metrovancouver
SERVICES AND SOLUTIONS FOR A LIVABLE REGION

METRO VANCOUVER REGIONAL DISTRICT
CLIMATE ACTION COMMITTEE

REGULAR MEETING

Friday, February 12, 2021
1:00 p.m.
28th Floor Boardroom, 4730 Kingsway, Burnaby, British Columbia

REVISED AGENDA[1]

1. ADOPTION OF THE AGENDA

1.1 February 12, 2021 Regular Meeting Agenda
That the Climate Action Committee adopt the agenda for its regular meeting scheduled for February 12, 2021 as circulated.

2. ADOPTION OF THE MINUTES

2.1 January 15, 2021 Regular Meeting Minutes
That the Climate Action Committee adopt the minutes of its regular meeting held January 15, 2021 as circulated.

3. DELEGATIONS

4. INVITED PRESENTATIONS

Withdrawn **4.1 Alex Boston, Executive Director, Renewable Cities**
Subject: Developing the Metro Vancouver LC3 (Low Carbon Cities Canada) Organization

5. REPORTS FROM COMMITTEE OR STAFF

5.1 *Climate 2050* Discussion Paper on Energy
That the Climate Action Committee receive for information the report dated January 20, 2021, titled "*Climate 2050* Discussion Paper on Energy".

5.2 Assessment of the Fossil Fuel Non-Proliferation Treaty Initiative
That the MVRD Board:
a) endorse the call for a Fossil Fuel Non-Proliferation Treaty as presented in the report dated January 20, 2021, titled "Assessment of the Fossil Fuel Non-Proliferation Treaty Initiative"; and

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

b) send letters urging the Canadian and BC governments to support the global initiative for a Fossil Fuel Non-Proliferation Treaty.

5.3 2021 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) Assessment of Carbon Capture Technology in the Metro Vancouver Region: $200,000 over two years starting in 2021;
b) Lights, Camera, Climate Action: $200,000 over two years starting in 2021;
c) Sharing Data for Zero Emission Buildings (SDZEB): $200,000 over two years starting in 2021;
d) Responding to the Climate Emergency: Enhanced Stakeholder Engagement: $200,000 over two years starting in 2021;
e) Social and Community Data Land Use Model: $60,000 in 2021;
f) Regional Land Use Assessment: $200,000 over two years starting in 2021;
g) Housing Retrofit Evolution – Pembina Institute Reframed Initiative: $200,000 over two years starting in 2021;
h) Managing Capacity and Reducing Emissions: Real-time Parking Availability in Regional Parks: $300,000 over three years starting in 2021;
i) Natural Asset Management in Regional Parks: $160,000 over two years starting in 2021; and,
j) Promoting Peatland Recovery in Areas Affected by Wildfire in Burns Bog Ecological Conservancy Area: $199,000 over two years starting in 2021.

5.4 2021 Water Sustainability Innovation Fund Applications

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

a) Building Information Modeling (BIM): Transforming Utilities Information Management: $800,000 over two years starting in 2021;
b) Microplastics Study in Source Waters and Water Treatment: $150,000 over two years starting in 2022;
c) Next Generation Snowpack Monitoring, Phase 2: $400,000 over two years starting in 2021;
d) Visual Documentation of Key Water Services Infrastructure: $700,000 over two years starting in 2022; and,
e) Industrial, Commercial & Institutional Sector Migration – Impact on Water Services: $150,000 over two years starting in 2021.

5.5 Hydrothermal Processing Demonstration Facility – Additional Sustainability Innovation Fund Funding Request

That the GVS&DD Board approve additional funding of $6.13 million from the Liquid Waste Sustainability Innovation Fund for the Hydrothermal Processing Biofuel Demonstration Facility.

5.6 Endorsement of Host Society for the Howe Sound Ocean Watch Action Committee
That the MVRD Board endorse the Howe Sound Biosphere Region Initiative Society as the host society for the Ocean Watch Action Committee**.**

5.7 Manager's Report
That the Climate Action Committee receive for information the report dated January 22, 2021, titled "Manager's Report".

6. INFORMATION ITEMS

6.1 Correspondence re: Ride Hailing, from Office of the Minister, Ministry of Transportation and Infrastructure, to MVRD Board Chair Sav Dhaliwal, dated January 22, 2021.

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 12, 2021.

Membership:

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

METRO VANCOUVER REGIONAL DISTRICT
CLIMATE ACTION COMMITTEE

Minutes of the Regular Meeting of the Metro Vancouver Regional District (MVRD) Climate Action Committee held at 1:02 p.m. on Friday, January 15, 2021 in the 28th Floor Boardroom, 4730 Kingsway, Burnaby, British Columbia.

MEMBERS PRESENT:
Chair, Councillor Adriane Carr, Vancouver
Vice Chair, Councillor Sav Dhaliwal, Burnaby
Councillor Petrina Arnason*, Langley Township
Chief Ken Baird*, Tsawwassen
Councillor David Hocking*, Bowen Island
Councillor Dylan Kruger*, Delta
Director Jen McCutcheon*, Electoral Area A
Councillor Jessica McIlroy*, North Vancouver City (departed at 2:05 p.m.)
Mayor Ron McLaughlin*, Lions Bay
Councillor Allison Patton*, Surrey
Councillor Zoe Royer*, Port Moody
Councillor Harold Steves*, Richmond
Councillor Ahmed Yousef*, Maple Ridge

MEMBERS ABSENT:
Councillor Laura Dupont, Port Coquitlam

STAFF PRESENT:
Roger Quan, Director, Air Quality and Climate Change, Parks and Environment
Lauren Cichon, Legislative Services Coordinator, Board and Information Services

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

1. ADOPTION OF THE AGENDA

1.1 January 15, 2021 Regular Meeting Agenda

It was MOVED and SECONDED
That the Climate Action Committee adopt the agenda for its regular meeting scheduled for January 15, 2021 as circulated.

CARRIED

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

2. ADOPTION OF THE MINUTES

2.1 November 13, 2020 Regular Meeting Minutes

It was MOVED and SECONDED
That the Climate Action Committee adopt the minutes of its regular meeting held November 13, 2020 as circulated.

CARRIED

3. DELEGATIONS

3.1 Ruth Simons, Project Lead, Howe Sound Biosphere Region Initiative Society

Ruth Simons spoke to members providing an update on the Howe Sound Biosphere Region Initiative and its progress regarding the nomination to become Canada's 19th UNESCO Biosphere Region, and is with UNESCO for consideration.

Members were provided with a presentation on the UNESCO nomination, and the Ocean Watch program.

Presentation material titled "Howe Sound Biosphere Reserve" is retained with the January 15, 2021 Climate Action Committee agenda.

A member commented on Metro Vancouver's involvement and ways to express support, for the initiative.

It was MOVED and SECONDED
That the Climate Action Committee direct staff to report back at the February meeting, with an assessment of Metro Vancouver's potential involvement and representation in the Ocean Watch initiative.

CARRIED

4. INVITED PRESENTATIONS

No items presented.

5. REPORTS FROM COMMITTEE OR STAFF

5.1 2021 Climate Action Committee Priorities and Work Plan

Report dated January 4, 2021, from Roger Quan, Director, Air Quality and Climate Change, Parks and Environment Department, providing the Committee with the priorities and work plan for the year 2021.

Members were provided with a presentation on the Committee's Terms of Reference and priorities.

Presentation material titled "2021 Priorities and Work Plan" is retained with the January 15, 2021 Climate Action Committee agenda.

Discussion ensued on the importance of the roadmaps, and on the need for updates on cannabis processing issues.

It was MOVED and SECONDED
That the Climate Action Committee endorse the work plan as presented in the report dated January 4, 2021, titled "2021 Climate Action Committee Priorities and Work Plan".

CARRIED

5.2 Update on Establishing the Metro Vancouver Region Low Carbon Cities Canada (LC3) Centre

Brad Badelt, Assistant Director, Sustainability, City of Vancouver, Conor Reynolds, Division Manager, Air Quality and Climate Change Policy, and Ann Rowan, Division Manager, Collaboration and Engagement, Metro Vancouver, provided members with a presentation on the Metro Vancouver Region's Low Carbon Cities Canada (LC3) Centre highlighting the goals, background, sites, establishment, and next steps.

Presentation material titled "Establishing a Low Carbon Cities Canada (LC3) Centre" is retained with the January 15, 2021 Climate Action Committee agenda.

2:05 p.m. Councillor Jessica McIlroy departed the meeting.

5.3 Alternative Fuel and Recyclables Recovery Interim Processing Strategy

Report dated January 6, 2021 from Paul Henderson, General Manager, Solid Waste Services, together with report dated January 6, 2021 from the Zero Waste Committee requesting to seek input from the Climate Action Committee prior to bringing the report forward to the GVS&DD Board for approval.

