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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

METRO VANCOUVER REGIONAL DISTRICT
CLIMATE ACTION COMMITTEE

REGULAR MEETING

Friday, February 11, 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

REVISED AGENDA[1]

1. ADOPTION OF THE AGENDA

1.1 February 11, 2022 Regular Meeting Agenda
That the Climate Action Committee adopt the agenda for its regular meeting scheduled for February 11, 2022 as circulated.

2. ADOPTION OF THE MINUTES

2.1 January 14, 2022 Regular Meeting Minutes
That the Climate Action Committee adopt the minutes of its regular meeting held January 14, 2022 as circulated.

Added **3. DELEGATIONS**

3.1 Alex Boston, Executive Director, Renewable Cities & Fellow, SFU Morris J Wosk Centre for Dialogue
Subject: Climate 2050 Land Use Policy Implications Preliminary Analysis & Land Use Big Moves to Meet Targets

4. INVITED PRESENTATIONS

4.1 Ralf Nielsen, Director, Enterprise Sustainability and Caitlin Cooper, Project Manager, Regional Transportation Strategy, TransLink
Subject: TransLink's Climate Action Strategy

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

5. REPORTS FROM COMMITTEE OR STAFF

5.1 2022 Liquid Waste Sustainability Innovation Fund Application

That the GVS&DD Board approve the allocation from the Liquid Waste Sustainability Innovation Fund of $270,000 over two years starting in 2022 for Phase 1 of the Biorock: Innovative Building Material for Shoreline Protection, Carbon Sequestration, and Habitat Creation project.

5.2 2022 Regional District Sustainability Innovation Fund Applications

That the MVRD Board approve the allocation from the Regional District Sustainability Innovation Fund for the following projects:

a) Showcasing Innovation in Alternative Powered Park Operations and Maintenance Equipment to Reduce Emissions: $35,000 in 2022;
b) Social and Community Data Model – Phase 2: $180,000 over two years starting in 2022;
c) Net Zero Water Technology Accelerator: $175,000 over two years starting in 2022;
d) Integrating greenhouse gases requirements into air emission permits and regulations: $150,000 over two years starting in 2022;
e) Taking out the Trash: Transitioning to Zero-Carbon Heavy Duty Vehicles through Waste Collection Trucks: $400,000 over three years starting in 2022;
f) Metro Vancouver Large Building Retrofit Accelerator: $850,000 over three years starting in 2022;
g) Driving Down Emissions: Working with Key Partners to Develop a Regional Pathway to Accelerate Transportation Emission Reductions: $455,000 over two years starting in 2022; and,
h) Smart Cities: Hyperlocal Air Quality Monitoring: $250,000 over two years starting in 2022.

5.3 2022 Water Sustainability Innovation Fund Applications

That the GVWD Board approve the allocation from the Water Sustainability Innovation Fund for the following projects:

a) 10-year Salmon Enhancement Action Plan: $180,000 over two years starting in 2022;
b) Hydrological Models for the Capilano and Seymour Watersheds: $750,000 over three years starting in 2022;
c) Digital Transformation of Water Transmission System Planning & Analysis: $950,000 over three years starting in 2022;
d) Feasibility Study to Optimize Transmission System Energy Use: $350,000 over two years starting in 2022;
e) Regional Equity and Affordability of Drinking Water: $550,000 over three years starting in 2022; and,
f) New Technology for the Determination of E.Coli in Recreational Water to Enhance Public Safety: $200,000 over two years starting in 2022.

5.4 Alignment between MoveUP Proposal and Metro Vancouver *Climate 2050 Buildings Roadmap*

That the MVRD Board direct staff to engage with the Canadian Office and Professional Employees Union (MoveUP) as part of the implementation of the *Climate 2050 Buildings Roadmap,* to seek opportunities for collaboration related to their proposal titled "Capitalizing on Retrofitting Opportunities for Greenhouse Gas Emissions Reductions and Job Creation".

5.5 Manager's Report

That the Climate Action Committee receive for information the report dated January 28, 2022 titled "Manager's Report".

6. INFORMATION ITEMS

7. OTHER BUSINESS

8. BUSINESS ARISING FROM DELEGATIONS

9. RESOLUTION TO CLOSE MEETING

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

10. ADJOURNMENT/CONCLUSION

That the Climate Action Committee adjourn/conclude its regular meeting of February 11, 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 1:02 p.m. on Friday, January 14, 2022 in the 28th Floor Boardroom Room, 4515 Central Boulevard, Burnaby, British Columbia.

MEMBERS PRESENT:
Chair, Councillor Adriane Carr, Vancouver
Vice Chair, Councillor Sav Dhaliwal*, Burnaby (departed at 4:31 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 4:01 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

OPENING REMARKS
Director Sav Dhaliwal, Board Chair and Vice Chair of the Climate Action Committee, acknowledged the contributions of the Metro Vancouver Standing Committee members in what has been a challenging time for the region due to the COVID-19 pandemic and recognized the vital role this Committee will play in moving forward.

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

1. ADOPTION OF THE AGENDA

1.1 January 14, 2022 Regular Meeting Agenda

It was MOVED and SECONDED
That the Climate Action Committee:

a) amend the agenda for its regular meeting scheduled for January 14, 2022 by adding:
   i. Item 3.1 Late Delegation – Alex Boston, Renewable Cities, Simon Fraser University;
   ii. Item 3.2 Late Delegation – Christy Juteau, A Rocha Canada;
   iii. Item 7.1 Other Business – Trans Mountain Pipeline Relocation Under Fraser River;
b) vary the order of the agenda by moving Item 6.1, "Report from Gregory Freeman, Senior Economist and Megan Gerryts, Senior Policy Advisory, Invest Vancouver re Clean Transportation: Findings and Actions to Strengthen the Sector in the Metro Vancouver Region, dated November 1, 2021", after Item 5.2, "Update on Metro Vancouver Zero Emissions Innovation Centre"; and
c) adopt agenda as amended.

CARRIED

2. ADOPTION OF THE MINUTES

2.1 November 5, 2021 Regular Meeting Minutes

It was MOVED and SECONDED
That the Climate Action Committee adopt the minutes of its regular meeting held November 5, 2021 as circulated.

CARRIED

3. DELEGATIONS

3.1 Alex Boston, Renewable Cities, Simon Fraser University

Alex Boston, Renewable Cities, spoke to the Climate Action Committee members on the need to focus efforts on reducing carbon emissions, increasing affordable housing and transportation options in relation to Item 5.1, "2022 Climate Action Committee Meeting Schedule and Work Plan".

Discussion occurred regarding the urgent need to reduce greenhouse gas emissions, increase the use of renewable fuels, and integrate land use and transportation planning.

Presentation material titled "Good to Great" is retained with the January 14, 2022 Climate Action Committee agenda.

3.2 Christy Juteau, A Rocha Canada

Christy Juteau, A Rocha Canada, spoke to the Climate Action Committee members on the proposed Regional Growth Strategy Amendment for South Campbell Heights, in relation to Item 5.1, "2022 Climate Action Committee Meeting Schedule and Work Plan".

Discussion occurred regarding the need for aquifer and forest protection, and urban land use and transportation planning in ecologically sensitive areas.

Presentation material titled "2022 Work Plan – Climate 2050 – Roadmaps for Nature and Ecosystems and Land Use and Growth Management" is retained with the January 14, 2022 Climate Action Committee agenda.

4 INVITED PRESENTATIONS

4.1 David Black, President and Norman Gludovatz, Director of Communications, MoveUP: the Movement of United Professionals

David Black, MoveUp: the Movement of United Professionals, spoke to Climate Action Committee members on opportunities for financing retrofit programs for existing buildings and grants targeting greenhouse gas emissions reductions.

Discussion occurred regarding the opportunity to liaise with the Provincial Government to explore the retrofit funding programs further.

Presentation material titled "Capitalizing on Retrofitting Opportunities for GHG Emission Reductions and Job Creation" is retained with the January 14, 2022 Climate Action Committee agenda.

It was MOVED and SECONDED

That the Climate Action Committee direct staff to review the alignment between the MoveUP proposal, as presented at the January 14, 2022 meeting in the delegation from David Black, MoveUP, and the *Climate 2050 Buildings Roadmap.*

CARRIED

5 REPORTS FROM COMMITTEE OR STAFF

5.1 2022 Climate Action Committee Meeting Schedule and Work Plan

Report dated January 4, 2022, from Roger Quan, Director, Air Quality and Climate Change, Parks and Environment, providing the Climate Action Committee with its Terms of Reference, the 2022 Work Plan, and the annual meeting schedule.

Members were provided with a presentation on the Climate Action Committee Work Plan priorities highlighting the extreme weather events in 2021 and the need to address the climate change effects on the region.

Members commented on the urgent need to reduce greenhouse gas emissions and the role that land use and transportation planning will have in achieving the climate targets. Discussion ensued on the plans and policies that are within the purview of other standing committees and opportunities for coordination.

Request of Staff:
Staff were requested to explore opportunities to coordinate with other Metro Vancouver standing committees to assist in prioritizing sustainable land use and transportation planning.

Presentation material titled "2022 Climate Action Committee Meeting Schedule and Work Plan" is retained with January 14, 2022 Climate Action Committee agenda.

It was MOVED and SECONDED
That the Climate Action Committee:

a) receive for information the Climate Action Committee Terms of Reference and the 2022 Annual Meeting Schedule, as presented in the report dated January 4, 2022, titled "2022 Climate Action Committee Meeting Schedule and Work Plan"; and
b) endorse the 2022 work plan, as presented in the report dated January 4, 2022, titled "2022 Climate Action Committee Meeting Schedule and Work Plan", incorporating the requested changes from the Climate Action Committee:
    i) analysis of how land use will contribute to achieving the greenhouse gas reduction targets, especially for transportation.

CARRIED

5.2 Update on Metro Vancouver Zero Emissions Innovation Centre

Report dated January 4, 2022, from Jen McCutcheon, Director, Electoral Area A, providing the Climate Action Committee with an update on the formation of the Metro Vancouver Zero Emissions Innovation Centre as a new entity that will contribute to the reduction of greenhouse gas emissions in the region.

Members were provided with a presentation on the Metro Vancouver Zero Emissions Innovation Centre highlighting the key milestones and collaboration opportunities.

Presentation material titled "Metro Vancouver Zero Emissions Innovation Centre (ZEIC)" is retained with the January 14, 2022 Climate Action Committee agenda.

It was MOVED and SECONDED
That the MVRD Board receive for information the report dated January 4, 2022, titled "Update on Metro Vancouver Zero Emissions Innovation Centre".

CARRIED

Agenda Order Varied
Pursuant to Item 1.1 of the agenda, the order of the agenda was varied to consider Item 6.1 at this point.

6 INFORMATION ITEMS

6.1 Report from Gregory Freeman, Senior Economist and Megan Gerryts, Senior Policy Advisory, Invest Vancouver re Clean Transportation: Findings and Actions to Strengthen the Sector in the Metro Vancouver Region dated November 1, 2021

Members were provided with a presentation on Clean Transportation highlighting Metro Vancouver's role as a regional service leader and outlining the priorities for economic development and the value propositions for key industries.

Presentation material titled "Clean Transportation: Findings and Actions to Strengthen the Sector in the Metro Vancouver Region" is retained with the January 14, 2022 Climate Action Committee agenda.

Agenda Order Resumed
The order of the agenda resumed with Item 5.3 being before the Committee.

5.3 MVRD Non-Road Diesel Engine Emission Regulation Amending Bylaw No. 1337, 2021

Report dated December 13, 2021, from Cindy Onyejekwe, Senior Policy Analyst, and Esther Berube, Division Manager, Air Quality Bylaw and Regulation Development, Parks and Environment, seeking the MVRD Board's approval of minor amendments to *Metro Vancouver Regional District Non-Road Diesel Engine Emission Regulation Bylaw No. 1329, 2021* (Bylaw 1329) that address operational issues and enhance clarity and alignment with the intent of the bylaw.

It was MOVED and SECONDED
That the MVRD Board:

a) give first, second and third reading to *Metro Vancouver Regional District Non-Road Diesel Engine Emission Regulation Amending Bylaw No. 1337, 2021*; and
b) pass and finally adopt *Metro Vancouver Regional District Non-Road Diesel Engine Emission Regulation Amending Bylaw No. 1337, 2021*.

CARRIED

5.4 Metro Vancouver Regional Consumption-Based Emissions Inventory

Report dated December 16, 2021, from Sheryl Cumming, Project Engineer, Parks and Environment, providing the Climate Action Committee with information about a consumption-based emissions inventory developed for Metro Vancouver, including key findings, trends, and potential implications for future greenhouse gas emissions policies, programs, and inventories.

Members were provided with a presentation on the regional consumption-based emissions inventory broken down by the sectors contributing to the emissions, highlighting opportunities for developing a regional approach for managing greenhouse gas emissions.

Presentation material titled "A Regional Consumption-Based Emissions Inventory" is retained with the January 14, 2022 Climate Action Committee agenda.

It was MOVED and SECONDED
That the Climate Action Committee receive for information the report dated December 16, 2021, titled "Metro Vancouver Regional Consumption-Based Emissions Inventory".

CARRIED

4:01 p.m. Councillor Royer departed the meeting.

5.5 Manager's Report

Report dated January 4, 2022, from Roger Quan, Director, Air Quality and Climate Change, Parks and Environment, providing the Climate Action Committee with an update on upcoming 2022 events, a provincial funding opportunity and various other on-going initiatives.

It was MOVED and SECONDED
That the Climate Action Committee receive for information the report dated January 4, 2022, titled "Manager's Report".

CARRIED

7. OTHER BUSINESS

7.1 Trans Mountain Pipeline Relocation Under Fraser River

Members discussed correspondence from the Protect the Planet group encouraging the Metro Vancouver Board members to file a statement of opposition with the Canada Energy Regulator over the proposal to relocate Trans Mountain pipeline tunnel under the Fraser River.

It was MOVED and SECONDED
That the Climate Action Committee refer to staff the matter of Trans Mountain's proposal to relocate and re-drill its tunnel under the Fraser River and report back to the Committee with an assessment of the potential impacts and a recommended course of action for consideration.

CARRIED

4:31 p.m. Vice Chair Dhaliwal departed the meeting.

8. BUSINESS ARISING FROM DELEGATIONS

The Committee discussed referring the information from the delegate, Christy Juteau, to the Regional Planning Committee.

It was MOVED and SECONDED

That the Climate Action Committee refer the information from the delegation, Christy Juteau, at the January 14, 2022 meeting to the Regional Planning staff for information and report back to the Climate Action Committee as part of the Manager's Report.

CARRIED

Councillor Yousef and Mayor McLaughlin voted in the negative

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 January 14, 2022.

CARRIED

(Time: 4:38 p.m.)

