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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

METRO VANCOUVER REGIONAL DISTRICT
CLIMATE ACTION COMMITTEE

REGULAR MEETING

Friday, May 13, 2022
1:00 p.m.
Meeting conducted electronically pursuant to the Procedure Bylaw
28th Floor Boardroom, 4515 Central Boulevard, Burnaby, British Columbia
Webstream available at http://www.metrovancouver.org

A G E N D A[1]

1. ADOPTION OF THE AGENDA

1.1 May 13, 2022 Regular Meeting Agenda
That the Climate Action Committee adopt the agenda for its regular meeting scheduled for May 13, 2022 as circulated.

2. ADOPTION OF THE MINUTES

2.1 April 8, 2022 Regular Meeting Minutes *pg. 4*
That the Climate Action Committee adopt the minutes of its regular meeting held April 8, 2022 as circulated.

3. DELEGATIONS

3.1 Dr. Larry Barzelai, Chair of the BC branch of the Canadian Association of the Physicians for the Environment *pg. 10*
Subject: Proposed Tilbury LNG Plant Expansion

4. INVITED PRESENTATIONS

4.1 Andrew Hamilton, Senior Project Manager, Tilbury Expansion Program, FortisBC
Subject: Overview of Project Proposal / Description, Project impacts and Mitigation

4.2 Mike Brotherston, Manager of Climate Action and Environment, Mel Cheesman Director of Corporate Services, Sean McGill, City Manager, City of Delta
Subject: Perspectives of Delta staff and Council on the Project, and Potential Impacts

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

4.3 Peter Russell, Director, Sustainability & District Energy, and Chad Paulin, Environment Manager, Engineering & Public Works, City of Richmond
Subject: Perspectives of Richmond staff and Council on the Project, and Potential Impacts

5. REPORTS FROM COMMITTEE OR STAFF

5.1 Initial Engagement to Develop an Approach for Managing Greenhouse Gas Emissions from Large Buildings in Metro Vancouver *pg. 12*

That the MVRD Board authorize staff to proceed with an initial phase of engagement to develop an approach for managing greenhouse gas emissions from large buildings as described in the report dated April 20, 2022, titled "Initial Engagement to Develop an Approach for Managing Greenhouse Gas Emissions from Large Buildings in Metro Vancouver".

5.2 Engagement on Proposed Amendments to GVRD Boilers and Process Heaters Emission Regulation Bylaw No. 1087, 2008 *pg. 40*

That the MVRD Board direct staff to proceed with engagement on the proposed amendments to *Greater Vancouver Regional District Boilers and Process Heaters Emission Regulation Bylaw No. 1087, 2008* as described in the report titled "Engagement on Proposed Amendments to *GVRD Boilers and Process Heaters Emission Regulation Bylaw No. 1087, 2008*", dated April 20, 2022.

5.3 2022 Update on Liquid Waste Sustainability Innovation Fund Projects *pg. 58*

That the Climate Action Committee receive for information the report dated April 20, 2022, titled "2022 Update on Liquid Waste Sustainability Innovation Fund Projects."

5.4 MVRD Concrete and Concrete Products Industries Emission Regulation Amending Bylaw No. 1341, 2022 *pg. 64*

That the MVRD Board:

a) give first, second and third reading to *Metro Vancouver Regional District Concrete and Concrete Products Industries Emission Regulation Amending Bylaw No. 1341, 2022*; and
b) pass and finally adopt *Metro Vancouver Regional District Concrete and Concrete Products Industries Emission Regulation Amending Bylaw No. 1341, 2022*.

5.5 MVRD Gasoline Distribution Emission Regulation Amending Bylaw No. 1342, 2022 *pg. 69*

That the MVRD Board:

a) give first, second and third reading to *Metro Vancouver Regional District Gasoline Distribution Emission Regulation Amending Bylaw No. 1342, 2022*; and
b) pass and finally adopt *Metro Vancouver Regional District Gasoline Distribution Emission Regulation Amending Bylaw No. 1342, 2022*.

5.6 MVRD Boilers and Process Heaters Emission Regulation Amending Bylaw No. 1343, 2022 *pg. 75*

That the MVRD Board:

a) give first, second and third reading to *Metro Vancouver Regional District Boilers and Process Heaters Emission Regulation Amending Bylaw No. 1343, 2022*; and

b) pass and finally adopt *Metro Vancouver Regional District Boilers and Process Heaters Emission Regulation Amending Bylaw No. 1343, 2022*.

5.7 Manager's Report

That the Climate Action Committee receive for information the report dated April 21, 2022 titled "Manager's Report". *pg. 80*

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 May 13, 2022.

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, Zoë – Port Moody
Steves, Harold – Richmond
Wilson, Chris – Coquitlam
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 1:04 p.m. on Friday, April 8, 2022 in the 28th Floor Boardroom, 4515 Central Boulevard, Burnaby, British Columbia.

MEMBERS PRESENT:
Chair, Councillor Adriane Carr, Vancouver
Vice Chair, Councillor Sav Dhaliwal*, Burnaby (departed at 1:12 p.m.)
Councillor Petrina Arnason*, Langley Township
Councillor Laura Dupont*, Port Coquitlam
Councillor David Hocking, Bowen Island
Councillor Dylan Kruger*, Delta
Director Jen McCutcheon*, Electoral Area A
Councillor Jessica McIlroy*, North Vancouver City
Mayor Ron McLaughlin*, Lions Bay
Councillor Allison Patton*, Surrey
Councillor Zoë Royer*, Port Moody (departed at 3:56 p.m.)
Councillor Harold Steves*, Richmond
Councillor Chris Wilson*, Coquitlam
Councillor Ahmed Yousef*, Maple Ridge

MEMBERS ABSENT:
Chief Ken Baird, Tsawwassen

STAFF PRESENT:
Roger Quan, Director, Air Quality and Climate Change, Parks and Environment
Jerry W. Dobrovolny, Chief Administrative Officer
Natalia Melnikov, Legislative Services Coordinator, Board and Information Services

1. ADOPTION OF THE AGENDA

1.1 April 8, 2022 Regular Meeting Agenda

It was MOVED and SECONDED
That the Climate Action Committee:
a) amend the agenda for its regular meeting scheduled for April 8, 2022 by adding Item 3.2 Late Delegation - Matthew Christensen, Ducks Unlimited Canada; and
b) adopt the agenda as amended.

CARRIED

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

2. ADOPTION OF THE MINUTES

2.1 March 11, 2022 Regular Meeting Minutes

It was MOVED and SECONDED
That the Climate Action Committee adopt the minutes of its regular meeting held March 11, 2022 as circulated.

CARRIED

3. DELEGATIONS

3.1 Eoin Finn and Peter van der Velden, Friends of Tilbury

Eoin Finn and Peter van der Velden, Friends of Tilbury, spoke to the Climate Action Committee regarding the LNG production and the Tilbury storage facility in Delta, outlining their opposition to the storage facility expansion and highlighting the negative impacts of gas emissions on the environment and the public safety concerns with regards to the storage of explosive material.

Members raised questions in regards to the nature of the material and the risk of a potential explosion. Discussion ensued regarding the need for more information on the project and its environmental impact on the region.

Request of Staff
The Climate Action Committee requested staff to invite the City of Delta, City of Richmond, the BC Environmental Assessment Office, and the proponent of the Delta Tilbury facility, to a future Climate Action Committee meeting to provide further information on the project.

1:12 p.m. Vice Chair Dhaliwal departed the meeting.

Presentation material titled "Fortis Tilbury LNG Expansion" is retained with the April 8, 2022 Climate Action Committee agenda.

It was MOVED and SECONDED
That the Climate Action Committee direct staff to review the information from the April 8, 2022 delegation from Friends of Tilbury, and report back from the perspective of Metro Vancouver's mandate on climate change and air quality by June 2022.

CARRIED

3.2 Matthew Christensen, Ducks Unlimited Canada

Matthew Christensen, Ducks Unlimited Canada, spoke to the Climate Action Committee regarding the use of conservation funds for nature-based solutions highlighting the benefits of the program for wetland protection, stormwater management, flood prevention, and water quality monitoring.

Members were informed of a number of polls conducted by member jurisdictions with general support for nature conservation.

Presentation material titled "Conservation Funds – Fraser Delta Farmland Protection and Stewardship Working Group Coastal Douglas-Fir Conservation Partnership" is retained with the April 8, 2022 Climate Action Committee agenda.

It was MOVED and SECONDED
That the Climate Action Committee direct staff to review the information from the April 8, 2022 delegation from Ducks Unlimited Canada, for consideration in the engagement and development of the Climate 2050 Nature and Ecosystems Roadmap.

CARRIED

4. INVITED PRESENTATIONS

No items presented.

5. REPORTS FROM COMMITTEE OR STAFF

5.1 Draft Climate 2050 Energy Roadmap

Report dated March 16, 2022, from Nicole Chan, Project Engineer, Jason Emmert, Program Manager, Climate Policy, Parks and Environment, seeking the MVRD Board's direction to proceed with engagement on the draft *Climate 2050 Energy Roadmap*.

Members were provided a presentation on the draft *Climate 2050 Energy Roadmap* outlining the strategy vision, goals and targets, key linkages to other Metro Vancouver roadmaps, and the strategies and big moves identified.

Discussion ensued regarding alternative fuel sources, such as wind and solar energy. Members were provided with comments on the engagement on the draft energy roadmap, growing population and increasing demand for energy as it relates to many other areas, including transportation and use of biosolid fuels.

Request of Staff
Staff were requested to report back to the Climate Action Committee on the hydrothermal liquefaction project as part of the Sustainability Innovation Fund updates.

Presentation material titled "Climate 2050 Energy Roadmap" is retained with the April 8, 2022 Climate Action Committee agenda.

It was MOVED and SECONDED
That the MVRD Board direct staff to proceed with engagement on the draft *Climate 2050 Energy Roadmap*, as presented in the report dated March 16, 2022,

titled “Draft *Climate 2050 Energy Roadmap*”, incorporating feedback from the Climate Action Committee.

CARRIED

5.2 Draft Climate 2050 Nature and Ecosystems Roadmap

Report dated March 9, 2022, from Edward Nichol, Regional Planner, Regional Planning and Housing Services, Josephine Clark, Natural Resource Management Planner, and Jason Emmert, Program Manager, Climate Policy, Parks and Environment, seeking the MVRD Board’s direction to proceed with engagement on the draft *Climate 2050 Nature and Ecosystems Roadmap*.

Members were provided a presentation on the draft *Climate 2050 Nature and Ecosystems Roadmap* highlighting the key concepts, goals, metrics, strategies and actions.

Members commented on the mental health benefits of nature and ecosystems. Discussion ensued regarding the importance of building green infrastructure, urban containment boundary, tree canopy preservation, and tree preservation challenges due to the population growth, and the need to work in partnership with all levels of government, Indigenous Nations, and businesses to address nature conservation and protection.

Presentation material titled “Climate 2050 Energy Roadmap” is retained with the April 8, 2022 Climate Action Committee agenda.

It was MOVED and SECONDED

That the MVRD Board direct staff to proceed with engagement on the draft *Climate 2050 Nature and Ecosystems Roadmap*, as presented in the report dated March 9, 2022, titled "Draft *Climate 2050 Nature and Ecosystems Roadmap*", incorporating feedback from the Climate Action Committee.

CARRIED

5.3 Proposed Roadmap for Climate Action Engagement to 2025 and Work Plan for 2022

Report dated March 10, 2022, from Lucy Duso, Policy Coordinator, Ann Rowan, Division Manager, Collaboration and Engagement, External Relations Department, providing the Climate Action Committee with information on a proposed roadmap for climate action engagement for Metro Vancouver and a work plan for 2022 through to 2025.

Members were provided a presentation on the Climate Action Engagement to 2025, outlining public awareness on climate change impacts, effective engagement strategies to support action, climate literacy learning platform launch, and further engagement with First Nations.

3:56 p.m. Councillor Royer departed the meeting.

Members commented on the importance of the engagement processes in policy making.

Presentation material titled "Climate Action Engagement for Metro Vancouver" is retained with the April 8, 2022 Climate Action Committee agenda.

It was MOVED and SECONDED
That the MVRD Board receive for information the report dated March 10, 2022 "Proposed Roadmap for Climate Action Engagement to 2025 and Work Plan for 2022".

CARRIED

5.4 Appointment of District Director and Enforcement Officers

Report dated March 15, 2022, from Maari Hirvi Mayne, Acting AQ Regulatory Program Manager, Environmental Regulation and Enforcement, Parks and Environment, appointing one Metro Vancouver employee as the Board-designated district director and another Metro Vancouver employee as a Board-designated officer, and rescinding the appointments of three former employees.

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. rescind the appointments of Ray Robb as district director, and of Kathy Preston as assistant district director;
   ii. appoint Metro Vancouver employee Kathy Preston as district director;
   iii. rescind the appointments of Toby Gritten, and Dan Saunders as officers; and
   iv. appoint Metro Vancouver employee Muhammad Ali as an officer.
b) pursuant to section 28 of the *Offence Act* for the purpose of serving summons for alleged violations under the *Greater Vancouver Regional District Air Quality Management Bylaw 1082, 2008*:
   i. rescind the appointments of Toby Gritten, and Dan Saunders; and
   ii. appoint Metro Vancouver employee Muhammad Ali.

CARRIED

5.5 Manager's Report

Report dated March 30, 2022, from Roger Quan, Director, Air Quality and Climate Change, Parks and Environment, providing the Climate Action Committee with an update on 2022 Work Plan, the Intergovernmental Panel on Climate Change Report titled "Climate Change 2022: Impacts, Adaptation and Vulnerability", Federal government announcement on Canada's 2030 Emissions Reduction Plan, and an update on the provincial Wood Stove Exchange Program changes, rebates, and funding for the First Nations.

It was MOVED and SECONDED
That the Climate Action Committee receive for information the report dated March 30, 2022 titled "Manager's Report".

CARRIED

6. INFORMATION ITEMS
No items presented.

7. OTHER BUSINESS
No items presented.

8. BUSINESS ARISING FROM DELEGATIONS

9. RESOLUTION TO CLOSE MEETING
No items presented.

10. ADJOURNMENT/CONCLUSION

It was MOVED and SECONDED
That the Climate Action Committee conclude its regular meeting of April 8, 2022.

CARRIED
(Time: 4:29 p.m.)

_____ _____

Natalia Melnikov,
Legislative Services Coordinator

Adriane Carr, Chair

52015180 FINAL

Presentation to Metro Vancouver Climate Action Committee – May 13, 2022

I am a family physician and am making this presentation on behalf of the BC branch of the Canadian Association of Physicians for the Environment. We are a group of physicians who look at the intersection between the environment and human health.

We strongly feel that the expansion of the Tilbury LNG plant is detrimental to the health of the citizens of BC.

What are the Systemic Issues involved?
-The IPCC has informed us that we dramatically need to decrease our use of fossil fuels. This year, they made a specific reference to the importance of reducing methane use.
-Canada and BC are committed to reduce their greenhouse gas output by 40 % by the year 2030 - Instead Canada's and BC's greenhouse gas output are increasing - Tilbury will lead to more methane and hence greenhouse gas dispersion into the atmosphere
-Health Canada estimates that 1900 people in BC die prematurely due to air pollution and fossil fuels are the main cause
https://www.canada.ca/en/health-canada/services/publications/healthy-living/2021-health-effects-indoor-air-pollution.html

BC has seen firsthand the results of climate change
-During the past year, we have witnessed (1) the Heat Dome which resulted in over 700 deaths; (2) the burning of the town of Lytton; (3) Atmospheric Rivers causing massive destructive flooding
-We, in BC, have seen the effects of climate change firsthand - How can we ignore it?

Fracking in northeastern BC causes incredible damage
-A major agricultural area is being decimated by fracking; Water use for fracking could dramatically lower water tables and river flows; Chemicals produced by fracking are polluting water tables; Earthquakes produced by fracking may cause large scale damage

What are the local health harms of fracking
-An Amnesty International report concluded that fracking is causing major disruptions in indigenous communities in BC
https://www.amnesty.ca/sites/amnesty/files/Out%20of%20Sight%20Out%20of%20Mind%20ES%20FINAL%20EN%20CDA.pdf
-Congenital abnormalities, early labour and small-for-dates babies are noted in BC's and Alberta's fracking areas
https://jamanetwork.com/journals/jamapediatrics/article-abstract/2790802
-Childhood leukemia is a real concern in babies born in fracking areas in BC
http://www.sciencedirect.com/science/article/pii/S0160412017310309
-American studies have shown increased hospitalizations, heart attacks and cancers in people living in proximity to fracking
-Veterinary studies associate deaths of fish, cows and horses with proximity to fracking

Local problems with Tilbury

-There is a constant danger of a possible explosion in an area close to large population – A 2014 explosion in an LNG facility, in Plymouth, Washington, forced mass evacuations and injured first responders

How Safe Is LNG? Not as Safe as the BC Government Has Claimed | The Tyee

Other concerns are a Jet fuel factory located nearby which could compound effects of an explosion and a narrow turning angle in the channel which could increase the risk of a marine accident

Conclusion

For all the above reasons, we strongly believe that the Tilbury expansion is detrimental to the health of citizens of BC and especially residents of the Lower Mainland

Dr. Larry Barzelai, chair of the BC branch of the Canadian Association of the Physicians for the Environment

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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Climate Action Committee

From: Erik Blair, Senior Planner
Julie Saxton, Air Quality Planner
Parks and Environment Department

Date: April 20, 2022 Meeting Date: May 13, 2022

Subject: **Initial Engagement to Develop an Approach for Managing Greenhouse Gas Emissions from Large Buildings in Metro Vancouver**

RECOMMENDATION

That the MVRD Board authorize staff to proceed with an initial phase of engagement to develop an approach for managing greenhouse gas emissions from large buildings as described in the report dated April 20, 2022, titled "Initial Engagement to Develop an Approach for Managing Greenhouse Gas Emissions from Large Buildings in Metro Vancouver".

EXECUTIVE SUMMARY

This report seeks authorization from the MVRD Board to proceed with initial engagement on potential approaches for reducing greenhouse gas emissions from existing large buildings. Buildings emit one quarter of regional GHG emissions, primarily through burning natural gas for space and water heating. The *Clean Air Plan* and *Climate 2050 Buildings Roadmap*, both approved by the Board in 2021, call for "greenhouse gas performance requirements for existing large buildings" as a pivotal GHG reduction measure to achieve regional climate targets, which would also reduce health-harming air emissions. Such requirements would address a current policy gap related to emissions from existing large buildings and complement provincial and local government action. Given the longevity of building stock in the region and the need for transparency to best allow building owners to plan for emission reductions and improvements, it is recognized that comprehensive research and engagement will be critical for successful program design and implementation. Accordingly, staff believe early signaling of long term future emission limits for GHG and other air emissions to building owners will allow them to plan for necessary changes, and to work with Metro Vancouver staff to design optimum approaches for phased implementation.