Members were provided with a presentation on the Alternative Fuel and Recyclables Recovery Project highlighting Metro Vancouver's solid waste system, maximizing waste reduction and recycling, small waste load composition, processing, and climate benefits.

Presentation material titled "Alternative Fuel and Recyclables Recovery Project" is retained with the January 15, 2021 Climate Action Committee agenda.

Discussion ensued on emission control systems and reductions, recycling of materials, radius of transportation of transferring materials, timeframe of the project, siting considerations, and how to dispose household items including toxicity concerns.

It was MOVED and SECONDED
That the Climate Action Committee receive for information the report dated January 6, 2021, titled "Alternative Fuel and Recyclables Recovery Interim Processing Strategy".

CARRIED

5.4 Manager's Report

Report dated January 4, 2021, from Roger Quan, Director, Air Quality and Climate Change, Parks and Environment Department, provided members with an update on the following:

- Virtual Attendance at 2021 Standing Committee Events
- Resilient Region Strategic Framework
- Member Jurisdiction Climate Adaptation Planning
- Federal Climate Action Planning
- *Clean Air Plan* and *Climate 2050*
- Metro Vancouver's Wood Stove Exchange Program
- UBC Odour and Health Research Study

It was MOVED and SECONDED

That the Climate Action Committee receive for information the report dated January 4, 2021, titled "Manager's Report".

CARRIED

6. INFORMATION ITEMS

6.1 Correspondence re: recommendations that would help BC rapidly transition to a sustainable economy and advance the goal of net-zero carbon emissions, dated November 9, 2020, from Dr. Janis Sarra, Professor of Law, University of British Columbia to The Honourable John Horgan, Premier of British Columbia.

Request of Staff

Staff were requested that the correspondence dated November 9, 2020, from Dr. Janis Sarra, Professor of Law, University of British Columbia to The Honourable John Horgan, Premier of British Columbia, be posted to the Board Network.

7. OTHER BUSINESS

No items presented.

8. BUSINESS ARISING FROM DELEGATIONS

No items presented.

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 15, 2021.

CARRIED

(Time: 2:49 p.m.)

_____ _____

Lauren Cichon,
Legislative Services Coordinator

Adriane Carr, Chair

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To: Climate Action Committee

From: Nicole Chan, Project Engineer, Parks and Environment Department

Date: January 20, 2021 Meeting Date: February 12, 2021

Subject: ***Climate 2050* Discussion Paper on Energy**

RECOMMENDATION

That the Climate Action Committee receive for information the report dated January 20, 2021, titled "*Climate 2050* Discussion Paper on Energy".

EXECUTIVE SUMMARY

In October 2019, the MVRD Board directed staff to begin an engagement process for a series of issue area discussion papers to support developing the *Climate 2050 Roadmaps*. Staff have developed a draft discussion paper on climate change issues related to energy, including ways to reduce greenhouse gas emissions and adapt to a changing climate. This discussion paper will support public, stakeholder and government engagement for *Climate 2050* and the upcoming updates to the *Drinking Water Management Plan*, *Solid Waste Management Plan* and the *Liquid Waste Management Plan*. The draft *Climate 2050* Discussion Paper on Energy is being presented to the Climate Action Committee for information, and feedback provided will be incorporated into the final paper and associated engagement process.

PURPOSE

To provide the Climate Action Committee with information about the *Climate 2050* Discussion Paper on Energy to support development of the *Climate 2050 Roadmaps*.

BACKGROUND

Climate 2050 is an overarching long-term strategy that will guide our region's policies and collective actions to transition to a carbon neutral and resilient region over the next 30 years. Metro Vancouver is implementing *Climate 2050* through ten issue area Roadmaps, which will describe long-term goals, targets, strategies and actions to reduce regional greenhouse gases and ensure that this region is resilient to climate change impacts. Implementation of the Roadmaps will be driven by Metro Vancouver's management plans and other policies, including the upcoming updates to the *Drinking Water Management Plan, Solid Waste Management Plan* and the *Liquid Waste Management Plan*.

On October 4, 2019, the MVRD Board directed staff to begin an engagement process for a series of issue area discussion papers to support developing the *Climate 2050 Roadmaps*. Discussion papers for buildings, industry, transportation, agriculture, nature and ecosystems, waste management, and water and wastewater infrastructure were presented to the Climate Action Committee and MVRD Board in 2019 and 2020.

This report presents the draft *Climate 2050* Discussion Paper on Energy (see Attachment), which will support engagement on greenhouse gas reduction and climate adaptation.

ENERGY DISCUSSION PAPER

The *Climate 2050* Discussion Paper on Energy includes long-term goals (i.e., with expected achievement by 2050) for clean, renewable energy and climate change adaptation, as shown below.

- 100% of the energy used in the Metro Vancouver region is derived from clean, renewable sources.
- All regional energy infrastructure is resilient to the impacts of climate change expected during their life cycle, including higher temperatures, severe weather, floods and wildfire impacts.

The discussion paper includes example metrics, targets, actions and big ideas, to support discussions to identify targets and actions for this region. The paper also outlines expected climate hazards for the region's energy system. Feedback provided by the Committee will be incorporated to finalize the discussion paper, which will be used as the basis for seeking public input.

ENERGY ENGAGEMENT ACTIVITIES

A technical working group involving representatives from key external organizations was convened in 2020 in support of the development of the Energy Roadmap, with members providing expert technical advice. Organizations represented on the technical working group include the BC Government, BC Hydro, FortisBC, Vancouver Fraser Port Authority, Pembina Institute and the Pacific Institute for Climate Solutions. The discussion paper seeks to incorporate the range of input from the technical working group, but does not necessarily represent the views of each organization represented, nor does it constitute an endorsement or approval from these organizations.

Metro Vancouver is planning activities to engage the public, stakeholders, and other governments, about climate action in the energy issue area, based on the ideas in the discussion paper, including but not limited to:

- present to the Regional Engineers Advisory Committee and its sub-committees;
- seek public and stakeholder input through a questionnaire and webinar; and
- communicate feedback opportunities on the Metro Vancouver website and promote on social media.

Engagement is intended to provide sufficient opportunity to interested parties to learn about the *Climate 2050 Roadmaps* and to provide feedback. Details on engagement will be available on the *Climate 2050* website (see Reference) and will be promoted using social media, newsletters, professional associations and similar.

FINANCIAL IMPLICATIONS

The overall resources required to develop and engage on *Climate 2050 Roadmaps* have been approved in program budgets for 2020 and 2021, including staff time, to support the engagement process and evaluation of the climate and air quality impacts of proposed actions. Alignment of engagement activities and deliverables with the development of the *Climate 2050 Roadmaps* and other management plans is intended to make the best use of resources available, as well as minimize time commitments for interested parties providing feedback.

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

CONCLUSION
Metro Vancouver is implementing *Climate 2050*, a long-term strategy to achieve a carbon neutral and resilient region over the next 30 years. A series of issue area discussion papers is being developed to provide an engagement tool to support developing the *Climate 2050 Roadmaps*.

The draft discussion paper presented here on the energy issue area identifies goals, hazards, and example targets and actions for transitioning to clean, renewable energy sources and climate change adaptation. Feedback from the public, stakeholders, and other governments will support the development of the *Climate 2050 Roadmaps*.

Attachment
Climate 2050 Discussion Paper on Energy, draft dated January 2021 *(39888912)*

Reference
www.metrovancouver.org/climate2050

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DRAFT

Energy

Discussion Paper to support *Climate 2050*

Reducing emissions and increasing climate resilience for energy in the Metro Vancouver region over the next 10 to 30 years

February 2020

Your feedback is valued.

This paper is introduced here for public, stakeholder and government comment during the COVID-19 pandemic response. Metro Vancouver assesses work plans on a case by case basis to determine if the COVID-19 pandemic response requires an adjustment to any work plans. For air quality and climate change programs and initiatives, this means continuing with work plans that protect human health and the environment, but adjusting how we approach engagement. Regional goals and targets in Metro Vancouver's climate-related plans are science-based and remain a priority. The interim target of a 45% reduction in greenhouse gas emissions below 2010 levels by 2030 has a time horizon of less than ten years. Pursuing a carbon neutral region by 2050 requires taking bold action now. Across the globe, the response to the pandemic has necessitated an unprecedented level of cooperation between key stakeholders in society. This provides a glimpse of what is possible and what we can achieve with coordinated efforts and common goals. Public feedback is valued and the Metro Vancouver Climate 2050 project team continues to seek input, create online feedback opportunities and ensure feedback is reflected as policy development moves forward. Documents, feedback forms and direct email links to the project team are all posted to the Metro Vancouver website, metrovancouver.org/climate2050.

Overview

Energy is critical to our daily lives – energy heats and cools our homes, fuels our vehicles and powers our society. However, the majority of the energy we use today is derived from fossil fuels, a major source of greenhouse gases and other air contaminant emissions. As we transition to clean, renewable energy, we need to transform the way we generate, distribute and use energy.