_____ _____

Natalia Melnikov,
Legislative Services Coordinator

Adriane Carr, Chair

50104880 FINAL

RENEWABLE CITIES

SFU MORRIS J. WOSK CENTRE FOR DIALOGUE

CLIMATE 2050 LAND USE POLICY IMPLICATIONS
PRELIMINARY ANALYSIS & LAND USE BIG MOVES TO MEET TARGETS

Clean Air Plan Commitments & Current Land Use Policy

Metro Vancouver's *Clean Air Plan* states

> ***"Strong regional land-use policies are foundational to achieving the targets in the Clean Air Plan. Building compact, mixed-used communities that connect homes, jobs and recreation with walking, cycling and public transit will reduce driving emissions and will support the protection of important lands such as agricultural and industrial lands, and natural areas"*** (Metro Vancouver, 2021)

Metro 2050's vision and goals are consistent with this statement and a broader agenda to advance a prosperous, sustainable, low carbon, resilient future. As the IPCC has underscored, what fundamentally matters for local is smart land use policy integrated with good transportation infrastructure. This is essential for driving GHG reductions and increasing resilience.

Auto oriented land use patterns have been a major driver of the region's largest and fastest growing sector: passenger transportation. Metro Vancouver's current and proposed land use designations unfortunately keep the region on course for a high carbon, high congestion, high cost, high risk and high inequity destination. Metro Vancouver explicitly articulates:

> ***"…no changes have been made to the location of any of the land use designations, the Urban Containment Boundary, the Urban Centres and Frequent Transit Development Areas, or the Special Study Areas."*** (Metro Vancouver, 2021)

Excellent Metro Vancouver analysis of urban tree canopy and impervious surface historical trends and projections, based on current (and proposed) land use designations have significant implications for meeting Climate 2050, Clean Air Plan and CleanBC Roadmap targets and objectives:

> ***"There are currently about 6,500 hectares of lands with the regional land use designation 'General Urban' within the UCB, that are undeveloped or rural and planned for future urban growth... the remaining urban lands within the UCB will be largely developed over the next 15-20 years... These areas are expected to be developed as mainly low-density housing with some higher density…"*** (Metro Vancouver, 2019)

The "undeveloped" 6,500 ha within the UCB is roughly the size of a medium sized municipality, e.g., half a City of Vancouver by area, one West Van, two Port Moodys, four New Westminsters *or* five City of North Vancouvers.

Current and Proposed Land Use Policy Climate 2050 Implications

Coarse projections using defensible and well-documented assumptions and analysis—notably relying on Metro Vancouver sources— show these land use policies and trends have immense consequences to meeting Metro Vancouver and CleanBC targets and should inform Climate Action Committee work plan priorities.

2030 Driving	2040 Driving	2030 GHGs	2040 GHGs	2030 Urban Tree Canopy	2040 Urban Tree Canopy
650 million km additional driving in Metro annually	one billion km additional driving in Metro annually	4.66% passenger vehicle GHG increase annually	5.25% passenger vehicle GHG increase annually	5% loss, shrinking UCB coverage from 32% to 30%	10% loss, shrinking UCB coverage from 32% to 28%
CleanBC Roadmap Target: ***25% reduction in driving km by 2030***		**Climate 2050 Target:** ***60% reduction by 2030***		**Metro 2050 Target:** ***Increase from 32% to 40%***	

Metro Vancouver's growth projections for undeveloped land have three implications:

1. ***Increased Carbon & Congestion:*** **Increase passenger vehicle GHGs an estimated 4.66 per cent by 2030 from 2010 levels versus contributing to a targeted 60 per cent reduction and add an estimated 650 million km of driving per year on Metro Vancouver roads versus a 25 per cent reduction as targeted by the BC Government.**
2. ***Loss of Urban Tree Canopy & Climate Resilience:*** "Result in a loss of over 3,000 ha of tree canopy," according to Metro Vancouver, virtually wiping out the prospect of meeting a target of increasing urban tree canopy from 32 to 40 per cent. **Implications include increased stormwater management costs, vulnerability to flooding and heat wave events, and a sustained decline in ecosystem health, biodiversity and terrestrial carbon.**
3. ***Increased Civic Infrastructure Deficits & Intergenerational Inequity:*** Because low density development doesn't generate enough revenue to operate, maintain and replace its civic infrastructure, this will increase civic infrastructure deficits. **This is a significant additional burden on future taxpayers, further exacerbating one of the greatest inequities of our time: intergenerational inequity. Young people today will not only confront greater climate change impacts, under current policy, affordability, congestion and taxpayer burden will grow and public services will decline. Young, disadvantaged populations will be more adversely impacted.**

Yes, the Urban Centres and FTDAs have *potential* to drive trends in the opposite direction. However, it will be *extremely* challenging to meet Metro's GHG reduction targets for 2030 and 2050 as well as broader sustainability and prosperity imperatives with current policies and trends in the undeveloped UCB let alone Special Study Areas.

Climate 2050 Course Correction Framework & Six Big Moves

Climate 2050 is built on *big moves*. Despite land use planning being the paramount authority of local government and the IPCC recommended arena for climate action, *Climate 2050* has no land use big moves. Here are six.

Each and every municipality, its residents, businesses and taxpayers and the region would benefit environmentally, socially and economically, and it would b

1. ***Housing & Commercial Transit Hubs*****,** generating 1000s of affordable housing units and revenue for TransLink
2. ***SkyTrain Connected Freight Consolidation Centres & Zero Emission Courier Vehicles****,* stemming the fastest growing source of carbon and congestion
3. ***Industrial Land Protection & Intensification*****,** implementing municipal and Metro policy, catching up to competing ports and embracing the region's lost practice of multi-storey industrial and employment buildings
4. ***General Urban Resiliency & Gentle Intensification****,* meaningfully addressing the region's single largest land use designation which is rapidly depopulating
5. ***Connecting Big Urban Centres - Frequent Transit Corridor Focused Growth****,* using existing policy tools to meet policy objectives and reverse Metro's slowest growing land use designation: FTDAs
6. ***Greenspace Protection****,* phasing out development on farm, forest and environmentally sensitive land that is driving civic infrastructure deficits, congestion, carbon, intergenerational inequity and increased vulnerability

Reinforcing Clean Air Plan Principles

Renewable Cities respectfully provides these insights in the interests of advancing renewable, resilient and restorative urban region, and optimistically, informing the Climate Action Committee Work Plan, notably including the recently added priority to be imminently initiated in Q2:

"analysis of how land use will contribute to achieving the greenhouse gas reduction targets"

Renewable Cities is hopeful these insights can support analysis as well as insight, engagement and policy development that helps Metro Vancouver deliver on its targets and the principles laid out in the Clean Air Plan.

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

TransLink Corporate Climate Action Strategy
Invited Presentation to Climate Action Committee, February 11, 2022

SPEAKERS
Ralf Nielsen, Director, Enterprise Sustainability, TransLink
Caitlin Cooper, Project Manager, Regional Transportation Strategy, TransLink

CONTEXT
This presentation is to inform the Committee on the key elements of TransLink's Corporate Climate Action Strategy, work planned for 2022 and how it supports the Regional Transportation Strategy, Transport 2050.

To respond to the climate emergency, TransLink has developed a Corporate Climate Action Strategy focusing on its operations and infrastructure. It has also committed to new climate and GHG reduction targets:

- Achieve net zero GHG emissions by 2050, with an interim reduction of 45% by 2030, from 2010 levels; and,
- Ensure our infrastructure and operations are resilient to the impacts of climate change.

TransLink has outlined a roadmap to net-zero that outlines the investments and projects required to meet its targets. Together with the roadmap, seven key strategies, and 31 actions have been developed:

1. Reduce GHG Emissions
    a. Implement Low Carbon Fleet Strategy
    b. Develop Net Zero Facilities Strategy
2. Adapt to Climate Impacts
    a. Develop Climate Change Adaptation and Resiliency Roadmap
    b. Support a More Climate-Resilient Region and Low Carbon Economy
3. Advance Governance and Funding
    a. Develop and Implement Supporting Climate Policies, Plans, and Processes
    b. Enhance Climate Education and Communication
    c. Secure Funding for Net Zero and Climate Resilience

The Corporate Climate Action Strategy and its implementation support the objectives of Transport 2050, Climate 2050, and a future Regional Resilience Strategy.

Reference:
TransLink's Corporate Climate Action Strategy is available at www.translink.ca/climate

To: Climate Action Committee

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

Date: January 19, 2022 Meeting Date: February 11, 2022

Subject: **2022 Liquid Waste Sustainability Innovation Fund Application**

RECOMMENDATION

That the GVS&DD Board approve the allocation from the Liquid Waste Sustainability Innovation Fund of $270,000 over two years starting in 2022 for Phase 1 of the Biorock: Innovative Building Material for Shoreline Protection, Carbon Sequestration, and Habitat Creation project.

EXECUTIVE SUMMARY

The Climate Action Committee is responsible for overseeing the Sustainability Innovation Funds, and for making all funding recommendations to the respective Boards. Staff assist the Climate Action Committee in reviewing and evaluating all proposals that are submitted for consideration. This report presents Phase 1 of the Biorock: Innovative Building Material for Shoreline Protection, Carbon Sequestration, and Habitat Creation project recommended for funding, totaling $270,000 over two years, which will be funded through the Liquid Waste Sustainability Innovation Fund.

PURPOSE

To present one project recommended for Sustainability Innovation Funding for the Climate Action Committee and the GVS&DD Board's consideration.

BACKGROUND

The Liquid Waste Sustainability Innovation Fund was created by the Board in 2004 to provide financial support to Liquid Waste Services projects that contribute to the region's sustainability. The GVS&DD Board adopted the *Liquid Waste Sustainability Innovation Fund Policy* in 2014, with further amendments in 2016 and 2021, to guide the use and management of the Fund. The Policy describes the process of generating, submitting, evaluating and recommending proposals for funding each year.

The Climate Action Committee is responsible for overseeing the Fund, and for making all funding recommendations to the Board. Staff assist the Climate Action Committee in reviewing and evaluating all proposals that are submitted for consideration.

LIQUID WASTE SUSTAINABILITY INNOVATION FUND POLICY

On an annual basis, Liquid Waste projects are submitted to an internal staff Steering Committee, representing a cross-section of the organization, to evaluate projects and initiatives based on the Fund's evaluation criteria. As defined in the policy, projects need to fulfill the following criteria:

- be overseen by the GVSⅅ
- be consistent with the authority and responsibility of the GVSⅅ
- be consistent with the objectives of the Board Strategic Plan or other Liquid Waste plans as applicable;

- consider partnerships including, but not limited to, member jurisdictions, academic institutions, non-governmental organizations, and community groups;
- result in a positive contribution, in the form of tangible results and/or measurable benefits, to the sustainability of the region;
- demonstrate innovation or a continuous improvement approach.

Annually the Climate Action Committee receives an update report on the projects supported by the Fund including the deliverables, outcomes, and the measurable benefits of these projects to the region's sustainability. A summary of past projects can be found on the Sustainability Innovation Program website (Reference 1).

2022 APPLICATION PROCESS

An internal call for proposals closed on November 5, 2021 and two Liquid Waste proposals were considered by the cross-departmental Sustainability Innovation Fund Steering Committee, composed of representatives from several departments within Metro Vancouver.

The Steering Committee evaluated the submissions and determined that one proposal has strong alignment with promoting regional sustainability and innovation. The proposal recommended for funding by the Steering Committee is listed in the table below with additional detail provided in the executive summary (see Attachment).

Recommended Allocation from the Liquid Waste Sustainability Innovation Fund		
Project Title	**Year**	**Amount Requested**
Biorock: Innovative Building Material for Shoreline Protection, Carbon Sequestration, and Habitat Creation (Phase 1)	2022-2023	$270,000
A biomimicry-inspired mechanism, Biorock uses naturally occurring ingredients in sea water to effectively construct marine structures under water. The process accumulates concrete-like material on a suitably designed frame and continues to grow and strengthen the structure over time. Biorock has been used to produce artificial reefs in other parts of the world.		

ALTERNATIVES

1. That the GVS&DD Board approve the allocation from the Liquid Waste Sustainability Innovation Fund of $270,000 over two years starting in 2022 for Phase 1 of the Biorock: Innovative Building Material for Shoreline Protection, Carbon Sequestration, and Habitat Creation project.

2. That the Climate Action Committee receive for information the report dated January 19, 2022, titled "2022 Liquid Waste Sustainability Innovation Fund Application" and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

If the Board approves Alternative 1, $270,000 for the project will be disbursed from the Liquid Waste Sustainability Innovation Fund over two years. The Fund has sufficient capacity to support Alternative 1.

Approved projects will be incorporated into applicable work plans and budgets.

CONCLUSION

The Liquid Waste Sustainability Innovation Fund was created by the Board in 2004 to provide financial support for Liquid Waste projects that contribute to the region's sustainability. The *Liquid Waste Sustainability Innovation Fund Policy* guides the use and management of the Fund and describes the process of generating, submitting, evaluating and recommending proposals for funding each year. The Climate Action Committee is responsible for overseeing the Fund, and for making all funding recommendations to the GVS&DD Board. Staff assist the Climate Action Committee in reviewing and evaluating all proposals that are submitted for consideration.

This report presents the Steering Committee's recommendation to fund Phase 1 of the Biorock: Innovative Building Material for Shoreline Protection, Carbon Sequestration, and Habitat Creation project over two years.

Additional details of this project are provided in the executive summary (see Attachment). Staff recommend that the Climate Action Committee approve the Steering Committee's recommendation for funding this proposal and forward the recommendation to the GVS&DD Board for consideration. Staff recommendation is presented as Alternative 1.

Attachment

Liquid Waste Sustainability Innovation Fund – Executive Summary *(49482895)*

Reference

http://www.metrovancouver.org/services/air-quality/sustainability-innovation-program/Pages/default.aspx

49331373

Sustainability Innovation Fund: Liquid Waste Services
Executive Summary

Project Name: **Biorock: Innovative building material for shoreline protection, carbon sequestration & habitat creation – Phase 1**

Amount Requested from Sustainability Innovation Fund: $270,000 for Phase 1 (2022-2023)

Purpose:

The purpose of this project is to explore the feasibility of Biorock, an artificial reef material that is grown in situ to provide resilient protection of coastal infrastructure, with the potential to capture carbon from local sea water. Shoreline infrastructure protection and resilience is a concern for critical components of the Metro Vancouver wastewater treatment system that are vulnerable to the effects of climate change, including rising sea level and storm surge.

Biorock is formed by applying low-voltage electric current to a submerged metal skeleton, which induces the deposition of solid calcium carbonate from dissolved carbon dioxide and calcium in sea water (Figure 1), similar to how seashells are formed. A Biorock artificial reef acts as a wave break to reduce forces on ocean-facing hard and soft infrastructure and can create marine habitat. Biorock sequesters carbon in the hard material that is formed, and may further sequester carbon by supporting marine vegetation growth. Expected advantages of Biorock over conventional rock or concrete shore protection include reduced carbon footprint, modularity, self-repairing capability, habitat creation, and reduced environmental impact during installation.

Project Objectives:

Phase 1 will take place over a two-year timeframe, with the following objectives:

- Support research to quantify the local carbon sequestration potential and ecological benefits of Biorock.
- Determine feasibility and develop a design for a Biorock demonstration structure adjacent to Iona Island, including consultation, risk assessment, permitting requirements and cost estimates.

If Phase 1 is successful, Phase 2 will involve fabrication, installation and commissioning of the Biorock demonstration off Iona Island. This SIF application is only for Phase 1. A separate SIF application will be submitted for Phase 2.