PURPOSE

To seek MVRD Board authorization to proceed with an initial phase of engagement with key stakeholders to seek input on potential approaches for managing greenhouse gas emissions from existing large buildings in the region, towards achievement of Board-adopted climate action targets.

BACKGROUND

In 2021, the MVRD Board approved the *Clean Air Plan* and endorsed the *Climate 2050 Buildings Roadmap*, which establish a target of reducing GHG emissions from buildings 35% below 2010 levels by 2030, and achieving zero emission buildings by 2050. The Plan and Roadmap prioritize acting on "Greenhouse Gas Performance Requirements for Existing Large Buildings". This is identified as one of the key 'big moves', that will be foundational to achieving the Board's climate action targets. However, it is recognized that comprehensive research and engagement will be critical for successful

program design and implementation. This report presents an approach for the initial phase of engagement on reducing GHG emissions from large buildings, and seeks Board approval to proceed.

BUILDINGS: A MAJOR CONTRIBUTOR TO CLIMATE CHANGE

Buildings produce approximately 25% of the region's total GHG emissions on an annual basis. The Intergovernmental Panel on Climate Change has stated that immediate and deep GHG emissions reductions across all sectors are necessary to limit global warming to 1.5°C, with global emissions needing to be reduced by almost half by 2030. Even with programs and incentives in place, GHG emissions from buildings have risen 10% since 2010 in Metro Vancouver. This increase is due in large part to the widespread use of natural gas for space and water heating in most buildings, which produces over 90% of building GHG emissions. Buildings are also a major contributor of other health-harming air emissions.

Buildings last a long time, and decisions made today will impact building GHG emissions for decades. Equipment replacements for space and water heating usually take place every 10-20 years, and building envelope upgrades may only occur every 30-50 years. Given these long replacement cycles, it is critical to ensure that retrofits from this point forward consider a long term view, and maximize GHG reductions and energy savings. Most existing buildings will eventually need retrofits to reduce their GHG emissions to low or zero emissions in line with the targets adopted in MVRD Plans. Initiating a dialogue about GHG reductions, while considering a phased approach that clearly signals future low or zero emission limits to building owners, will enable them to plan for effective retrofits on or before these replacement cycles.

Proven technologies are already widely available to dramatically reduce or eliminate GHG and other health-harming air emissions. Some of these technologies, such as air source heat pumps that heat and cool, can also have life-saving health benefits for building occupants during extreme heat events.

FILLING THE GAP IN CURRENT LEGISLATION

There is a gap in current policy aimed at reducing GHG emissions from buildings when it comes to existing buildings. At the provincial level, the *CleanBC Roadmap to 2030* commits to important climate actions that focus on newly constructed buildings and on the energy efficiency of heating and cooling equipment sold and installed in BC. Recent federal announcements commit to developing a model building alterations code by 2030, and providing financial support to building owners to reduce the cost of low carbon retrofits. *However, there are no current requirements for GHG reductions from existing buildings at the federal or provincial levels.*

With the exception of Metro Vancouver and the City of Vancouver, local governments in BC do not have access to policy tools that would allow them to limit GHG emissions from existing buildings. Through the *Help Cities Lead* initiative, a number of local governments have advocated to the Province of BC to grant them this authority. In response to the adoption of the *Climate Emergency Action Plan* in late 2020, Vancouver City Council directed staff to bring forward recommendations to establish energy and emissions reporting, and to limit GHG emissions from homes and buildings. City of Vancouver staff intend to bring forward a proposed bylaw to address these recommendations in May 2022. Metro Vancouver and City of Vancouver staff continue to work closely to ensure alignment on initiatives to reduce emissions from buildings.

Metro Vancouver has an opportunity to address the current policy gap related to the operational emissions from existing large buildings in the region and complement senior and local government action. Modelling the impact of potential climate actions has shown that addressing GHG emissions from existing large buildings in the region – those with a gross floor area greater than 2322 m^2 (25,000 ft^2) – would yield major reductions in total GHG emissions from buildings. A program of this design would be very effective, as buildings of this size comprise less than 2% of building stock in the region.

PROPOSED APPROACH FOR REDUCING GHG EMISSIONS FROM BUILDINGS

Metro Vancouver is responsible for managing air quality and regulating the discharge of air contaminants in the region under authority delegated from the provincial government in the *Environmental Management Act*. The attached discussion paper (Attachment 1) describes the proposed approach to conduct technical research and seek initial feedback on the conceptual approach, including:

- collecting data on GHG emissions from buildings;
- appropriate phasing of GHG limits for various types of buildings that would lead to significant and measurable progress toward the region's climate targets; and
- clearly signaling the long term need and time frame for large buildings to meet a final limit of zero emissions by 2050, as adopted by the Board in the *Climate 2050 Buildings Roadmap*.

The initial phase of engagement on the proposed approach would seek to understand the challenges faced by owners of various types of buildings to prepare for upgrades. This information would enable Metro Vancouver staff to fine-tune the potential stages and timelines for requirements for various building types, which would set the stage for subsequent engagement and help address anticipated concerns about equity, affordability, and alignment between Metro Vancouver, City of Vancouver, and provincial initiatives. Early awareness of the proposed approach would enable building owners to plan their investments and avoid large investments in projects that would not align with GHG emission reduction targets. Building owners would also become more familiar with the incentives, information, and technical support that will facilitate the transition to zero-emission buildings.

Metro Vancouver's existing *GVRD Boilers and Process Heaters Emission Regulation* (Bylaw 1087), manages emissions of health-harming air emissions such as nitrogen oxides and particulate matter, from heating equipment in buildings and other sectors. A separate report in the May 2022 Climate Action Committee package describes the proposed engagement process to amend Bylaw 1087 to further reduce health-harming air contaminants, in line with new federal air quality standards for nitrogen dioxide. Buildings that use fossil fuels or renewable natural gas would need to concurrently manage health-harming air emissions in accordance with Bylaw 1087 or other relevant regional air emission control requirements, including amended bylaws. Buildings would be encouraged to use zero-emission heating technology to comply with limits on GHG and other health-harming air emissions. Recognizing the overlap between some boilers and heaters authorized under Bylaw 1087 and the potential approaches to manage GHG emissions from large buildings, engagement would be harmonized to the extent possible.

ENGAGEMENT PLAN

Metro Vancouver is committed to engaging with the public, interested and affected parties, First Nations, and other orders of government on potential approaches for managing GHG emissions from large buildings across the region. Staff propose that engagement will first proceed to gather information and insights to inform the development of an approach to manage greenhouse gas emissions from large buildings. Additional engagement will be developed to help develop more detailed proposals for GHG emission reduction requirements.

The engagement will build on learnings from the engagement conducted for Metro Vancouver's *Climate 2050 Buildings Roadmap*, as well as the work currently underway by the City of Vancouver. If supported by the Board, initial engagement will take place between June and November 2022, and will be coordinated with engagement for the proposed amendments to Bylaw 1087. The development of new emission requirements is an iterative process that will involve considering feedback from interested and affected parties and information from ongoing research. Staff will consider all feedback in developing potential requirements that will be incorporated into a proposed approach to manage GHG and other emissions from buildings, and presented to the Board for consideration.

ALTERNATIVES

1. That the MVRD Board authorize staff to proceed with an initial phase of engagement to develop an approach for managing greenhouse gas emissions from large buildings as described in the report dated April 20, 2022, titled "Initial Engagement to Develop an Approach for Managing Greenhouse Gas Emissions from Large Buildings in Metro Vancouver";

2. That the MVRD Board authorize staff to proceed with an initial phase of engagement to develop an approach for managing greenhouse gas emissions from large buildings as described in the report dated April 20, 2022, titled "Initial Engagement to Develop an Approach for Managing Greenhouse Gas Emissions from Large Buildings in Metro Vancouver", with the changes proposed by the Climate Action Committee; and

3. That the MVRD Board receive for information the report dated April 20, 2022, titled "Initial Engagement to Develop an Approach for Managing Greenhouse Gas Emissions from Large Buildings in Metro Vancouver", and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

Under Alternative 1, staff will proceed with preliminary engagement on managing GHG emissions from large buildings. The resources needed for this first phase of engagement, including staff time and consulting costs, will be covered through approved program budgets for 2022. A projection of resource needs for the implementation of the proposed requirements would be presented along with a proposed program for Board consideration, after the engagement process.

CONCLUSION

The *Clean Air Plan* and *Climate 2050 Buildings Roadmap* set an ambitious path towards zero-emission buildings by 2050. Phasing in GHG emission limits for various types of large buildings will play a key role in enabling our region to meet the Board's GHG emission targets and avoid the worst impacts of climate change. Preliminary engagement on the proposed approach for managing GHG emissions

from large buildings would be integrated with engagement on proposed amendments to Metro Vancouver's *Boilers and Process Heaters Emission Regulation* (Bylaw 1087) related to health-harming air emissions from buildings and other sources. Feedback will enable staff to consider the concerns and challenges of affected audiences when developing more detailed proposals for further engagement, if supported by the Board. Staff recommend Alternative 1, to provide authorization for staff to proceed with initial engagement.

Attachments

1. Draft Discussion Paper: "Potential Approaches for Managing Greenhouse Gas Emissions from Large Buildings in Metro Vancouver"
2. Draft Engagement Approach: "Engagement to Develop an Approach for Managing Greenhouse Gas Emissions from Large Buildings in Metro Vancouver"

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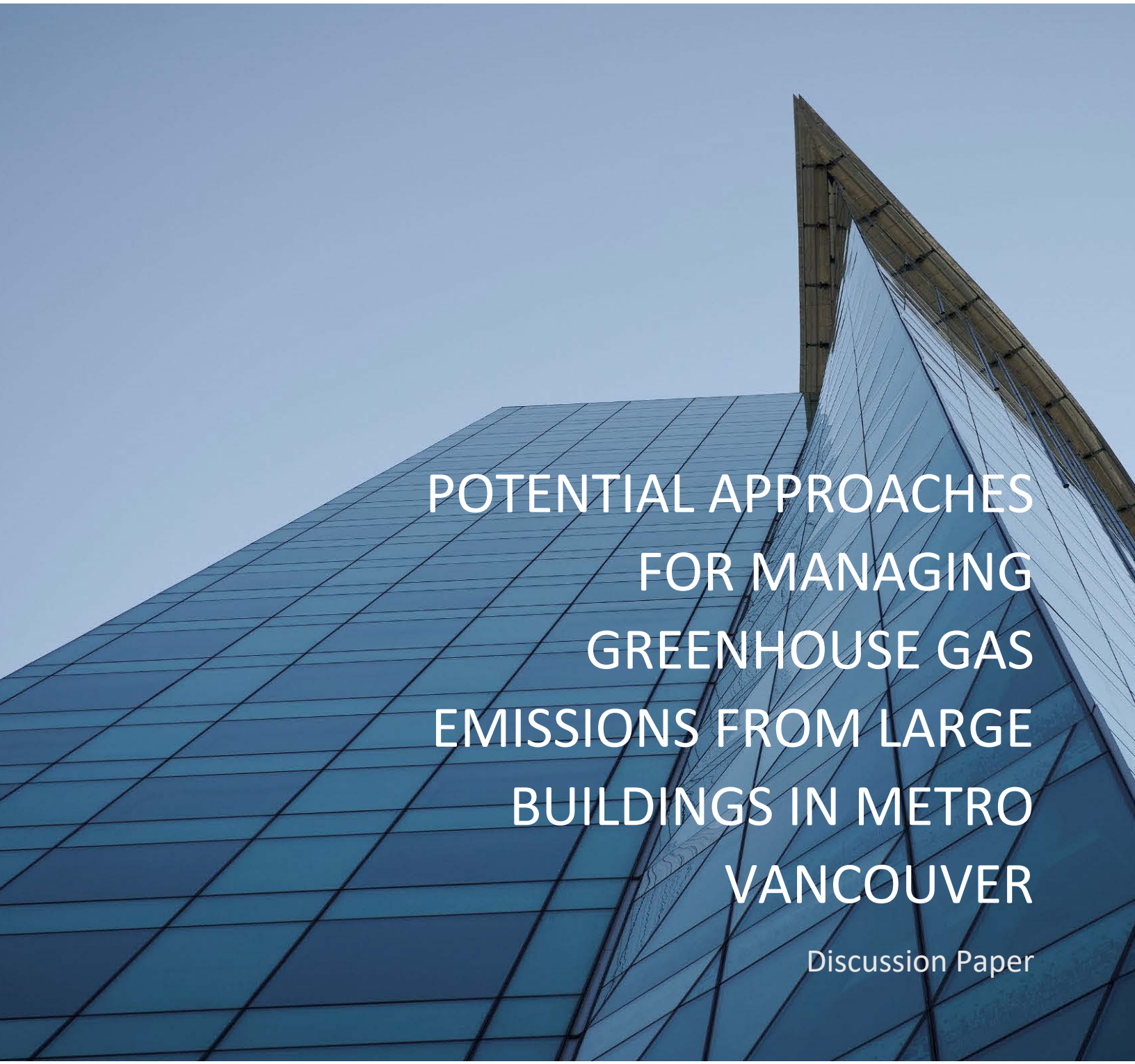


POTENTIAL APPROACHES FOR MANAGING GREENHOUSE GAS EMISSIONS FROM LARGE BUILDINGS IN METRO VANCOUVER

Discussion Paper

May 2022

DRAFT

Overview

The Intergovernmental Panel on Climate Change has stated that immediate and deep greenhouse gas emissions reductions across all sectors are necessary to limit global warming to 1.5°C, with global emissions needing to be reduced by almost half by 2030. In response, the Metro Vancouver Board of Directors (Board) adopted the *Climate 2050 Strategic Framework* in 2018 and endorsed the *Clean Air Plan* and *Climate 2050 Buildings Roadmap* in 2021. The goals and targets in these air quality and climate change-related plans include the following:

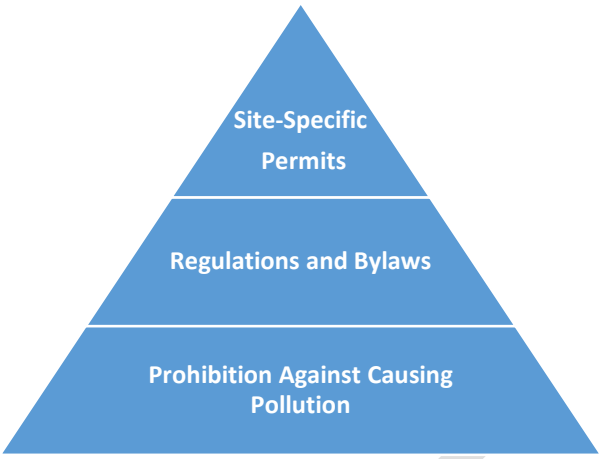
- Reduce greenhouse gas (GHG) emissions 45% below 2010 levels by 2030;
- Achieve regional carbon neutrality by 2050; and
- Ensure that ambient air quality meets or is better than the ambient air quality objectives and standards that are regularly updated by Metro Vancouver, the BC Government, and the Government of Canada

The *Clean Air Plan* also includes targets specific to the building sector including:

- A 35% reduction in GHG emissions from buildings below 2010 levels by 2030;
- A 15% reduction in nitrogen oxides emissions below 2020 levels by 2030; and
- A 35% reduction in fine particulate matter emissions below 2020 levels by 2030

The *Clean Air Plan* and *Climate 2050 Buildings Roadmap* include key actions – called "Big Moves" – which are necessary to achieve our climate and air quality targets for 2030 and 2050. Some of these Big Moves signal the transition to zero emission buildings through requirements and standards that would help address an existing gap to manage greenhouse gases. In addition, more stringent ambient air quality objectives were adopted by the Metro Vancouver Board in 2019 to protect public health and the environment and align with federal standards and provincial objectives.

Metro Vancouver Regional District (MVRD) is responsible for managing and regulating air quality in the region under authority delegated from the provincial government in the *Environmental Management Act*. Metro Vancouver protects public health and the environment through a tiered approach to managing the discharge of air contaminants that applies the use of site-specific permits, sectoral emission regulations, and provisions in the *Greater Vancouver Regional District (GVRD) Air Quality Management Bylaw No. 1082, 2008* (Bylaw 1082).



A tiered approach to regulating air contaminants in Metro Vancouver. A Large Building GHG Emission Regulation and proposed amendments to the Boilers & Process Heaters Emission Regulation Bylaw (Bylaw 1087) would fall into the "regulations and bylaws" category.

This discussion paper is one of two discussion papers that present related proposals for managing emissions from stationary combustion equipment. The two discussion papers address the discharge of:

- GHG air contaminants from natural gas and propane burning equipment in large buildings.
- Health-harming air contaminants from boilers used to provide heat or energy for buildings in commercial, institutional, residential or industrial settings, and from process heaters used in industrial settings. Emissions of air contaminants from these sources are currently regulated under the *Greater Vancouver Regional District Boilers and Process Heaters Emission Regulation Bylaw No. 1087, 2008* (Bylaw 1087).

This summary highlights the linkages between these initiatives to inform dialogue with interested parties.

Conceptual Approach for Managing GHG Emissions from Large Buildings

A conceptual approach for managing GHG emissions from large buildings is described in this discussion paper, for the purpose of obtaining feedback. Establishing performance requirements for emissions of greenhouse gases from large buildings is one of the Big Moves in the *Clean Air Plan*, and such requirements could eventually be incorporated into a bylaw regulating GHG and other air emissions from buildings. This discussion paper seeks to provide context for dialogue on the approach of establishing GHG limits to make significant and measurable GHG emission reductions from existing large buildings to achieve the region's climate targets.

The types of buildings envisioned to be within the scope of the approach in this discussion paper include commercial, institutional, and multifamily residential buildings over 2,322 m^2 (25,000 ft^2) in gross floor area (GFA). In order to allow time for building owners to prepare for upgrades and avoid large investments in projects that do not align with greenhouse gas emission reduction targets, a phased implementation approach is desirable, but it will be important to clearly signal longer term targets and requirements. In addition to reducing GHG emissions, buildings that consume renewable natural gas to achieve interim GHG emission limits, or natural gas or propane, would need to concurrently manage emissions of health-

harming air contaminants in accordance with the requirements in Bylaw 1087 or other relevant regional air emission control requirements.

Proposed Amendments to the Boilers and Process Heaters Emission Regulation (Bylaw 1087)

Emissions of health-harming air contaminants such as nitrogen oxides from boilers and process heaters with a facility capacity of 50 MW or less, including boilers found within large buildings, are currently managed through Bylaw 1087. Nitrogen oxides, or NO_x, include both nitrogen dioxide (NO_2) and nitric oxide (NO). In November 2019, the Board adopted stricter regional Ambient Air Quality Objectives for nitrogen dioxide (NO_2) that align with the 2020 NO_2 Canadian Ambient Air Quality Standards (CAAQS). The NO_2 CAAQS are expected to become even stricter by 2025. Amendments to Bylaw 1087 are proposed to support ongoing attainment of the Ambient Air Quality Objectives. The discussion paper titled "Proposed Amendments to the *GVRD Boilers and Process Heaters Emission Regulation Bylaw No. 1087, May 2022*" proposes stricter emission limits for nitrogen oxides and additional requirements for dispersion modelling and emission stack design to reduce localized impacts.

