

The two part NGSM project has been planned to be delivered in two phases:

- **Phase 1:** Approved in 2019, the first phase is now completed. During this phase, several scripts were developed to analyze the snow-covered extent of the watersheds using freely available satellite imagery. The project team also completed five fixed-wing aerial LiDAR snow depth surveys in 2019 and 2020. Due to COVID-19 restrictions, the planned field validation work could not be completed.
- **Phase 2:** The second phase of this project was approved in 2021. To date the team has completed five aerial LiDAR surveys and two surveys using remotely piloted aerial systems (RPAS, or drones). The project team has successfully field validated the survey data and initial results are expected soon. The RPAS method enables mapping of snow depth over smaller areas (approximately 1 to 3 km²).

Treating Emerging Contaminants at the Seymour Capilano Filtration Plant: In Progress

Consulting engineering services are required to evaluate the resiliency of the Seymour Capilano Filtration Plant (SCFP) to changes in raw water quality caused by emerging contaminants of concern. The project is divided into two phases:

- **Phase A:** To conduct literature survey and an assessment of existing treatment at the SCFP.
- **Phase B:** To provide a testing plan to assess the effectiveness of operational and/or process changes for treatment (pilot testing, jar testing etc.).

A high-level watershed summary report has been prepared as part of the Phase A (Literature Review) requirements. Comments on the report have been provided to the project consultant following an internal review. The next task for the project consultant is to report on the summary of pathways and

contaminants of anthropogenic origin relevant to Metro Vancouver watersheds. This second report is expected in July 2021.

UV Transmittance Analyzers for Continuous Monitoring of Disinfection By-Products: In Progress

Consulting engineering services are required to evaluate the use of multi-spectrum UV visible analyzers for continuous monitoring of disinfection by-products (DBPs) at the Coquitlam Water Treatment Plant (CWTP) and various locations in the water transmission system. Data collected using the UV visible analyzers may enable the implementation of DBP prediction models to optimize sodium hypochlorite and ozone dosages at CWTP, and thereby minimize the formation of DBPs in the water transmission system.

This project is planned to be delivered in two phases:

- **Phase A:** A literature survey and desktop analysis that requires the collection of data over a full year. In June 2021 Metro Vancouver engaged a consultant to carry out Phase A. Metro Vancouver will evaluate the results of Phase A in Fall 2022, before deciding on the next phase.
- **Phase B:** Detailed design – subject to results from Phase A.

Earthquake Early Warning and Strategic Response System Pilot: In Progress

In 2020, detailed project requirements were developed and a competitive procurement process was completed. The project consultant was engaged in December 2020 and work began in January 2021. To date, site visits and installation planning have been completed for the three sites – Metro Tower III, Seymour Capilano Filtration Plant (SCFP) and the Coquitlam Ultra Violet (UV) Disinfection Facility. The installation of the early warning system at the SCFP site is almost completed.

It is expected that the full installation at all three sites will be completed this Fall and the project completion, including initial testing and training of staff, will occur before the end of the year. In 2022, Metro Vancouver staff will begin to review and pilot the use of the system.

Enhancing the Data Processing of the Water Flow Metering Network: In Progress

This project will evaluate and develop Artificial Intelligence (AI) software solutions that use Artificial Neural Networks (ANN) to enhance the data processing of the water flow metering network. This project will involve setting up a software system, analyzing historic data from the flow metering network, generating forecasts and comparing them with live data, and reporting unexpected trends to staff for further investigation.

The objective is to:

- Increase automation of the existing data quality control process thereby reducing the staff time required to review the raw data; and
- Improve customer service by decreasing the time required to confirm final flow data used for billing, data requests, and data sharing with member jurisdictions.

The procurement process to hire a project consultant has concluded and the contract was awarded on July 13, 2021.

To: Climate Action Committee

From: Roger Quan, Director, Air Quality and Climate Change
Parks and Environment Department

Date: August 30, 2021 Meeting Date: September 10, 2021

Subject: **Manager's Report**

RECOMMENDATION

That the Climate Action Committee receive for information the report dated August 30, 2021, titled "Manager's Report".