Contributions to Regional Sustainability:

Environmental benefits include increased resilience of existing infrastructure to the impacts of climate change, reduced environmental impact of new shore protection installations, and reduced carbon emissions. Biorock installations elsewhere have reduced erosion, created protected ecosystems for marine life, and increased biodiversity. Social/community benefits include development of expertise within the region on alternative coastal infrastructure and educational opportunities for graduate students supported by this project. The project will include opportunities for engagement with Indigenous

communities, neighbours, local environmental groups, and schools. Economic benefits of full-scale installation could include significant savings by extending the lifespan of coastal infrastructure or by providing a lower-cost alternative to traditional shore protection measures. Lifecycle cost comparisons will include the value of carbon set by the *Carbon Price Policy*.

Innovation Element:

This project aims to demonstrate Biorock as a viable alternative shore protection material in coastal BC waters and determine the range of applications within Metro Vancouver. Although Biorock is well established in other areas of the world, the project seeks to identify the regional scalability and economic considerations of this innovative approach to coastal infrastructure. The ecological benefits of Biorock could lead to innovations in local habitat restoration and applied research partnerships.

Tangible Benefits and Outcomes:

Tangible benefits and outcomes of the project are:

- Quantify carbon footprint of Biorock compared to conventional shore protection structures.
- Prepare design, installation, and operational requirements for a demonstration unit through review of ocean conditions including wave energy, tidal impacts and water quality.
- Produce a feasibility study and cost estimate for a demonstration Biorock installation adjacent to Iona Island, and enable an informed Phase 2 application.
- Develop project plan and identify gaps in expertise or partnerships necessary for permitting, construction, installation, and monitoring of a Biorock demonstration in Phase 2.

Members and Other Partners:

Liquid Waste Services staff will lead the project. The project will be advised by Dr. Thomas Goreau of Blue Regeneration. Dr. Goreau is a preeminent Biorock expert with over 30 years' experience directly with the technology inventor and has commissioned numerous installations. Dr. Goreau will provide site assessment, conceptual and preliminary design options, and insight into using this unique material. The project will be completed through a research partnership with Principal Investigator Dr. Kim Juniper of University of Victoria and professor Dr. Alfonso Mucci of McGill University. Dr. Juniper's team will review the formation of Biorock in coastal BC water conditions and quantification of carbon lifecycle. University of Victoria will leverage its allocated SIF funds to seek grants from agencies such as Natural Sciences and Engineering Research Council (NSERC), Mitacs, and others. The scope of work in Phase 1 includes opportunities for engagement with Musqueam, interested municipalities, community groups, and neighbours of Iona Island. Through this, cultural and ecological considerations can be integrated into the design process.

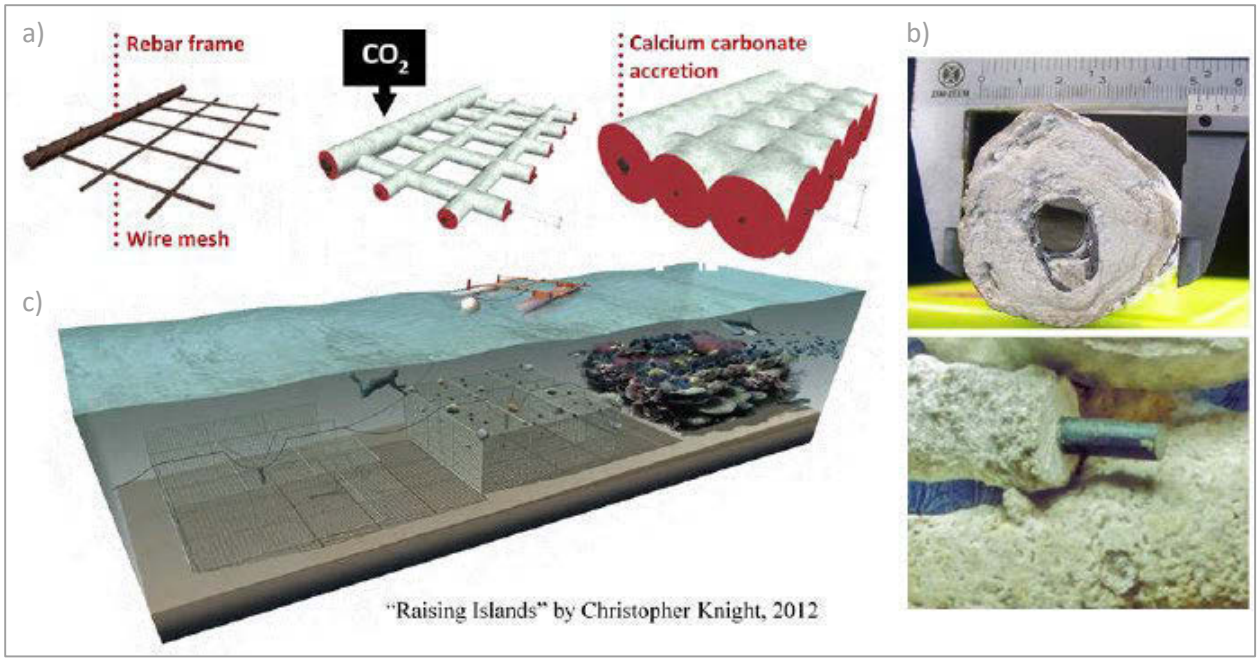

Figure 1. Biorock formation process: a) progression of accretion on the metal scaffold, b) thickness of Biorock on 10 mm rebar after 18 months, c) illustration of Biorock lifecycle in tropical regions for coral reef formation.

To: Climate Action Committee

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

Date: January 10, 2022 Meeting Date: February 11, 2022

Subject: **2022 Regional District Sustainability Innovation Fund Applications**

RECOMMENDATION

That the MVRD Board approve the allocation from the Regional District Sustainability Innovation Fund for the following projects:

a) Showcasing Innovation in Alternative Powered Park Operations and Maintenance Equipment to Reduce Emissions: $35,000 in 2022;
b) Social and Community Data Model – Phase 2: $180,000 over two years starting in 2022;
c) Net Zero Water Technology Accelerator: $175,000 over two years starting in 2022;
d) Integrating greenhouse gases requirements into air emission permits and regulations: $150,000 over two years starting in 2022;
e) Taking out the Trash: Transitioning to Zero-Carbon Heavy Duty Vehicles through Waste Collection Trucks: $400,000 over three years starting in 2022;
f) Metro Vancouver Large Building Retrofit Accelerator: $850,000 over three years starting in 2022;
g) Driving Down Emissions: Working with Key Partners to Develop a Regional Pathway to Accelerate Transportation Emission Reductions: $455,000 over two years starting in 2022; and,
h) Smart Cities: Hyperlocal Air Quality Monitoring: $250,000 over two years starting in 2022.

EXECUTIVE SUMMARY

The Climate Action Committee is responsible for overseeing the Sustainability Innovation Funds, and for making all funding recommendations to the respective Boards. Staff assist the Climate Action Committee in reviewing and evaluating all proposals that are submitted for consideration. This report presents eight projects recommended for funding, totaling $2,495,000 over three years, which will be funded through the Regional District Sustainability Innovation Fund. The projects cover a wide range of climate action areas including reducing transportation and building emissions, improving the air quality monitoring network, growing the region's net zero water technology sector and encouraging alternative powered park operations and maintenance equipment.

PURPOSE

To present eight projects recommended for Sustainability Innovation Funding for the Climate Action Committee and the MVRD Board's consideration.

BACKGROUND

The Regional District Sustainability Innovation Fund was created by the Board in 2004 to provide financial support to Regional District projects that contribute to the region's sustainability. The MVRD Board adopted the *Regional District Sustainability Innovation Fund Policy* in 2014, with further

amendments in 2016 and 2021, to guide the use and management of the Fund. The Policy describes the process of generating, submitting, evaluating and recommending proposals for funding each year.

The Climate Action Committee is responsible for overseeing the Fund, and for making all funding recommendations to the Board. Staff assist the Climate Action Committee in reviewing and evaluating all proposals that are submitted for consideration.

REGIONAL DISTRICT SUSTAINABILITY INNOVATION FUND POLICY

On an annual basis, Regional District projects are submitted to an internal staff Steering Committee, representing a cross-section of the organization, to evaluate projects and initiatives based on the Fund's evaluation criteria. As defined in the policy, projects need to fulfill the following criteria:

- be overseen by the MVRD;
- be consistent with the authority and responsibility of the MVRD;
- be consistent with the objectives of the Board Strategic Plan or other regional district plans as applicable;
- consider partnerships including, but not limited to, member jurisdictions, academic institutions, non-governmental organizations, and community groups;
- result in a positive contribution, in the form of tangible results and/or measurable benefits, to the sustainability of the region;
- demonstrate innovation or a continuous improvement approach.

Annually the Climate Action Committee receives an update report on the projects supported by the Fund including the deliverables, outcomes, and the measurable benefits of these projects to the region's sustainability. A summary of past projects can be found on the Sustainability Innovation Program website.

2022 APPLICATION PROCESS

An internal call for proposals closed on November 5, 2021 and eight Regional District proposals were considered by the cross-departmental Sustainability Innovation Fund Steering Committee, comprised of representatives from a wide variety of departments within Metro Vancouver.

The Steering Committee evaluated the submissions and determined the proposals have strong alignment with promoting regional sustainability and innovation. The proposals recommended for funding by the Steering Committee are listed in the table below with additional detail provided in the executive summaries (Attachment 1).

Recommended Allocation from the Regional District Sustainability Innovation Fund		
Project Title	**Year**	**Amount Requested**
Showcasing Innovation in Alternative Powered Park Operations and Maintenance Equipment to Reduce Emissions	2022	$35,000
Social and Community Data Model	2022-2023	$180,000
Net Zero Water Technology Accelerator	2022-2023	$175,000

Recommended Allocation from the Regional District Sustainability Innovation Fund		
Project Title	**Year**	**Amount Requested**
Integrating greenhouse gases requirements into air emission permits and regulations	2022-2023	$150,000
Taking out the Trash: Transitioning to Zero-Carbon Heavy Duty Vehicles through Waste Collection Trucks	2022-2024	$400,000
Large Building Retrofit Accelerator	2022-2024	$850,000
Driving Down Emissions: Developing a Regional Policy to Reduce Transportation Emissions	2022-2023	$455,000
Smart Cities: Hyperlocal Air Quality Monitoring	2022-2024	$250,000
Total		$2,495,000

ALTERNATIVES

1. That the MVRD Board approve the allocation from the Regional District Sustainability Innovation Fund for the following projects:
   a) Showcasing Innovation in Alternative Powered Park Operations and Maintenance Equipment to Reduce Emissions: $35,000 in 2022;
   b) Social and Community Data Model – Phase 2: $180,000 over two years starting in 2022;
   c) Net Zero Water Technology Accelerator: $175,000 over two years starting in 2022;
   d) Integrating greenhouse gases requirements into air emission permits and regulations: $150,000 over two years starting in 2022;
   e) Taking out the Trash: Transitioning to Zero-Carbon Heavy Duty Vehicles through Waste Collection Trucks: $400,000 over three years starting in 2022;
   f) Metro Vancouver Large Building Retrofit Accelerator: $850,000 over three years starting in 2022;
   g) Driving Down Emissions: Working with Key Partners to Develop a Regional Pathway to Accelerate Transportation Emission Reductions: $455,000 over two years starting in 2022; and,
   h) Smart Cities: Hyperlocal Air Quality Monitoring: $250,000 over two years starting in 2022.

2. That the Climate Action Committee receive for information the report dated January 10, 2022, titled “2022 Regional District Sustainability Innovation Fund Applications” and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

If the Board approves Alternative 1, $2,495,000 for the projects will be disbursed from the Regional District Sustainability Innovation Fund over three years. The Fund has sufficient capacity to support Alternative 1.

Approved projects will be incorporated into the applicable work plans and budgets.

CONCLUSION

The Regional District Sustainability Innovation Fund was created by the Board in 2004 to provide financial support for Regional District projects that contribute to the region's sustainability. The *Regional District Sustainability Innovation Fund Policy* guides the use and management of the Fund and describes the process of generating, submitting, evaluating and recommending proposals for funding each year. The Climate Action Committee is responsible for overseeing the Fund, and for making all funding recommendations to the MVRD Board. Staff assist the Climate Action Committee in reviewing and evaluating all proposals that are submitted for consideration.

This report presents the Steering Committee's recommendation to fund the following project proposals:

- Showcasing Innovation in Alternative Powered Park Operations and Maintenance Equipment to Reduce Emissions
- Social and Community Data Model – Phase 2
- Net Zero Water Technology Accelerator
- Integrating greenhouse gases requirements into air emission permits and regulations
- Taking out the Trash: Transitioning to Zero-Carbon Heavy Duty Vehicles through Waste Collection Trucks
- Metro Vancouver Large Building Retrofit Accelerator
- Driving Down Emissions: Working with Key Partners to Develop a Regional Pathway to Accelerate Transportation Emission Reductions
- Smart Cities: Hyperlocal Air Quality Monitoring

Additional details of each project are provided in the executive summaries (Attachment 1). Staff recommend that the Climate Action Committee approve the Steering Committee's recommendations for funding the proposals and forward the recommendations to the MVRD Board for consideration. Staff recommendations are presented as Alternative 1.

Attachment

1. Regional District Sustainability Innovation Fund Projects – Executive Summaries *(50358975)*

Reference

1. http://www.metrovancouver.org/services/air-quality/sustainability-innovation-program/Pages/default.aspx

49393828

Sustainability Innovation Fund: Regional District
Executive Summary

Project Name: **Regional Parks: Showcasing Innovation in Alternative Powered Park Operations and Maintenance Equipment to Reduce Emissions**

Amount Requested from Sustainability Innovation Fund (SIF):

Project Phases: Event planning early 2022 / Event delivery later 2022 - Total = $35,000

Purpose:

The purpose of this project is to encourage a transition to alternative powered (mainly electric) operations and maintenance equipment. The District will lead and support the initiative by offering commercial equipment vendors an opportunity to spot-light their innovations at a showcase event. Manufactures and suppliers will collaborate at the event with regional and municipal parks operations staff, fleet, procurement and other interested professionals. The ultimate goal is to foster a change in behaviour amongst regional and municipal park operators to increase acceptance and use of emission reducing alternative powered equipment options.

Regional Parks will measure the success of this initiative a couple different ways. First, we will record the number and types of commercial vendors, manufactures and suppliers attending the event. Post-hoc analysis of interest, turnout and the mixture of staff present from member municipalities can inform whether objectives are met. Additionally, Visitor and Operations Services might commission two short surveys following the event. The first survey can solicit feedback from attendees on the relative value of the day. A second survey, intended for operations and maintenance staff, might seek to understand the momentum of transition resulting from the showcase event by analyzing new technology performance and measuring against current Park operation standards, priority tasks and objectives. This survey could attempt to quantify and report on increases in adoption of electric equipment and inform future purchasing by agencies over the next 12 to 24 months.