Energy systems are vulnerable to the impacts of climate change. Extreme weather can affect energy infrastructure and lead to higher frequency of power outages. As the region responds to a changing climate, we need to maintain and strengthen our energy system to ensure that the region has access to reliable energy, now and into the future.

We are creating a roadmap to help us reach a carbon neutral, resilient future. By 2050, we can reduce total energy use by using less energy and investing in energy efficient technologies. We can transition from fossil fuels to clean, renewable energy through a fair and equitable transition for residents, businesses and industries.

Please provide us with your feedback on these ideas by April 30, 2021.

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Introduction

Underlined words are key concepts and are defined in the Glossary on page 22.

Key questions for feedback are shown in boxes marked ?

Planning for the Future

Climate 2050 is an overarching long-term strategy that will guide our region's policies and collective actions to transition to a carbon neutral and resilient region over the next 30 years. Metro Vancouver is implementing *Climate 2050* through 10 issue area *Roadmaps* (see Figure 1), which will describe how the region can reduce greenhouse gas emissions and adapt to climate change impacts. Implementation of the *Roadmaps* will be driven by Metro Vancouver's management plans and other policies, as well as Metro Vancouver's forthcoming Resilient Region Strategic Framework that will integrate the principles of resiliency and social equity across all Corporate functions.

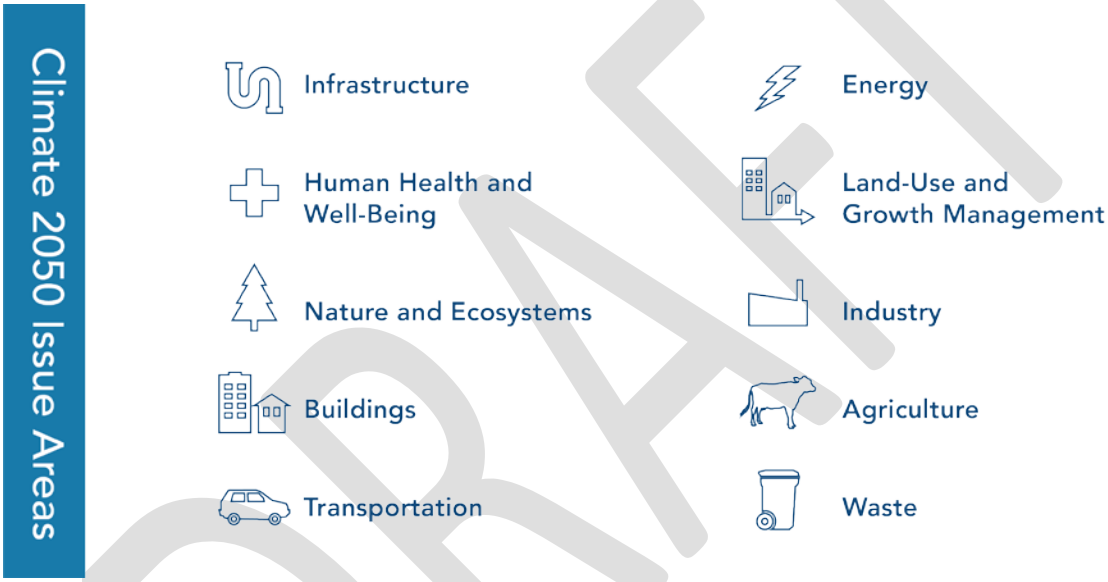

Figure 1: Issue areas for *Climate 2050*

This discussion paper is about the energy issue area, and is intended to promote discussion and enable feedback that will be used in the *Climate 2050 Energy Roadmap*. The feedback will also inform other Metro Vancouver planning documents such as *Metro 2050* (the update to the regional growth strategy), the *Clean Air Plan* and upcoming updates to the Metro Vancouver *Integrated Solid Waste and Resource Management Plan*, *Integrated Liquid Waste and Resource Management Plan,* and *Drinking Water Management Plan*.

Meeting Long-term Targets for the Region

Metro Vancouver, together with its member jurisdictions, has been taking climate action for many years. But actions must be accelerated to reduce our impacts on global climate change, and to adapt to the anticipated impacts from a changing climate. Actions to transition regional energy systems from using fossil fuels to clean, renewable energy are fundamental to meeting long-term climate change targets.

Climate Change Targets

Climate change is directly associated with greenhouse gas emissions, primarily carbon dioxide. While emissions are global, we all have a shared responsibility to take local action. The major sources of greenhouse gas emissions in the Metro Vancouver region are from combustion of fossil fuels within the sectors of transportation, buildings and industry, with smaller contributions from waste management and agriculture. Climate projections for this region by the year 2050 include longer, hotter and drier summers, warmer and wetter fall and winter seasons with decreased snowpack, and more extreme weather.

Metro Vancouver has adopted the following regional climate action targets:

1. reduce regional greenhouse gas emissions by 45% from 2010 levels by 2030;

2. become a carbon neutral region by 2050; and

3. ensure our infrastructure, ecosystems and communities are resilient to the impacts of climate change.

Although the region has made progress over the past 15 to 20 years, we need to accelerate our climate actions to meet these targets and avoid the dangerous impacts of climate change. More information on climate change in our region is available on the *Climate 2050* website.

We need to accelerate our climate actions to meet these targets and avoid the dangerous impacts of climate change.

Fossil Fuels and Air Quality

Combustion of fossil fuels, such as gasoline, diesel and fossil natural gas, produces common air contaminants, such as fine particulate matter and nitrogen dioxide. Health researchers from Canada and around the world have indicated that there are no known safe levels for some common air contaminants, including fine particulate matter, ground-level ozone and nitrogen dioxide. Health Canada estimates that at least 1,600 British Columbians die prematurely every year due to common air contaminants and many more live with the associated health effects. Since there is significant overlap between the sources of greenhouse gas emissions and common air contaminants, actions that address emissions reductions to protect public health can often (but not always) reduce greenhouse gas emissions, and vice versa. When feasible, Metro Vancouver prioritizes policies and programs that reduce both greenhouse gases and common air contaminants.

More information regarding the linkages between air contaminants and energy can be found in Metro Vancouver's *Clean Air Plan*, currently under development.

We Need Your Feedback

The purpose of this energy discussion paper is to seek input on key climate change issues related to clean, renewable energy, and on ways to reduce emissions and adapt to a changing climate. This discussion paper is intended for the public, stakeholders, and other governments, including First Nations.

The goals, targets and actions identified in this discussion paper are considered potential opportunities for the region's use of energy. We must take action now to continue to reduce emissions by transitioning to clean, renewable energy and ensure that energy infrastructure is resilient to a changing climate. We need your help to figure out the best path forward.

Some neighbourhoods, households and individuals will be better able to make the transition to clean, renewable energy and prepare for or protect themselves from climate change. A priority of *Climate 2050* is to incorporate the voices and needs of a full range of communities into program and policy design to ensure that fairness and equity are reflected in the actions that Metro Vancouver implements or advocates for. Policies and programs that encourage use of clean, renewable energy should support an equitable distribution of benefits and costs as well as support for increased economic opportunities in a carbon neutral economy, affordable housing and more diverse transportation options. Issues of intergenerational equity will also be considered.

Specific opportunities to provide feedback are described under *Feedback and Engagement Process*, on page 21.

Linkages to Other Issue Areas

There are many linkages between energy and other *Climate 2050* issue areas. Metro Vancouver is considering these linkages when developing policies and actions. Strategies to reduce energy demand through energy conservation, energy efficiency, and end-user fuel switching are addressed in related issue areas including:

- **Buildings –** use less energy, install more efficient equipment and switch to heating and cooling systems that use clean, renewable energy;
- **Transportation –** use active modes of transport and public transit, improve efficiency of engines, mode-switch to more efficient transportation methods, switch to zero emission vehicles and increase zero emission refueling infrastructure;
- **Industry –** increase energy efficiency of industrial processes and explore equipment that can use clean, renewable energy;
- **Infrastructure –** improve process efficiencies to reduce energy use, utilize water and wastewater infrastructure to generate clean, renewable energy;
- **Waste –** reduce energy use and emissions associated with waste collection and disposal, consider circular economy principles within energy generation, including how waste can be used to generate clean, renewable energy; and
- **Agriculture –** increase energy efficiency of agricultural processes and explore equipment that can use clean, renewable energy.

These issue areas have been explored with greater detail in discussion papers of their own. They are currently available on the Metro Vancouver website.

Transitioning to Clean, Renewable Energy

Achieving significant emission reductions will mean switching from fossil fuels to clean, renewable energy. In British Columbia, clean, renewable energy will be primarily electricity from renewable sources such as hydro, wind or solar power. Using electricity also has the critical co-benefit of not producing emissions of common air contaminants, which will improve regional air quality and the health of residents within our region.