The proposals and approaches set out in the discussion papers for amendments to Bylaw 1087 and for managing GHG emissions from large buildings create opportunities for co-benefits in meeting our climate targets to avoid the worst impacts of climate change and to improve local and regional air quality. Zero-emission technology, such as electrification or zero-emission district energy, can simultaneously achieve zero emissions of health-harming air contaminants and GHG emissions.

Overview of Engagement on the Related Regulatory Proposals and Approaches

Overlapping audiences for engagement on these two initiatives include the general public, building owners and managers, developers, district energy providers, and staff at member jurisdictions and other orders of government. To meet the needs of audiences interested in both initiatives, coordinated engagement on managing GHG emissions from large buildings and amendments related to boilers and process heaters will be conducted in 2022. Audiences will also be invited to participate in engagement activities specific to the individual initiatives. Engagement on the proposed amendments to Bylaw 1087 is expected to be completed in 2022 and followed by the development of amendments to Bylaw 1087 for consideration by the Board. Feedback from engagement on GHG emissions will inform the development of more detailed proposals that could be included in a future bylaw, including the possibility of amalgamating requirements into one bylaw covering all building-related emissions. The more detailed proposals would be the subject of additional engagement, if supported by the Board.

Metro Vancouver Key Audiences Impacted by Proposed Approaches to Reduce GHG and Air Contaminant Emissions in Buildings

AUDIENCES	PROPOSED APPROACH FOR MANAGING GHG EMISSIONS LARGE Large Buildings >25,000ft²	BOILERS & PROCESS HEATER BYLAW AMENDMENTS Boilers < 50 MW
Owners of Large Buildings (Heating Capacity up to 50MW) >2,322 m2 (25,000 ft2)	✓	✓
District Energy Providers	✗	✓
Industrial Buildings with Process Heating	✓ for Space and Domestic Hot Water Heating/Cooling ✗ Process Heating/Cooling	✓
Developers of Newly Constructed Buildings	✗	✓

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Introduction

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. Essential services include drinking water, sewage treatment, and solid waste disposal, along with regional services such as regional parks, housing, land use planning and air quality management that help keep the region one of the most livable in the world.

Metro Vancouver's Member Municipalities and Population

The *Clean Air Plan* is Metro Vancouver's air quality and greenhouse gas management plan. Actions in the plan will reduce air contaminant emissions including greenhouse gases (GHG) by 2030, and support the goal of becoming a carbon neutral region by 2050, outlined in Metro Vancouver's *Climate 2050 Strategic Framework*. The development of regulatory requirements for existing large buildings to meet GHG emission performance targets is an action in the *Clean Air Plan* and will accelerate GHG reductions.

Under delegated authority from the BC *Environmental Management Act* (EMA), the Metro Vancouver Regional District is seeking feedback from affected audiences about potential approaches for managing GHG emissions from large buildings. Metro Vancouver is interested in reducing GHG emissions from the region's building sector, since GHG emissions are air contaminants that damage or are capable of damaging the environment.

Purpose

The purpose of this discussion paper is to:

- Provide information about the GHG emissions from the building sector in the region, as well as the benefits of establishing a timeline for requirements to achieve deep reductions in GHG emissions from the sector

- Encourage feedback from affected and interested parties on potential approaches to manage GHG emissions from large buildings in Metro Vancouver

This discussion paper may be of interest to:

- Member jurisdictions
- Building owners, managers, and developers
- Industry and business associations including boards of trade and chambers of commerce
- Other orders of government
- First Nations who may be considering or have implemented aligned regulations
- District energy providers
- Utility providers
- General public

Interested parties are invited to provide feedback by November 30, 2022.

Terms in bold letters are defined in the glossary at the end of this discussion paper.

Defining the Problem

Buildings in Metro Vancouver produce a significant share of the region's total GHG emissions, representing the second highest emitting sector. The GHG emissions from buildings in Metro Vancouver also account for approximately 50% of province-wide GHG emissions from buildings.

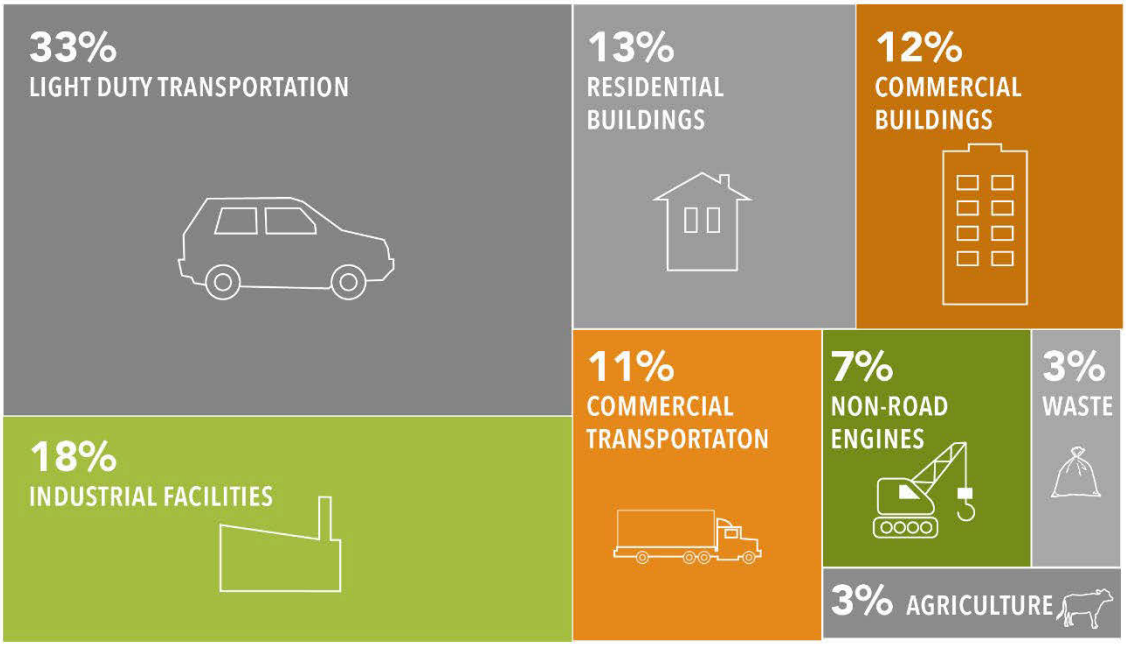
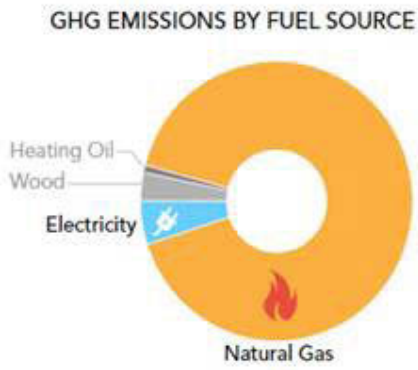
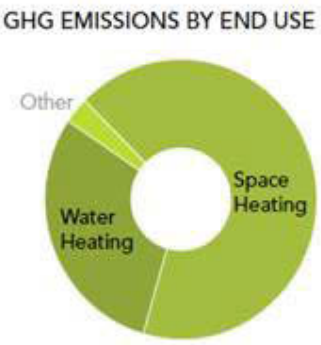


Figure: A breakdown of the Metro Vancouver region's GHG emissions by sector in 2015.

In our region, over 90% of GHG emissions from buildings come from burning natural gas for space heating, hot water, and some household appliances, while close to 3% come from out-of-region electricity generation. Space and water heating are responsible for nearly all of the natural gas use in buildings.





There are nearly 500,000 buildings throughout Metro Vancouver that collectively have more than 185 million m^2 (2 billion ft^2) of floor space. Together, these buildings are the second largest source of greenhouse gas emissions in Metro Vancouver after transportation, emitting over 4 million tonnes per year. Regardless of programs and incentives in place, greenhouse gas emissions from buildings have risen 10% since 2010 in Metro Vancouver. This increase is due in large part to the widespread and continued use of natural gas to heat space and water in many of our new and existing buildings. Buildings also last a long time, and decisions made a century ago about design and construction are affecting our GHG levels

today. Similarly, the decisions we make today about the design and retrofit of buildings will determine the amount of GHG emissions they create well beyond 2050.

An initial Metro Vancouver modelling study showed that requirements to limit GHG emissions from existing buildings will make a significant contribution to the deep emission reductions necessary to bring the region closer to meeting climate targets, and in turn reducing the impacts of climate change. Reductions in GHG emissions from large buildings can be achieved through a number of policies and requirements. Most existing buildings will eventually need retrofits to reduce their GHG emissions, such as switching to heat pumps or improving insulation and air tightness. Equipment options are currently available for many building types that can reduce a building's GHG emissions as well as emissions of health harming air contaminants such as **nitrogen oxides (NOx)**.

How to Address the Problem: Zero Emission and Resilient Buildings by 2050

The ***Climate 2050 Strategic Framework*** sets out the region's long term strategy for climate action. Under this Framework, Metro Vancouver has set the following goals:

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

Metro Vancouver's *Clean Air Plan* and *Climate 2050 Buildings Roadmap* set sector specific GHG reduction target for the region's building sector:

- By 2030, a 35% reduction in GHG emissions below 2010 levels.
- All buildings are zero emissions in their operation, deriving all energy needs from 100% clean and renewable sources.

Both policy documents describe specific strategies, actions and metrics required in the building sector to meet the *Climate 2050* long term emission reduction, and resiliency targets. This proposed approach responds to one of these key actions, which is to "establish GHG performance requirements for large existing buildings".

Reducing GHG emissions from the region's building sector will be an important step to ensure that Metro Vancouver does its part in the global effort to take action on climate change and create more resilient and healthy communities.

Why Manage GHG Emissions from Large Buildings Through Requirements?

Given our ambitious climate targets, requirements to reduce GHG emissions in buildings would provide more certainty of achieving regional, provincial, and local government climate targets. Many leading jurisdictions in North America have implemented regulatory requirements in order to decarbonize their building sectors. Metro Vancouver is proposing a similar approach to work towards the region's long term climate goals. These requirements would provide an important signal to building owners to prepare for

zero-emission retrofits, but to be successful they would need to be paired with supporting resources, tools and programs. Metro Vancouver's *Clean Air Plan* and *Climate 2050 Buildings Roadmap* include actions that will support zero-emission retrofits, including the creation of a Large Building Retrofit Accelerator. The Retrofit Accelerator aims to be a regional resource hub that provides technical support and resources to building owners and managers to implement low- and zero-emission retrofits.

The *Clean Air Plan* and the *Climate 2050 Buildings Roadmap* include strategies and actions, including several actions that are identified as a "Big Move". Big Moves are key actions that are foundational to meeting the GHG emission reduction targets for 2030 and beyond. To meet targeted GHG emission reductions for the region's building sector, a specific action was identified as a Big Move for buildings as outlined below:

"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."

Reducing GHG emissions, as well as other health harming air contaminants, will require long term planning to help support a transition to **zero carbon emission** buildings by 2050. The potential approach for managing large building GHG emissions is an important tool to signal the changes to a building that will be necessary, so that building owners can plan for emission reductions as a part of the decision-making process for building upgrades and equipment replacements.

Where implemented carefully and effectively, requirements for reporting and limiting GHG emissions from buildings have been demonstrated to greatly accelerate the number and depth of building retrofits across a jurisdiction. Examples of programs operating in other North American jurisdictions that require reporting, set GHG emission limits, or both, include: Ontario, Seattle, New York City, and Washington DC.

Co-Benefits of Reducing Building-Related GHG Emissions

Reducing GHG emissions from large buildings contributes to meeting our climate targets and helps to avoid the worst impacts of climate change. However, investments in energy-efficient, low-carbon building systems also have a number of other demonstrated benefits that are increasingly valued by occupants, tenants, and investors, including:

- Improvements to local air quality
- Improvements to occupant health, where improvements to ventilation systems are often made in conjunction with emission reduction measures and energy efficiency improvements
- Improvements to occupant comfort and safety, especially where low-carbon systems such as electric heat pumps (which provide both heating and cooling) are installed
- Improved resilience to power outages and extreme weather events, especially where energy efficiency upgrades are paired with on-site renewable energy systems and energy storage

Working within the Legislation

Potential approaches to managing GHG emissions from large buildings would need to fill a gap in existing policy to reduce GHG emissions from buildings in our region. This section outlines the current legislation across orders of government, and describes the opportunity to significantly reduce GHG emissions from existing buildings.

Federal Regulations & Actions

The Government of Canada *Pan-Canadian Framework on Clean Growth and Climate Change (PCF-CGCC): A Healthy Environment and Healthy Economy*, and the federal *Net Zero Accountability Act* set GHG reduction targets of 40%-45% by 2030, and net zero by 2050 (relative to 2005 levels). Recognizing that buildings account for 12% of total national emissions in 2019, the *PCF-CGCC* commits the federal government to support retrofits of existing building through strategies including, but not limited to:

- Developing a model building alterations code by 2030 to be adopted by provinces and territories.
- Supporting the continuation and expansion of provincial and territorial efforts to retrofit existing buildings.
- A Canada Investment Bank commitment to invest $2 billion to finance up-front capital costs of commercial and large scale building retrofits.

Provincial Regulations and Actions

Through its *CleanBC* plan, the Province of BC has committed to developing new standards for building upgrades via the introduction of an alterations code for existing buildings by 2024, which will bring existing buildings up to modern standards for efficiency and comfort. With the release of the *Clean BC Roadmap to 2030*, the following plans have been identified:

- The introduction of GHG emission standards in the BC Building Code for newly constructed buildings in 2024, with zero carbon new construction required by 2030.
- After 2030, all new space and water heating equipment sold and installed in B.C. will be at least 100% efficient (i.e. electric resistance heating, heat pumps).

If enacted, the initiatives outlined above would support efforts to reduce GHG emissions from newly constructed buildings. They would also support low carbon upgrades in existing buildings at the time of replacement of building equipment, after 2030.

The Province also administers the Better Buildings incentive program to support existing building energy efficiency and emissions reductions.

Existing Policies and Programs in the Region

In Metro Vancouver, a number of local governments have continued to push for action to enable building level greenhouse gas reporting (often referred to as “benchmarking”) and setting GHG emission limits. Building on its voluntary Building Energy Challenge program, the City of Richmond has drafted a model bylaw for a building energy benchmarking policy for use by other municipalities. Additionally, the cities of Burnaby, Richmond, Surrey, Vancouver and others have since introduced energy benchmarking requirements for new Part 3 (commercial, multifamily, industrial) buildings, alongside BC Energy Step Code requirements.

Going further, the City of Vancouver's Climate Emergency Action Plan, adopted in late 2020, outlines requirements to meet their 2030 space and water heating targets of cutting GHG emissions in half from 2007 levels. Through the Plan, Vancouver City Council directed staff to bring forward recommendations to limit annual GHG emissions from existing large commercial buildings, and detached homes beginning in 2025, as well as recommendations to require energy and emissions reporting by 2023. City of Vancouver staff intend to bring forward proposed bylaws to address the recommendations in May of 2022.

Metro Vancouver: A Path Forward

There is currently a gap in the BC policy landscape to manage GHG emissions from existing buildings in the region (outside of the City of Vancouver). In this section, an approach is proposed for consideration, outlining how Metro Vancouver would manage GHG emissions from large buildings, which could address this gap, and complement provincial and local action by ensuring improved performance in buildings that have been constructed to older and less stringent standards for energy use and GHG emissions. The proposed approach would also support improvements prior to (or alongside) any requirements that could be triggered by upcoming provincial requirements for efficient equipment standards.

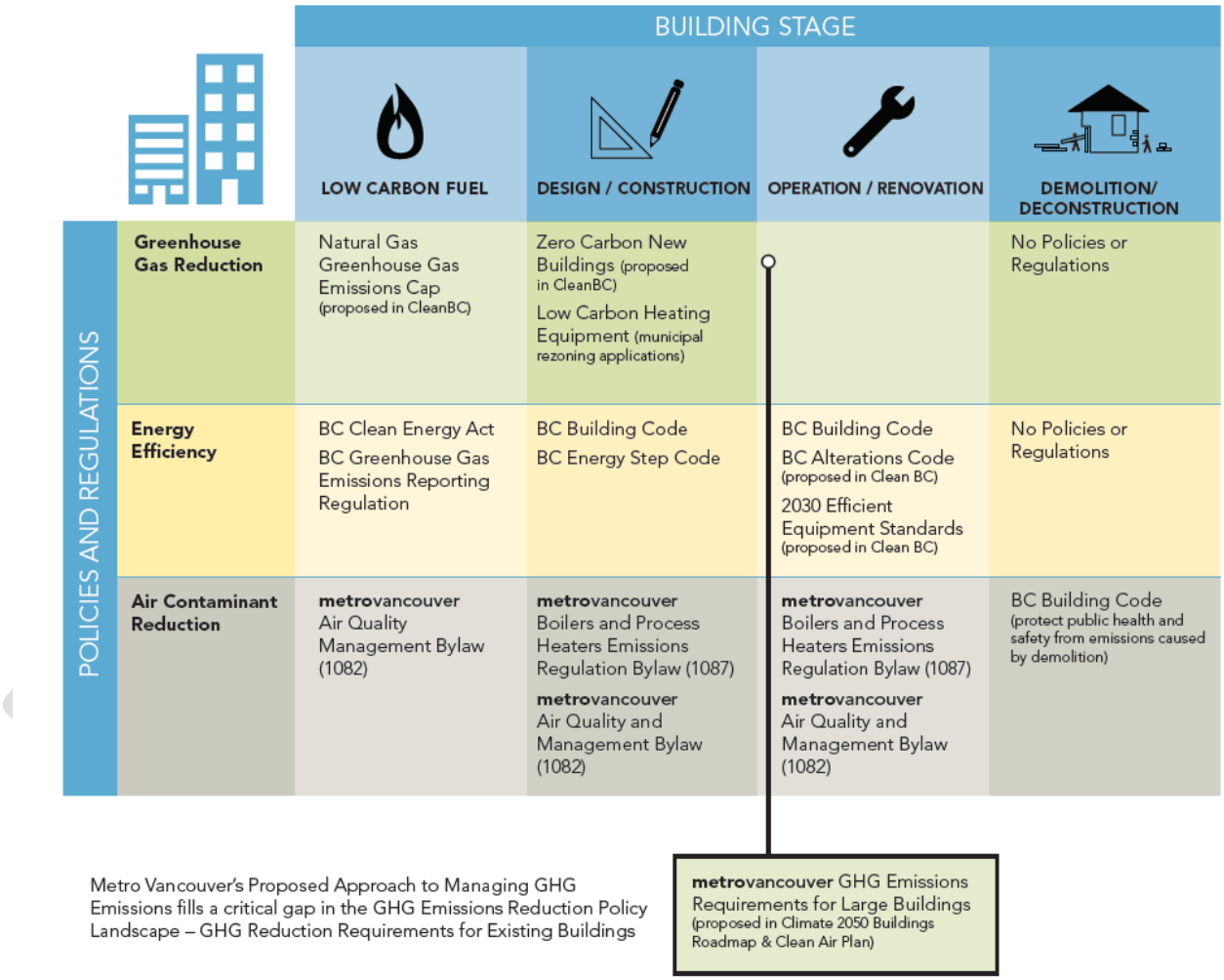


Figure: The proposed approach to managing large building GHG emissions would fill a gap in current Provincial policies and regulations for reducing greenhouse gases from the building sector.