Project Objectives:

To allow for the demonstration and adoption of innovative electric powered equipment which can be used for operations and maintenance tasks. Legacy objectives of the large one-day showcase event in 2022 include:

- working with member jurisdictions, industry and business groups to develop an awareness about the benefits of zero-emission equipment while showcasing Parks O&M electrical equipment;
- demonstrating the ability of electric powered equipment to “do the job”;
- reducing greenhouse gas and other harmful emissions to support air quality, public health and wellness of Metro Vancouver employees and residents; and
- providing regional leadership to member jurisdictions by encouraging the transition to new and innovative electric technology/equipment options

Contributions to Regional Sustainability:

This project will meet sustainability goals by encouraging the use of electric equipment, thereby reducing harmful emissions and other adverse environmental or social impacts from the use of traditional fossil-fueled powered equipment. This contributes to promoting climate change resilient operational

activities/communities and reduces staff exposure to harmful pollution across the region. This project supports Metro Vancouver's Climate 2050 goals for the region by helping to achieve the target of a 45% reduction in emissions from 2010 levels by 2030 and the goal of becoming a carbon neutral region by 2050. Also, concurrent with the development of the regional climate action strategy, this event will continue efforts to encourage small and medium size businesses to make progress on increasing energy efficiency and reducing their carbon footprints. Allowing for the sharing of results / lessons learned from this event and collaborative analysis amongst partners and a broader audience facing similar challenges will provide an opportunity to enhance sustainable operational and maintenance practices and could have a significant cumulative impact on reducing greenhouse gas emissions across the region.

Innovation Element:

This event will provide a venue where equipment manufacturers and vendors can demonstrate the latest technology in electric equipment that can be used in Parks operations and maintenance settings, and bring together internal work groups / municipal peers that do not customarily collaborate on Parks maintenance practices and the procurement of equipment. It is innovative in the sense that this opportunity will offer public agencies the ability to network with industry for the purpose of gaining familiarity with electric powered equipment or vehicles. Unique aspects of the collaboration will focus on electric equipment which: currently exists, is in the research and development stage, or will soon be offered in the market.

Tangible Benefits and Outcomes:

The tangible benefits and outcomes of this project include providing an opportunity to learn about advanced technology and capabilities of the latest electric equipment. An interactive hands-on showcase experience, for regional and municipal parks staff and vendors, will afford the ability to share findings from the event with a broader audience.

The event will promote options to achieve a healthier/safer work environment for employees at worksites across the region. Worksites with less noise pollution, cleaner air and increased health and wellness when using electric equipment to maintain parks and greenways throughout the region. This project also aligns with Corporate & Departmental plans and principles to provide safe, clean and well maintained facilities to park visitors, and promote positive visitor experiences.

Members and other Partners:

Representatives from Metro Vancouver's 21 member jurisdictions, Electoral Area and Treaty First Nation will be invited to participate in the event, along with agents representing private industry, and potentially academia.

The event may include a partnership with British Columbia Recreation and Parks Association who represent parks agencies from across the Province of BC, and could offer MV Air Quality & Climate Change staff an opportunity to display its clean air exhibit and educate both industry and public sector staff on its Clean Air Plan.

Sustainability Innovation Fund: Regional District Executive Summary

Project Name: Social and Community Data Model – Phase 2

Amount Requested from Sustainability Innovation Fund: $180,000 (2022)

Purpose:

Develop and collect data for the Behaviour Model that will provide an enhanced set of assumptions to be used in the Growth Management and Infrastructure Model. This model will assist with decision making related to future planning and infrastructure investment activities.

Project Objectives:

This project has two main objectives: understanding residential housing and neighborhood choices by conducting a new survey and using survey outcomes to develop the Behavioural Model. This model will then be used to base assumptions for the Growth Management and Infrastructure Model. The model will be a critical regional planning tool in spatial forecasting and identifying future infrastructure investments.

Contributions to Regional Sustainability:

This project will have long term impacts from the environmental/social/economic perspective as the outcomes of this project will provide qualitative assumptions, ultimately creating a more robust scenario modelling tool.

From the modeling perspective, Regional Planning has a very robust database of quantitative data that is used to inform policies; these databases are comprehensive and well maintained. The challenge is with the qualitative - "soft" data. For example, we have "numbers" about inter-municipal migrations (quantitative data), but we would like to know which factors triggered inter-municipal migrations within the region (qualitative data)? We are aware that housing affordability is one of the most important factors for deciding where to live, but we also want to know how other factors influence the decision to live in a certain areas of the region or move to another municipality?

With this type of data, Regional Planning will have an additional data source, which will be qualitative in nature, to frame future regional growth and planning policies. It will help set up assumptions for future population and dwelling unit projections; along with helping to define the urban centre and FTDA's growth targets, currently in the Regional Growth Strategy. This data will enhance the inputs for projections and growth targets, ultimately producing better outputs and information for the region's and Metro Vancouver's utilities and investments in liquid waste, solid waste, and water.

Understanding how people are making choices about housing will impact intra-municipal migration data and this information will assist municipalities in their local growth management and land-use policies.

Innovation Element:

There is a strong innovation element in this project. Metro Vancouver has not invested in similar projects in the past. The Behavioural Model will help regional planning through many aspects: we will better understand what attracts people to live in certain areas, is densification a preferred concept for all age

groups or only work-age population, which age groups prefers to live in urban centres and which ones prefer less dense and peripheral zones, what is the preferred housing type for highly skilled professionals, what is the urban design vision of the student population, where do seniors prefer to live, and what is their preferred housing type, etc. We will also test what walkability means to our residents. Is walkability a critical factor in deciding where to live?

In addition, we would like to obtain the data by socio-economic groups (i.e. urban inners, sub-urban outers, high skilled professionals, students, seniors, etc.) to understand their preferences about location/socio-economics/visual factors (i.e. urban form, walkability, proximity to transit, proximity to facilities, etc.).

Using these data/assumptions, Regional Planning staff will run many different spatial scenarios. One of the important innovations and benefits is the ability to run each scenario in an integrated manner. This means criteria can be aggregated to a specific purpose and be assessed against the "business as usual" scenario (BAU - baseline scenario) that excludes the Behavioral model inputs. Regional Planning will then be able to test the difference between regional growth according to historical trends (BAU scenario) and regional growth based on people's preferences (their vision), creating a very rich data source/trend line.

Overall, this data, and the project as a whole, is important to understanding people patterns across the region. Generally, because it requires significant resources and is costlier to collect, qualitative data is not as widely used in land use modelling scenarios. However, having these assumptions will have a profound impact on how land use designations and region building are undertaken across the Region in the future.

Tangible Benefits and Outcomes:

This project is phased for one year with the following deliverables:

1. Finalize survey questions
2. Select the sampling method that will be used for the survey
3. Conduct the survey
4. Analyze survey results
5. Develop the Behavioural Model

Project results will benefit the Regional Planning and Housing and other Metro Vancouver departments, mainly Parks and Environment, Water Services, and Liquid Waste Services. They will be able to use the behavioural model data independently or as a scenario that is integrated with the land-use model. Moreover, aggregated survey results by municipalities will be an excellent source for municipal partners in framing their local land-use policies.

Members and other Partners:

Metro Vancouver will finance this project, but project outputs will be aggregated geographically to MV sub-regions and municipalities. Therefore, municipalities can be considered partners since they will have strong benefits from this project.

Sustainability Innovation Fund: Regional District Executive Summary

Project Name: Net Zero Water Technology Accelerator

Amount Requested from Sustainability Innovation Fund: $175,000 (2022-2023)

Purpose:

Climate change, drought, population growth, and urbanization pose significant threats to water systems across our planet. The Net Zero Water Technology Accelerator project is aimed at accelerating the Metro Vancouver region's water technology innovation ecosystem to solve global challenges in water systems. In collaboration with Foresight Cleantech Accelerator this project will help firms in the region commercialize, grow, and export their net zero water technologies.

Project Objectives:

The Metro Vancouver region has an opportunity to lead innovation in the water technology space. Working with Foresight's WaterNEXT team, the Net Zero Water Technology Accelerator project will:

- Define the regional specializations in this industry
- Build capacity for net zero applications
- Provide strategic support for Metro Vancouver-based startups, small and medium sized enterprises (SMEs), and service providers
- Host a global showcase of Metro Vancouver net zero water technologies to investors in key markets

Contributions to Regional Sustainability:

This project will advance the capabilities of the region as a hub for water innovation, advancing the sustainability of many of the largest sectors in Canada including utilities, energy, mining, agriculture, and manufacturing. The project is specifically targeting net zero water applications.

Innovation Element:

Innovation and technology has a vital role to play globally in improving water scarcity and safety, water efficiency, utility operations, monitoring and treatment, and data and analytics. Increasingly, there is a greater willingness by investor-owned and public utilities to test, pilot, adopt, and scale promising technologies, such as the remote sensing of water and the internet of things, which enables smart irrigation, water quality control, and water management. (Source: Chloe Oliver Viola, "The future of water: How innovations will advance water sustainability and resilience worldwide", World Bank (dated: June 15, 2020.) The Metro Vancouver region has built-in productive advantages (R&D expertise, public sector procurement and commitment, labour market specializations, capital access, etc.) to develop world-leading specialization in water technology.

This project is specifically aimed at advancing innovation around net zero water technology. The targeted companies are advancing innovation in water tech across many specializations, including filtration and treatment, data and software, as well as monitoring and testing.

Tangible Benefits and Outcomes:

The outcomes of each stage are highlighted below:

Stage 1: Understanding regional specializations and opportunities around net zero

- Invest Vancouver research report detailing regional water technology players, capabilities, strengths, barriers to success, and innovation pathways
- A net zero water toolkit with resources that water technology developers and users can use to inform their planning and communication around water and net zero

Stage 2: Strategic support program for regional net zero water technologies

- A tailored support program targeting approximately 20 companies operating in the region

Stage 3: Global showcase of Metro Vancouver net zero water technologies

- Promotional material marketing the Metro Vancouver region's specializations and assets related to water technology (sector profile, video creation)
- A showcase event to highlight Metro Vancouver net zero water capabilities and companies to technology users and investors in key markets

Each of these stages will bring environmental, social and economic benefits to the region:

Environmental

This project will advance the capabilities of the region as a hub for water innovation, advancing the sustainability of many of the largest sectors in Canada including utilities, energy, mining, agriculture, and manufacturing. The project is specifically targeting net zero water applications.

Social/Community

The advancement of a water innovation ecosystem, and specifically the strategic support program, will help to build the capacity of innovators operating in the water technology space.

Economic/Financial

By advancing the water innovation ecosystem, the Metro Vancouver region is positioning itself as a more attractive place for investment into this key industry. As these firms are able to attract investment and scale up their operations, there will be positive economic benefits for the region at large.

Members and other Partners:

In addition to Foresight, who will be a key project partner, this project will engage:

- Academic institutions as key enablers in the region
- The Invest Vancouver Advisory Committee to provide advice and recommendations on this project
- Potential participation of consul generals from target markets such as the Netherlands and Singapore

Sustainability Innovation Fund: Regional District
Executive Summary

Project Name: **Integrating greenhouse gases requirements into air emission permits and regulations**

Amount Requested from Sustainability Innovation Fund:
$150,000 (Year 1: $75,000; Year 2: $75,000)

Purpose:
Industrial facilities and activities are significant sources of greenhouse gases (GHG) and health-harming air contaminants in the Metro Vancouver region. This project aims to explore innovative approaches to integrate management of greenhouse gas emissions into Metro Vancouver's air permits and emission regulations, which have historically focused on improving regional and local air quality. The project will support foundational actions in the *Clean Air Plan*, the region's 10-year air quality and GHG management plan.

Metro Vancouver has unique delegated authority from the BC Government through the *Environmental Management Act* to manage and regulate the discharge of air contaminants in the region. A Metro Vancouver integrated authorization process to consider impacts from industrial sources of air contaminants, including greenhouse gases, is the key innovation element and a potentially novel concept in Canada and within North America.

Results of this project will inform Metro Vancouver's efforts to coordinate with the provincial government on their permitting and regulatory processes. It will also provide better clarity on permit application review process for industrial facilities and consideration of impacts of their emissions on air quality and the environment. The project will also provide guidance for industrial facilities on Metro Vancouver's air emissions permitting and regulatory processes, specifically on the potential co-benefits and acceptability of trade-offs between greenhouse gases and health-harming air contaminants in permit applications.

Project Objectives:
- Reduce industrial emissions in the region to support Metro Vancouver's *Clean Air Plan*, including greenhouse gas reduction targets that are aligned with the science to keep warming down to 1.5 degrees Celsius.
- Align with *Clean Air Plan* targets for continuous improvement in regional air quality to protect public health and the environment.
- Strengthen collaboration with the BC Government on integrating greenhouse gases into air discharge permits and air emission regulations for industrial facilities and other industrial sources in the Metro Vancouver region.

Contributions to Regional Sustainability:
Environmental
Reducing emissions from industrial facilities and other industrial activities could significantly reduce the region's contribution to global climate change, in alignment with the Metro Vancouver Board's commitments through *Climate 2050* and the *Clean Air Plan*. Reducing emissions of health-harming air

contaminants would also improve regional air quality by helping to reduce the ambient concentration of air contaminants that residents breathe.

Social and Community
The integrated process could help ensure that the implemented emission reductions would provide the most public benefit. This integrated approach could also serve as a model for regulating industrial greenhouse gas emissions for other jurisdictions.

Economic and Financial
An integrated process would provide increased clarity on emissions reduction requirements for industrial facilities in Metro Vancouver. This process could also identify linkages to other impacts such as costs (e.g., new technology/equipment, regulatory fees). Consideration of areas of consistency with potential provincial requirements would also provide clarity for industrial facilities, as well as for regulating agencies.

Innovation Element:
An integrated authorization process that considers impacts from industrial sources of air contaminants, including greenhouse gases, is the key innovation element in this project. Historically, most jurisdictions have considered air quality and greenhouse gas emissions through separate regulatory processes. Developing an approach to consider both issues through a single integrated process, particularly for a regional jurisdiction such as Metro Vancouver, is a potentially novel approach in Canada and within North America, one which could be applied in other jurisdictions.

Tangible Benefits and Outcomes:
1. An assessment of different innovative approaches for integrating greenhouse gases into air permits and emission regulations, including examples used in other jurisdictions, with consideration of how these approaches might apply in an urban area like Metro Vancouver.
2. A recommended mechanism (e.g., new or amended regulation, process flows, standalone guidance) to integrate air quality and greenhouses gases into existing application review processes at Metro Vancouver.
3. Improved informational guidance for industrial facilities on the regulation of both greenhouse gases and health-harming air contaminants.

Members and other Partners:
Metro Vancouver staff will work with the following key partners:

BC Government: Coordination with the BC Government (e.g., Climate Action Secretariat; Ministry of Environment and Climate Change Strategy; Ministry of Energy, Mines and Low Carbon Innovation; and others) could improve the effectiveness of greenhouse gas emission reduction mechanisms for industrial sources in the Metro Vancouver region, while enhancing clarity for industrial facilities.

Government of Canada: Engagement with the Government of Canada (e.g., Environment and Climate Change Canada) could inform the project of planned and current federal regulatory mechanisms. Coordinating with different levels of government could also potentially align processes, which would increase consistency for industrial facilities across different jurisdictions.