Other forms of renewable energy, such as wood waste, biofuels, and renewable natural gas, have a lower carbon footprint than comparable fossil fuels and are also expected to support a transition to a carbon neutral region. However, they still produce emissions of common air contaminants, which have potential negative impacts for public health and the environment and require emission controls.

Regional Greenhouse Gas Emissions and Energy

Energy Use

Energy plays a vital role in powering the region's economy and our daily lives. Energy is fundamentally derived from primary energy sources, such as oil or wind. Secondary energy sources, such as electricity, are sources derived from primary energy sources. Clean, renewable energy is energy derived from sources with low or zero emissions, and is replenished over days and years. In Metro Vancouver, 28% of the energy we use is clean, renewable energy (Figure 2). The major energy sources used within each sector are as follows:

- Buildings – fossil natural gas and electricity are used to heat and cool our homes as well as power our devices and appliances;
- Transportation – diesel and gasoline fuel the movement of people, goods and services – whether by car, truck, train, plane or boat; electricity powers a small but increasing part of this sector
- Non-road engines – diesel and gasoline fuel non-road equipment such as backhoes and excavators
- Industry – many different sources of energy are used in industrial processes including fossil natural gas, electricity, coal and coke
- Agriculture – fossil natural gas provides most of the energy for greenhouses

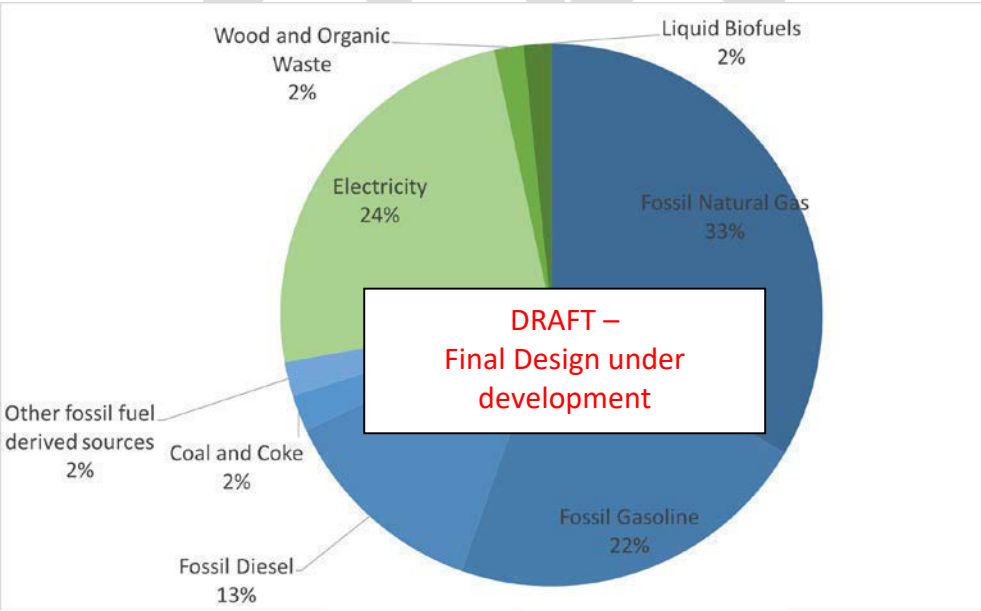

Figure 2: Sources of energy within Metro Vancouver (2015)

Fossil fuels are responsible for 90% of the region's greenhouse gas emissions (Figure 3)[1]. Non-energy emissions are primarily related to greenhouse gases produced during natural and industrial chemical processes. Reducing the use of fossil fuels and increasing the use of clean, renewable energy is a key emissions reduction opportunity.

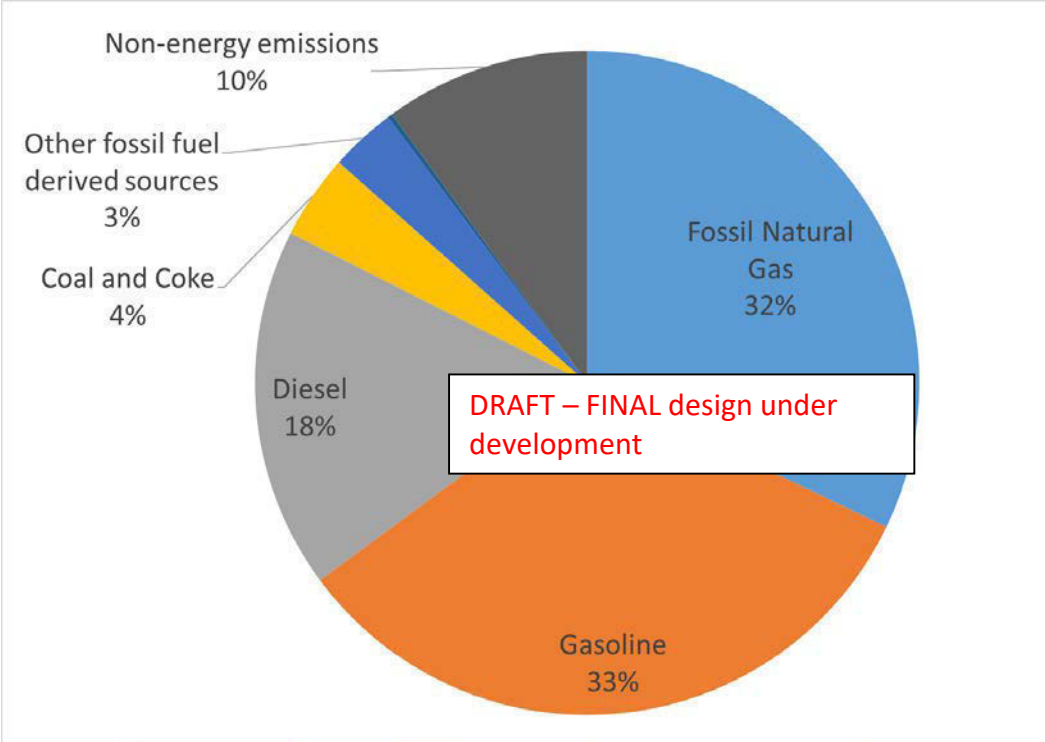

Figure 3: Contribution of different energy sources to total greenhouse gas emissions within Metro Vancouver

Current Actions to Increase Use of Clean, Renewable Energy

Metro Vancouver, its member jurisdictions and other regional partners, are already taking action to increase use of clean, renewable energy. Some significant current initiatives in our region are outlined below.

(Additional information on the actions is listed in the web links shown.)

Electrification

1. ***Zero Emission Vehicle Act*** requires that automakers sell an escalating annual percentage of new zero emission cars and trucks each year, reaching 100% of sales by 2040 (BC Government).

2. **Port of Vancouver Electrification Roadmap 2030** will help guide equipment upgrades at port operations (Vancouver Fraser Port Authority).

[1] Electricity does not produce emissions within our region. As BC's electricity is primarily produced from clean, renewable sources, a small amount of emissions is produced, which occurs outside of our region.

3. **Low Carbon Fleet Strategy** will help achieve TransLink's environmental sustainability target of utilizing 100% renewable energy in all operations by 2050 (TransLink).

4. **Solar energy cooperative** allow interested members of the public to own a share of the utility's solar garden (New Westminster).

Increasing Clean, Renewable Energy Supply

5. A biofuel facility **converts organic waste into renewable natural gas** (Surrey).

6. **Waste heat recovered** from sewage pipes is used in district energy systems to heat buildings (Vancouver).

7. **Biogas produced during wastewater treatment** is captured to provide energy for use within wastewater treatment plants (Metro Vancouver).

8. A pilot **hydrothermal liquefaction facility is being developed to generate bio-crude**, which can be used to create liquid biofuels (Metro Vancouver, Parkland Fuel Corporation, BC Government).

9. **BC *Low Carbon Fuel Standard*** will require a 20% improvement in the carbon intensity of transportation fuels by 2030 (BC Government).

10. For making natural gas consumption cleaner, there will be a **minimum requirement of 15% to come from renewable gas** in residential and industrial applications (BC Government).

Limiting Fossil Fuel Expansion

11. Some governments are endorsing the Fossil Fuel Non-Proliferation Treaty, an initiative to **prevent further proliferation of coal, oil and natural gas** by advocating for an end to all new exploration and production (Vancouver, Borough of Amber Valley).

12. Some governments cooperated to **oppose the Trans Mountain Pipeline Expansion project** (Metro Vancouver and various regional partners).

13. The carbon tax is proposed to **increase to $170/tonne** by 2030 (Canadian Government).

Equity

14. The Climate Action Tax Credit **offsets carbon taxes paid based on household income** (BC Government).

15. **Non-payment disconnections are postponed** for residential customers during winter months (BC Hydro).