As proposed, the approach could provide coordination and streamlined administration of requirements to reduce GHG emissions from large buildings across multiple local government jurisdictions, reducing the burden on individual member jurisdictions. Metro Vancouver would ensure that requirements to limit GHG emissions from large buildings integrate efficiently with other provincial codes and programs. Metro Vancouver would also work with its member jurisdictions to ensure they are informed and able to support the implementation of the approach particularly by identifying and supporting building owners in their communities.

In addition to the efforts taken by other levels of government, many building owners in Metro Vancouver already benchmark and disclose energy use and emissions from their buildings on a voluntary basis. A growing number of these owners also participate in the Building Benchmark BC program, which seeks to increase building benchmarking and disclosure to accelerate low carbon retrofits. These owners represent more than 1600 commercial, residential, industrial, and institutional properties in BC. Analysis shows that voluntary benchmarking programs alone will not be sufficient to achieve the necessary GHG emissions reductions. However, the growing use of benchmarking and lessons learned from Building Benchmark BC would inform a regional approach to reporting of energy consumption and GHG emissions that would support the design of potential requirements to manage GHG emissions in large buildings.

Metro Vancouver – Developing an Approach for Managing GHG Emissions from Large Buildings

Metro Vancouver is interested in hearing about any challenges or opportunities associated with accelerating the transition to zero-emission buildings through Metro Vancouver's proposed management of GHG emissions from large buildings.

Guiding Principles

The guiding principles and directions that will help shape the management of GHG emissions are:

1. Minimize the risk to public health, the local environment, and the global climate from GHG emissions and other air contaminants
2. Set and signal requirements in advance to allow time for building owners to prepare for upgrades and avoid large investments that do not align with GHG emission reduction goals
3. Develop fair requirements that consider the particular challenges faced by various building types
4. Collaborate with affected parties and organizations to create a coordinated, streamlined, efficient, and well-supported program
5. Recover costs efficiently, in a fair and effective manner that reflects the harmful impacts of GHG emissions

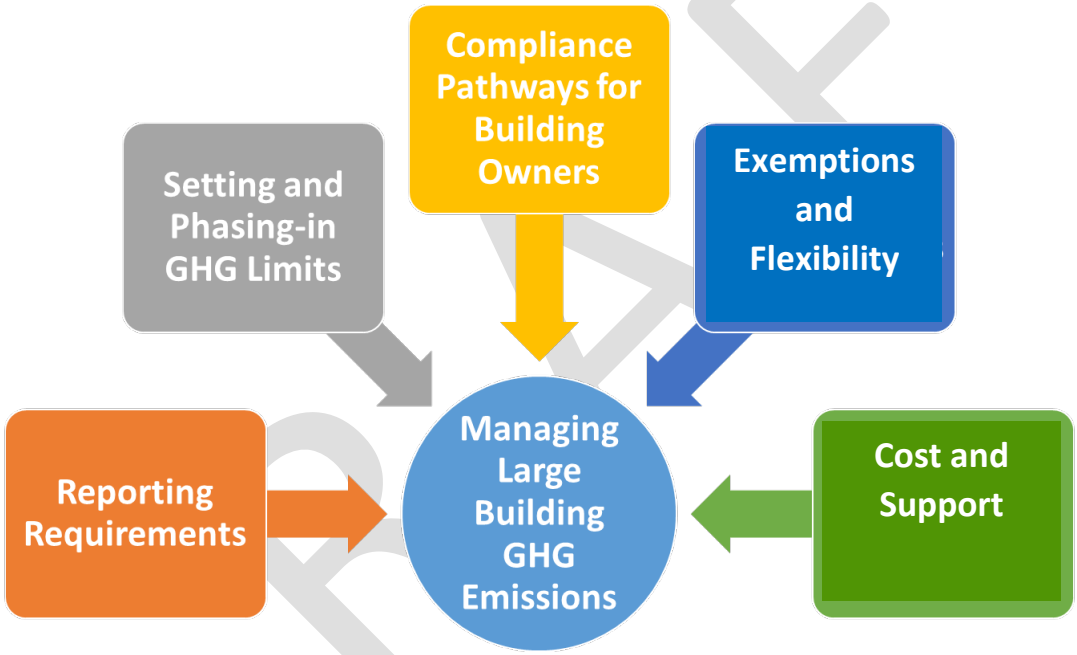
Program Scope

The proposed approach to managing GHG emissions would require building owners to report the GHG emissions from their buildings on an annual basis to ensure that emissions fall below limits established by the Metro Vancouver Regional District for specified building types and sizes. Building types and sizes that could be in the scope of the potential requirements are commercial, institutional, and residential buildings over 2,322 m^2 (25,000 ft^2). Agricultural buildings would not be within the scope of the proposal.

While only making up 2% of the total number of buildings in the region, large buildings comprise 35% of the total building floor area of all buildings, and will contribute to a significant amount of the GHG emission reductions required to meet the region's climate targets.

Design Elements

The following are key considerations for the development of potential requirements that would be the subject of further engagement, if supported by the Board:



- **Reporting Requirements:** Type of data reported and frequency of reporting.
- **Setting and Phasing-in GHG Emission Limits:** Initial GHG emission limits based on research and analysis, future interim limits based on analysis of reported data from various types of buildings. Limits would be phased in over time for various building types, depending on their capacity to implement changes.
- **Compliance Pathways:** The ways in which a building owner may be able to achieve compliance with the emission limits.
- **Exemptions and Flexibility:** Exemptions or more flexible requirements for certain building types or circumstances.
- **Cost:** Technical support would be available to assist building owners with planning for cost-effective transitions to zero-emission technology. Program fees would be designed to support the achievement of health and environmental benefits from emission reductions, promote

continuous improvement, and recover costs of program development and compliance promotion based on the established principles of discharger-pay, equity, and fairness.

Reporting Requirements

Several municipalities have expressed interest in benchmarking energy use and emissions of buildings, and the Province administers the voluntary Building Benchmark BC reporting program. Standardized annual reporting of energy consumption and type of fuel to Metro Vancouver could be proposed, to reduce the time and resources that building owners and managers spend on reporting data. Metro Vancouver could also explore the feasibility of using current industry standards for reporting such as the ENERGY STAR Portfolio Manager online platform. Metro Vancouver would convert energy consumption to GHG emissions based on the type of fuel consumed using the carbon dioxide equivalent (CO2e) emission factor for each respective fuel, set by the Province of BC Best Practices Methodology for Quantifying GHG Emissions Report.

Energy use and emissions reporting programs generally collect the following information about buildings:

Types of Data Generally Collected - All Buildings
• Property name • Property address • Owner name • Property type • Total gross area of property • Gross floor area for each property use in the building • Year of construction • Number of buildings • Twelve consecutive months of energy data for all energy sources • Fuel sources • Metered areas ('whole building' is usually the only 'compliant' response) * • GHG emissions and emissions intensity • Heating or hot water technologies • Reporter contact information * *Sub-metered portions of a building could be tracked separately, but total consumption reported must encompass the whole building for performance metrics to be meaningful*

Table 1: Building data typically collected for benchmarking (i.e. reporting) programs.

This information about buildings can be used to calculate the greenhouse gas intensity (GHGi), which is a measure of the total GHG emissions (kg or tonnes of carbon dioxide equivalent) divided by the gross floor area of a building (m^2) emitted in a year. GHGi facilitates the comparison of emissions from buildings of a similar type and size, and the identification of appropriate GHGi limits for various building types and sizes.

Setting and Phasing-in Greenhouse Gas Emission Intensity Limits

Different GHG emission intensity limits for different building types, representing the maximum emissions that a building of a particular type could emit per unit of floor area, could be established and phased in over time. Building types are groupings of buildings with similar characteristics such as occupancy class, age, size, and design features for which emissions performance can be compared. Examples of building types may include, but are not limited to, various size categories within the following:

- Large Office Buildings
- Large Retail Buildings
- Office Buildings and Retail Complexes
- Mid-rise Residential
- Multifamily Residential

For brevity, this document refers to GHG emission intensity limits as "GHG emission limits". Initial GHG emission limits could be determined by research and analysis of GHGi of different building types. More stringent GHG emission limits could then be developed and introduced over time based on the reported information about energy use and emissions, for fairness, accuracy, and alignment with the region's GHG reduction goals and other local government initiatives.

Over time, more buildings within scope would make changes to meet the GHG emission limit for their building type. Buildings with the lowest GHG emissions would only be affected further in the future, as the region approaches the goal of zero-emission buildings by 2050.

Compliance Pathways for Building Owners

Building owners would have the flexibility to choose the most cost-effective upgrades and retrofits needed to ensure building emissions meet or are below the GHG emission limit that could be set for their building type.

Deep emission reductions require long term planning. As buildings make decisions today about replacing heating equipment and other building components, it will be important to consider the long term implications of those decisions, given the long life cycles of buildings and heating equipment.

Building upgrades could be required to meet or be better than GHG emission limits for that building type through various pathways, with examples shown in the figure below. In the near term, improved energy efficiency could play a strong role in reducing emissions. However, to achieve the goal of zero-emission buildings by 2050, buildings would eventually be required to use zero-emission technology and renewable energy sources, such as electricity and low- or zero-emission district energy.

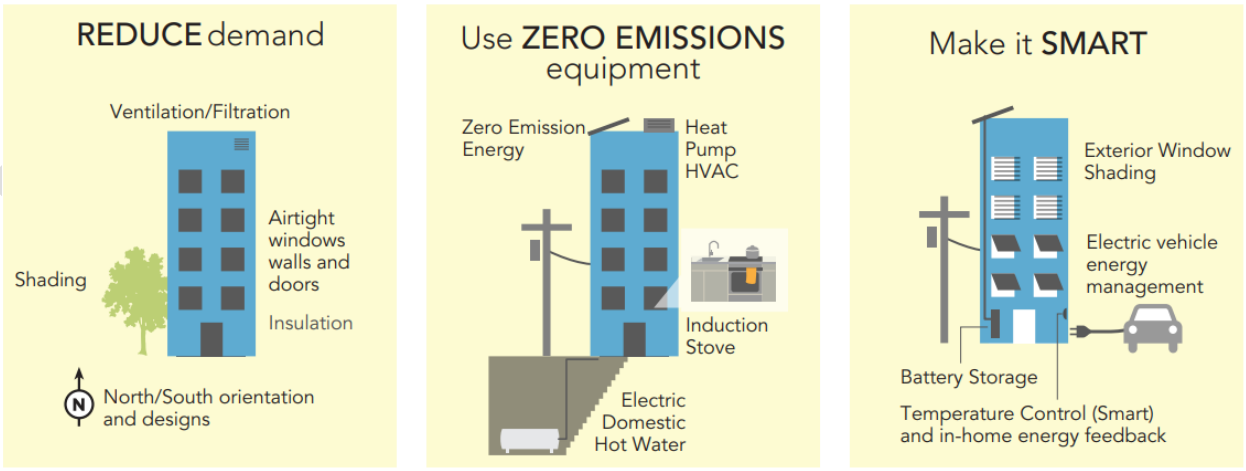


Figure: Taking a whole building approach to increase efficiency and reduce GHG emissions.

Submission of a building GHG emission reduction plan and timeline could also be a compliance pathway.

Renewable natural gas (RNG) may have a role as a compliance pathway for buildings. For some existing heating systems that are harder to electrify quickly, such as high-temperature water or steam boilers, RNG may be a viable path to reduce GHG emissions. While RNG reduces GHG emissions, it still produces harmful air contaminants such as NOx when it is burned. Building owners who choose to purchase RNG to lower their GHG emissions would still be subject to other air quality requirements under Bylaw 1087.

Learn more about low carbon fuel options for buildings in the Climate 2050 Buildings Roadmap.

Exemptions and Flexibility

Some building types over 2,322 m^2 (25,000 ft^2) may require more flexibility to address challenges such as:

1. **Specific constraints related to the operations of a building**
   Some building types house specialized processes and activities that increase energy use and related GHG emissions, complicating the comparison of GHGi. Examples of buildings in this category include:
   - Industrial facilities
   - Recreational facilities (such as buildings that include ice rinks or swimming pools)

2. **Financial constraints or hardship**
   There are some building types that may need a longer timeline to make upgrades or retrofits, regardless of building size, due to risks related to affordability. There may also be financial hardships that can delay a building's ability to meet proposed requirements. Examples include:
   - Purpose built rentals (e.g. non-market rental housing)
   - Buildings under severe financial distress or other forms of hardship

3. **Recently constructed buildings and building sales**
   Recently constructed buildings could be required to comply with GHG emission limits after occupancy. Proposed requirements would need to consider the financial and logistical challenges for a recently completed building to implement changes to reduce GHG emissions soon after the building was constructed. This points to the critical need to ensure new buildings today are designed and built to zero emissions or zero-emission-ready standards to avoid future retrofit costs for building owners.

   Another consideration is the transfer of building ownership and how to provide flexibility for new building owners to meet the requirements.

4. **District energy connected buildings**
   Buildings that receive all of their space and water heating from an offsite district energy facility may not be included in the proposed requirements. Reducing GHG emissions from buildings connected to district energy systems depends in part on the attributes of each district energy system and whether connected buildings receive energy from other sources. Many district energy systems in the region already have plans to significantly reduce GHG emissions. Metro Vancouver could assess opportunities to support GHG emission reductions in district energy systems, and determine if additional requirements may be necessary at the source to accelerate this transition, as indicated in the *Clean Air Plan*.

5. **Large building portfolio owners**
   Metro Vancouver is considering how Real Estate Investment Trusts (REIT), institutional organizations, and other large building portfolio owners could achieve compliance at the portfolio scale for buildings located in the Metro Vancouver region.

Cost and Support

Metro Vancouver recognizes the significant investments needed to upgrade or retrofit buildings to reduce GHG emissions. Technical support would be available to help building owners identify the most cost-effective pathways to transition to zero emissions. Metro Vancouver has initiated a three year (2022-2024) project to develop a Large Building Retrofit Accelerator, and anticipates close collaboration with the Metro Vancouver Zero Emissions Innovation Centre and other organizations supporting the transition to a low-carbon future.

Other jurisdictions in North America have used different methods to support program administration. For example, the City of Los Angeles charges an annual fee per building, while other jurisdictions have used tax revenue or energy efficiency funding to support program delivery. Metro Vancouver is exploring options that would align with the principles of discharger-pay, equity, and fairness. There would be further engagement with affected audiences on proposed mechanisms for program cost recovery, if supported by the Board.

Providing Feedback and Comments

Interested parties are invited to provide feedback by November 30, 2022.

Metro Vancouver staff and contractors will treat comments received with confidentiality; however, please note that comments you provide and information that identifies you as the source of those comments may be publicly available if a freedom of information (FOI) request is made under the *Freedom of Information and Protection of Privacy Act*.

If you have any questions or comments regarding this initiative, please call 604-432-6200 or email us at_@metrovancouver.org.

Visit www.metrovancouver.org/XXX for more information. Sign up for the project mailing list to receive updates and notification about engagement opportunities.

Glossary

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.

Boiler means any combustion equipment fueled solely by natural gas, propane, or biomass that produces hot water or steam, but does not include: (a) waste heat boilers; (b) sulphur plant reaction furnaces, steam reformer heaters and steam cracking heaters in the refined petroleum products industry as identified in the North American Industry Classification System (NAICS) code 324110; and (c) process heaters.

Carbon dioxide (CO2) is a greenhouse gas, and the primary driver of climate change. Carbon dioxide is produced both naturally and through human activity, primarily by burning fossil fuels.

Carbon neutral region means that we have achieved the deepest greenhouse gas emissions reductions possible across all economic sectors, and any emissions left are balanced out by the carbon dioxide removed from the atmosphere by the plants, trees, and soil in the region, as well as by potential carbon capture technologies that are under development.

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

Nitrogen oxides (NOx) 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.

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.

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).

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ENGAGEMENT PLAN

The discussion paper titled "*Potential Approaches for Managing GHG Emissions from Large Buildings in Metro Vancouver"* will be reviewed with the Metro Vancouver Climate Action Committee and with the MVRD Board prior to an initial phase of engagement with relevant levels of government, First Nations, interested and affected groups, and the public. This initial step is intended to enable staff to listen and learn from key audiences, and gather feedback to help develop more detailed proposals for GHG emission reduction requirements that would be subject to further engagement at a later date, if supported by the MVRD Board. The next steps in the preliminary engagement will include:

- Creating a project webpage and FAQ document
- Initiating discussions and correspondence with the identified audiences
- Considering creating a technical working group, which could comprise invited representatives from the identified audiences
- Conducting a combination of virtual and in-person engagement events
- Hosting an online feedback form
- Providing a dedicated email address that will be monitored by the project team to answer any enquiries related to the project

Concurrently, the project team will continue with the technical analysis mentioned in this report.

Preliminary engagement on managing GHG emissions from large buildings will be coordinated with engagement on proposed amendments to Metro Vancouver's *Boilers and Process Heaters Emission Regulation Bylaw No. 1087, 2008* related to stricter requirements on health-harming air contaminants from buildings and other sources.

The results of these initial engagement activities will be compiled and analyzed and will then be used to inform the recommendations for the next steps in reducing emissions from large buildings coming back to the Metro Vancouver Climate Action Committee and the MVRD Board.