Sustainability Innovation Fund: Regional District
Executive Summary

Project Name: **Taking out the Trash: Transitioning to Zero-Carbon Heavy Duty Vehicles through Waste Collection Trucks**

Amount Requested from Sustainability Innovation Fund:
$400,000 (Year 1: $180,000; Year 2: $120,000; Year 3: $100,000)

Purpose:
To identify barriers and opportunities to catalyze the transition of Municipal Solid Waste (MSW) collection vehicles to zero-emission vehicles, and create a scalable transition model for other heavy-duty vehicles (HDV). This project will encourage the procurement of zero-emission HDV by exploring various types of incentives and the consolidation of municipal buying power through a feasibility study, and by factoring in the cost of health and environmental impacts from fossil fuel emissions into the cost-benefit analysis for new vehicles. Based on the broader analysis of costs and benefits, the project will also explore the expansion of federal and provincial grants or subsidies to support the transition of MSW collection fleets to zero-emission technologies, similar to electric light-duty vehicle rebates.

Project Objectives:
This project aims to:

- Reduce health-harming and greenhouse gas emissions from heavy-duty vehicles, including black carbon, carbon dioxide (CO_2), nitrogen oxides (NO_x), and fine particulate matter ($PM_{2.5}$), to support Metro Vancouver's *Clean Air Plan* and *Climate 2050*.
- Fund a feasibility study to support early adoption of zero-emission MSW collection HDV by one or more member jurisdictions, exploring opportunities to partially offset the higher vehicle cost and associated infrastructure for a pilot project. The study will explore opportunities to collaborate with partners that have expertise and interest with the switch to zero-emission technologies.
- Explore the possibility of consolidating the buying power of multiple municipalities, to negotiate with HDV suppliers for several vehicles as part of a potential pilot program.
- Assess the financial and operational feasibility of zero-emission MSW collection HDV and share early learnings on electric or hydrogen technologies with municipalities and the broader HDV sector.
- Leverage Metro Vancouver's ability to convene municipal, regional, provincial, and federal staff to influence greater incentives to reduce emissions from MSW collection HDV through evidence-based consideration of health-harming and greenhouse gas emissions.
- Develop a scalable model to support transition to zero-emission technologies for MSW collection HDV and other publicly-owned or contracted HDV.
- Support the development of potential regulatory requirements for zero-emission MSW HDV and other types of HDV.

Contributions to Regional Sustainability:
This project contributes to regional sustainability through environmental, social and economic benefits.

Environmental: Reduced greenhouse gases and health-harming air contaminants, including black carbon, carbon dioxide (CO_2), nitrogen oxides (NO_x), and fine particulate matter ($PM_{2.5}$). Additionally, this work will assist Metro Vancouver is meeting emission reduction targets set out in the *Clean Air Plan*.

Social: Reduced respiratory and cardiovascular health impacts for residents in the region, along with reduced noise impacts. Public trust in local governments and willingness to reduce emission may increase as we reduce emissions from HDV in local waste collection operations that are visible to residents.

Economic: This project will strengthen the business case to help accelerate the transition to zero-emission MSW collection HDV in the Metro Vancouver region, and will advocate for greater federal and provincial incentives for zero-emission HDV. Additionally, the project will document options to consolidate the buying power of multiple municipalities and Metro Vancouver, to negotiate with truck suppliers and waste haulers for several vehicles as part of the potential pilot project and for future procurement. The project will also explore opportunities to collaborate with partner agencies to encourage investment in the development of zero-emission HDV technology in the region.

Innovation Element:

Zero-emission heavy duty vehicles are considered cutting edge technology. Through discussions with regional fleet managers, Metro Vancouver staff learned that ordering an electric MSW collection vehicle is complex and requires case-specific engineering. Additional demand and incentives for zero-emission MSW collection vehicles are expected to send a signal to manufacturers and lead to an increase in the number of readily available commercial models of zero-emission heavy-duty vehicles.

Tangible Benefits and Outcomes:

- Enhanced understanding of health and environmental benefits that may be realized by adoption of zero-emission technologies for MSW collection HDV
- Improved business case and consolidated buying power for purchasing or contracting of zero-emission MSW collection HDV for Metro Vancouver, municipalities, and other organizations
- Results from the pilot project will document solutions to minimize barriers to zero-emission MSW collection HDV
- Stronger advocacy for federal and provincial incentives to enable the transition to zero-emission HDV more broadly
- Reduced environmental and health impacts through the accelerated transition of MSW collection HDV to zero-emission technologies

Members and other Partners:

1. Member jurisdictions will be included throughout the project to provide insight into the performance requirements for MSW collection HDV. Members, Metro Vancouver departments (Corporate Facilities, Regional Parks, and Housing), and Recycle BC (extended producer responsibility program collecting recyclable materials from residences) will also be invited to a workshop to highlight the current barriers to transitioning to zero-emission MSW collection HDV and potential opportunities to expedite transition of other publicly-owned or contracted HDV to zero-emission technologies. These organizations will ultimately benefit from the information gained through the project.
2. Member jurisdictions will be invited to participate in a feasibility study where Metro Vancouver will partner with one or more member jurisdictions to conduct a trial of zero-emission MSW collection heavy duty vehicles. Metro Vancouver will explore different models to partially offset the increased cost of zero-emission MSW collection HDV and associated infrastructure for this feasibility study.
3. Senior levels of government: Incentives offered by provincial or federal governments may be essential in supporting the transition to zero-emission HDV, especially in the early stages. The results of the cost-benefit analysis study will be shared with senior levels of government, and discussions may address how they can support the transition to zero-emission HDV.

Sustainability Innovation Fund: Regional District
Executive Summary

Project Name: **Metro Vancouver Large Building Retrofit Accelerator**

Amount Requested from Sustainability Innovation Fund (SIF):

$850,000 (Year 1: $275,00, Year 2: $275,000, Year 3: $300,000)

Purpose:

The purpose of this Project is to create and implement a regional Retrofit Accelerator program, which will act as a one stop resource support hub to rapidly increase the number of deep carbon building retrofits undertaken in Metro Vancouver. In order to achieve our target of a 35% reduction in GHGs in the buildings sector by 2030, hundreds of large buildings must complete retrofits and efficiency upgrades every year to greatly reduce building emissions. Many building owners will require support, guidance and resources in order to successfully meet GHG reduction targets for their buildings. The Retrofit Accelerator will support the current gap in services for large building owners, and will be a critical support program, by providing available resources and tailored solutions for building owners to turn to on how best to meet any future regional GHG regulations.

The Project will develop the necessary partnerships, programming, and long-term funding to start a regional Retrofit Accelerator for large buildings. The development of a Retrofit Accelerator responds directly to actions in the *Clean Air Plan* and the *Climate 2050 Buildings Roadmap* to provide energy advisor services for large building owners. This Project will build on the previous work undertaken as part of the SIF funded Strata Energy Advisor Pilot, and will focus on serving large, commercial buildings. It will also provide the opportunity to engage with the buildings sector and support emissions reductions opportunities before potential regulations are introduced.

Project Objective:

The long-term objective of the Retrofit Accelerator project is to create and implement a sustainably funded resource hub with concierge-style energy advisory services to support building owners in decarbonizing the existing regional building stock.

Contributions to Regional Sustainability:

Environmental

The buildings sector contributes to 25% of GHG emissions in the region, primarily from burning natural gas for space and water heating, making it the second largest emission source after transportation. Existing large buildings account for approximately half of all building GHG emissions. The Retrofit Accelerator will target existing large buildings and provide clear pathways to decarbonization.

Social

The Retrofit Accelerator will help building owners access the right information and services, and get ahead of incoming requirements. In many cases, there will be significant upfront costs and resourcing related to shifting towards zero emission and resilient buildings—it is essential that all owners have the access to capital and resources to undertake these retrofits. The Retrofit Accelerator program will ensure that we have a direct line of communication with building owners to hear more about the type of support required

from government and better understand barriers, so that further actions can be identified to ensure that fairness and equity are prioritized.

Economic
A Retrofit Accelerator in Metro Vancouver will play a key role in driving the green buildings economy and will lead to employment and business opportunities in our region. The Project will leverage and connect building owners to existing financial incentives that are currently available through programs like Clean BC or utility-led incentives. It will also serve as a portal for new financing tools such as Property Assessed Clean Energy (PACE) currently under development by the Province.

Innovation Element:

Innovation in the delivery of retrofit solutions will play a central role for building owners to achieve regional climate goals. The increased demand for innovative solutions will create future job opportunities, providing continuous improvement in the sector and decreasing the GHGs emitted from local buildings. World-leading practices in retrofit accelerators—such as the NYC Accelerator program and the TAF Retrofit Accelerator—are fostering innovation in the buildings sector as it moves towards decarbonization.

Tangible Benefits and Outcomes:

The Retrofit Accelerator will result in the following benefits/outcomes:

- Technical support and resources to building owners and managers for monitoring energy performance, and implementing energy efficiency retrofits and upgrades with the objective of achieving deep emissions reductions.
- Sustainable funding model to provide consistent and long-term support to building owners and property managers (i.e. provide technical support and resources for understanding energy performance and implementation of deep carbon retrofits).
- Dedicated staff to secure sustainable funding, administer the resource hub, design and deliver energy advisor programming, and maintain an online presence through a website and outreach materials.

Members and other Partners:

Metro Vancouver will work with the Metro Vancouver Zero Emissions Innovation Centre (ZEIC) to develop and run the Retrofit Accelerator. Additional partners will include the Zero Emissions Building Exchange (ZEBx), and the City of Vancouver. The Retrofit Accelerator will also require Metro Vancouver External Relations support for any associated Metro Vancouver promotional and branding activities. As the program develops, there is a potential to involve other member jurisdictions and utilities as key partners.

Sustainability Innovation Fund: Regional District
Executive Summary

Project Name: **Driving Down Emissions: Working with Key Partners to Develop a Regional Pathway to Accelerate Transportation Emission Reductions**

Amount Requested from Sustainability Innovation Fund: $455,000 (2022 – 2023)

Purpose:

To develop a recommended regulatory and/or pricing pathway to drive deep emission reductions from on-road vehicles in the Metro Vancouver region, for consideration by the Board. The recommended pathway will be based on world-leading approaches and will take into account cost and equity implications for the region. It will also be informed by a deep analysis of the public's perceptions and attitudes toward different regulatory and pricing policies.

Project Objectives:

Conduct research and analysis on regulatory and pricing policies that would accelerate emission reductions from on-road vehicles in the region, leading to a staff-recommended regulatory and/or pricing pathway (either a single policy or a combination of policies). The recommended pathway will be based on a comprehensive evaluation of 3 to 7 regulatory and pricing policies. This evaluation will consider expected emission reductions, equity impacts and exemptions, household and program costs, and other criteria. The initial list of policies (e.g., low emission zones, vehicle emission standards) will be drawn from world-leading jurisdictions and then grounded in the specific Metro Vancouver regional and municipal contexts. The recommended pathway will outline policy design, administration, and enforcement, including the roles of Metro Vancouver, the BC Government and other governments and agencies.

To inform the design and successful implementation of the recommended pathway, this project will include public attitude research such as surveys and focus groups. This research will explore the public's awareness of vehicle emission policies, how they perceive fairness and balance tradeoffs in transportation, and their level of support for different regulatory and pricing policies. Household archetypes will be used to understand how different regulatory and pricing policies could impact different households. The project will also identify the supportive programs (e.g., rebates, electric vehicle charging infrastructure, transit expansion) needed to respond to cost and equity impacts, as well as other barriers that cannot be directly addressed through the design of the recommended pathway.

This project is part of the implementation of several transportation-related Big Moves in Metro Vancouver's recently adopted *Clean Air Plan* and *Climate 2050 Transportation Roadmap*. The recommend pathway will help achieve the 2030 target to reduce greenhouse gas emissions from passenger vehicles by 65%, and Metro Vancouver's science-based commitment to become a carbon neutral region by 2050.

Contributions to Regional Sustainability:

Environmental

On-road vehicles (passenger and commercial vehicles) are a dominant source of both greenhouse gases and health-harming air contaminants (e.g., diesel particulate matter, nitrogen oxides) in the Metro Vancouver region. The recommended pathway will reduce the transportation sector's contribution to regional greenhouse gas emissions and improve regional air quality and public health, by accelerating the

uptake of low and zero emission vehicles, increasing the use of renewable fuels, and shifting suitable trips to lower emission modes (e.g., cycling/transit instead of driving, rail/marine instead of trucking).

Social and Community
The recommended pathway will likely encourage more residents to travel by foot, bike, and transit, reducing their transportation costs and generally improving their health. Evaluation of the policies will consider equity impacts to ensure that all residents and businesses continue to have access to affordable transportation options in the region, including residents who cannot avoid driving. The accelerated emission reductions could also help reduce the higher air quality impacts that are experienced by residents living near major roads.

Economic and Financial
A core component of the regulatory and pricing policies evaluated through this project will be a cost mechanism that provides an incentive to reduce emissions, either as the primary tool or as fines for non-compliance. The regulatory and pricing policies will be evaluated based on the impacts and distributions of costs, along with the supportive policies needed to minimize cost burdens on residents and businesses. Some of the policies could have substantial economic and financial co-benefits, for example by reducing lost worker productivity and cost of goods transportation due to traffic congestion, and by reducing the need to expand highways or other transportation infrastructure.

Innovation Element:

The recommended pathway could position Metro Vancouver as a leading jurisdiction in advancing transportation climate policy. The region and the Province have a strong foundation of leading climate policies and programs targeting vehicle emissions (e.g., provincial targets for the sale of new zero emission vehicles). However, a more ambitious regulatory and/or pricing pathway is needed for the region to meet regional and provincial climate targets. The project will consider the region's unique regulatory landscape and equity concerns, while drawing from the best and most innovative policies from jurisdictions that target significantly reduced vehicle emissions.

Tangible Benefits and Outcomes:

The key project deliverable will be a report outlining a recommended regulatory and/or pricing pathway that fairly and equitably reduces regional emissions from on-road vehicles, along with a summary of the policy evaluation and public attitudes research. Staff will seek direction from the Board on implementation. If the Board-selected pathway centres around a new Metro Vancouver air emission regulation, staff would conduct engagement on the selected pathway with the public, member jurisdictions and other stakeholders prior to bringing forward a proposed regulation for Board consideration. Alternatively, if the Board-selected pathway would be implemented by other governments, such as the BC Government, staff will seek Board direction to advocate to and work with the appropriate governments on implementation.

Members and other Partners:

The project complements and supports policy directions in the Metro Vancouver *Regional Growth Strategy*, TransLink's *Transport 2050*, the City of Vancouver's Transport Pricing initiative, and the Clean Transportation Action Plan that the BC Government is developing as part of the *CleanBC* climate plan. All the regulatory and/or pricing pathways considered by the project will require collaboration between multiple governments and other organizations. This project is expected to bring together key partners including TransLink, member jurisdictions, and the BC Government.