16. Income-qualifying programs **help lower-income customers save energy and money** (BC Hydro, FortisBC).

17. A **climate and equity working group** was created to inform the Climate Emergency Action Plan and ensure that equity was embedded into the plan (Vancouver).

18. The 20/20 Catalysts Program **supports Indigenous communities** embarking on clean energy projects (Indigenous Clean Energy).

Roles and Responsibilities in Energy

Metro Vancouver is responsible for managing and regulating air quality and greenhouse gas emissions in the region, under authority delegated by the BC Government in the *Environmental Management Act*. Metro Vancouver is also responsible for developing, implementing and stewarding *Metro Vancouver 2040: Shaping our Future (Metro 2040),* the regional growth strategy. *Metro 2040* contains Metro Vancouver's regional greenhouse gas emissions reduction targets, and includes a strategy to encourage land use and transportation infrastructure that reduce energy consumption.

Air quality management and climate action require close coordination among all levels of government, as well as businesses, utilities, institutions and residents. The roles of key partners in transitioning to clean, renewable energy are outlined below.

- **BC Ministry of Energy, Mines and Low Carbon Innovation** is responsible for British Columbia's electricity, alternative energy, mining and petroleum resource sectors and supporting work to meet BC's greenhouse gas reduction targets.
- **BC Utilities Commission** regulates public utilities, such as electricity, natural gas and heat distribution utilities.
- **BC Oil and Gas Commission** regulates oil and gas activities and pipelines in British Columbia.
- **Energy utilities (e.g., FortisBC, BC Hydro)** provide safe and reliable energy, install and operate energy infrastructure and provide rebates to customers.
- **Local governments** have authority over local land use, which can impact energy use in different sectors. Local governments are also involved in installing energy infrastructure, such as electric vehicle charging stations.
- **Government of Canada** is responsible for the management of energy resources on federal and frontier lands and it regulates the international and interprovincial movement of energy and energy goods.
- **Local businesses and residents** support emission reductions by reducing the amount of energy they use in their businesses, homes, and vehicles and making decisions about the energy sources they choose to use.

Our Clean, Renewable Energy Opportunity

Transitioning to clean, renewable energy is crucial to achieving emissions reductions. Energy is complex as multiple sectors use different sources of energy. At the community scale, residents and businesses need to change the technologies that they use to heat and cool their buildings, fuel their transportation

and power their businesses. At the system scale, we need to ensure there is sufficient clean, renewable energy to meet our emission reduction targets.

In British Columbia, electricity is derived from clean and renewable sources. Switching from fossil fuels to electricity is an essential strategy to reducing emissions. Transitioning to electricity will also improve regional air quality and the health of residents. Many electrification technologies, such as electric vehicles and heat pumps for home heating are already commercially available.

In sectors that are not yet suitable for electrification such as some industrial processes and heavy-duty vehicles, an emerging opportunity is to use renewable natural gas and biofuels. While the current supply of these cleaner energy sources is currently insufficient to enable a full transition to 100% clean, renewable energy without electrification, they will be an essential part of the strategy to reach carbon neutrality by 2050.

Transitioning our energy system to clean, renewable energy is also an opportunity to address inequity. We need to ensure that lower income and disproportionately impacted households have equitable access to clean, renewable and affordable energy and that actions and efforts to decarbonize our energy system do not increase inequity. Ultimately, the transition to clean, renewable energy needs to be designed to ensure that it reduces our emissions, improves the health of our residents, and supports a fairer and more equitable region.

Discussion:

Reducing Emissions from Energy Sources

The following sections outline proposed goals, example targets, example actions, and potential Big Ideas to facilitate transition to clean, renewable energy sources in the region.

Proposed Long-Term Goal for Clean, Renewable Energy

This long-term goal describes a desired future state for low emission and carbon neutrality, with expected achievement in 2050 and beyond. Long-term goals will help identify and prioritize new actions to achieve the emissions reduction required in the energy sector.

Please consider the following the long-term goal proposed for the Climate 2050 Energy Roadmap. Will this goal help us reach our desired future state?

1. 100% of the energy used in the Metro Vancouver region is derived from clean, renewable sources

Example Energy Targets

Near-term targets are milestones to support achievement of the long-term goals and will be included in the *Climate 2050 Energy Roadmap*.

Please consider the following near-term targets from other jurisdictions. Are any of these the right milestones to help us reach our long-term goal? What should our near-term targets look like?

(Additional information on the targets is listed in the web links shown.)

By 2025:

1. Reach 30% renewable energy use in buildings (Vermont).

By 2030:

1. Renewable energy will account for at least 55% of total energy use (Denmark).
2. Energy used in road and rail transport must be 14% renewable. Of the 14%, 3.5% must come from biogas or advanced biofuels (European Union).

By 2050:

1. 100% of the energy used is derived from renewable sources by 2050 (Vancouver, Victoria, Saanich).

Example Energy Emission Reduction Actions

Actions are the policies and programs, including regulations, incentives and educational outreach campaigns, which will lead to emission reductions. Actions will be included in the *Climate 2050 Energy Roadmap*. They will also be considered in the *Clean Air Plan* as well as the upcoming updates to the *Solid Waste, Liquid Waste* and *Drinking Water Management Plans*. In addition to existing actions (see page 7), we need new actions to address the many opportunities we have to further reduce emissions and meet our near- and long-term targets.

Please consider the following actions from other leading jurisdictions, which show a range of actions that could be implemented to reduce emissions. Could any of these help us further reduce emissions to reach our goals? What should new, additional actions look like?

(Additional information on the actions is listed in the web links shown.)

Electrification

1. **All-electric building codes** require that all new buildings only use electricity (San Francisco).

2. **Large batteries** can be used with power generation to increase use of renewable energy and reduce dependency on fossil natural gas (Australia).

3. **Vehicle to grid projects** will allow electric vehicles to store electricity in their batteries and sell renewable energy back to the grid when energy is not available (United Kingdom).

4. **Time-of-use rates** for using electricity in homes and vehicles help encourage uptake of electricity (San Diego).

Increasing Clean, Renewable Energy Supply

5. Power-to-gas projects will convert **excess electricity from renewables into green hydrogen**, to help decarbonize the fossil natural gas system (Markham, Ontario).

6. Biofuels are **exempt from energy taxes** (Sweden).

7. **Co-digestion of sewage sludge with food waste, agricultural waste or other organics**, such as food fats, oils and grease, enhance the production of biogas at wastewater treatment plants (Oakland, California).

Energy Utility Planning

8. Energy utilities are required to incorporate the **cost of carbon dioxide emissions in resource planning**, starting at $46/tonne in 2020 (Colorado).

9. A roadmap was created to **update and clarify energy utility commission objectives to address climate change and equity**, and to develop modern regulatory tools, market structures and processes to achieve those objectives (Oregon).

10. A review was ordered by a utilities commission, aimed at **reducing or eliminating the need for investment in gas infrastructure** (New York).

Limiting Fossil Fuel Expansion

11. More than 30+ cities have **prohibited new natural gas infrastructure in new buildings** (California).

12. A key water permit was **denied for a proposed coal-export facility** along the Columbia River (Washington).

13. **Local ordinances ban new and expansion of storage tank capacity** at existing bulk fossil fuel terminals (Portland, Oregon).

14. Governments and investors around the world are **divesting from fossil fuel companies** (various agencies).

Fair and Equitable Transition

15. A 100% clean energy law stipulates that electric utilities must make **funding available for low-income bill assistance** (Washington).

16. **Low-income weatherization programs** help deliver whole building energy efficiency retrofits for affordable housing owners as well as provide investment in community solar projects (California).

17. Implementing programs to **retrain oil industry workers** to work in renewable energy trades, such as the solar industry (Alberta).

Potential Big Ideas for Transitioning to Clean, Renewable Energy

To achieve a cleaner, healthier, more equitable future, we need to think big and act quickly. Metro Vancouver has identified several potential **Big Ideas** to accelerate use of clean, renewable energy in the region. The Big Ideas were selected for different reasons, including potential for accelerating the use of clean, renewable energy, ease of implementation or their foundational nature (i.e., they are needed to support other actions).

Please consider the following Big Ideas. Could any of these help us significantly accelerate the use of clean, renewable energy to reach our goals? What other Big Ideas should Metro Vancouver consider?

Big Idea 1: *Accelerate electrification*

Electrification is a key decarbonization strategy to meeting emission reduction targets. Technologies that use electricity have critical co-benefits such as reduced emissions, improved air quality, cooling in homes and increased energy efficiency – making it a priority pathway for achieving significant greenhouse gas reductions. While electricity is currently abundant, as large parts of the region electrify, there may be capacity constraints for electrical supply that need to be resolved.