Audiences

The following have been identified as those who might be interested or may be impacted by a potential development of a regulation for GHG emissions from large buildings in Metro Vancouver:

- Member jurisdictions
- Building owners, managers, and developers
- Industry and business associations including boards of trade and chambers of commerce
- Other orders of government
- First Nations
    - Where First Nations may be considering or have implemented aligned regulations
- District energy providers
- Utility providers
- General public

Similar and Aligned Initiatives:

It is helpful to both Metro Vancouver and the audiences for this engagement to be aware of similar and or aligned regulations, particularly those directed at emissions from large buildings. At this time, staff are aware of:

- Metro Vancouver's additional mitigation actions in the *Clean Air Plan*, 2021
- Metro Vancouver's additional mitigation and adaptation actions in the *Climate 2050 Buildings Roadmap*.
- Metro Vancouver's *Boilers and Process Heaters Emission Regulation Bylaw No. 1087, 2008*
- Metro Vancouver's three year (2022-2024) Sustainability Innovation Fund project to develop a Large Building Retrofit Accelerator
- City of Vancouver's Draft Carbon Pollution Regulations for Existing Commercial and Multi-Family Buildings
- Related actions in the provincial *CleanBC Roadmap to 2030*
- Potential for additional similar and aligned initiatives from other jurisdictions

Methods and Timing
In order to engage with the identified audiences, the following methods are being proposed as part of the preliminary phase of engagement:

Method	Purpose
Metro Vancouver website	Provide up-to-date information about the engagement process and provide an FAQ document
Communications to identified audiences	Provide notification to the identified audience that engagement is beginning, and provide information on opportunities to engage, and on how to provide input
In-person and virtual engagement events	Send invitations to member jurisdictions and interested and affected groups to participate in events that will provide an update on the initiative and solicit questions and input
Invitation letter to meet with First Nations	Offer to consider any issues or concerns from First Nations, and provide any additional information as requested. Clarify if there are implications for buildings located on First Nation's lands, including leased lands.
Online feedback form	Provide an online opportunity for interested individuals and groups to provide input

If authorized by the Board, engagement is expected to take place between June and November 2022.

Next Steps in Engagement
On completion of this preliminary engagement process, and consideration of feedback and ongoing technical assessments, staff intend to return to the Board with recommendations for next steps in reducing emissions from large buildings.

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To: Climate Action Committee

From: Arvind Saraswat, Senior Project Engineer
Esther Bérubé, Division Manager, Air Quality Bylaw and Regulation Development
Parks and Environment Department

Date: April 20, 2022 Meeting Date: May 13, 2022

Subject: **Engagement on Proposed Amendments to GVRD Boilers and Process Heaters Emission Regulation Bylaw No. 1087, 2008**

RECOMMENDATION

That the MVRD Board direct staff to proceed with engagement on the proposed amendments to *Greater Vancouver Regional District Boilers and Process Heaters Emission Regulation Bylaw No. 1087, 2008* as described in the report titled "Engagement on Proposed Amendments to *GVRD Boilers and Process Heaters Emission Regulation Bylaw No. 1087, 2008*", dated April 20, 2022.

EXECUTIVE SUMMARY

This report seeks authorization from the MVRD Board to proceed with engagement on proposed amendments to *GVRD Boilers and Process Heaters Emission Regulation Bylaw No. 1087, 2008* (Bylaw 1087). If supported by the Board, this would be coordinated with preliminary engagement on managing greenhouse gas emissions from large buildings, recognizing that there is some overlap in the stakeholder audience. Under the current Bylaw 1087, Metro Vancouver regulates the discharge of air contaminants from boilers and process heaters. In November 2019, the Board adopted stricter Ambient Air Quality Objectives for nitrogen dioxide (NO_2) that align with national standards. Metro Vancouver staff seek to engage on proposed amendments to Bylaw 1087 to continue to meet the ambient air quality objectives for NO_2, as they become more stringent, thereby enabling continuous improvement in air quality. The proposed amendments include stricter emission limits for nitrogen oxides, additional requirements for dispersion modelling and responses when modelling indicates exceedance of air quality objectives, and additional requirements for emission stack design to reduce impacts near boilers and process heaters.

PURPOSE

This report seeks Board approval to initiate engagement on proposed amendments to *GVRD Boilers and Process Heaters Emission Regulation Bylaw No. 1087, 2008 (Bylaw 1087)*, focused on reducing impacts of harmful emissions of nitrogen oxides (NO_x), which include both nitrogen dioxide (NO_2) and nitric oxide (NO).

BACKGROUND

The MVRD Board adopted the *Clean Air Plan* (Reference 1) in September 2021, which includes targets for air quality to meet or be better than the ambient air quality objectives and standards at the regional, provincial, and federal levels. This report seeks Board authorization to engage on proposed amendments to Bylaw 1087 to continue to meet ambient air quality objectives for NO_2 as they become more stringent, thereby enabling continuous improvement in ambient air quality.

MANAGING EMISSIONS FROM BOILERS AND PROCESS HEATERS

Buildings and industrial facilities are important sources of NO_x in the region. Bylaw 1087 regulates harmful air emissions, including NO_x from boilers and process heaters having a combined capacity under 50 MW in residential, institutional, commercial, and industrial facilities. Facilities with a larger boiler and process heater capacity are typically regulated under site-specific permits.

The *Clean Air Plan* aims to reduce regional greenhouse gas (GHG) emissions by 45% from 2010 levels by 2030. A separate report in this agenda seeks Board approval to begin initial research and engagement on regulating GHG emissions from large buildings, which may apply to some boilers and heaters currently regulated under Bylaw 1087. Switching to zero-emission technologies, such as electrification or zero-emission district energy, could simultaneously eliminate GHG emissions and other harmful air contaminants such as NO_x.

MORE STRINGENT AMBIENT AIR QUALITY OBJECTIVES

Emissions of NO_x can contribute to the formation of ground-level ozone as well as fine particulate matter. In addition, there is strong evidence that exposure to ambient NO_2 causes respiratory issues, even at low ambient concentrations, and can cause mortality. Some evidence suggests links to many other health impacts (Reference 2). In 2017, the Canadian Council of Ministers of Environment adopted Canadian Ambient Air Quality Standards (CAAQS) for NO_2 that would become more stringent in 2020 and 2025. On November 29, 2019, the MVRD Board adopted the 2020 NO_2 CAAQS as Metro Vancouver's Ambient Air Quality Objectives for NO_2. There is a potential for emissions from large developments with high-capacity boilers and process heaters to increase nearby concentrations of NO_2 above these ambient air quality objectives. Because NO_2 is harmful even at low concentrations, it is important to protect sensitive populations, such as children, the elderly, and people with existing health conditions, from exposure to these emissions. Amendments to Bylaw 1087 are needed to continue meeting Metro Vancouver's ambient air quality objectives in the vicinity of boilers and process heaters and to enable continuous improvement of air quality.

PROPOSED AMENDMENTS TO BYLAW 1087

Bylaw 1087 currently requires dispersion modelling for any boiler or process heater burning biomass, to estimate potential impacts of emissions on nearby receptors and inform facility design. Requiring dispersion modelling of emissions from the combustion of other fuel sources that also produce NO_x, such as natural gas and propane, would be beneficial to address potential impacts of the emissions.

Bylaw 1087 includes emission limits for NO_x from boilers and process heaters burning natural gas or propane, but not for those burning biomass. The availability of ultra-low NO_x combustion technology makes it possible for boilers and process heaters to achieve lower emission limits. More stringent NO_x emission limits will support continuous improvement in regional air quality and protect nearby receptors. Owners of boilers and process heaters will also be encouraged to consider switching to zero-emission technology to meet emission limits for NO_x and other air contaminants in Bylaw 1087 and potential future restrictions on GHG emissions in line with regional climate targets.

Staff are seeking to engage on the following proposed amendments to Bylaw 1087:

1. Mandatory dispersion modelling for new boilers or process heaters with a facility capacity between 10 MW and 50 MW burning natural gas or propane.

2. Mandatory dispersion modelling for new boilers and process heaters with a facility capacity between 3 MW and 10 MW burning natural gas or propane within 100 metres of sensitive receptors, such as schools, hospitals, and daycares.
3. The District Director may also require additional studies, such as more complex emissions modelling, ambient monitoring, and implementation of an approved exposure mitigation plan.
4. Owners of existing boilers or process heaters that cannot demonstrate achievement of ambient air quality objectives would be required to show they are meeting the objectives when replacing an existing boiler or process heater or within ten years, whichever is sooner.
5. Improvements to emission stack design, which would reduce impact of emissions on nearby receptors by improving dispersion of emissions.
6. Reduce NO_x emission limit for new and replacement boilers and process heaters fueled by natural gas or propane from 60 mg/m^3 to 20 mg/m^3.
7. Introduce a NO_x emission limit of 120 mg/m^3 for boilers and process heaters fueled by biomass.
8. After January 1, 2040, emissions from all boilers and process heaters would be required to meet NO_x emission limits noted above.

ENGAGEMENT PLAN

Metro Vancouver is committed to engaging with the public, interested and affected parties, First Nations, and other governments; and incorporating their feedback into the development of the proposed bylaw amendments. Staff propose to lead an engagement process as outlined in the attached Engagement Plan (Attachment 2).

The engagement will build on learnings from previous engagements that intersect climate action and air quality initiatives. The engagement has been designed to reach a focused audience of those likely to comment, be impacted, or have a role in implementation, and will involve activities that provide opportunities for dialogue on the proposed changes. If supported by the Board, engagement will take place between June and November 2022; and will be coordinated with the concurrent engagement on the proposed approach for managing greenhouse gas emissions from large buildings.

Staff will review and explore feedback from the wide-ranging audience identified in Attachment 2, which will help refine the proposed amendments for Committee and Board consideration in 2023.

ALTERNATIVES

1. That the MVRD Board direct staff to proceed with engagement on the proposed amendments to *Greater Vancouver Regional District Boilers and Process Heaters Emission Regulation Bylaw No. 1087, 2008* as described in the report titled "Engagement on Proposed Amendments to *GVRD Boilers and Process Heaters Emission Regulation Bylaw No. 1087, 2008*", dated April 20, 2022.

2. That the MVRD Board receive for information the report titled "Engagement On Proposed Amendments to *GVRD Boilers and Process Heaters Emission Regulation Bylaw No. 1087, 2008*", dated April 20, 2022 and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

Under Alternative 1, staff would proceed with engagement on the proposed amendments to *GVRD Boilers and Process Heaters Emission Regulation Bylaw No. 1087, 2008*. The resources needed, including staff time and other costs associated with the engagement program and subsequent development of bylaw amendments, have been approved within program budgets for 2022.

CONCLUSION

The proposed amendments are expected to support continuous improvement in ambient air quality and enable localized air quality near boilers and industrial process heaters to meet or be better than regional ambient air quality objectives for NO_2, as these objectives become more stringent over time. Engagement on the proposed amendments to Bylaw 1087 in coordination with preliminary engagement on reducing GHG emissions from large buildings will allow staff to obtain and consider feedback from affected audiences, and present it to the Board along with bylaw recommendations for consideration.

Staff recommend Alternative 1, to proceed with engagement on the proposed changes described in the attached discussion paper titled, "Proposed Amendments to the *GVRD Boilers and Process Heaters Emission Regulation Bylaw No. 1087, 2008*, Draft Discussion Paper, May 2022." Engagement is intended to provide sufficient opportunities for the public, businesses, member jurisdictions, First Nations, other orders of government, and other impacted or affected parties, to learn about the proposal and provide feedback.

Attachments

1. Proposed Amendments to the *GVRD Boilers and Process Heaters Emission Regulation Bylaw No. 1087, 2008*, Draft Discussion Paper, May 2022
2. Engagement Plan for the Proposed Amendments to the Boilers and Process Heaters Emission Regulation Bylaw No. 1087, May 2022

References

1. Clean Air Plan, 2021
2. Human Health Risk Assessment for Ambient Nitrogen Dioxide (NO_2), Health Canada, 2016

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Proposed Amendments to the

Boilers and Process Heaters Emission Regulation Bylaw No. 1087

Draft Discussion Paper

May 2022

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SUMMARY

The Metro Vancouver Board of Directors approved the *Clean Air Plan* in September 2021 to guide air quality management actions over the next ten years and to support the Board's commitment to be a carbon neutral region by 2050. The Board also set interim targets to achieve a 45% reduction in greenhouse gas (GHG) emissions by 2030 from 2010 levels; and to meet or exceed ambient air quality objectives and standards set by Metro Vancouver, the provincial government, or the federal government.

Metro Vancouver regulates the discharge of air contaminants from boilers and process heaters under the *Greater Vancouver Regional District Boilers and Process Heaters Emission Regulation, Bylaw No. 1087, 2008* (Bylaw 1087). Boilers are commonly used to generate heat or energy for buildings or in industrial or commercial settings; process heaters are used to generate heat for industrial processes. Combustion of fossil fuels or biomass in boilers and process heaters results in the discharge of air contaminants such as nitrogen oxides and GHG emissions, although combustion of biomass is considered carbon neutral. In November 2019, the Board adopted stricter Ambient Air Quality Objectives for nitrogen dioxide (NO_2) for the Metro Vancouver region that align with the 2020 NO_2 Canadian Ambient Air Quality Standards (CAAQS). Amendments to Bylaw 1087 are required to support ongoing attainment of the Ambient Air Quality Objectives. NO_2 CAAQS will become more stringent in 2025. At that time, staff will present recommendations to the Board regarding adoption of 2025 CAAQS.

The proposed amendments to Bylaw 1087 seek to establish more stringent emission limits for nitrogen oxides emitted due to the combustion of fossil fuels and biomass in boilers and process heaters. New requirements to demonstrate attainment of Metro Vancouver's ambient air quality objectives and additional requirements for stack design are also being proposed.

The *Clean Air Plan* also calls for emission regulations to include measures to reduce GHG emissions, where feasible. About a quarter of regional GHG emissions is attributable to emissions associated with buildings due to combustion of fossil fuels. Staff are seeking Board approval to initiate a separate engagement to develop an approach for managing GHG emissions from large buildings (gross floor area greater than 2322 m^2 or 25,000 sq.ft.) for space and water heating.

This discussion paper is focused on the rationale and potential means for reducing the discharge of air contaminants from the use of boilers and process heaters in buildings and industrial facilities in the region. However, decisions regarding the adoption of new technologies and equipment should be informed by Metro Vancouver's proposed approach for managing GHG emissions from large buildings. Adoption of zero emission technologies can avoid the discharge of health-harming air contaminants as well as GHG emissions from buildings.

In addition, industrial facilities that might switch to renewable natural gas or biomass to achieve reductions in GHG emissions would need to manage their discharge of health-harming air contaminants in accordance with proposed amendments to Bylaw 1087, if adopted.

Public engagement on the proposed amendments to Bylaw 1087 will highlight connections with regional *Climate 2050* goals for buildings, district energy providers, and other industries regulated through Bylaw 1087. This public engagement will enable facility owners, operators, and other affected audiences to understand and provide feedback on the

ramifications for long-term capital and retrofit planning to comply with Bylaw 1087 and potential requirements to manage GHG emissions.

INTRODUCTION

Metro Vancouver adopted the *Climate 2050 Strategic Framework* in 2018 and endorsed the *Clean Air Plan* in 2021.

The targets in the Clean Air Plan are:

- Greenhouse gas (GHG) emissions are 45% below 2010 levels by 2030.
- The Metro Vancouver region is carbon neutral by 2050.
- Ambient air quality meets or is better than the federal, provincial, and regional ambient air quality objectives and standards.

Metro Vancouver is responsible for managing and regulating air quality in the region under authority delegated from the provincial government in the BC *Environmental Management Act*. Metro Vancouver protects public health and the environment through a tiered approach to managing the discharge of air contaminants that applies the use of site-specific permits, sectoral emission regulations, and provisions in the *Greater Vancouver Regional District (GVRD) Air Quality Management Bylaw No. 1082, 2008* (Bylaw 1082). Further to Bylaw 1082, the discharge of air contaminants by an industry, trade, or business is prohibited unless the discharge is conducted strictly in accordance with an emission regulation or a permit, or unless the discharge is specifically exempted from the prohibition in Bylaw 1082. In all cases, without exception, Bylaw 1082 prohibits any person from discharging an air contaminant so as to cause pollution. Emissions of air contaminants from boilers and process heaters, with a facility capacity of 50 MW or less, are regulated under Bylaw 1087.

Activities and complex facilities with significant levels of emissions with the potential for high impacts on the environment and public health are generally authorized by site-specific permits. Activities and less complex facilities that share similar air emission characteristics are generally authorized by emission regulations. Facilities can choose to seek authorization of their emissions under an emission regulation, if they meet all the requirements, or under a permit.

Metro Vancouver has developed two separate discussion papers for engagement on two related initiatives to reduce emissions of:

- Health-harming air contaminants from boilers used to provide heat or energy for buildings, commercial, industrial or institutional settings, and from process heaters used in industrial settings
- GHG emissions from large buildings

Air Contaminant Emissions from Boilers and Process Heaters

This discussion paper focusses on emissions of health-harming air contaminants from boilers and process heaters currently managed through Bylaw 1087. Bylaw 1087 covers requirements for the control of particulate matter, nitrogen oxides (NO_x), volatile organic compounds, and carbon monoxide emissions from boilers and process heaters.

NO_x emissions from boilers and process heaters result in formation of nitrogen dioxide (NO_2). There

is strong evidence that exposure to ambient NO_2 causes both short-term and long-term respiratory effects, and can cause mortality, as well as evidence that suggests links to a wide range of other adverse health outcomes. Additionally, NO_2 aids formation of ground-level ozone—an air contaminant that has adverse health effects on the respiratory system, and on crops and vegetation. In order to protect public health near boilers and process heater and meet increasingly stringent ambient air quality standards for NO_2, emissions of NO_x from boilers and process heaters need to be reduced.

The proposed amendments described in this discussion paper would reduce emissions of health-harming air contaminants from boilers and process heaters with a facility capacity of 50 MW or less, including boilers found within large buildings. The proposed amendments include more stringent emissions limits for NO_x, additional requirements to demonstrate attainment of air quality objectives, and additional requirements for stack design.

The regulatory proposals in both of these discussion papers create opportunities for co-benefits in meeting our climate targets to avoid the worst impacts of climate change and to improve local and regional air quality. Electrification can simultaneously achieve zero emissions of health-harming air contaminants and GHGs. By signaling the long-term goals defined in the *Clean Air Plan*, building owners can make informed decisions about retrofits that will meet emission requirements for health-harming air contaminants and potential requirements for managing GHG emissions from large buildings.

Metro Vancouver will coordinate engagement on the proposed amendments related to discharge of air contaminants from boilers and process heaters with relevant engagement on managing GHG emissions from buildings and facilities equipped with boilers and process heaters. Engagement on the proposed air quality related amendments to Bylaw 1087 is expected to be completed in 2022 and followed by the development of bylaw amendments for consideration by the Board in 2023. Additional engagement on more detailed proposals for managing GHG emissions from various sectors would proceed later, subject to Board approval. A set of requirements to manage overall emissions from each sector could be proposed to the Board after comprehensive engagement.

PURPOSE

The proposed amendments to Bylaw 1087 are expected to reduce the impact of emissions from boilers and process heaters on ambient air quality, and enable continuous improvement and protection of human health by supporting attainment of science-based ambient air quality objectives and standards.

The proposed engagement plan is designed to inform interested and impacted parties as well as the public of the rationale for amending Bylaw 1087 and the proposed changes. All feedback and comments will be welcomed. The engagement period will end November 30, 2022, but feedback will be considered until the Board makes a decision with respect to the proposed amendments.