CLIMATE ACTION COMMITTEE 2021 WORK PLAN

The attachment to this report sets out the Committee's Work Plan for 2021. The status of work program elements is indicated as pending, in progress, or complete. The listing is updated as needed to include new issues that arise, items requested by the Committee, and changes to the schedule.

SUMMER 2021 AIR QUALITY ADVISORIES

As reported to the Climate Action Committee at the July meeting, the first air quality advisory of the summer coincided with an unprecedented heat wave event in late June that affected Metro Vancouver, British Columbia and the entire Pacific Northwest. The advisory, which was in place from June 26 until June 30, was issued initially due to high levels of ground-level ozone and extended on June 29 to also include fine particulate matter (PM_{2.5}) due to increasing haziness from a buildup of local emissions and secondary formation of PM_{2.5}.

On July 30, 2021 a single day ozone advisory was issued for eastern Metro Vancouver and the Fraser Valley Regional District, due to high concentrations of ground-level ozone as a result of nitrogen oxides and volatile organic compounds reacting in the air in the presence of sunlight during hot and sunny weather.

The summer of 2021 has become an extremely active wildfire season, especially in the B.C. Interior. To date B.C. has experienced an above average number of wildfires and area burned, which has produced considerable smoke at times covering much of the province. Southwest B.C. and coastal regions of the province, including Metro Vancouver, were spared from wildfire smoke throughout July, but in August a change in weather brought smoke to our region for a few days.

On August 1, 2021 smoke from wildfires burning in the interior of B.C. and Washington moved into and over the Metro Vancouver region, contributing to elevated PM_{2.5} concentrations and hazy skies. Exceedances of the 24-hour PM_{2.5} objective occurred in the eastern Fraser Valley with other parts of the region experiencing elevated PM_{2.5} for short periods, but remaining better than objectives. Widespread smoke aloft contributed to hazy skies throughout the region. An air quality advisory was

issued for Metro Vancouver and the Fraser Valley Regional District that remained in place until August 3, 2021 when a change in weather resulted in onshore winds that helped clear the smoke.

The smoke returned August 12, 2021 with outflow winds - winds blowing from the B.C. interior towards the coast - and an air quality advisory was issued for both elevated levels of PM_{2.5} and ground-level ozone. During this time, with heat warnings also in place, fine particulate matter exceedances were widespread and at times the Air Quality Health Index (AQHI) was at the highest risk level (10+) throughout the region. The advisory remained in place until August 15, 2021 when it was cancelled due to a change in the weather. Recent cooler and wetter weather have helped moderate wildfire activity and smoke production in B.C.

During both August advisories there was considerable media interest with stories about the wildfire smoke advisory being picked up widely on radio, television, print and online media outlets. Staff conducted numerous recorded and live interviews with local media.

2021 UBCM RESOLUTIONS RELATED TO CARIP AND HELP CITIES LEAD CAMPAIGN

UBCM has published its 2021 UBCM Resolutions Book in preparation for the Convention taking place virtually on September 15-16, 2021 (Reference 1). A number of resolutions are related to climate action, and are aligned with actions in the *Clean Air Plan* and the *Climate 2050* Roadmaps (particularly for Buildings and Transportation, using financial levers and enabling legislation). A detailed summary of all resolutions in the 2021 UBCM Resolutions Book has been prepared for the September 8 meeting of the Finance and Intergovernment Committee (Reference 2), with staff comments on alignment with Metro Vancouver services and priorities. Two resolutions related to previous discussions by the Climate Action Committee are highlighted in this Manager's Report: the cancellation of the Provincial Climate Action Revenue Incentive Program (CARIP), and the Help Cities Lead Campaign.

A Special Resolution will be considered at the UBCM Convention related to the cancellation of CARIP. Special Resolutions address priority issues identified by the UBCM Executive, which are considered to be of concern to a broad range of UBCM members around the province. This Special Resolution has been brought forward in an effort to consolidate the five resolutions (C2-C6) that were submitted this year related to the cancellation of the CARIP program. The Special Resolution, "**SR1: CARIP Replacement Funding**" calls on the Province to immediately develop a CARIP replacement program which provides:

- annualized funding that is equal to or greater than CARIP;
- formula based funding that recognizes varying local capacity for climate action; and
- maximum flexibility on eligible projects that support local needs and priorities.