To meet emission reduction targets, electrification should be prioritized for all passenger cars and trucks, most buildings, and some industrial and commercial activities, with a focus on affordable and equitable outcomes. Where electrification is not technically feasible or too costly, other types of renewable energy (e.g., renewable natural gas, biofuels) can be utilized to achieve climate change targets.

Some examples of jurisdictions implementing policies to accelerate electrification are outlined below:

- California is actively considering requiring **all-electric new construction** for some building types statewide as part of its 2022 building code update (California).
- The California Air Resources Board has adopted a first-in-the-world rule, which requires that by 2045, **every heavy-duty vehicle sold will be zero-emission** (California).

To achieve the significant level of electrification required to meet climate targets, Metro Vancouver will need to coordinate with other levels of government, member jurisdictions, energy utilities and energy regulators to accelerate electrification. Some examples from leading jurisdictions of ways that local governments can enable electrification are:

- Engage with energy utilities to coordinate programs and actions. The City of Vancouver has had a **Memorandum of Understanding with BC Hydro** since 2009. As part of this partnership, BC Hydro and the City of Vancouver are completing a grid constraints study, which will analyze the impact of electrification policies on the local electrical grid (City of Vancouver, BC Hydro).

- Collaborate with other local governments to ensure that **accelerated electrification is considered within utility regulatory processes**. The California Local Government Sustainable Energy Coalition is engaging in energy utility regulatory proceedings as an official intervenor on behalf of a coalition of local governments (California Local Government Sustainable Energy Coalition).

- Engage with energy regulators to ensure that **utilities are planning for accelerated electrification**. Oregon's Public Utility Commission has developed a dynamic strategy to adapt to a changing electric sector, including addressing the electric sector's role in greenhouse gas mitigation (Oregon).

Metro Vancouver will study these initiatives further as it examines ways to accelerate electrification.

Big Idea 2: *Increase regional supply of renewable gas*

Renewable gas (i.e., renewable natural gas, hydrogen) is an emerging source of renewable energy that can help decarbonize hard-to-electrify sectors, such as process heating for industrial processes, and will play an important role in reaching 100% clean, renewable energy by 2050. However, there is currently limited supply in the region and thus, a need to increase production of renewable gas. Renewable natural gas can be a direct substitute for fossil natural gas, enabling it to be directly injected into the gas distribution system. This helps decarbonize the gas system and has the added benefit of repurposing fossil gas infrastructure for distribution of clean, renewable energy.

Many local organizations are already producing renewable natural gas, or planning to develop new supply, including:

- The City of Vancouver and FortisBC are collaborating to install a system at Vancouver Landfill to **upgrade captured, landfill gas to renewable natural gas** (City of Vancouver, FortisBC).

- Seabreeze Farms **generates renewable natural gas from dairy manure and off-farm organics**. Co-products such as farm bedding and phosphorous rich mulch are also generated for beneficial farm use as part of this process (Seabreeze Farms).

Metro Vancouver is currently pursuing a **Memorandum of Understanding with FortisBC**, in which a priority is to collaborate on projects that expand renewable gas production from Metro Vancouver's assets. Metro Vancouver is also looking at ways to expand its role in provision of clean, renewable energy (see Big Idea 4) and support other organizations looking at increasing supply of renewable gas.

Big Idea 3: *Expand Metro Vancouver's role in providing clean, renewable energy*

Metro Vancouver currently generates renewable energy for use in its own facilities and provides it to other users in the region, such as generation of renewable natural gas from its wastewater treatment plants. Metro Vancouver is also piloting a number of projects, such as increasing biogas production and hydrothermal processing of wastewater residuals to create low-carbon biofuels. To support reaching regional greenhouse gas reduction targets, Metro Vancouver could expand its role in providing clean,

renewable energy. An expanded role could involve establishing a clear mandate to provide clean, renewable energy, such as Metro Vancouver's mandate to supply clean drinking water; creating a dedicated clean energy service for members, such as a service focused on energy and heat recovery from waste streams; or accelerating investment in clean, renewable energy projects. Local governments, including member jurisdictions, are already expanding their role in providing clean, renewable energy, including those outlined below:

- Metro Vancouver's North Shore Wastewater Treatment Plant is planning on **capturing waste heat from sewage and supplying low-carbon energy** to the Lonsdale Energy Corporation, a nearby district energy system that supplies heating to buildings (City of North Vancouver, Metro Vancouver).

- The City of Richmond established the Alexandra District Energy Utility to **use low carbon, renewable geo-exchange technology to heat and cool buildings** (City of Richmond).

- The City of Toronto has **mandated the installation of renewable energy systems** on all City buildings, where feasible, by 2020 (City of Toronto).

Metro Vancouver will study these leading initiatives further as it looks to expand its role as a clean, renewable energy provider.

Big Idea 4: *Limit expansion of fossil fuel supply infrastructure*

In addition to accelerating the transition to clean, renewable energy, we also need to simultaneously limit expansion of fossil fuel supply infrastructure. As per the United Nations Environment Programme's *Production Gap Report 2020*, current projections are that countries will collectively produce 120% more fossil fuels by 2030 than would be consistent with limiting global warming to 1.5^{o}C. While fossil fuel production primarily occurs outside of our region, distribution infrastructure, such as pipelines, tank farms and distribution terminals can be located within our region. Several local governments have already taken steps to limit expansion of fossil fuel supply infrastructure, such as adopting greenhouse gas targets for new residential buildings, which will limit the use of fossil natural gas in new homes (District of North Vancouver). Metro Vancouver and a number of its member jurisdictions have also worked together to oppose expansion of large fossil fuel supply infrastructure including the Trans Mountain Pipeline Expansion Project and thermal coal exports at Fraser Surrey Docks.

Some examples of leading jurisdictions around the world that are using their local authorities to limit expansion of fossil fuel supply infrastructure are outlined below:

- The City of Portland has established **zoning amendments** that prohibit new, and expansion of, bulk fossil fuel storage terminals (City of Portland).

- King County has established **strict regulations against fossil fuel projects** including limits on development and operation of fossil fuel facilities (King County).

Metro Vancouver and its member jurisdictions will study these leading initiatives further in order to better coordinate local policy and regulatory requirements for fossil fuel supply infrastructure and advocacy related to large fossil fuel infrastructure expansion projects within the region.

Regional Energy Adaptation to Climate Change

The energy system that serves the Metro Vancouver region has been designed to meet the region's energy needs in a safe and reliable manner. Energy is critical to everyone in the region and is necessary to heat and cool our homes, fuel our vehicles and power our society. Energy infrastructure includes underground natural gas and electricity pipes, overhead power lines, electrical substations and transmission lines.

Energy infrastructure lasts for decades and has not always been designed to accommodate the anticipated impacts of climate change. Climate change adaptation needs to be considered during design and critical maintenance and repairs need to be completed to preserve the life of existing energy infrastructure.

Our regional energy system may be impacted by the following climate hazards, which could cause impacts to the region's energy system in numerous ways, including those outlined below.

- **Severe weather,** such as more intense rainfall, storms and high winds, could cause disruptions to the energy system resulting in extended durations and frequency of power outages. This is especially a high risk to service continuity of essential services, such as respite areas, hospitals and community centers.

- **Sea level rise combined with storm surges** threaten the low-elevation parts of the energy network with flooding, including critical infrastructure such as electrical substations or district energy systems.

- **Seasonal water shortages** are expected to increase in frequency due to rising temperatures and changes in precipitation and snowfall, which may have an impact on hydroelectric generation and electricity supply to the region.

- Other hazards include increasingly **severe wildfire seasons**, which could damage energy infrastructure.

Current Actions to Adapt Energy to Climate Change

Metro Vancouver and its member jurisdictions have been taking action to prepare for climate change impacts for well over a decade. Some key current actions for energy adaptation are outlined below.

(Additional information on the actions is listed in the web links shown.)

1. **Improving system resiliency to intense storm events with backup power** for essential processes in water and wastewater systems, such as treatment facilities and pump stations. Metro Vancouver and its members continue to implement and prioritize backup power at key water and wastewater facilities (Metro Vancouver and member jurisdictions).
2. **Adapting to future sea level rise and storm surges** through identifying flood prone areas, community planning to avoid future development in susceptible locations and identifying critical community

services requiring back up energy generation (District of West Vancouver, District of North Vancouver, City of North Vancouver, City of Richmond, City of Surrey, City of Vancouver)

3. **Accounting for climate vulnerabilities and risks in capital planning and asset management** to ensure all new and retrofitted infrastructure is adapted to future climate conditions to the end of its expected lifespan (Metro Vancouver and member jurisdictions).

4. **Expand district energy systems** in order to advance energy self-sufficiency within the community to increase resilience to climate events (City of Surrey, Richmond, Burnaby, City of North Vancouver).

5. **Support the development of the Lower Mainland Flood Management Strategy** led by the Fraser Basin Council (various local municipalities).