This discussion paper may be of interest to:

- Members of the public
- Owners and operators of boilers and process heaters that fall within the scope of Bylaw 1087
- Owners and developers of buildings and industrial facilities with boilers and process heaters that fall within the scope of Bylaw 1087
- Energy utilities and district energy providers
- Consultants, manufacturers, and suppliers that provide services such as air emission control
- Businesses involved in the design, installation, maintenance or operation of boilers and process heaters
- First Nations
- Metro Vancouver's member jurisdictions
- Local government facility operators
- Other orders of government
- Public health experts and health authorities
- Other interested parties affected by the proposed changes or by air quality in the Metro Vancouver region

Boilers used for agricultural purposes are covered by a separate bylaw, therefore the proposed changes to Bylaw 1087 will not affect agricultural operations.

MEETING STRICTER AIR QUALITY OBJECTIVES

In 2016, Health Canada published a report titled "Human Health Risk Assessment for Ambient Nitrogen Dioxide" to support the development of the CAAQS for NO_2. In 2017, the Canadian Council of Ministers of Environment (CCME) adopted NO_2 CAAQS. NO_2 CAAQS will become more stringent in 2025 (Table 2). The Province of BC and the MVRD Board adopted the 1-hour and annual NO_2 2020 CAAQS as the provincial air quality objectives and Metro Vancouver's ambient air quality objectives for NO_2, respectively. Closer to 2025, staff intend to present recommendations to the Board regarding updating of Metro Vancouver's ambient air quality objectives to meet or be better than the 2025 NO_2 CAAQS. Future NO_2 CAAQS and GHG requirements are an important consideration in decision-making related to upgrade boilers and process heaters in large buildings and industrial facilities.

The Board endorsed the *Clean Air Plan* in September 2021 signaling its commitment to protect human health and the environment while reducing GHG emissions. One of the three targets of this plan is to ensure that ambient air quality in the region meets or is better than the federal, provincial, and regional ambient air quality objectives and standards. Bylaw 1087 needs to be updated to enable continuous improvement in air quality and to continue meeting ambient air quality objectives in the vicinity of boilers and process heaters.

NO_2 is one of the key air contaminants associated with emissions from boilers and process heaters. Exposure to NO_2 is known to have adverse effects on human respiratory and cardiovascular health, even at low concentrations. Children, the elderly, and people with cardiac and respiratory conditions are particularly at risk.

Table 2: Nitrogen Dioxide (NO_2) Canadian Ambient Air Quality Standards (CAAQS)

Averaging time	Numerical Value	
	2020	2025
1-hour[a]	60 ppb	42 ppb
Annual[b]	17 ppb	12 ppb

[a] The 3-year average of the annual 98th percentile of the daily maximum 1-hour average concentrations

[b] The average over a single calendar year of all 1-hour average concentrations

NO_2 also contributes to formation of other air contaminants like fine particulate matter and ozone—both of which are known to have adverse health effects even at low concentrations. Emissions from boilers and process heaters can lead to high ambient concentrations of NO_2. For these reasons, it is important to minimize the impact due to air contaminants discharged by using the best available control technology and by incorporating the most effective stack design to disperse emissions, informed by dispersion modelling where appropriate.

Zero-emission technology options for heating and cooling of buildings, such as electrification, offer opportunities to avoid NO_2 and other health-harming air contaminants, as well as greatly reduce GHG emissions. However, decisions regarding the adoption of new technologies and equipment should be informed by the approach being developed by Metro Vancouver for managing GHG emissions from large buildings.

In addition, industrial facilities that might switch to renewable natural gas or biomass to achieve reductions in GHG emissions would need to manage their discharge of health-harming air contaminants in accordance with proposed amendments to Bylaw 1087, if adopted.

GUIDING PRINCIPLES

The proposed amendments would align with the following principles:

- Continuously improve regional air quality to protect human health and the environment, and meet or exceed the federal, provincial and regional ambient air quality objectives and standards.
- Set efficient and effective requirements that will protect the public and the environment.
- Follow a 'discharger pay' principle.
- Set fair requirements that balance the impacts of emissions and the availability and affordability of best available control technology.
- Align with the management plans and strategies adopted by the Board, including the *Clean Air Plan* and *Climate 2050.*

WORKING WITHIN THE LEGISLATION

Under Section 31 of the *BC Environmental Management Act* (EMA), Metro Vancouver has delegated authority for air pollution control and air quality management within the Metro Vancouver region.

EMA states that the Metro Vancouver Board "may, by bylaw, prohibit, regulate and otherwise control and prevent the discharge of air contaminants". EMA defines air contaminants as substances in the air that impact or are capable of impacting health, environment, property, or the normal conduct of business[1]. Under Bylaw 1082, Metro Vancouver exercises its air quality regulatory authority with a system of permits, approvals, and emission regulations. Metro Vancouver can set emission regulations for emissions of air contaminants in the region that are more stringent than provincial regulatory requirements that apply elsewhere in the province.

Emissions from boilers and heaters with a facility capacity smaller than 50 MW are currently regulated under Bylaw 1087.

[1] Please refer to the *Environmental Management Act* [SBC 2003], for exact wording

PROPOSED CHANGES TO BYLAW 1087

Existing boiler or process heater: means one that is registered or operational before the Board adopts amendments to Bylaw 1087

Replacement boiler or process heater: means one that would replace or upgrade an already registered or operational boiler or process heater.

New boiler or process heater: means one that was not operational before the Board adopts amendments to Bylaw 1087, and does not replace an operational boiler or process heater.

The following changes are proposed:

1. Introduce mandatory dispersion modelling for new boilers or process heaters fueled by propane or natural gas:
    - when the facility capacity is greater than or equal to 10 MW
    - when the facility capacity is greater than 3 MW and less than 10 MW, and the discharge point(s) are within 100 metres of sensitive receptors such as schools, hospitals, and community care facilities

The owner or operator of such boilers or process heaters would need to conduct dispersion modelling *at the facility design stage* to demonstrate attainment of Metro Vancouver's ambient air quality objectives at nearby sensitive receptors.

Operators of boilers and process heaters fueled by biomass are already required to conduct dispersion modelling under Bylaw 1087, Section 29 (1).

2. To better assess potential impacts of emissions from any boiler or process heater, the District Director may require additional testing and modelling of emissions at any time, including wind tunnel testing or computational fluid dynamics (CFD) modelling for nearby impacts. Section 29(2) of Bylaw 1087 already clarifies that the District Director may require an owner or operator to conduct dispersion modelling.

3. If dispersion modelling shows that modelled impact due to emissions from a new boiler or process heater exceeds an ambient air quality objective, the operator or owner of a new boiler or process heater would be required to make changes to the discharge of air contaminants and/or stack configuration to demonstrate attainment. Alternatively, the operator or owner of a new boiler or process heater would be required to conduct ambient air quality monitoring in accordance with an NO_2 monitoring plan approved by the District Director and implement an NO_2 exposure mitigation plan approved by the District Director. The District Director may require the operator to make ambient air quality data publicly available, or provide other relevant information, in a manner acceptable to the District Director.

4. Owners or operators of existing boilers or process heaters that demonstrate non-

attainment of Metro Vancouver's air quality objectives in any dispersion modelling required by the District Director would have to demonstrate attainment within ten years of demonstrating non-attainment or when replacing an existing boiler or process heater, whichever is sooner. This timeframe is proposed to allow sufficient time for capital planning for replacement of boilers and process heaters, and consideration of the changing regulatory environment for GHG emissions.

5. Emission discharge stacks would have to be designed to discharge air contaminants vertically from all new boilers or process heaters. A minimum exit velocity is being proposed for all new boilers and process heaters, subject to operational feasibility. Rain caps on stacks would be prohibited as they are known to impede dispersion of emissions. This is to enable good dispersion of air contaminants and minimize adverse impacts on nearby sensitive receptors.

6. To minimize the discharge of NO_x, any new or replacement boilers and process heaters fueled by natural gas or propane would have to be ultra-low NO_x (emissions of NO_x not to exceed 20 mg/m^3). Currently, the NO_x emission limit for new or modified boilers and process heaters fueled by natural gas or propane is 60 mg/m^3.

7. Emissions of NO_x from any new or replacement boilers and process heaters fueled by biomass would not be allowed to exceed 120 mg/m^3. Currently, Bylaw 1087 does not include a NO_x emission limit for boilers and process heaters fueled by biomass.

Metro Vancouver's Clean Air Plan sets a target of 45% reduction in GHG emissions from 2010 levels, by 2030.

Electrification and zero-emission district energy can eliminate emissions of health-harming air contaminants and GHG simultaneously. These technologies would enable a facility to be prepared for the changing regulatory environment for GHG emissions. Zero emissions would also satisfy Bylaw 1087's air quality requirements.

8. By January 1, 2040, emissions of NO_x from all existing boilers and process heaters fueled by natural gas or propane would not be allowed to exceed 20 mg/m^3; and emissions of NO_x from all boilers and process heaters fueled by biomass would not be allowed to exceed 120 mg/m^3. This would enable continuous improvement of air quality near boilers and process heaters and at the regional level.

ADMINISTRATION OF THE EMISSION REGULATION

Metro Vancouver's regulatory system includes a system of user fees which are intended to recover the costs of developing and administering permits and regulations, following a 'discharger pay' principle. The costs associated with administering Bylaw 1087 are intended to be covered by registration and annual fees.

Following public engagement in early 2021, the Board adopted the *Air Quality Management Fees Bylaw No. 1330* on October 29, 2021. That resulted in updates to emission fee rates that would apply to annual fees payable under Bylaw 1087. Fees set out in Appendix 1 of Bylaw 1087 will be revised to align with Bylaw 1330. The updated registration and annual fees payable under Bylaw 1087 are expected to take effect in 2023, subject to the Board's approval. NO_x concentrations for biomass boilers deemed to be used in the calculation of fees, specified in Appendix 1 of Bylaw 1087, would be revised to be consistent with the proposed emission limits when presented to the Board for consideration. No further changes are proposed at this time.

PROVIDING COMMENTS ON THE PROPOSED AMENDMENTS

Metro Vancouver is seeking input on the proposed amendments to the *Greater Vancouver Regional District Boilers and Process Heaters Emission Regulation Bylaw No. 1087, 2008*, from the public as well as interested and impacted parties. Metro Vancouver welcomes feedback with respect to the regulatory proposals outlined in this discussion paper. The Board will receive a summary of the inputs received.

Metro Vancouver staff and contractors will treat comments received with confidentiality; please note that comments you provide and information that identifies you as the source of those comments may be publicly available if a freedom of information (FOI) request is made under the *Freedom of Information and Protection of Privacy Act*. If you have any questions or comments regarding the engagement process, please call 604-432-6200.

Metro Vancouver invites you to provide feedback on this discussion paper by November 30, 2022 to AQBylaw@metrovancouver.org. Feedback will be considered until the Board makes a decision in respect of the proposed amendments.

Thank you for taking the time to consider and provide input on the proposed amendments.

ENGAGEMENT PLAN

The discussion paper titled "Proposed Amendments to the *GVRD Boilers and Process Heaters Emission Regulation Bylaw No. 1087*" will be reviewed with the Metro Vancouver Climate Action Committee and with the MVRD Board prior to engagement with relevant levels of government, First Nations, interested and affected groups, and the public. The engagement will focus on those likely to comment, be impacted, or have a role in implementation of the proposed amendments; and will centre around the discussion paper which describes amendment proposals and implementation timeline. The next steps in the engagement process will include:

- Creation of a project webpage and FAQ document
- Initiating discussions and correspondence with the identified audiences
- A combination of virtual and in-person engagement events
- An online feedback form
- A dedicated email address that will be monitored by the project team to answer any project related enquiries

The engagement will be coordinated with initial research and preliminary engagement on managing GHG emissions from large buildings in Metro Vancouver, with joint engagement with overlapping audiences.

The results of the engagement will be compiled and analyzed and will then be used to refine the proposed amendments to Bylaw 1087 for Board consideration. An engagement summary report, which will describe how feedback is reflected in the proposed amending bylaw, will be presented to the Metro Vancouver Climate Action Committee and the MVRD Board.

Audiences
The following have been identified as those who might be interested or may be impacted by the proposed amendments:

- member jurisdictions
- building owners and managers
- institutional facility owners and operators
- industrial facility owners and operators
- industry associations working in building management and in equipment installation and repair
- other orders of government
- First Nations
    - Where First Nations may be considering or have implemented aligned regulations
- Energy utilities and district energy providers
- General public

Throughout the engagement process, it will be recognized that there are a number of initiatives from Metro Vancouver, member jurisdictions and other orders of government that are similar or aligned with the proposed changes to Bylaw 1087. This will be acknowledged and efforts will be taken to avoid audience confusion.

Methods and Timing

In order to engage with the identified audience, the following methods are being proposed as part of the engagement strategy:

Method	Purpose
Metro Vancouver website	Provide up to date information about the engagement process and provide an FAQ document
Communications to identified audiences	Provide notification to the identified audience that engagement is beginning, and provide information on opportunities to engage, and on how to provide input
In-person and virtual engagement events	Send invitations to member jurisdictions and interested and affected groups to participate in events that will provide an update on the initiative and solicit questions and input
Presentations to existing committees	Offer to present at existing committees including staff from member jurisdictions and regulatory agencies, such as Lower Fraser Valley Air Quality Coordinating Committee (LFVAQCC), to provide updates and gather input
Invitation letter to meet with First Nations	Offer to consider any issues or concerns from First Nations, and provide additional information as requested. Clarify if there are implications for buildings located on First Nation's lands, including leased lands.
Online feedback form	Provide an online opportunity for interested individuals and groups to provide input

If authorized by the Board, engagement is expected to take place between June and November 2022. There may be additional engagement needs that arise through this process and staff will adjust and accommodate where possible.

To: Climate Action Committee

From: Lillian Zaremba, Program Manager, Collaborative Innovation, Liquid Waste Services

Date: April 20, 2022 Meeting Date: May 13, 2022

Subject: **2022 Update on Liquid Waste Sustainability Innovation Fund Projects**

RECOMMENDATION

That the Climate Action Committee receive for information the report dated April 20, 2022, titled "2022 Update on Liquid Waste Sustainability Innovation Fund Projects."

EXECUTIVE SUMMARY

This report provides an update on eight projects that were approved for funding in 2017 through 2021 under the Sustainability Innovation Fund. Of the eight projects, two are highlighted for significant milestones:

- Genomics Approach to Anaerobic Digestion Optimization. The United States Patent and Trademark Office granted a patent titled "Syntrophic Enrichment for Enhanced Digestion Processes" to Metro Vancouver in March 2022.
- Hydrothermal Processing – Biofuel Demonstration Facility. The contract for design of the hydrothermal processing unit was awarded in January 2022.

Descriptions of the other six projects that are progressing are included in the Attachment.

PURPOSE

This report provides an update on projects funded under the Liquid Waste Sustainability Innovation Fund.

BACKGROUND

The Liquid Waste Sustainability Innovation Fund (the Fund) was created by the Board in 2004 to provide financial support to Liquid Waste Utility projects that contribute to the region's sustainability. The GVS&DD Board adopted the *Liquid Waste Sustainability Innovation Fund Policy* on June 27, 2014, with further amendments in 2016 and 2021, 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. The projects outlined below were approved for funding from 2017 to 2021. No new project proposals were submitted or approved in 2021; however, the previously approved Hydrothermal Processing - Biofuel Demonstration Facility received additional funding in February 2021 as identified below.

STATUS OF SUSTAINABILITY INNOVATION PROJECTS (APPROVAL YEARS: 2017 – 2021)

Project	Approval Year	Amount Approved	Status
High Efficiency Aeration Demonstration	2017	$750,000	In Progress
Genomics Approach to Anaerobic Digestion Optimization	2017	$460,000	Complete
Intelligent Water Systems - Making Use of Sensors and Big Data Analytics	2018	$200,000	In Progress
Hydrothermal Processing - Biofuel Demonstration Facility	2018 2021	$8,250,000 $6,130,000	In Progress
Multiphase Composite Coating (MCC) for Concrete Sewers	2019	$620,000	In Progress
Pump Station Optimization	2019	$330,000	In Progress
Advanced Resource Recovery from Sludge: Industrial Research Chair Program	2019	$2,985,000	In Progress
Handheld Wastewater Microbial DNA Monitor	2020	$330,000	In Progress

Genomics Approach to Anaerobic Digestion Optimization: Complete
The goal of this project is to identify a means to increase biomethane generation from existing anaerobic digestion processes at Metro Vancouver wastewater treatment plants. There were two academic teams on this project: i) environmental genomic experts at UBC Department of Microbiology and Immunology, and ii) anaerobic digestion experts from UBC School of Engineering, within the Bioreactor Technology Group.

Outcomes:
- Secured federal academic grants totaling over $700,000.
- Genomic sequencing of the microbiome provided insights for the invention of a compact add-on reactor to boost renewable natural gas production from existing digesters.
- The UBC team successfully tested a lab-scale prototype of the reactor for enhanced digestion.
- Creation of intellectual property. The United States Patent and Trademark Office granted a patent titled “Syntrophic Enrichment for Enhanced Digestion Processes” to Metro Vancouver in March 2022 and an international patent application is pending.

Hydrothermal Processing – Biofuel Demonstration Facility: In Progress
The goal of this project is to design, fabricate, and operationalize a hydrothermal processing demonstration facility at the Annacis Island Wastewater Treatment Plant. Compared to the current anaerobic digestion process, the hydrothermal processing technology promises a smaller footprint, reduced net costs, and production of biocrude that can be refined to low-carbon transportation fuels, include marine biofuel, sustainable aviation fuel, and biodiesel.

Outcomes to Date:
- Preliminary design completed in 2020.
- Contractor retained for design, fabrication, delivery and commissioning of the hydrothermal processing unit.

Milestone:
- The design of the hydrothermal processing unit was awarded in January 2022.

Next steps involve completing the detailed design and awarding the fabrication phase of the hydrothermal processing unit.

ALTERNATIVES
This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS
The projects summarized in this report had funding approved by the GVS&DD Board from 2017-2021. The disbursals of funds were made in accordance with the applicable *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 Sustainability Innovation Fund reserve.

Project	Total Amount of Funding Approved	Est. Spent (as of Mar. 31, 2022)
2017 Approval Year		
High Efficiency Aeration Demonstration	$750,000	$124,481
Genomics Approach to Anaerobic Digestion Optimization	$460,000	$402,705
2018 Approval Year		
Intelligent Water Systems - Making Use of Sensors and Big Data Analytics	$200,000	$184,562
Hydrothermal Processing - Biofuel Demonstration Facility	$8,250,000 $6,130,000	$1,099,300
2019 Approval Year		
Multiphase Composite Coating (MCC) for Concrete Sewers	$620,000	$137,618
Pump Station Optimization	$330,000	$195,043
Advanced Resource Recovery from Sludge: Industrial Research Chair Program	$2,985,000	$953,528
2020 Approval Year		
Handheld Wastewater Microbial DNA Monitor	$330,000	$88,750

The balance in the Liquid Waste Sustainability Innovation Fund at Dec. 31, 2021 was $18.8 million.