Sustainability Innovation Fund: Regional District
Executive Summary

Project Name: **Smart Cities: Hyperlocal Air Quality Monitoring**

Amount Requested from Sustainability Innovation Fund: $250,000 over two years

Purpose:

Emerging low-cost consumer-grade air quality monitoring technology has become extremely popular in recent years. Combining dozens of these consumer-grade, lower quality air sensors with Metro Vancouver's regulatory air quality monitoring network would create a hyperlocal, block-level understanding of air quality trends. Hyperlocal monitoring could help identify impacts from major transportation routes and industrial emitters, inequities in air quality experienced at the neighbourhood level, the efficacy of emission reduction strategies and a better understanding of localized health outcomes related to air quality.

Project Objectives:

The Lower Fraser Valley Ambient Air Quality Network Review, completed in 2021, recommended that consumer-grade air sensor technology be integrated into the Lower Fraser Valley Ambient Air Quality Monitoring Network. The new Clean Air Plan also outlines a number of issue areas which will be supported by more enhanced air quality monitoring capabilities.

This project will allow staff to assess emerging monitoring technologies and design a monitoring system that can ingest, in real-time, significantly more data than is already being processed. Currently, the Air Quality Monitoring Network produces over half a million data points every day, and integrating consumer-grade air sensors will require appropriate infrastructure, including database architecture, communication handling, on-the-fly quality control, network status information and data analytics. Development of a reporting tool showing near real-time of the data will also be a key consideration of the project.

Staff will also develop a critical understanding of how these types of air sensors operate and the methods and procedures for deploying similarly dense networks across the region. Understanding the feasibility, resources and logistics of installing a system like this will facilitate planning for future installations. Consumer-grade air sensors will continue to gain popularity and it is important staff has experience using these types of monitors. This project will identify options for how hyperlocal networks can be used in the region, which could include a framework where Metro Vancouver provides oversight/guidance and data analytics support while a member municipality installs and operates a hyperlocal network.

Contributions to Regional Sustainability:

Regional Environment Benefits:

- Increased ability to identify new and existing emission sources.
- Improve understanding of air quality on a neighbourhood scale which will aid in addressing equity considerations as part of the Clean Air Plan.

Social/Community Benefits:

- Enhance the current regulatory monitoring network by providing a neighborhood level understanding of air quality.

- Supports more direct engagement with residents by increasing Metro Vancouver's visibility in the community and providing measurements very close to where people live.
- Potential identification of previously overlooked emission sources and/or exposure to degraded air quality in certain areas.
- Community cohesion – build healthy and committed air-conscious communities.

Economic/Financial Benefits:

- A hyperlocal air quality monitoring network will allow staff to better respond to air quality concerns in a community and provide evidence to create/modify/enforce air quality policy.

Innovation Element:

Consumer-grade air sensors are not part of the regulatory air quality monitoring network in Metro Vancouver. While the regulatory monitoring network provides world-class coverage for our region, supplementing this data with high spatial resolution data can aid in pinpointing specific sub-regional areas of concern related to air quality.

This project will involve a significant increase in the amount of data being handled in real time and will require the deployment of "big data" analysis techniques to produce on-the-fly information that is relevant for the community and staff.

Tangible Benefits and Outcomes:

- A real-time data visualization tool which integrates Metro Vancouver's regulatory monitoring with the hyperlocal air quality monitoring network. This will be used by staff to monitor the status of the network and the measurements of air quality from the air sensors.
- Initial feasibility assessment of how a data visualization tool could become a public display of air quality data from the hyperlocal network.
- A roadmap for installing hyperlocal systems in other parts of the region, including budgeting and time considerations and infrastructure requirements. This will also identify various configuration options for a hyperlocal network, including consideration of how many air sensors to deploy, where in a given region to place them and what local air quality concerns would benefit from a hyperlocal network.
- Strengthen partnerships with health authorities, local governments, and other organizations concerned about air quality.
- Enhance awareness of air quality in the work, play, and live environments of communities.
- Increase understanding of localized air quality variations that can better inform land use planning.

Members and other Partners:

There is considerable interest in higher spatial resolution air quality monitoring in the region. Project partners could include:

- Metro Vancouver member jurisdictions that are advancing Smart Cities technologies
- Academic institutions, including UBC's iREACH Lab (Integrated Research in Energy, Air, Climate and Health)
- Health Authorities (Vancouver Coastal Health and Fraser Health)
- Environment and Climate Change Canada's National Air Pollution Surveillance program

To: Climate Action Committee

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

Date: January 10, 2022 Meeting Date: February 11, 2022

Subject: **2022 Water Sustainability Innovation Fund Applications**

RECOMMENDATION

That the GVWD Board approve the allocation from the Water Sustainability Innovation Fund for the following projects:

a) 10-year Salmon Enhancement Action Plan: $180,000 over two years starting in 2022;
b) Hydrological Models for the Capilano and Seymour Watersheds: $750,000 over three years starting in 2022;
c) Digital Transformation of Water Transmission System Planning & Analysis: $950,000 over three years starting in 2022;
d) Feasibility Study to Optimize Transmission System Energy Use: $350,000 over two years starting in 2022;
e) Regional Equity and Affordability of Drinking Water: $550,000 over three years starting in 2022; and,
f) New Technology for the Determination of E.Coli in Recreational Water to Enhance Public Safety: $200,000 over two years starting in 2022.

EXECUTIVE SUMMARY

The Climate Action Committee is responsible for overseeing the Sustainability Innovation Funds, and for making all funding recommendations to the respective Boards. Staff assist the Climate Action Committee in reviewing and evaluating all proposals that are submitted for consideration. This report presents six projects recommended for funding, totaling $2,980,000 over three years, which will be funded through the Water Sustainability Innovation Fund. The projects cover a wide range of climate action areas including habitat protection, energy use and the equity and affordability of drinking water.

PURPOSE

To present six projects recommended for Sustainability Innovation Funding for the Climate Action Committee and the GVWD Board's consideration.

BACKGROUND

The Water Sustainability Innovation Fund was created by the Board in 2004 to provide financial support to Water projects that contribute to the region's sustainability. The MVRD Board adopted the *Water Sustainability Innovation Fund Policy* in 2014, with further amendments in 2016 and 2021, to guide the use and management of the Fund. The Policy describes the process of generating, submitting, evaluating and recommending proposals for funding each year.

The Climate Action Committee is responsible for overseeing the Fund, and for making all funding recommendations to the Board. Staff assist the Climate Action Committee in reviewing and evaluating all proposals that are submitted for consideration.

WATER SUSTAINABILITY INNOVATION FUND POLICY

On an annual basis, Water projects are submitted to an internal staff Steering Committee, representing a cross-section of the organization, to evaluate projects and initiatives based on the Fund's evaluation criteria. As defined in the policy, projects need to fulfill the following criteria:

- be overseen by the GVWD;
- be consistent with the authority and responsibility of the GVWD;
- be consistent with the objectives of the Board Strategic Plan or other Water plans as applicable;
- consider partnerships including, but not limited to, member jurisdictions, academic institutions, non-governmental organizations, and community groups;
- result in a positive contribution, in the form of tangible results and/or measurable benefits, to the sustainability of the region;
- demonstrate innovation or a continuous improvement approach.

Annually the Climate Action Committee receives an update report on the projects supported by the Fund including the deliverables, outcomes, and the measurable benefits of these projects to the region's sustainability. A summary of past projects can be found on the Sustainability Innovation Program website.

2022 APPLICATION PROCESS

An internal call for proposals closed on November 5, 2021 and seven Water proposals were considered by the cross-departmental Sustainability Innovation Fund Steering Committee, comprised of representatives from a wide variety of departments within Metro Vancouver.

The Steering Committee evaluated the submissions and determined the proposals have strong alignment with promoting regional sustainability and innovation. The proposals recommended for funding by the Steering Committee are listed in the table below with additional detail provided in the executive summaries (Attachment 1).

Recommended Allocation from the Water Sustainability Innovation Fund		
Project Title	**Year**	**Amount Requested**
10-year Salmon Enhancement Action Plan	2022-2023	$180,000
Hydrological Models for the Capilano and Seymour Watersheds	2022-2024	$750,000
Digital Transformation of Water Transmission System Planning & Analysis	2022-2024	$950,000
Feasibility Study to Optimize Transmission System Energy Use	2022-2023	$350,000
Regional Equity and Affordability of Drinking Water	2022-2025	$550,000
New Technology for the Determination of E.Coli in Recreational Water to Enhance Public Safety	2022-2023	$200,000

Recommended Allocation from the Water Sustainability Innovation Fund		
Project Title	**Year**	**Amount Requested**
Total		$2,980,000

ALTERNATIVES

1. That the GVWD Board approve the allocation from the Water Sustainability Innovation Fund for the following projects:
   a) 10-year Salmon Enhancement Action Plan: $180,000 over two years starting in 2022;
   b) Hydrological Models for the Capilano and Seymour Watersheds: $750,000 over three years starting in 2022;
   c) Digital Transformation of Water Transmission System Planning & Analysis: $950,000 over three years starting in 2022;
   d) Feasibility Study to Optimize Transmission System Energy Use: $350,000 over two years starting in 2022;
   e) Regional Equity and Affordability of Drinking Water: $550,000 over three years starting in 2022; and,
   f) New Technology for the Determination of E.Coli in Recreational Water to Enhance Public Safety: $200,000 over two years starting in 2022.

2. That the Climate Action Committee receive for information the report dated January 10, 2022, titled "2022 Water Sustainability Innovation Fund Applications" and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

If the Board approves Alternative 1, $2,980,000 for the projects will be disbursed from the Water Sustainability Innovation Fund over three years. The Fund has sufficient capacity to support Alternative 1.

Approved projects will be incorporated into the applicable work plans and budgets.

CONCLUSION

The Water Sustainability Innovation Fund was created by the Board in 2004 to provide financial support for Water projects that contribute to the region's sustainability. The *Water Sustainability Innovation Fund Policy* guides the use and management of the Fund and describes the process of generating, submitting, evaluating and recommending proposals for funding each year. The Climate Action Committee is responsible for overseeing the Fund, and for making all funding recommendations to the GVWD Board. Staff assist the Climate Action Committee in reviewing and evaluating all proposals that are submitted for consideration.

This report presents the Steering Committee's recommendation to fund the following project proposals:

- 10-year Salmon Enhancement Action Plan
- Hydrological Models for the Capilano and Seymour Watersheds
- Digital Transformation of Water Transmission System Planning & Analysis

- Feasibility Study to Optimize Transmission System Energy Use
- Regional Equity and Affordability of Drinking Water
- New Technology for the Determination of E.Coli in Recreational Water to Enhance Public Safety

Additional details of each project are provided in the executive summaries (Attachment 1). Staff recommend that the Climate Action Committee approve the Steering Committee's recommendations for funding the proposals and forward the recommendations to the GVWD Board for consideration. Staff recommendations are presented as Alternative 1.

Attachment

1. Water Services Sustainability Innovation Fund Projects – Executive Summaries *(50317771)*

Reference

1. http://www.metrovancouver.org/services/air-quality/sustainability-innovation-program/Pages/default.aspx

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Sustainability Innovation Fund: Water Services
Executive Summary

Project Name: **Metro Vancouver 10-year Salmon Enhancement Action Plan**

Amount Requested from Sustainability Innovation Fund: $180,000 (2022)

Purpose:

This SIF project will develop a Metro Vancouver 10-year Salmon Enhancement Action Plan to coordinate and integrate corporate salmon enhancement activities to maximize salmon populations and increase salmon viability despite the impacts of development, climate change, and Metro Vancouver operations. This project will seek First Nations participation from the start to shape the scope and direction of the 10-year action plan. Metro Vancouver members and salmon-focused agencies and organizations will also be engaged.

Metro Vancouver has a number of departments/functions (Water, Regional Parks, Liquid Waste, Liquid Waste, Regional Planning and Housing) that promote or support salmon and habitat enhancements. Several departments/functions provide services or support development that may have the potential to impact salmon and salmon habitat (Liquid Waste, Water, Regional Planning and Housing, Solid Waste, Facilities, Housing, Fleet).

Project Objectives:

Enhanced salmon habitat and salmon populations through a coordinated and integrated Metro Vancouver 10-year Salmon Enhancement Action Plan with a regular reporting process (frequency and scope to be determined). Please note that Water Services currently provides annual reporting to the Water Committee on Water Services Fisheries Initiatives.

Contributions to Regional Sustainability:

A 10-year action plan will support salmon populations within Metro Vancouver's corporate operations, with a focus on increasing salmon sustainability and resilience to the impacts of development and climate change.

Innovation Element:

While great work has been implemented over decades, current salmon enhancements are conducted on a site or project basis without a coordinated and integrated corporate vision or plan. This project will coordinate, integrate and accelerate corporate salmon enhancement projects.

This project also provides an opportunity to engage First Nations within the region to help develop the scope and direction for Metro Vancouver's coordinated corporate salmon enhancement plan and have an ongoing role as the plan develops.

Tangible Benefits and Outcomes:

The primary outcome is a Metro Vancouver 10-year Salmon Enhancement Action Plan that will include:

- Assessment of the current salmon habitat, salmon-related facilities, partnerships, and "salmon productivity" (i.e. salmon populations supported) managed or directly supported by Metro Vancouver functions
- Assessment of the creeks and areas that would benefit the most from restoration for "salmon productivity" and identification of opportunities by priority
- Framework and actions, both planned and opportunistic, for Metro Vancouver to work in a coordinated and integrated manner both internally and with partners
- Recommendations on monitoring and assessing the success of enhanced salmon habitat, facilities, and programs
- Recommendations on water quality monitoring to assist with salmon habitat and population improvements

In addition, the following benefits will be realized through this project:

- Enhanced opportunities to work with the region's First Nations on Indigenous knowledge and cultural understanding of salmon and stewardship
- Enhanced ecosystem (not just for salmon, but a wide range of species) health and resilience to the impacts of Metro Vancouver operations, development and climate change
- More opportunities to engage the public on salmon and ecosystem protection

Members and other Partners:

This project will provide opportunities to engage with First Nations within the region, Metro Vancouver member jurisdictions, provincial and federal agencies, post-secondary institutions, and salmon-focused stewardship groups.

Sustainability Innovation Fund: Water Services
Executive Summary

Project Name: **Hydrological Models for the Capilano and Seymour Watersheds**.

Amount Requested from Sustainability Innovation Fund: $750,000 (2022 – 2024)

Purpose:
To develop, build and calibrate hydrological models, for the Capilano and Seymour watersheds, to predict reservoir inflows, ensure a reliable water source for the region, make forecasts, and effectively monitor long-term climate change scenarios.

Project Objectives:
This project builds on a previously approved two-phased SIF project utilizing LIDAR data for snowpack monitoring. This two-phased project will:

- Carry out a feasibility study to identify data and modeling gaps and opportunities, and detail the requirements (and performance specifications) for an in-house, comprehensive, integrated, and learning hydrological model. This groundwork sets up the data storage and interface layers for improving near-time forecasts of water discharges from these two source water reservoirs.
- Following option selection and recommendations for a suitable model structure, the second phase will procure, build, calibrate, test, validate and implement the necessary infrastructure and model components to full operability.

Contributions to Regional Sustainability:
The project aligns with the direction of the *Board Strategic Plan* by contributing towards our regional role in emergency response, and strengthening the drinking water system's resiliency and adaptability to climate change. Effective working relationships with key stakeholders will be enhanced as adaptation measures are integrated into regional water system planning and management.