6. **Maintaining current climate projections and analyzing up-to-date data** will support long-range planning efforts and enable sustainable decision making for future energy infrastructure needs (Metro Vancouver).

Roles and Responsibilities in Energy Adaptation to Climate Change

Across the region, many different organizations are taking early action to understand and act upon different areas of vulnerability, but everyone has a role to play in preparing for a changing climate. Regional adaptation initiatives will require the cooperation and support of all levels of government. As the regional government, Metro Vancouver can act as a regional forum in facilitating collaboration with local governments and others to create efficiencies and improve alignment of adaptation strategies and actions.

Our Adaptation Opportunity

By proactively adapting our energy system to climate change and incorporating climate projections into land use planning, we can significantly reduce risk to health and safety as well as reduce severe financial loss. For example, ensuring that for critical energy supply infrastructure has redundant back-ups would ensure the energy system can continue to provide energy even if one corridor is damaged by a climate hazard (e.g., if a major storm causes damages to key power lines).

Climate resilience must be integrated into all energy infrastructure, throughout its lifecycle. This requires a continuous and iterative process that incorporates emerging best practices supported by current climate science.

Some of the key opportunities for climate resilience in our energy systems will include identifying vulnerable and critical infrastructure at risk of failure during climate hazards such as storms and flooding events and implementing adaptive measures to mitigate the impacts. This will require cross-stakeholder collaboration with member local governments and utilities to identify work that has already been completed and to understand where the gaps for adaptation still exist.

Discussion:

Energy Adaptation

The following sections outline proposed goals, example metrics, example actions, and a potential Big Idea to adapt to climate change impacts.

Proposed Long-Term Goal for Energy Adaptation

Long-term goals describe a desired future state for a climate resilient energy system, with expected achievement in 2050 and beyond. Long-term goals will help identify and prioritize new actions to achieve the adaptations required from the energy sector. Adaptation goals for the energy sector in this region are the responsibility of multiple organizations.

To achieve a climate resilient region over the long term—the next 30 years—more stringent transportation adaptation goals may need to be adopted by the relevant agencies.

Please consider the following long-term adaptation goal proposed for our region's energy sector. Will this goal help us ensure the region is resilient to climate change?

1. **All regional energy infrastructure is resilient to the impacts of climate change expected during their life cycle, including higher temperatures, severe weather, floods and wildfire impacts.**

Example Energy Adaptation Indicators

To support achievement of the long-term adaptation goal, it is important to measure progress towards a climate resilient energy system. How climate resiliency is measured is an emerging field of research and our region will be learning alongside other local jurisdictions. Adaptation indicators will be included in the *Climate 2050 Energy Roadmap*.

Please consider the following proposed, planned or in-use adaptation indicators from other leading jurisdictions. Could any of these help us measure progress toward reaching our long-term goal? What should adaptation indicators look like for our region?

(Additional information on the indicators is listed in the web links shown.)

1. Minimize disruptions to electrical supply caused by flooding of electrical equipment (Durham)

2. Prevent electrical outages due to trees falling on electrical lines and equipment (Durham).

3. Underground critical sections of the overhead electrical distribution system to ensure resilience by 2080 (Con Edison).

4. Fortify electric substations to withstand increased incidence of heavy rain events by 2080 (Con Edison).

5. Continue to invest in grid modernization to increase resilience to climate change (Con Edison).

6. Ensure that all City critical infrastructure has backup power (City of Calgary).

7. Update all relevant design standards to account for the effects of climate change (City of Calgary).

Example Energy Adaptation Actions

Actions are the policies and programs, including requirements, incentives and educational outreach campaigns, which will lead to a more climate resilient energy system. Actions will be included in the *Climate 2050 Energy Roadmap*. In addition to existing actions (see page 17), we need new actions to address the many opportunities we have to increase resilience and meet our long-term goals.

Please consider the following proposed, planned or underway actions from other leading jurisdictions. Could any of these help us increase resilience to reach our goal? What should new, additional actions look like?

(Additional information on the actions is listed in the web links shown.)

1. Climate-ADAPT is a **"one-stop" shop for adaptation information in Europe** (European Union).

2. Develop a **Climate Change Vulnerability Assessment and Adaptation Plan** (Seattle).

3. Electric distribution companies should **improve preparedness and responses to major storms** (New Jersey).

4. **Prioritize vulnerability and risk assessments of critical infrastructure** based on climate change impacts and setting priorities for adaptation strategies (Baltimore, Portland, San Francisco, Palo Alto)

5. **Invest capital into strengthening electric and gas systems** to better withstand storms, improve reliability and enhance resiliency, including initiatives such as raising flood-prone substations (New Jersey).

6. **Create a municipal micro-grid** to provide electricity for critical services such as police, fire and emergency communications (Fairfield).

7. **Determine backup power requirements for City systems and infrastructure** in preparation for cascading power losses in the event of multiple extreme weather events (Calgary).

8. **Conduct sea level rise vulnerability assessments** on critical infrastructure and develop multi-year sea level rise implementation plans (Palo Alto).

9. **Update design standards** to ensure that new energy assets are built to withstand the impact of climate change hazards (New York).

Potential Big Idea for Energy Adaptation

To respond to the accelerating impacts of climate change, we need to think big and act quickly. Metro Vancouver has identified a potential **Big Idea** to improve regional resilience. The Big Idea was selected for different reasons, including potential to significantly advance climate resilience of the energy network, ease of implementation or their foundational nature (i.e., they are needed to support other actions).

Please consider the following Big Idea. Could this help us to significantly advance climate resilience for the energy system? What other Big Ideas should Metro Vancouver consider?

***Big Idea 1**: Conduct a vulnerability assessment on the region's energy system*

A coordinated regional approach to resiliency requires a better understanding of the vulnerability of the region's systems. Metro Vancouver and other public organizations have completed vulnerability assessments of specific infrastructure in the region, with varying limitations and emphasis on specific climate hazards. The fragmented nature of local information means that critical interdependencies may not have been considered. A comprehensive climate risk and vulnerability assessment for the region's energy systems integrated with a comprehensive regional vulnerability assessment would support the development of a more coordinated approach to climate adaptation in the region.

Although it is the primary responsibility of the energy utilities to ensure energy infrastructure is resilient to a variety of hazards, Metro Vancouver could play a key role in coordinating a vulnerability assessment across the region's infrastructure, ecosystems, and communities. The assessment could map out key hazards to critical infrastructure, ecosystems, and communities and identify the interdependencies that require inter-jurisdictional and interagency coordination.

Other leading metropolitan regions are already taking a more coordinated approach to climate adaptation for energy. For example, a climate change vulnerability assessment of Ontario's electrical transmission sector was jointly completed by various organizations including Toronto Region Conservation Authority, Ontario Climate Consortium, Independent Electrical System Operator (Ontario), Risk Sciences International and Nodelcorp Consulting Inc. (Ontario).

Feedback and Engagement Process

Metro Vancouver invites feedback from diverse viewpoints to help shape *Climate 2050*. Metro Vancouver will carefully consider all input. Feedback is welcome by email at Climate2050@metrovancouver.org, or by telephone at 604-432-6200.

To ensure your comments are considered please provide feedback by April 30, 2021.

To ensure efficiency and cross-project considerations, feedback on this discussion paper will also be shared with the Metro Vancouver project teams for additional projects including the upcoming updates to the regional drinking water and liquid waste management plans and Clean Air Plan.

To ensure your comments are considered please provide feedback

by April 30, 2021.

How Feedback Will Be Used

With revisions, content from this discussion paper will form the basis of the *Climate 2050 Energy Roadmap*, which will be available for feedback before it is finalized.

Comments and suggestions will be compiled into a summary report for consideration by the Metro Vancouver Board and will be made publicly available.

Metro Vancouver staff will treat personal information with confidentiality; please note that comments you submit may be provided to a third party if a freedom of information request is made under the *Freedom of Information* and *Protection of Privacy Act*. If you have any questions or comments regarding the consultation process, please call 604-432-6200.

Thank you for taking the time to provide your valuable feedback.

For more information, visit www.metrovancouver.org/climate2050,

or call 604-432-6200.

Glossary

Carbon neutral region is a region that has achieved the deepest greenhouse gas emissions reductions possible across all economic sectors and removes or captures sufficient carbon dioxide to balance any remaining regional greenhouse gas emissions.

Clean energy is energy derived from sources with low or zero emissions.

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

Climate resilience describes the capacity of ecosystems, economies, infrastructure, and communities to absorb the impacts of climate change while maintaining essential services and functions needed to support health and well-being. In some cases, climate resilience involves changing services and functions so they are more sustainable.

Combustion refers to the process of burning a fuel to make energy.

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

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

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

Ground-level ozone (O_3) can have harmful impacts on everyone, especially children, seniors, and people with lung and heart conditions. It is primarily formed when nitrogen oxides and volatile organic compounds react in the air on hot and sunny days.