CONCLUSION
This report presented an update on eight projects funded under the Liquid Waste Sustainability Innovation Fund. The Fund was created by the Board in 2004 to provide financial support to Liquid Waste Utility projects that contribute to the region's sustainability.

Attachment
Update on other Liquid Waste Sustainability Innovation Fund Projects in Progress

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UPDATE ON OTHER LIQUID WASTE SUSTAINABILITY INNOVATION FUND PROJECTS IN PROGRESS

High Efficiency Aeration Demonstration: In Progress
Aeration is energy-intensive – it can consume more than half of the energy required by a wastewater treatment plant. This project will assess the performance at pilot scale of the Perlemax Fluidic Oscillator, a new device that has shown its ability to improve aeration energy efficiency by 25% in small tanks. Project partners are the District of Columbia Water and Sewer Authority (DC Water), where the testing will be conducted, and the Water Research Foundation (WRF), who are coordinating a third-party independent validation.

Outcomes to Date:

- Perlemax delivered a preliminary design of their system for testing at DC Water.
- WRF assembled an expert independent evaluation panel.
- Finalized contract with DC Water to construct and test the pilot.
- Detailed design of pilot aeration tank approved by all project partners.

Testing is scheduled to begin in late 2022.

Intelligent Water Systems – Making Use of Sensors and Big Data Analytics: In Progress
Metro Vancouver and its member jurisdictions monitor and collect large amounts of data. As increasing numbers of less expensive sensors are deployed, the volume of data is expected to increase exponentially. The purpose of this project is to identify and evaluate innovative tools and techniques to help regional and municipal liquid waste utilities create information from the wave of "Big Data" that is transforming the industry. The project partner is the Water Research Foundation (WRF).

Outcomes to Date:

- In partnership with the WRF, a consultant has been retained to explore how Big Data techniques can be unified and leveraged with artificial intelligence to enable predictions, adapt operational rules, schedule maintenance and the like. Other considerations include integration of databases for precipitation, land use, population, and environmental monitoring.

Next steps involve working with the consultant using Metro Vancouver as a case study.

Multiphase Composite Coating (MCC) for Concrete Sewers: In Progress
The overall goal of this project is to field test and validate the performance of a new coating material developed by UBC with the potential to protect both new and existing concrete sewer pipes from biological corrosion, which can dramatically reduce the service life of sewer networks and result in significant repair and replacement costs. The project partners are UBC's Department of Civil Engineering, Ocean Pipe, and Metro Testing & Engineering.

Outcomes to Date:

- Laboratory testing of coating material in progress at UBC.

- A spray-on version of the coating is under development at UBC with plans for piloting on a small scale rehabilitation project.
- An NSERC proposal was submitted by UBC in December 2021 for additional funding to further develop the spray placement of the MCC coating using robotics and artificial intelligence.
- Field and laboratory testing is progressing on the pilot application of the coating material in a heavily corroded concrete sewer chamber in Delta. Physical, chemical and mechanical properties of the coating are currently being evaluated and showing positive results.

Milestone:

- Significant laboratory work has been done on the yield stress and viscosity of the material to allow the coating to be sprayed more effectively, increasing its potential for commercial viability. This represents a major jump in the development of this coating material.

Performance testing of the pilot application will continue into 2023.

Pump Station Optimization: In Progress

The goal of this project is to investigate opportunities to improve wet weather system performance and save energy by adjusting operating strategies at sanitary pump stations. Metro Vancouver's 33 pump stations consume electricity that costs approximately $2.4 million per year. This project is a partnership with the UBC Sauder School of Business involved in the field of Operations Research.

Outcomes to Date:

- Advanced modelling and new operational controls for Metro Vancouver's Lynn Pump Station in the North Vancouver indicate a potential 25% reduction in energy use.
- COVID-related priorities, facility lock-downs, and operational restrictions suspended work in 2020 and 2021.
- The UBC collaboration effort was discontinued in 2021 due to the closure of UBC's industry partnership program.

A trial of the amended control strategy for the Lynn Pump Station is scheduled for 2022.

Advanced Resource Recovery from Sludge: In Progress

The main goals of this 5-year project are: i) assess the integration of hydrothermal and anaerobic digestion processes and characterize the potential for nitrogen and phosphorus recovery, ii) evaluate the effectiveness of hydrothermal processing in destroying a wide range of micropollutants, iii) develop a prototype and pilot-scale bioreactor that can augment biomethane production. Advancing the recovery of resources from wastewater to produce value-added output for use by other industries can help build a stronger circular economy. The project partners are UBC School of Engineering and the Natural Sciences and Engineering Research Council.

Outcomes to Date:

- UBC successfully tested a wide range of configurations and identified the optimal arrangement for integrating hydrothermal processes and anaerobic digestion.
- UBC's prototyping provided valuable insights for bioreactor scoping and design at the pilot scale.

Next steps include developing a method to detect and quantify the fate of prioritized compounds of environmental concern through hydrothermal processes.

Handheld Wastewater Microbial DNA Monitor: In Progress

The goal of this project is to adapt an off-the-shelf DNA sequencer to test the microbes in wastewater samples taken from treatment processes, which will provide quantitative results to support existing visual assessments. Combined with the development of artificial intelligence, this system could provide early warning of treatment process upsets, allowing greater time to take corrective action and prevent process failure.

Outcomes to Date:

- UBC entered into a Collaborative Research Agreement and kicked off research in 2021.
- UBC researchers began collecting wastewater samples at Annacis Island WWTP to develop and validate the DNA extraction method, with promising initial results.

Full scale testing will begin in 2022.

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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Climate Action Committee

From: Cindy Onyejekwe, Senior Policy Analyst
Esther Berube, Division Manager, Air Quality Bylaw and Regulation Development
Parks and Environment Department

Date: May 3, 2022 Meeting Date: May 13, 2022

Subject: **MVRD Concrete and Concrete Products Industries Emission Regulation Amending Bylaw No. 1341, 2022**

RECOMMENDATION

That the MVRD Board:

a) give first, second and third reading to *Metro Vancouver Regional District Concrete and Concrete Products Industries Emission Regulation Amending Bylaw No. 1341, 2022*; and
b) pass and finally adopt *Metro Vancouver Regional District Concrete and Concrete Products Industries Emission Regulation Amending Bylaw No. 1341, 2022*.

EXECUTIVE SUMMARY

Metro Vancouver regulates the discharge of air contaminants through site-specific permits and emission regulations that apply to groups of similar sources. A system of regulatory fees has been established to recover administrative costs and encourage emission reductions based on the potential health and environmental impact of air contaminants. Engagement on updates to air quality management fees took place from January to April 2021. Emails were sent to all facilities regulated under *GVRD Concrete and Concrete Products Industries Emission Regulation Bylaw No. 1084, 2008* (Bylaw 1084), with information that would result in increases of $50 to each facility's annual fees. Metro Vancouver heard no concerns from these regulated facilities. On October 29, 2021, the MVRD Board updated the fees when it adopted *MVRD Air Quality Management Fees Regulation Bylaw No. 1330, 2021* (Bylaw 1330). Consequential amendments to Bylaw 1084 are needed, to update fees in alignment with the changes proposed during engagement and the updated fee rates in Bylaw 1330.

PURPOSE

To seek MVRD Board adoption of amendments to fees in Bylaw 1084 to align with the changes proposed during engagement and with Bylaw 1330, adopted by the MVRD Board in October 2021.

BACKGROUND

At its October 29, 2021 meeting, the MVRD Board adopted Bylaw 1330 (Reference 1), which repealed and replaced *GVRD Air Quality Management Fees Regulation Bylaw No. 1083, 2008* to update Metro Vancouver's air quality permit and regulatory fees. Consequently, updates to fees are needed in Bylaw 1084, in order to maintain consistency with the fee rates set out in Bylaw 1330 and to implement changes to bylaw administration fees as proposed during engagement. This report seeks Board adoption of amendments to fees in Bylaw 1084.

RECENT UPDATES TO AIR QUALITY PERMITTING AND REGULATORY FEES

Metro Vancouver charges fees for authorized air emissions to recover the cost of its air quality regulatory services, incentivize emission reductions, and improve air quality. Fees are stipulated in an air quality management fees bylaw for individual permitted facilities and various emission regulations for industrial sectors. Emission regulations apply fixed registration fees, as well as annual administration fees that have both fixed and variable components. The variable portion of the fees are based upon the quantity and type of air contaminants authorized to be discharged.

During an engagement process from January to April 2021, Metro Vancouver sought feedback on adjusting fixed fees for inflation and increasing variable fees for emissions of air contaminants (Reference 2). Emails and invitations to webinars were sent to all facilities registered under Bylaw 1084. Metro Vancouver did not hear any concerns from these regulated facilities. Bylaw 1330 was then developed in alignment with Metro Vancouver's principles of continuous improvement, discharger pay, and cost recovery. Bylaw 1330 includes updated fees for emissions of air contaminants that reflect new information on the estimated costs of health impacts associated with various types of emissions.

With the adoption of Bylaw 1330, supporting amendments to emission regulations are needed to reflect the new fees and inflationary changes, since these fees have not increased since the bylaws were adopted in 2008. As specified in Bylaw 1330, the air contaminant emission fee rates used to calculate the variable emission fees will increase gradually until 2028.

UPDATES TO CONCRETE AND CONCRETE PRODUCTS INDUSTRIES EMISSION REGULATION BYLAW 1084

The proposed amendments to Bylaw 1084 in Amending Bylaw 1341 (Attachment 1) seek to increase the annual fixed administrative fees from $200 to $250 to reflect inflationary changes, as proposed during engagement (Reference 2). The updated fees would take effect on January 1, 2023.

ALTERNATIVES

1. That the MVRD Board:
   a) give first, second and third reading to *Metro Vancouver Regional District Concrete and Concrete Products Industries Emission Regulation Amending Bylaw No. 1341, 2022*; and
   b) pass and finally adopt *Metro Vancouver Regional District Concrete and Concrete Products Industries Emission Regulation Amending Bylaw No. 1341, 2022*.

2. That the MVRD Board receive for information the report dated May 3, 2022, titled "MVRD Concrete and Concrete Products Industries Emission Regulation Amending Bylaw No. 1341, 2022" and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

Under Alternative 1, the proposed bylaw would update Bylaw 1084 to align with the regulatory fees in Bylaw 1330 and the administrative fees proposed during engagement. Starting in 2023, updated regulatory costs would be recovered from emitters authorized under Bylaw 1084, in alignment with Metro Vancouver's principles of discharger pay, continuous improvement, and cost recovery. The amendments would result in an increase of $50 to each facility's annual fees.

CONCLUSION

After an engagement process from January to April 2021, the Board adopted the *MVRD Air Quality Management Fees Regulation Bylaw No. 1330, 2021* (Bylaw 1330) on October 29, 2021, to include updated fees for air emissions and account for inflationary changes that have not been reflected in the bylaw since 2008. Consequentially, changes to *GVRD Concrete and Concrete Products Industries Emission Regulation Bylaw No. 1084, 2008* are needed to ensure fees are aligned with the fees proposed during engagement and those set out in Bylaw 1330. With the amendments to Bylaw 1084, the expected fees from dischargers will cover a share of Metro Vancouver's air quality regulatory services, while also encouraging emission reductions and leading to air quality improvements. Alternative 1 is recommended.

Attachment

1. *MVRD Concrete and Concrete Products Industries Emission Regulation Amending Bylaw No. 1341, 2022*

References

1. *MVRD Air Quality Management Fees Regulation Bylaw No. 1330, 2021* (Bylaw 1330)
2. Discussion Paper - Proposed Amendments to Air Quality Permit and Regulatory Fees in Metro Vancouver

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METRO VANCOUVER REGIONAL DISTRICT
BYLAW NO. 1341, 2022
A Bylaw to Amend "Greater Vancouver Regional District Concrete and Concrete Products Industries Emission Regulation Bylaw No. 1084, 2008"

WHEREAS:

A. The Metro Vancouver Regional District has enacted the "Greater Vancouver Regional District Air Quality Management Bylaw No. 1082, 2008";

B. That Bylaw contemplates that the Board of the Metro Vancouver Regional District may establish emission regulations and fees;

C. The Metro Vancouver Regional District has enacted the "Metro Vancouver Regional District Air Quality Management Fees Regulation Bylaw No. 1330, 2021";

D. The Metro Vancouver Regional District has enacted the "Greater Vancouver Regional District Concrete and Concrete Products Industries Emission Regulation Bylaw No. 1084, 2008"; and

E. The Board of the Metro Vancouver Regional District wishes to amend the "Greater Vancouver Regional District Concrete and Concrete Products Industries Emission Regulation Bylaw No. 1084, 2008".

NOW THEREFORE the Board of the Metro Vancouver Regional District enacts as follows:

Citation

1. The official citation of this bylaw is "Metro Vancouver Regional District Concrete and Concrete Products Industries Emission Regulation Amending Bylaw No. 1341, 2022".

Amendment of Bylaw

2. "Greater Vancouver Regional District Concrete and Concrete Products Industries Emission Regulation Bylaw No. 1084, 2008" is amended as follows:

   (a) Section 4 is amended by striking out "Greater Vancouver Regional District" in both places and substituting "Metro Vancouver Regional District".

   (b) Section 10 is deleted and replaced with the following:

      10. Each year, each registered operator must pay to the District a fee of $250 for that calendar year or portion thereof, payable by April 1 of each year, or upon registration if registration occurs after April 1 of that year.

   (c) Section 14 is amended by striking out "Greater Vancouver Regional District" and substituting "Metro Vancouver Regional District".

Read a first time this _____ day of _____, _____.

Read a second time this _____ day of _____, _____.

Read a third time this _____ day of _____, _____.

Passed and finally adopted this _____ day of _____, _____.

Sav Dhaliwal, Chair

Chris Plagnol, Corporate Officer

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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Climate Action Committee

From: Cindy Onyejekwe, Senior Policy Analyst
Esther Berube, Division Manager, Air Quality Bylaw and Regulation Development
Parks and Environment Department

Date: May 3, 2022 Meeting Date: May 13, 2022

Subject: **MVRD Gasoline Distribution Emission Regulation Amending Bylaw No. 1342, 2022**

RECOMMENDATION

That the MVRD Board:

a) give first, second and third reading to *Metro Vancouver Regional District Gasoline Distribution Emission Regulation Amending Bylaw No. 1342, 2022*; and
b) pass and finally adopt *Metro Vancouver Regional District Gasoline Distribution Emission Regulation Amending Bylaw No. 1342, 2022*.

EXECUTIVE SUMMARY

Metro Vancouver regulates the discharge of air contaminants through site-specific permits and emission regulations that apply to groups of similar sources. A system of regulatory fees has been established to recover administrative costs and encourage emission reductions based on the potential health and environmental impact of air contaminants. Engagement on updates to air quality management fees took place from January to April 2021. Emails were sent to all facilities regulated under *GVRD Gasoline Distribution Emission Regulation Bylaw No. 1085, 2008* (Bylaw 1085), with information about increases to annual fees ranging from $50 for most facilities to a few thousand dollars for bulk and terminal facilities. Metro Vancouver heard no concerns from these regulated facilities. On October 29, 2021, the MVRD Board updated the fees when it adopted *MVRD Air Quality Management Fees Regulation Bylaw No. 1330, 2021* (Bylaw 1330). Consequential amendments to Bylaw 1085 are needed, to update fees in alignment with the changes proposed during engagement and the updated fee rates in Bylaw 1330.

PURPOSE

To seek MVRD Board adoption of amendments to fees in the *GVRD Gasoline Distribution Emission Regulation Bylaw No. 1085, 2008* (Bylaw 1085) to align with Bylaw 1330, adopted by the MVRD Board in October 2021.

BACKGROUND

At its October 29, 2021 meeting, the MVRD Board adopted Bylaw 1330 (Reference 1), which repealed and replaced *GVRD Air Quality Management Fees Regulation Bylaw No. 1083, 2008* to update Metro Vancouver's air quality permit and regulatory fees. Consequently, updates to fees are needed in Bylaw 1085, in order to maintain consistency with the fee rates set out in Bylaw 1330. This report seeks Board adoption of amendments to fees in Bylaw 1085.

RECENT UPDATES TO AIR QUALITY PERMITTING AND REGULATORY FEES

Metro Vancouver charges fees for authorized air emissions to recover the cost of its air quality regulatory services, incentivize emission reductions, and improve air quality. Fees are stipulated in an air quality management fees bylaw for individual permitted facilities and various emission regulations for industrial sectors. Emission regulations apply fixed registration fees, as well as annual administration fees that have both fixed and variable components. The variable portion of the fees are based upon the quantity and type of air contaminants authorized to be discharged.

During an engagement process from January to April 2021, Metro Vancouver sought feedback on adjusting fixed fees for inflation and increasing variable fees for emissions of air contaminants (Reference 2). Emails and invitations to webinars were sent to all facilities registered under Bylaw 1085. Metro Vancouver did not hear any concerns from these audiences during the engagement period. Bylaw 1330 was then developed in alignment with Metro Vancouver's principles of continuous improvement, discharger pay, and cost recovery. Bylaw 1330 includes updated fees for emissions of air contaminants that reflect new information on the estimated costs of health impacts associated with various types of emissions.

With the adoption of Bylaw 1330, supporting amendments to emission regulations are needed to reflect the new fees and inflationary changes, since these fees have not increased since the bylaws were adopted in 2008. As specified in Bylaw 1330, the air contaminant emission fee rates used to calculate the variable emission fees will increase gradually until 2028.

UPDATES TO GASOLINE DISTRIBUTION EMISSION REGULATION BYLAW 1085

Bylaw 1085 contains fixed administrative fees and variable emission fees for photoreactive volatile organic compounds (VOC). The proposed amendments seek to increase the fixed fees for bulk plants, distribution terminals, and fuel transfer vehicles from $200 to $250; and to increase the fixed fees for service stations from $150 to $200, to adjust for inflation as proposed during engagement. Under Bylaw 1085, the variable emission fees only apply to bulk and terminal plants. The proposed Amending Bylaw 1342 (Attachment 1) seeks to add a new Air Contaminant Emission Fee schedule outlining the air contaminant emission fee rates for photoreactive VOC to match the emission fee rates in Bylaw 1330. The updated fees would take effect on January 1, 2023.

ALTERNATIVES

1. That the MVRD Board:
   a) give first, second and third reading to *Metro Vancouver Regional District Gasoline Distribution Emission Regulation Amending Bylaw No. 1342, 2022*; and
   b) pass and finally adopt *Metro Vancouver Regional District Gasoline Distribution Emission Regulation Amending Bylaw No. 1342, 2022*.