This resolution responds to concerns raised by Metro Vancouver and a number of its member jurisdictions. At its June 2021 meeting, the Climate Action Committee provided input on a staff report on the cancellation of the CARIP program, and the MVRD Board subsequently authorized the Board Chair to write a letter to the Provincial Minister of Municipal Affairs, Minister of Environment and Climate Change Strategy, and Minister of Finance, regarding the cancellation and providing details on key elements to be retained in a replacement program, with additional suggested improvements.

Resolution “**EB35: Help Cities Lead**” has been endorsed by the Lower Mainland Local Government Association and calls upon the Province to immediately introduce legislation supporting the three measures identified by Help Cities Lead and addressed in ministerial mandate letters: GHG requirements for new buildings, Property Assessed Clean Energy (PACE) financing, and home energy labelling. In addition, it calls upon the Province to introduce empowering legislation to permit local governments who so choose to implement the remaining two measures identified in the campaign: GHG requirements for existing buildings and building energy benchmarking. This resolution is aligned with the strategies and actions in the draft *Climate 2050 Buildings Roadmap*. At its meeting on April 16, 2021, the Climate Action Committee endorsed the recommendation that the MVRD Board write letters expressing its support for the Help Cities Lead campaign to five Provincial Ministers, and this was endorsed by the MVRD Board on April 30. A response to the Board Chair’s letter was subsequently received from the Provincial Government indicating that the Help Cities Lead policy areas highlighted in the letter represent priority areas for the Province.

IPCC SIXTH ASSESSMENT REPORT – THE PHYSICAL SCIENCE BASIS

In August 2021, the Intergovernmental Panel on Climate Change (IPCC) approved the Sixth Assessment Report on the Physical Science Basis of Climate Change, with an associated high-level summary for policy makers (Reference 3). This report represents the most up-to-date scientific understanding of the climate system and climate change, and the summary for policy makers states: “It is unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere, and biosphere have occurred”. Additional reports from the IPCC working groups are expected in early 2022, on climate change impacts and adaptation, and on greenhouse gas mitigation (reduction), and those reports will be followed by a final “synthesis report”.

Key findings of the Physical Science Basis report include the following:

- **Global mean sea level increased by approximately 0.2m** between 1901 and 2018, and human influence was very likely the main driver of these increases since at least 1971. Sea level rise has been faster since 1900 than over any preceding century in at least the last 3000 years.
- It is virtually certain that **hot extremes (including heatwaves) have become more frequent** and more intense across most land regions since the 1950s.
- The **frequency and intensity of heavy precipitation events have increased** since the 1950s over most land areas for which there is sufficient data. It is very likely that heavy precipitation events will intensify and become more frequent in most regions with additional global warming.

A critical conclusion of the Physical Science Basis report is that global surface temperature will continue to increase until at least the mid-century under all emissions scenarios considered. Unless deep reductions in GHG emissions occur in the coming decades, global warming of 1.5°C and 2°C will be exceeded in the coming decades.

26th UN CLIMATE CHANGE CONFERENCE OF THE PARTIES (COP26)

The 26th United Nations Climate Change Conference of the Parties (COP26) will be held in Glasgow from October 31 to November 12, 2021 (Reference 4). The objective of COP meetings is to secure coordinated commitments to climate action across national governments. Although the UN has been convening these global climate summits for almost three decades, some of them have had more

impact than others. At COP21, which took place in Paris in 2015, every country agreed to work together to limit global warming to well below 2°C and aim for 1.5°C, to adapt to the impacts of a changing climate, and to make money available to deliver on these aims. However, the subsequent commitments by each country to reduce emissions were not sufficient to limit global warming to 1.5°C, and in fact would result in warming of well above 3°C by 2100 compared to pre-industrial levels. Given that temperature and precipitation extremes are projected to be larger in frequency and intensity with every additional increment of global warming, the COP26 summit this Fall is seen as being particularly important in global efforts toward carbon neutrality by 2050. Countries are being asked to bring forward ambitious 2030 emissions reductions targets that will keep warming limited to 1.5°C within reach.