The developed hydrological model will strengthen watershed management by identifying potential risks to source water quantity and quality in a timely fashion. This ensures the sustainable provision of clean and safe water which is a key strategy of the *Drinking Water Management Plan* and a key benefit of *Metro Vancouver's Joint Water Use Plan*.

The development of an in-house hydrological model contributes to Metro Vancouver's fiscal, social, and environmental objectives by:

- enhancing Water Services' capability to predict climate change impact assessments on inflow, available storage, and water releases from the source-water reservoirs;
- informing investment decisions on the optimization of existing facilities and the construction of new facilities.

Innovation Element:
As the 100th anniversary of GVWD nears, this will be the first time for Metro Vancouver to build in-house comprehensive hydrological models for its watersheds. The project embraces the latest in data science

and model development to advance the management of a valuable resource. These models will increase the productivity and efficiency of watershed management, and hydrological analyses functions. The in-house models enable the integration of various water source-side functionalities, operations, forecasting, and reporting requirements.

Tangible Benefits and Outcomes:

Tangible benefits and outcomes from the project reach every aspect of the water utility.

- A predictive tool that Metro Vancouver can use to make short and long-term planning decisions for source water availability and storage, water supply management, regional water conservation, and future infrastructures upgrades.
- The capability to perform hydrological simulations and projections at any time utilizing in-house resources will save procurement time and costs.
- The model will set up conditional baselines and measure, track and monitor climate changes for the future, and boost mitigation and adaptation efforts.
- Enhanced sharing and visualization capabilities enable real-time data to be efficiently and reliably utilized for regional planning and emergency management and safety programs.
- The developed and integrated data layers, and the hydrological model outputs to the existing Capilano and Seymour hydraulic models will be an integral part of the Artificial Intelligence (AI) based source water reservoir operational outflow forecasting system.

Members and other Partners:

This project relies on cross-functional and inter-departmental collaborations for success. Water Services PPA will lead this project with IT support. Other WS divisions include WEM, O&M TSS, while the Air Quality and Climate Change division are also identified as major project partners.

The project will build and grow existing external partnerships and collaborations with agencies including the provincial Climate Related Monitoring Program (CRMP), the Water Management Branch, and The National Lab for Coastal & Mountain Meteorology Prediction and Services West Division's ARkSuperStorm project. Expertise will be resourced from local academia, WRF, NSERC, and the private consulting fraternity, as well as other potential collaborators.

Member jurisdictions within the watershed zones, and First Nation communities, as well as other interest groups, could be included in determining the functional requirements through the ERL and Indigenous Relations teams at Metro Vancouver. Member jurisdictions with their own water supply sources for potable water supply such as source lakes (e.g. Eagle Lakes in District of West Vancouver) or well fields may be consulted to share their experiences regarding any hydrological model applications for annual or seasonal inflow or water yield prediction.

Sustainability Innovation Fund: Water Services
Executive Summary

Project Name: **Digital Transformation of Water System Planning & Analysis (Smart Water Network Foundations)**

Amount Requested from Sustainability Innovation Fund: $950,000 (2022 to 2024)

Purpose:
To develop an up-to-date water transmission model using the newly adopted software, InfoWater Pro, and implement a Data Analysis Platform integrated with the model to analyze data, predict system performance, and develop patterns, KPIs and dashboards.

Project Objectives:
The project's objective is to develop an analysis and decision-making tool for water system planning and operation and to implement a data analysis platform in conjunction with the model, which will integrate and utilize historical and live data for predictive analysis, developing performance metrics, and data visualization dashboards. This project forms the foundation of the Corporation's water transmission dynamic digital twin (real-time model) that meets and exceeds current industry best practices in infrastructure planning and operation.

Contributions to Regional Sustainability:
The project aligns with several directions of the *Board Strategic Plan* including the theme of system stewardship. It embraces innovation in the delivery of Metro Vancouver services contributing to the region's resilience and prosperity. It also contributes to financial stability through data-driven decision-making for optimizing capital and operational investments in the water transmission system.
The project supports the *Drinking Water Management Plan* goals to ensure efficient, reliable and sustainable supply of drinking water. By providing reliable predictions of system performance under various future scenarios, identifying and optimizing improvement projects, and deferring non-critical upgrades, the hydraulic model enables proactive and sustainable management of the water transmission infrastructure.

Innovation Element:
The up-to-date digital representation (model) of the water transmission system provides a robust, industry-aligned and progressive analysis and decision-making tool for system planning and operation. The Data Analysis Platform, integrated with the model, will enable proactive and predictive decision making with sharable results (data, metrics and KPIs) across divisions and utility functions. This tool will also provide new opportunities for collaboration, engagement, and data sharing with member jurisdictions.

Tangible Benefits and Outcomes:
The up-to-date digital model in conjunction with the Data Analysis Platform will analyze data, predict system performance, and develop patterns, KPIs and dashboards providing new opportunities for

collaboration and data sharing with member jurisdictions. As an example and included in this project is a seasonal water consumption index that compares actual consumption against an average consumption baseline which can be reported on the Metro Vancouver dashboard. This will raise public awareness and can be combined with water conservation messaging and advertisements.

Together with the Data Analysis Platform, the digital representation of the water transmission system will form the backbone of Metro Vancouver's water system dynamic digital twin. This will be a major step towards the digital transformation of system planning and analysis.

The longer-term and wider-ranging benefits include:

- Improved conservation and management of water resources and efficiency gains in operations and construction.
- Improved water planning and analytical capabilities for faster, accurate and data-driven decisions, daily and in the long-term.
- Increased capital efficiency and optimization of capital projects' size and timing ensuring sustained long-term affordability of the regional water system.
- Increased resiliency in response to changes in climate, demographics, demands, and regulatory requirements by predicting water system performance under varying future scenarios and reducing service disruptions.

Members and other Partners:

This project is largely internal and relies on cross-functional and inter-departmental collaborations for success. Water Services PPA will lead this project and IT and WS O&M are identified as major project partners. ERL will be included for communication and media messaging. Subject matter expertise may be needed and drawn from the Water Research Foundation expert panels. Member jurisdictions will be engaged throughout the project to provide relevant water system information required for modelling, such as demand distribution.

Sustainability Innovation Fund: Water Services
Executive Summary

Project Name: **Feasibility Study to Optimize Energy use in the WS Transmission System**

Amount Requested from Sustainability Innovation Fund: $350,000 (2022-2023)

Purpose:
This project will investigate options to reduce MV's purchase of electricity from BC Hydro by optimizing operations of the transmission system and investigating alternative lower-carbon energy sources to power high-energy-demand operations.

Project Objectives:
The overall long-term objective of this project is to work towards producing drinking water more sustainably. This will be achieved by:

- Producing drinking water more efficiently by reducing the energy use intensity (GJ/ML); and
- Reducing Water Services overall energy use to meet Metro Vancouver's 2050 Climate Change Plan.

Contributions to Regional Sustainability:
This project supports the aims of the *Board Strategic Plan* for financial stability by reducing energy purchases and providing a more financially stable drinking water system.

This project also aligns with MV's *Climate 2050 Strategic Framework* by working towards the target of reducing greenhouse gas emissions by 45% of the 2010 levels, by 2030.

Finally, this work aligns with MV's *Corporate Energy Management Policy*, stating MV commits to continuously improve energy performance in its operations.

Innovation Element:
Through this project, benchmarking WS' energy use will establish a baseline for measuring continuous improvements in energy consumption across the system. New operational processes for individual facilities will be recommended as well as an analysis of the transmission system as a whole to identify operational improvements.

Through the second phase of the project, the business case for the development of innovative alternative lower-carbon energy sources to power WS' operations, including innovative solutions to use the resources already available to MV.

Tangible Benefits and Outcomes:

The following deliverables will be developed through this project:

- Recommendations for optimizing operations at high-energy demand facilities, including:
  - Operational review of high-energy-demand facilities.
  - Energy use benchmarking at the high-energy-demand facilities.
  - Operation optimization recommendations.
  - Analysis of recommendations against previous year's data to provide measurable and demonstrated improvements.
- The business case for implementing alternative energy sources, including:
  - Feasibility review of alternative energy.
  - Business Case Development including a triple bottom line analysis of the short-listed options.

The benefits include

- Identifying strategies to reduce energy costs and reliance on BC Hydro sources.
- Reducing the costs of water services contributes to affordability and the overall liveability of the region.
- Reduced greenhouse gas emissions for improved environmental conditions and air quality within the region and province.
- Developing baseline trends and energy performance metrics to support ongoing system and operational performance.

Members and other Partners:

This project will work with BC Hydro to determine the feasibility of installing low-carbon energy sources at the Coquitlam dam. Local research centers such as the Clean Energy Research Centre from UBC have been identified as possible partners. Additional expertise and guidance can be drawn as needed from the Water Research Foundation and the previous energy management work completed by the LWS Department.

Sustainability Innovation Fund: Water Services
Executive Summary

Project Name: **Regional Equity and Affordability of Drinking Water**

Amount Requested from Sustainability Innovation Fund: $550,000 (2022-2024)

Purpose:

To ensure regional drinking water supply remains sustainable, equitable and affordable amid the challenges of rising utility and household costs, a post-pandemic recovery, and climate and demographical changes.

Project Objectives:

The project will:

- Review existing regional water rate design and structure, policies and processes, water billing and collection efficacies, affordability practices and policies, income-related demographic and household data, and identify common issues, trends and gaps and areas for improvement.
- Investigate the principles and key drivers behind rate designs and structures, affordability policies, across the utility sectors (water, wastewater, electricity, gas, telecommunications), and from selected locations.
- Identify innovations and sustainable metrics that could be beneficial to the region now and into the future.
- Determine whether the region has a water equity and/ or affordability issue and whether an assistance policy or program is needed, and make recommendations.
- Prepare a guideline on developing appropriate pricing and rate structures, building on the 2019 *Residential Water Metering in Metro Vancouver - Best Practices Guide for Local Governments*.

Contributions to Regional Sustainability:

The project supports the aims of the *Board Strategic Plan* and the *Drinking Water Management Plan*. It strengthens our region by ensuring financial sustainability and fostering collaboration and engagement. The information from the study will improve impact-driven decision-making and optimize capital and operational infrastructure spending. It helps the region prepare for changing climate and demographic conditions and by building resiliency. The project supports the initiatives to increase residential water metering and contributes towards sustainable use of drinking water. It can also guide member jurisdictions on their water rate designs and billing programs, and water conservation efforts.

Innovation Element:

The project aims to utilize the latest data science and analytics tools to process and visualize the data. It will also review tariff design and structures across utilities and geographies, identify innovative practices and make suitable recommendations for implementation within the region.

Tangible Benefits and Outcomes:

The data and results from this study will:

- Provide a post-pandemic regional review of water rate designs and structures of Metro Vancouver and member jurisdictions, identify gaps and make recommendations for improvement.
- Confirm or reveal correlations between socioeconomic and demographic realities and water billing and collections, water rates design and structure, and water consumption.
- Help to determine whether the region has water affordability and equity issues and advise whether an assistance policy or program is needed.
- Inform the development of a guideline for member jurisdictions to use when designing water rates and structures, billing and collection programs.

Members and other Partners:

There are partnering and collaboration opportunities with the Natural Sciences and Engineering Research Council (NSERC), the Social Sciences and Humanities Research Council (SSHRC) and the Water Research Foundation (WRF) to utilize their expert panels and knowledge base.

Member jurisdictions will be engaged throughout to support the project by providing data and information on water rate design, billing and collections, equity and affordability within their jurisdictions.

Internal collaborations with Metro Vancouver departments and divisions (Invest Vancouver, External Relations, Regional Planning) are critical to project success. It is also possible that Legal Services and Indigenous Relations will be engaged to improve project understanding of consumer law and water rights.

Sustainability Innovation Fund: Water Services
Executive Summary

Project Name: **New Technology for the Determination of E. coli in Recreational Water to enhance Public Safety**

Amount Requested from Sustainability Innovation Fund: $200,000 (2022 – 2023)

Purpose:
To incorporate Quantitative Polymerase Chain Reaction (qPCR) testing into Metro Vancouver's water quality testing program.

Project Objectives:
The project studies the potential for Metro Vancouver to include the qPCR testing technique in the water quality monitoring programs. It aims to standardize the implementation of qPCR testing for monitoring recreational water quality at regional beaches.

Contributions to Regional Sustainability:
The project supports the aims of the *Board Strategic Plan* for Regional Parks Services and Liquid Waste Services. It also aligns with goals and strategies of the *Regional Parks Plan*.

By reducing the number of days that beaches are closed throughout the summer, the project promotes a well-maintained natural environment and positive visitor experiences, community engagement and well-being. This in turn improves public perception of the regional beaches and water bodies.

Through more accurate determination of the source of the contamination, a more robust approach to mitigating the contamination can be implemented to protect the natural environment in the future.

Reducing the number of days that the beaches are closed benefits businesses that rely on the beaches to attract their customers, i.e. rental companies, restaurants, and recreational groups.

Innovation Element:
The qPCR testing technique is widely used in all areas of biological science. This project studies whether it is beneficial to bring it into the water quality testing program.

The outcomes support organizational improvement and enhance public safety, while increasing collaboration within Metro Vancouver and with other agencies.

Tangible Benefits and Outcomes:

This project looks to continuously improve the beach monitoring program through reducing the turn around time between sampling and testing, beach closure and reopening. Since 2011, the average number of days of beach closures is approximately 14 days per season, mostly due to longer turn around times when using current testing and analysis methods. Existing methods require a minimum of 18 hours to provide reliable results, whereas the qPCR will shorten the turn around time to 3 hours.

The new testing procedures will improve accuracy and reduce delays when identifying the source of the contamination and will enable proactive elimination of common sources. This would assist staff to better manage the sources of contamination (and potentially identify an unknown source of concern) and limit the number of beach closures within the region.

The improved testing and monitoring program will improve cleanliness at the beaches, improve reputation of regional beaches and increase public use and wellness.

Once the qPCR testing procedures are confirmed and incorporated into the water quality testing program, appropriate training and equipment needs will be identified and procured improving regional testing services.

Members and other Partners:

Within Metro Vancouver, staff from Water Services Interagency Projects & Quality Control (IPQC) will partner with Liquid Waste Services Environment Management and Quality Control (EMQC) for this project.

Testing services for qPCR techniques and samples need to be confirmed; however, an existing partnership with the British Columbia Centre of Disease Control (BCCDC) will be used extensively for this study.

metrovancouver
SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Climate Action Committee

From: Nav Hundle, Senior Policy and Planning Analyst
Jason Emmert, Program Manager, Climate Policy
Parks and Environment Department

Date: January 27, 2022 Meeting Date: February 11, 2022

Subject: **Alignment between MoveUP Proposal and Metro Vancouver *Climate 2050 Buildings Roadmap***

RECOMMENDATION

That the MVRD Board direct staff to engage with the Canadian Office and Professional Employees Union (MoveUP) as part of the implementation of the *Climate 2050 Buildings Roadmap,* to seek opportunities for collaboration related to their proposal titled "Capitalizing on Retrofitting Opportunities for Greenhouse Gas Emissions Reductions and Job Creation".