2. That the MVRD Board receive for information the report dated May 3, 2022, titled "MVRD Gasoline Distribution Emission Regulation Amending Bylaw No. 1342, 2022" and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

Under Alternative 1, the proposed bylaw would update Bylaw 1085 to align with the regulatory fees in Bylaw 1330. Starting in 2023, updated regulatory costs would be recovered from emitters authorized under Bylaw 1085, in alignment with Metro Vancouver's principles of discharger pay, continuous improvement, and cost recovery. The amendments would result in an increase of $50 in annual fees for most facilities, with a small number of bulk and terminal facilities seeing an increase of less than $4500 in annual fees per facility.

CONCLUSION

After an engagement process from January to April 2021, the Board adopted the *MVRD Air Quality Management Fees Regulation Bylaw No. 1330, 2021* (Bylaw 1330) on October 29, 2021, to include updated fees for air emissions and account for inflationary changes that have not been reflected in the bylaw since 2008. Consequentially, changes to *GVRD Gasoline Distribution Emission Regulation Bylaw No. 1085, 2008* (Bylaw 1085) are needed to ensure fees are aligned with the fees proposed during engagement and those set out in Bylaw 1330. With the amendments to Bylaw 1085, the expected fees from dischargers will cover a share of Metro Vancouver's air quality regulatory services, while also encouraging emission reductions and leading to air quality improvements. Alternative 1 is recommended.

Attachment

1. *MVRD Gasoline Distribution Emission Regulation Amending Bylaw No. 1342, 2022*

References

1. *MVRD Air Quality Management Fees Regulation Bylaw No. 1330, 2021* (Bylaw 1330)
2. Discussion Paper - Proposed Amendments to Air Quality Permit and Regulatory Fees in Metro Vancouver

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METRO VANCOUVER REGIONAL DISTRICT
BYLAW NO. 1342, 2022
A Bylaw to Amend "Greater Vancouver Regional District Gasoline Distribution Emission Regulation Bylaw No. 1085, 2008"

WHEREAS:

A. The Metro Vancouver Regional District has enacted the "Greater Vancouver Regional District Air Quality Management Bylaw No. 1082, 2008";

B. That Bylaw contemplates that the Board of the Metro Vancouver Regional District may establish emission regulations and fees;

C. The Metro Vancouver Regional District has enacted the "Metro Vancouver Regional District Air Quality Management Fees Regulation Bylaw No. 1330, 2021";

D. The Metro Vancouver Regional District has enacted the "Greater Vancouver Regional District Gasoline Distribution Emission Regulation Bylaw No 1085, 2008"; and

E. The Board of the Metro Vancouver Regional District wishes to amend the "Greater Vancouver Regional District Gasoline Distribution Emission Regulation Bylaw No 1085, 2008".

NOW THEREFORE the Board of the Metro Vancouver Regional District enacts as follows:

Citation

1. The official citation of this bylaw is "Metro Vancouver Regional District Gasoline Distribution Emission Regulation Amending Bylaw No. 1342, 2022".

Effective Date

2. This bylaw will come into effect on January 1, 2023.

Schedule

3. The following Schedule is attached to and forms part of this bylaw:
   Schedule "A", Air Contaminant Emission Fees.

Amendment of Bylaw

4. "Greater Vancouver Regional District Gasoline Distribution Emission Regulation Bylaw 1086, 2008", as amended (in this bylaw, the "Emission Regulation"), is amended as follows:

   (a) Section 4 is amended by striking out "Greater Vancouver Regional District" in both places and substituting "Metro Vancouver Regional District".

(b) Section 10 is deleted and replaced with the following:

10. Each year, each registered operator terminal or bulk plant must pay to the District a fee of $250 plus the total emission fee calculated in accordance with procedures approved by the district director using the air contaminant emission fee rates in Schedule A for that calendar year or portion thereof, payable by April 1 of each year, or upon registration if registration occurs after April 1 of that year.

(c) Section 11 is deleted and replaced with the following:

11. Each year, each registered operator of a fuel transfer vehicle must pay to the District a fee of $250 plus $50 per fuel transfer vehicle for that calendar year or portion thereof, payable by April 1 of each calendar year, or upon registration if registration occurs after April 1 of that year.

(d) Section 12 is deleted and replaced with the following:

12. Each year, each registered operator of a service station must pay to the District a fee of $200 per service station for that calendar year or portion thereof, payable by April 1 of each calendar year, or upon registration if registration occurs after April 1 of that year.

(e) Schedule A to this bylaw is added as Schedule A to the Emission Regulation.

Read a first time this _____ day of _____, _____.

Read a second time this _____ day of _____, _____.

Read a third time this _____ day of _____, _____.

Passed and finally adopted this _____ day of _____, _____.

_____
Sav Dhaliwal, Chair

_____
Chris Plagnol, Corporate Officer

Schedule A

Air Contaminant Emission Fees

1. "**Air contaminant emission fees"** (Z) for air contaminants listed in Table 1 are calculated as follows:

$$Z = A \times B$$

where,

A is the authorized discharge in tonnes of an air contaminant listed in Column 1 of Table 1, and

B is the corresponding emission fee rate for that air contaminant listed in Column 2 of Table 1.

Table 1 – Air Contaminant Emission Fee Rates for Authorized Discharges

Column 1 **Air Contaminant (A)**	Column 2 **Emission Fee Rate ($/tonne) (B)**					
	2023	**2024**	**2025**	**2026**	**2027**	**2028 and later**
Photoreactive volatile organic compounds	$146	$169	$191	$214	$237	$260

metrovancouver
SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Climate Action Committee

From: Arvind Saraswat, Senior Project Engineer
Esther Berube, Division Manager, Air Quality Bylaw and Regulation Development
Parks and Environment Department

Date: May 3, 2022 Meeting Date: May 13, 2022

Subject: **MVRD Boilers and Process Heaters Emission Regulation Amending Bylaw No. 1343, 2022**

RECOMMENDATION

That the MVRD Board:

a) give first, second and third reading to *Metro Vancouver Regional District Boilers and Process Heaters Emission Regulation Amending Bylaw No. 1343, 2022*; and
b) pass and finally adopt *Metro Vancouver Regional District Boilers and Process Heaters Emission Regulation Amending Bylaw No. 1343, 2022.*

EXECUTIVE SUMMARY

Metro Vancouver regulates the discharge of air contaminants through site-specific permits and emission regulations that apply to groups of similar sources. A system of regulatory fees has been established to recover administrative costs and encourage emission reductions based on the potential health and environmental impact of air contaminants. Engagement on updates to air quality management fees took place from January to April 2021. Emails were sent to all facilities regulated under *GVRD Boilers and Process Heaters Emission Regulation Bylaw No. 1087, 2008* (Bylaw 1087), with information about proposed increases in fees ranging from about $500 to $5000 in each facility's annual fees. Metro Vancouver heard no concerns from these regulated facilities. On October 29, 2021, the MVRD Board updated the fees when it adopted *MVRD Air Quality Management Fees Regulation Bylaw No. 1330, 2021* (Bylaw 1330). Consequential amendments to Bylaw 1087 are needed, to update fees in alignment with the changes proposed during engagement and the updated fee rates in Bylaw 1330.

PURPOSE

To seek MVRD Board adoption of amendments to fees in the *GVRD Boilers and Process Heaters Emission Regulation Bylaw No. 1087, 2008* (Bylaw 1087) to align with Bylaw 1330, adopted by the MVRD Board in October 2021.

BACKGROUND

At its October 29, 2021 meeting, the MVRD Board adopted Bylaw 1330 (Reference 1), which repealed and replaced *GVRD Air Quality Management Fees Regulation Bylaw No. 1083, 2008* to update Metro Vancouver's air quality permit and regulatory fees. Consequently, updates to fees are needed in Bylaw 1087, in order to maintain consistency with the fee rates set out in Bylaw 1330. This report seeks Board adoption of amendments to fees in Bylaw 1087.

RECENT UPDATES TO AIR QUALITY PERMITTING AND REGULATORY FEES

Metro Vancouver charges fees for authorized air emissions to recover the cost of its air quality regulatory services, incentivize emission reductions, and improve air quality. Fees are stipulated in an air quality management fees bylaw for individual permitted facilities and various emission regulations for industrial sectors. Emission regulations apply fixed registration fees, as well as annual administration fees that have both fixed and variable components. The variable portion of the fees are based upon the quantity and type of air contaminants authorized to be discharged.

During an engagement process from January to April 2021, Metro Vancouver sought feedback on adjusting fixed fees for inflation and increasing variable fees for emissions of air contaminants (Reference 2). Emails and invitations to webinars were sent to all facilities registered under Bylaw 1087. Metro Vancouver did not hear any concerns from these regulated facilities. Bylaw 1330 was then developed in alignment with Metro Vancouver's principles of continuous improvement, discharger pay, and cost recovery. Bylaw 1330 includes updated fees for emissions of air contaminants that reflect new information on the estimated costs of health impacts associated with various types of emissions.

With the adoption of Bylaw 1330, supporting amendments to emission regulations are needed to reflect the new fees and inflationary changes, since these fees have not increased since the bylaws were adopted in 2008. As specified in Bylaw 1330, the air contaminant emission fee rates used to calculate the variable emission fees will increase gradually until 2028.

UPDATES TO BOILERS AND PROCESS HEATERS EMISSION REGULATION BYLAW 1087

Bylaw 1087 includes fixed administrative fees and variable fees for particulate matter, nitrogen oxides (NO_x), total photoreactive VOC, and total non-photoreactive VOC. The fixed administrative fees would increase from $200 to $250 to reflect inflationary changes, as proposed during engagement. The proposed Amending Bylaw 1343 (Attachment 1) seeks to replace the air contaminant emission fee rates in the emission regulation to match the air contaminant emission fee rates for fine particulate matter, NO_x, photoreactive VOC, and non-photoreactive VOC in Bylaw 1330. The updated fees would take effect on January 1, 2023.

ALTERNATIVES

1. That the MVRD Board:
   a) give first, second and third reading to *Metro Vancouver Regional District Boilers and Process Heaters Emission Regulation Amending Bylaw No. 1343, 2022*; and
   b) pass and finally adopt *Metro Vancouver Regional District Boilers and Process Heaters Emission Regulation Amending Bylaw No. 1343, 2022*.

2. That the MVRD Board receive for information the report dated May 3, 2022, titled "MVRD Boilers and Process Heaters Emission Regulation Amending Bylaw No. 1343, 2022" and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

Under Alternative 1, the proposed bylaw would update Bylaw 1087 to align with the regulatory fees in Bylaw 1330. Starting in 2023, updated regulatory costs would be recovered from emitters

authorized under Bylaw 1087, in alignment with Metro Vancouver's principles of discharger pay, continuous improvement, and cost recovery. The amendments would result in an increase ranging from about $500 to $5000 per facility in annual fees.

CONCLUSION

After an engagement process from January to April 2021, the Board adopted the *MVRD Air Quality Management Fees Regulation Bylaw No. 1330, 2021* (Bylaw 1330) on October 29, 2021, to include updated fees for air emissions and account for inflationary changes that have not been reflected in the bylaw since 2008. Consequentially, changes to *GVRD Boilers and Process Heaters Emission Regulation Bylaw No. 1087, 2008* (Bylaw 1087) are needed to ensure fees are aligned with the fees proposed during engagement and those set out in Bylaw 1330. With the amendments to Bylaw 1087, the expected fees from dischargers will cover a share of Metro Vancouver's air quality regulatory services, while also encouraging emission reductions and leading to air quality improvements. Alternative 1 is recommended.

Attachment

1. *MVRD Boilers and Process Heaters Emission Regulation Amending Bylaw No. 1343, 2022*

References

1. *MVRD Air Quality Management Fees Regulation Bylaw No. 1330, 2021* (Bylaw 1330)
2. Discussion Paper - Proposed Amendments to Air Quality Permit and Regulatory Fees in Metro Vancouver

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METRO VANCOUVER REGIONAL DISTRICT
BYLAW NO. 1343, 2022
A Bylaw to amend "Greater Vancouver Regional District Boilers and Process Heaters Emission Regulation Bylaw No. 1087, 2008"

WHEREAS:

A. The Metro Vancouver Regional District has enacted the "Greater Vancouver Regional District Air Quality Management Bylaw No. 1082, 2008";

B. That Bylaw contemplates that the Board of the Metro Vancouver Regional District may establish emission regulations and fees;

C. The Metro Vancouver Regional District has enacted the "Metro Vancouver Regional District Air Quality Management Fees Regulation Bylaw No. 1330, 2021";

D. The Metro Vancouver Regional District has enacted the "Greater Vancouver Regional District Boilers and Process Heaters Emission Regulation Bylaw 1087, 2008"; and

E. The Board of the Metro Vancouver Regional District wishes to amend the "Greater Vancouver Regional District Boilers and Process Heaters Emission Regulation Bylaw 1087, 2008".

NOW THEREFORE the Board of the Metro Vancouver Regional District enacts as follows:

Citation

1. The official citation of this bylaw is "Metro Vancouver Regional District Boilers and Process Heaters Emission Regulation Amending Bylaw No. 1343, 2022".

Effective Date

2. This bylaw will come into effect on January 1, 2023.

Amendment of Bylaw

3. "Greater Vancouver Regional District Boilers and Process Heaters Emission Regulation Bylaw 1087, 2008", as amended, is amended as follows:

   (a) Section 12 is deleted and replaced with the following:

   12. Each year, each registered operator of a boiler or process heater must pay to the District a fee of $250 plus the total emission fees calculated in accordance with Appendix 1 for each calendar year or portion thereof, payable by June 30 of each calendar year, or upon registration if registration occurs after June 30 of that year.

(b) Appendix 1 is amended by deleting Table 1 and replacing with the following:

Table 1 – Air Contaminant Emission Fees per Tonne of Air Contaminant

Column 1	**Column 2**					
Air contaminant	**Emission fee per tonne of air contaminant**					
	2023	**2024**	**2025**	**2026**	**2027**	**2028 and later**
Fine Particulate Matter ($PM_{2.5}$)	$729	$943	$1,157	$1,371	$1,586	$1,800
Nitrogen Oxides (NOx)	$79	$93	$107	$121	$136	$150
Photoreactive volatile organic compounds	$146	$169	$191	$214	$237	$260
Non-photoreactive volatile organic compounds	$33	$34	$36	$37	$39	$40

(c) Section 2 of Appendix 1 is amended by adding the following subsection:

(3) For the purposes of calculating air contaminant emission fees, condensable particulate matter and filterable particulate matter are deemed to be fine particulate matter.

Read a first time this _____ day of _____, _____.

Read a second time this _____ day of _____, _____.

Read a third time this _____ day of _____, _____.

Passed and finally adopted this _____ day of _____, _____.

Sav Dhaliwal, Chair

Chris Plagnol, Corporate Officer

To: Climate Action Committee

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

Date: April 21, 2022 Meeting Date: May 13, 2022

Subject: **Manager's Report**

RECOMMENDATION
That the Climate Action Committee receive for information the report dated April 21, 2022 titled "Manager's Report".

Climate Action Committee 2022 Work Plan
The attachment to this report sets out the Committee's Work Plan for 2022. 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.

IPCC Report - Climate Change 2022: Mitigation of Climate Change
On April 4, 2022, the Intergovernmental Panel on Climate Change approved the third part of its Sixth Assessment Report, titled "Climate Change 2022: Mitigation of Climate Change". Part One (the Physical Science Basis), and Part Two (Impacts, Adaptation and Vulnerability) were summarized in previous Climate Action Committee Manager's Reports.

This new report makes it clear that unless there are immediate and deep greenhouse gas emission reductions across all sectors, far beyond the level of action currently underway, it will not be possible to limit global warming to 1.5°C. The result would be more frequent and intense extreme weather events (such as what has been experienced in the past year in the Metro Vancouver region), with widespread adverse impacts and related losses and damages to nature and people.

This report outlines the main sources of emissions, and describes the aggressive policy actions that need to be taken in order to cut emissions by half in the coming years. Unfortunately, despite increasing consensus and commitments regarding the need to take action, global emissions have continued to rise over the past decade, although the rate of growth has been slower than in previous decades. Globally, the largest source of emissions is the fossil fuel industry, which includes extraction and use of coal, oil, and natural gas; it will be critical to address both supply and demand of these fossil fuels if dangerous levels of heating are to be avoided. The report also identifies that carbon capture, utilization and storage technologies will be needed alongside emissions reductions policies, and carbon removal (such as the pilot plant in Squamish BC) will likely be critical to reduce atmospheric levels of carbon dioxide by mid-century.

Metro Vancouver's *Clean Air Plan* and the *Climate 2050 Roadmaps* for Transportation, Buildings, and Industry & Business include a wide range of actions that address demand-side use of fossil fuels and identify decarbonization pathways (for example, accelerating the adoption of heat pumps and

electric vehicles), while the draft *Energy Roadmap* identifies strategies and actions to decarbonize the energy supply to our region (such as through the use of renewable and low-carbon fuels).

Equity and social justice considerations related to climate mitigation are an important theme of the report, given that moving to low-carbon energy, zero emissions technologies, and compact, livable land-use patterns can also significantly improve energy security, enhance resilience to extreme weather, protect vulnerable populations, and improve social cohesion.

Reference 1 provides a link to a concise version of the results of the full report, the Summary for Policymakers.

Reference

1. IPCC Report – Climate Change 2022: Mitigation of Climate Change Summary for Policymakers

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Climate Action Committee 2022 Work Plan
Report Date: April 21, 2022

Priorities

1st Quarter	**Status**
Climate Action Committee 2022 work plan and meeting schedule	Complete
Climate 2050 – draft roadmap for industry	Complete
Climate 2050 – draft roadmap for nature and ecosystems	Complete
Air quality – initiate process to update boilers and process heaters regulation	In progress
Sustainability Innovation Fund (SIF) – 2022 proposals	Complete
2nd Quarter	
Climate 2050 – management of GHG emissions from large buildings	In progress
Climate 2050 – draft roadmap for energy	Complete
Climate 2050 – draft roadmap for land use and growth management	In progress
Climate 2050 - analysis of how land use will contribute to achieving greenhouse gas reduction targets, especially for transportation	In progress
Climate 2050 – annual report and progress tracking	In progress
Air Quality – Initiate engagement on regulation for non-road two-stroke engines	Pending
Air quality – cannabis production and processing emission regulation	In progress
Air quality – open air burning emission regulation	In progress
Annual Caring for the Air report	In progress
Update on ecological health initiatives	In progress
SIF - status report on previously approved liquid waste projects	In progress
SIF - status report on previously approved regional district projects	In progress
3rd Quarter	
Climate 2050 final roadmap: agriculture	Pending
Climate 2050 final roadmap: industry	Pending
Climate 2050 – draft roadmap for infrastructure	Pending
Provincial replacement program for local government climate action	In progress
Air quality – amendments to air quality management fees in emission regulations	In progress
Air quality – amendments to ticketing bylaws	Pending
SIF - status report on previously approved water projects	In progress
4th Quarter	
Climate 2050 final roadmap: energy	Pending
Climate 2050 final roadmap: nature and ecosystems	Pending
Annual budget and 5 year financial plan	In progress
Best Management Practices for invasive species	Pending