Metro Vancouver's *Clean Air Plan*, which is included in the September 10, 2021 Climate Action Committee agenda, identifies initial actions needed to meet the region's 2030 greenhouse gas target – a 45% reduction in regional greenhouse gas emissions from 2010 levels. Achieving the 45% target sets the foundation for moving the region towards the *Climate 2050* commitment to a carbon neutral region by 2050.

ALTERNATIVE FUEL AND RECYCLABLES RECOVERY INTERIM PROCESSING STRATEGY

At the January 15, 2021 meeting, the Climate Action Committee received an information report from Solid Waste Services Department staff about an interim processing strategy for alternative fuels and recovery of recyclables.

As directed by the Board, Metro Vancouver is initiating procurement for the processing of approximately 60,000 tonnes per year of small load waste to recover recyclables and alternative fuel. Key elements of the procurement process will be maximizing alternative fuel and recyclable material recovery; obtaining all information necessary to quantify and, if possible, retain credit for greenhouse gas emission reductions; and ensuring all environmental and regulatory requirements are met. Any alternative fuel created as a result of this initiative will be used to replace fossil fuels at users such as cement plants, industrial biomass facilities or district energy systems. Assuming 40% of small load waste can be recovered, this initiative could result in emissions reductions of up to 20,000 tonnes CO₂ equivalent per year.

ENGAGEMENT UPDATES

PNE outreach

Metro Vancouver was at the PNE this year, BCs largest outdoor event, held from August 21 to Sept 6, with our 'Together we make our region strong' interactive display. Residents were invited to explore Metro Vancouver services, major infrastructure and sustainability initiatives. Substantial content from our Air Quality and Climate Change programs was included in the displays. At the Air Quality and Climate Change tent, a stacking-bricks game with climate actions etched on each piece engaged families, and a pledge wall encouraged visitors to make their own commitments to take action on climate change. Staff debuted LumiAir, a real-time air quality display that can show air quality data from our monitoring network and compare it to other locations. Metro Vancouver's Mobile Air Monitoring Unit (MAMU) was also on site, and enabled LumiAir to show visitors information about the air they were breathing. Emotive, our zero emission vehicle engagement program, was also part of Metro Vancouver's PNE activation.

Managing Emissions from Cannabis Production and Processing

At the July 16, 2021 meeting of the Climate Action Committee, staff received direction on the proposed second phase of engagement on development of an emission regulation for managing emissions from cannabis production and processing. The Board subsequently authorized staff to initiate engagement, and per that direction, staff have been preparing material for engagement and outreach in the fall. The Discussion Paper for Phase 2 engagement has now been published on the project website.

The project website has been updated to reflect the most current regulatory proposals as well as advertise engagement opportunities, which have been promoted on relevant Metro Vancouver social media channels. The engagement opportunities include an online feedback form, an email address to correspond directly with project staff, in-person meeting with project staff, and an invitation to attend public webinars. Staff will be holding two public webinars, beginning on September 22, 2021 in addition to more technology-focused stakeholder meetings and meetings with other governments.

Managing Emissions from Open-Air Burning from Vegetative Debris

Engagement material for consultation on managing emissions from open-air burning from vegetative debris has now been published on the project website, including a detailed discussion paper, a proposal summary document, a recording of a staff presentation on the discussion paper and a feedback form for directed feedback on the proposals. An email to inform stakeholders of the updated proposals and methods of providing feedback has been sent to an extensive list of the public, affected stakeholders including regional agricultural associations, and other orders of government.

Staff are holding three public webinars throughout September and October, the first of which will be held on September 10, 2021. Stakeholders were invited to sign up to attend the webinars through the web page. In addition to these public opportunities, staff have scheduled meetings with municipal staff, municipal fire departments, relevant health agencies and other orders of government. Staff have also presented the proposals for this potential regulation at three municipal agricultural committees, with three more scheduled through the end of October.

Advertising and outreach has been through the relevant Metro Vancouver social media channels, advertisements in relevant agricultural association newsletters and a regional agricultural magazine. At the beginning of September, a postcard to notify of the potential bylaw proposals with direction on how to provide feedback was mailed to all of the farms in the Metro Vancouver region.