EXECUTIVE SUMMARY

At its January 14, 2022 meeting, the Climate Action Committee received an invited presentation titled "Capitalizing on Retrofitting Opportunities for GHG Emission Reductions and Job Creation" from the Canadian Office and Professional Employees Union ("MoveUP").

Buildings are the second largest source of greenhouse gas emissions in the region, contributing about 25% of total GHGs. The MoveUP proposal seeks to establish a new provincial agency with a focus on retrofitting existing buildings and reducing GHG emissions. Responding to the Committee's direction to staff to analyze the alignment of the proposal with the *Climate 2050 Buildings Roadmap,* staff note that there is good alignment but are recommending further engagement with MoveUP to refine the proposal and seek opportunities to build it into the existing workplan for building retrofits.

PURPOSE

To provide an analysis of the proposal from MoveUP, and its alignment with the *Climate 2050 Buildings Roadmap*, as directed by the Climate Action Committee

BACKGROUND

At the January 14, 2022 Climate Action Committee meeting, the Committee received an invited presentation from the Canadian Office and Professional Employees Union ("MoveUP"), which outlined a proposal to develop a provincial agency established for better coordination of retrofitting residential, commercial, industrial and government buildings (Attachment 1). Following the presentation, the Climate Action Committee made the following resolution:

> *That the Climate Action Committee direct staff to review the alignment between the MoveUP proposal, as presented at the January 14, 2022 meeting in the delegation from David Black, MoveUP, and the Climate 2050 Buildings Roadmap.*

This report responds to that direction.

ALIGNMENT BETWEEN MOVEUP PROPOSAL AND *CLIMATE 2050 BUILDINGS ROADMAP*

Low and zero emissions buildings are key to meeting the science-based regional greenhouse gas (GHG) emission reduction targets of 45% by 2030 and carbon neutral by 2050. The *Climate 2050 Buildings Roadmap* has identified building sector targets of 35% reduction in GHG emissions by 2030 (from 2010 levels), and all buildings to be zero emissions in their operation, deriving all energy needs from 100% clean and renewable sources by 2050. Metro Vancouver's *Carbon Neutral Region Modeling* study (Reference 3) identified decarbonization of the region's existing building stock as a primary driver to achieve deep emission reductions in the buildings sector. Achieving these reductions will require retrofitting most of our existing buildings over the next few decades.

MoveUP Proposal

MoveUP is Local 378 of the Canadian Office and Professional Employees Union and is affiliated with the BC Federation of Labour, the Canadian Labour Congress, and provincial labour councils (Reference 1) . MoveUP represents over 12,000 union members with values related to building a just and inclusive society. They work with communities to bring awareness to elected government officials and the public on the benefits of unions for the economy.

MoveUP's presentation recognized the GHG reduction actions available for new buildings, but emphasized the urgency to reduce GHG emissions from existing buildings while ensuring an equitable lens is applied in the implementation of retrofits to ensure job creation, and improving affordability. MoveUP requested "a commitment from Metro Vancouver to work together to continue to develop the proposal to ensure it meets local needs and ultimately seek provincial support for the proposal to move forward on its implementation."

The MoveUP proposal identifies a number of key challenges and opportunities to scaling up building retrofits that could be addressed through a coordinated approach. Some of the challenges include the need for building sector training, technical advisor and retrofit support services for building owners, coordinated funding and financial support, and outreach and awareness-raising of the support available to building owners. The proposal noted the significant opportunities for job and economic growth and the ability to address the equitable distribution of costs and benefits through a more coordinated approach.

Related Actions in *Climate 2050 Buildings Roadmap*

Staff have identified many of these same challenges and opportunities through previous Metro Vancouver projects and initiatives (e.g., Strata Energy Advisor Pilot, Home Energy Labelling Project). Metro Vancouver will be further addressing many of these challenges and taking advantage of these opportunities as part of the implementation of the actions in the *Climate 2050 Buildings Roadmap.*

Some examples of actions from the Metro Vancouver *Climate 2050 Buildings Roadmap,* that directly address some of the issues raised in the MoveUP proposal include:

> 2.3 *New Financing Tools for Low Carbon Upgrades* - Work with member jurisdictions, BC Government, Government of Canada, energy utilities and other partners to develop strategic financing tools for home and building owners to accelerate low carbon building upgrades

2.4 *Building Decarbonization Coalition* - Work with governments, energy utilities, construction industry, academic institutions, non-governmental organizations and other regional partners to develop a Building
Decarbonization Coalition.

2.5 *Energy Advisor Services for Homes and Large Buildings* - Work with the BC Government and the buildings industry to enhance energy advisor services for home and building owners energy advisor services for home and building owners.

2.8 *Training and Education in Zero Emissions and Resilient Buildings* - Work with industry stakeholders and other governments to ensure industry training and certification meets the growing market demand for zero emissions and resilient building design, technology, installation and operation, for both new builds and retrofits of existing buildings

The Retrofit Accelerator project proposed as part of the Sustainability Innovation Fund applications for 2022, which was the subject of Report 5.1 in the Committee's February meeting agenda, is one of the initial projects to begin implementation of these actions.

Opportunities for Further Collaboration and Alignment

A number of approaches will be needed to address the issues raised in the MoveUP proposal. The establishment of a new provincial utility focused on GHG emission reductions and efficiency from buildings may be part of a more coordinated retrofit approach, but requires further discussions with key stakeholders and the Province to understand how this approach fits with other approaches. Staff are recommending to continue to engage MoveUP, as well as the Province, and other key stakeholders on the merits of establishing a new provincial agency focused on GHG emission reductions and efficiency from buildings and how it fits with other related initiatives.

ALTERNATIVES

1. That the MVRD Board direct staff to engage with the Canadian Office and Professional Employees Union (MoveUP) as part of the implementation of the *Climate 2050 Buildings Roadmap,* to seek opportunities for collaboration related to their proposal titled "Capitalizing on Retrofitting Opportunities for Greenhouse Gas Emissions Reductions and Job Creation".

2. That the Climate Action Committee receive for information the report titled, "Alignment between MoveUP Proposal and Metro Vancouver Climate 2050 Buildings Roadmap", dated January 27, 2022, and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

Under Alternative 1, staff time to engage with MoveUP and other agencies can be accommodated within approved budgets pertaining to work on implementation of the *Climate 2050 Buildings Roadmap*.

CONCLUSION

The challenges and opportunities raised in the MoveUP proposal, as presented at the January 14, 2022 Climate Action Committee meeting, are the focus of several key actions in the *Climate 2050 Buildings Roadmap*. Staff recommend Alternative 1, to engage MoveUP to further develop their

proposal related to GHG emissions reductions and efficiency improvements through building retrofits. Refinement of the proposal would also lead to engagement with the Province and other key stakeholders on the merits of establishing a new provincial agency focused on the key aspects of the proposed program. Given the alignment with the *Climate 2050 Buildings Roadmap*, there is potential to integrate the MoveUP initiative as a topic of discussion for the regional Buildings Decarbonization Coalition, as well as part of the Retrofit Accelerator program, pending approval of the Sustainability Innovation Fund application for that project.

Attachment

"Capitalizing on Retrofitting Opportunities for GHG Emission Reductions and Job Creation" (proposal summary), MoveUP, dated January 14, 2022 *(50551465)*

References

1. https://moveuptogether.ca/about-us/
2. Climate 2050 Buildings Roadmap
3. Modelling a Carbon Neutral Metro Vancouver Region

50510825

Capitalizing on Retrofitting Opportunities for GHG Emission Reductions and Job Creation

Speakers

David Black, President and Norman Gludovatz, Director of Communications, MoveUP: the Movement of United Professionals

Details

MoveUP proposes the creation of a provincial agency to coordinate retrofitting for residential, commercial, industrial and government buildings. The proposal addresses the urgent need to reduce GHG emissions emanating from existing buildings in the province, by applying a social equity lens that creates jobs and opportunities for communities with lower levels of labour market participation, and improves affordability for low-income families.

Long-standing concerns about the volume of GHG emissions from residential, commercial, industrial and public buildings have not led to consensus on an approach; however, multi-jurisdictional research highlights a number of strategies that effectively incentivize action on the shared challenge and maximize effectiveness of public investment.

MoveUP seeks a commitment from Metro Vancouver to work together to continue to develop the proposal to ensure it meets local needs and ultimately seek provincial support for the proposal to move forward on its implementation.

To: Climate Action Committee

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

Date: January 28, 2022 Meeting Date: February 11, 2022

Subject: **Manager's Report**

RECOMMENDATION
That the Climate Action Committee receive for information the report dated January 28, 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.

Per direction from the Committee at the January meeting, 2 items have been added to the work plan as follows:

- analysis of how land use will contribute to achieving the greenhouse gas reduction targets, especially for transportation, 2nd quarter
- update on ecological health initiatives, 2nd quarter

The first item was added in response to discussion related to two delegations received by the Committee in January. Reporting back on analysis related to land use and GHG reduction targets has been added for the 2nd quarter, coinciding with the draft *Climate 2050 roadmap* for land use and growth management. The connection between land use, the regional growth strategy *Metro 2050*, and *Climate 2050* was discussed at the MVRD Board meeting on January 28. Regional Planning staff will be providing a report on the relationship between *Metro 2050*, *Climate 2050*, the *Clean Air Plan* and *Transport 2050* at the February Regional Planning Committee. This report will be provided to the Climate Action Committee for information.

Staff were also requested to refer the information from one of the delegations, related to the regional growth strategy amendment bylaw pertaining to South Campbell Heights in the City of Surrey, to Regional Planning staff and report back to the Climate Action Committee. The information has been referred, and staff to staff discussions are ongoing. At the MVRD Board meeting on January 28, the matter was referred back to staff for further discussion.

TransLink's Regional Transportation Strategy, Transport 2050
On January 27, 2022, the Mayor's Council and TransLink board approved *Transport 2050*. *Transport 2050* is a comprehensive regional transportation strategy, with strategies and actions outlined for local governments, Metro Vancouver, TransLink, the Provincial and Federal Governments as well as for the private sector, community organizations and academia. The strategy was developed with

close collaboration from staff at Metro Vancouver, and is well aligned with the *Climate 2050 Transportation Roadmap*, *Clean Air Plan*, and *Metro 2050*. Staff will continue to work together through the implementation of these plans.

TransLink has identified several implementation priorities for 2022, including a focus on the *Transport 2050* action to eliminate greenhouse gas emissions from passenger vehicles in the region by 2050 and reduce emissions by 65% by 2030 – a target adopted in alignment with the *Climate 2050 Transportation Roadmap*. Staff from TransLink and Metro Vancouver are developing coordinated work plans to ensure the region meets these targets. Additional priorities include TransLink's corporate *Climate Action Strategy*, also released in January 2022, which was the subject of an invited presentation in the Committee's February meeting agenda, and the development of a new *10-Year Vision* document, which will guide all investment decisions after 2022.

Metro Vancouver Zero Emission Innovation Centre (ZEIC) Update

At its meeting on January 14, 2022, the Climate Action Committee received an update on the Metro Vancouver Zero Emission Innovation Centre (ZEIC), advising that the documents to meet the "readiness requirements" for Low Carbon Cities Canada (LC3) had been received by Federation of Canadian Municipalities and that ZEIC was expecting to receive the federal endowment early in 2022. The endowment was received on January 31, 2022, with FCM transferring $21.3M to ZEIC. Staff will now work with the Investment Committee on the procurement process to engage a fund manager, and aims to bring forward a recommendation to the ZEIC Board in Q2 2022.

ZEIC continues to make good progress in its establishment as a new organization and is working now to bring on staff and build partnerships to launch program activities by Q2. Key priorities for ZEIC in 2022 include (1) securing charitable status, (2) engagement within the region to understand needs, opportunities and how ZEIC may best support and help accelerate climate action (3) strategic planning to identify priority focus areas, and (4) delivering programs related to green buildings and the Women for Climate mentorship initiative.

In addition, at its January meeting the ZEIC Board unanimously approved the recommendation to integrate the Zero Emissions Building Exchange (ZEBx) with ZEIC. This integration will enable ZEIC to more rapidly deliver impactful programs and activities related to the decarbonization of buildings at a regional scale.

Air Quality Monitoring Study at Tsleil-Waututh Nation's Burrard Inlet IR 3 Lands

Metro Vancouver has completed a report (see Reference) on an air quality monitoring study conducted at Tsleil-Waututh Nation's Burrard Inlet Indian Reserve No. 3 Lands (Tsleil-Waututh Reserve Lands) located within the District of North Vancouver, approximately three kilometres east of the Ironworkers Memorial Bridge on the north shore of Burrard Inlet. The study was initiated by Metro Vancouver to gain a better understanding of sulphur dioxide (SO_2) levels in the area and contributing emissions sources such as the nearby oil refinery and marine vessels. Sulphur dioxide is an air pollutant that is emitted when sulphur-containing fuels are burned, and has both health and environmental effects. Exposure to SO_2 can cause people with lung conditions such as asthma to experience breathing problems, and is linked with increases in hospital admissions.

Metro Vancouver's Mobile Air Quality Monitoring Unit (MAMU) was located at Tsleil-Waututh Reserve Lands in 2018 and 2019 and measured air contaminants that are known to have effects on human health and the environment including sulphur dioxide, nitrogen dioxide, ground-level ozone, carbon monoxide, fine particulate matter, and black carbon. Results showed that air contaminant levels at the Tsleil-Waututh Reserve Lands were below (i.e., better than) Metro Vancouver's ambient air quality objectives, with the exception of fine particulate matter during a wildfire smoke event in the summer of 2018, when air quality was impacted throughout the region. Overall, Tsleil-Waututh Reserve Lands experienced some of the lowest average levels of all the contaminants measured during the study compared to other parts of the region.

The highest SO_2 concentrations at the Tsleil-Waututh Reserve Lands occurred when high winds were blowing from the direction of the oil refinery. Information about emissions from the refinery was obtained to determine if there was any association with concentrations of SO_2 measured at the Tsleil-Waututh Reserve Lands. The highest SO_2 concentrations were not associated with flaring events, but rather a single wind event that occurred at a time when the sulphur recovery unit (SRU) experienced higher than normal emissions. However, the highest 1-hour SO_2 concentration measured at the Tsleil-Waututh Reserve Lands was 34 ppb which was below Metro Vancouver's air quality objective of 70 ppb.

The oil refinery has a requirement in its permit to install at least one air quality monitoring station on the North Shore for continuous monitoring of sulphur dioxide, fine particulate matter ($PM_{2.5}$) and inhalable particulate matter (PM_{10}), as well as wind speed and direction. Metro Vancouver operates three permanent air quality monitoring stations on the North Shore: North Vancouver-Second Narrows, North Vancouver-Mahon Park and Horseshoe Bay. A fourth station is proposed for the Norgate community in North Vancouver in advance of Metro Vancouver's new North Shore Wastewater Treatment plant.

Attachment
Climate Action Committee 2022 Work Plan

Reference
Air Quality Monitoring Study at Tsleil-Waututh Nation's Burrard Inlet IR 3 Lands

50324773

Climate Action Committee 2022 Work Plan
Report Date: January 28, 2022

Priorities

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

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