RESIDENTIAL WOOD BURNING

Outreach has been conducted over the summer on the restrictions under MVRD Residential Indoor Wood Burning Emissions Regulation Bylaw No. 1303 on residential indoor wood burning between May 15 to September 15 each year. Staff have also responded to enquiries about the bylaw provisions and reducing wood smoke emissions by using best burning practices and cleaner appliances, as well as the availability of the wood stove exchange program. Educational information and answers to frequently asked questions about the bylaw have also been updated on the Residential Wood Burning Bylaw webpage and content about where to find information about the bylaw was provided in the PNE display.

In preparation for the heating season, staff are planning outreach that is expected to include newspaper advertisements in multiple languages, use of digital methods such as social media messaging through Metro Vancouver's corporate channels (Facebook, Twitter, LinkedIn & Instagram) and email communications to target audiences such as municipal fire departments and Metro Vancouver's 'Residential Wood Smoke' mailing list subscribers.

Additionally, to encourage continued exchange of older, uncertified wood-burning appliances, rebate amounts in Metro Vancouver's Wood Stove Exchange Program will be increased starting September 15, as follows:

- \$750 for an exchange from an uncertified wood-burning appliance to an electric heat pump, (increased from \$400).
- \$500 for an exchange from an uncertified wood-burning appliance to a natural gas or propane appliance, or pellet stove, (increased from \$400).
- \$300 for an exchange from an uncertified wood-burning appliance to a certified wood-burning appliance or electric insert, (increased from \$250).

Attachment

Climate Action Committee 2021 Work Plan

References

1. [2021 UBCM Resolutions Book](#)
2. [Finance and Intergovernment Committee, September 8, 2021 Agenda](#)
3. [IPCC 2021: Summary for Policymakers – The Physical Science Basis](#)
4. [UN Climate Change Conference of the Parties 2021 \(COP26\) – Overview](#)

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Climate Action Committee 2021 Work Plan
Report Date: August 30, 2021

Priorities

1st Quarter	Status
Climate Action Committee 2021 work plan and priorities	Complete
Climate 2050 – FCM Low Carbon Cities Canada initiative	Complete
Climate 2050 – carbon neutral modelling	Complete
Climate 2050 – electric vehicle programs review and recommendations	Complete
Sustainability Innovation Fund (SIF) – 2021 proposals	Complete
2nd Quarter	
Climate 2050 – draft Roadmap: Buildings	Complete
Climate 2050 – draft Roadmap: Transportation	Complete
Climate 2050 – Energy Roadmap discussion paper	Complete
Air quality – draft Clean Air Plan	Complete
Air quality – second phase of consultation on open air burning emission regulation	Complete
Air quality – monitoring network review and upgrades	Complete
10 th annual Caring for the Air report	Complete
SIF – status report on previously approved liquid waste projects	Complete
3rd Quarter	
Climate 2050 – draft Roadmap: Industry	In progress
Climate 2050 – draft roadmaps: Agriculture; Nature and Ecosystems	In progress
Climate 2050 – Land Use and Growth Management Roadmap discussion paper	Pending
Climate 2050 – Metro Vancouver’s climate actions and carbon neutral progress	Complete
Climate 2050 – initiate consultation on proposed buildings regulatory initiative	Pending
Air quality – amendments to air quality permit and regulatory fees	In progress
Air quality – amendments to non-road diesel engine emission regulation	In progress
Air quality – update on regulatory initiative for cannabis processing	Complete
SIF – status report on previously approved regional district projects	Complete
SIF – status report on previously approved water projects	In progress
Ecological Health Framework – annual report	Pending
4th Quarter	
Climate 2050 – annual report and progress tracking	In progress
Climate 2050 – Human Health and Well-being Roadmap discussion paper	Pending
Climate 2050 – final roadmaps: Buildings, Industry, Transportation	Pending
Climate 2050 – managing Metro Vancouver’s corporate GHG emissions and energy	In progress
Air quality – Clean Air Plan for Board approval	In progress
Air quality - initiate process to update boilers and process heaters regulation	Pending
Annual budget and 5 year financial plan	In progress