Hazard refers to a dangerous phenomenon, substance, human activity, or condition. In this context, hazards are caused or made worse by climate change. Examples include rainstorms, extreme weather, wildfires, storm surges, landslides and floods.

Impacts refers to the consequences of realized risks on ecosystems, economies, infrastructure and communities. Impacts may be referred to as consequences or outcomes, and can be adverse or beneficial.

Nitrogen dioxide (NO_2) can damage people's health by aggravating existing lung diseases like asthma and bronchitis and reducing immunity to lung infections. It is formed during high-temperature fuel combustion.

Primary energy sources are directly derived from natural resources, before transformation. For example, wind and solar are primary energy sources.

Renewable energy is energy derived from sources that can be replenished over days or years.

Secondary energy sources are generated from primary energy sources. For example, electricity generated from wind energy is a secondary energy source.

Social cost of carbon is a monetary benefit/cost value for the consequences of reducing/increasing greenhouse gas emissions in terms of measuring the impacts of climate change.

Vulnerability is the degree to which ecosystems, economies, infrastructure and communities are susceptible to, or unable to cope with, the adverse effects of climate change. Vulnerability varies based on exposure, sensitivity and adaptive capacity. Geographic location, socio-economic conditions, and other factors can impact susceptibility to harm and adaptive capacity.

Vulnerability assessments identify areas or populations most likely to be impacted by projected changes in climate and build an understanding of why these areas are vulnerable, including the interaction between climate change, non-climatic stressors and cumulative impacts. Assessments evaluate the effectiveness of previous coping strategies and target potential adaptation measures.

Metro Vancouver is a federation of 21 municipalities, one Electoral Area and one Treaty First Nation that collaboratively plans for and delivers regional-scale services. Its core services are drinking water, wastewater treatment and solid waste management. Metro Vancouver also regulates air quality, plans for urban growth, manages a regional parks system and provides affordable housing. The regional district is governed by a Board of Directors of elected officials from each local authority.

Member jurisdictions of Metro Vancouver include:

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

To: Climate Action Committee

From: Nicole Chan, Project Engineer
Conor Reynolds, Division Manager, Air Quality and Climate Change Policy
Parks and Environment Department

Date: January 20, 2021 Meeting Date: February 12, 2021

Subject: **Assessment of the Fossil Fuel Non-Proliferation Treaty Initiative**

RECOMMENDATION

That the MVRD Board:

a) endorse the call for a Fossil Fuel Non-Proliferation Treaty as presented in the report dated January 20, 2021, titled "Assessment of the Fossil Fuel Non-Proliferation Treaty Initiative"; and
b) send letters urging the Canadian and BC governments to support the global initiative for a Fossil Fuel Non-Proliferation Treaty.

EXECUTIVE SUMMARY

The Fossil Fuel Non-Proliferation Treaty Initiative is a global campaign intended to spur international cooperation on the responsible use of fossil fuels. Staff completed an assessment of this initiative at the direction of the Climate Action Committee. Metro Vancouver's *Climate 2050* is strongly aligned with the principles underlying the Fossil Fuel Non-Proliferation Treaty Initiative. The three key areas of focus are: ending new exploration and production of fossil fuels; phasing out existing stockpiles and production; and fast-tracking real solutions for a peaceful and just transition.

While it is difficult to predict the impact of the proposed treaty and associated public campaign, it has the potential to contribute towards the development of global policies that limit fossil fuel use and raise public awareness. Based on this assessment, staff recommend that the MVRD Board endorse the call for a Fossil Fuel Non-Proliferation Treaty. Direct actions related to limiting fossil fuel use are already being considered within the development of the *Climate 2050 Roadmaps*.

PURPOSE

To provide the Climate Action Committee with an assessment of the Fossil Fuel Non-Proliferation Treaty Initiative and recommend a course of action for Metro Vancouver.

BACKGROUND

At its November 13, 2020 meeting, the Committee received a delegation regarding the Fossil Fuel Non-Proliferation Treaty (FFNPT) and the Cities Standing Against Fossil Fuel Expansion (SAFE) initiative (see Reference). The Committee subsequently passed the motion:

> *That the Climate Action Committee direct staff to report back with an assessment of the Fossil Fuel Non-Proliferation Treaty and recommendations for Metro Vancouver's involvement.*

This report responds to the Committee's direction.

FOSSIL FUEL NON-PROLIFERATION TREATY INITIATIVE

The FFNPT Initiative intends to spur international co-operation on the responsible use of fossil fuels in line with the Intergovernmental Panel on Climate Change (IPCC) target of limiting global warming below 1.5^{o}C and on a peaceful and just transition to a sustainable future. The treaty is modelled on the Treaty on the Non-Proliferation of Nuclear Weapons, commonly known as the Non-Proliferation Treaty (NPT), and calls for international cooperation in three key areas:

- Non-Proliferation: End all new exploration and production of coal, oil and gas
- Global Disarmament: Phase-out existing stockpiles and production of fossil fuels in line with maintaining warming below 1.5^{o}C
- Peaceful Transition: Fast-tracking real solutions for a peaceful and just transition through a proactive plan to enable economic diversification, implement renewable energy and other reliable, cost-effective low carbon solutions and support every worker, community and country.

Metro Vancouver's *Climate 2050* is strongly aligned with the intent of the treaty to limit fossil fuel usage in alignment with the IPCC target of limiting global warming below 1.5^{o}C. Metro Vancouver has adopted greenhouse gas reduction targets of 45% reduction by 2030, compared to 2010 levels, and carbon neutrality by 2050 within the *Climate 2050 Strategic Framework*, in alignment with the *IPCC Special Report on Global Warming of 1.5^{o}C*. The UN Environment Programme's *Production Gap Report 2020* highlights that around the world, countries planned fossil fuel production levels by 2030 are 120% higher than would be consistent with limiting global warming below 1.5^{o}C. Transitioning away from fossil fuels is essential to reaching the IPCC target and achieving carbon neutrality by 2050.

POTENTIAL IMPACT OF A FOSSIL FUEL NON-PROLIFERATION TREATY

The FFNPT Initiative makes the case that such a treaty could constructively contribute towards curbing global fossil fuel non-proliferation. However, it is difficult to assess whether a FFNPT would be effective in its stated ambitions, given uncertainty about how the treaty would be developed and implemented. To examine the question of effectiveness, staff considered the impact of the historic nuclear Non-Proliferation Treaty (NPT). The NPT was developed to contain the expansion of nuclear weapons and nuclear states, and entered into force in 1970. The NPT is considered a landmark international treaty and has close to universal participation amongst world nations. Signatories of the NPT have been shown to be less likely to initiate nuclear weapons programs, but it is unclear whether a causal relationship exists between these actions and the NPT. Scholars who have studied the NPT hold varying viewpoints about whether it has been effective at curbing the proliferation of nuclear weapons. Some scholars argue that the NPT has played a pivotal role in curbing the proliferation of nuclear weapons whereas others argue that countries were already taking action to limit proliferation of these dangerous weapons prior to ratifying the NPT. Staff's conclusion is that while it is difficult to completely quantify the effect, international non-proliferation treaties have the potential to have a positive effect towards achieving their stated ambitions.

ENDORSEMENT OF THE CALL FOR A FOSSIL FUEL NON-PROLIFERATION TREATY

Currently, the FFNPT Initiative is seeking endorsement of the call for a treaty from local governments, with the goal of building the public profile of the campaign and putting pressure on national governments to sign and ratify a treaty. The campaign calls for two key actions from local

governments: endorsement of the call for a treaty, and a commitment to implementing fossil fuel non-proliferation actions. The campaign was launched during Climate Week NYC in September 2020. To date, more than 180 organizations, over 7,000 individuals and two local governments (City of Vancouver and Amber Valley Borough Council, UK) have endorsed the call for a treaty. The City of New York, Los Angeles and Barcelona are actively considering motions to endorse. Organizational support is cross-cutting and international, including:

- Wilderness Committee
- Comox Valley Council of Canadians
- Burnaby Residents Opposing Kinder Morgan Expansion (BROKE)
- UK Youth Climate Coalition
- Canadian Union of Postal Workers
- Physicians for Social Responsibility Pennsylvania

Should the FFNPT initiative be successful, it could raise public awareness and engagement levels on fossil fuel non-proliferation. Given that the endorsement of a call for a treaty would require minimal staff time, have a potential positive effect on limiting fossil fuel use and is in alignment with the principles of *Climate 2050*, staff recommend that Metro Vancouver endorse the call for a fossil fuel non-proliferation treaty.

CLIMATE 2050 AND SAFE CITIES POLICIES

The delegation also presented on the Cities Standing Against Fossil Fuel Expansion initiative (SAFE), a movement to keep local communities safe from fossil fuels. SAFE policies have four categories: local government resolutions on fossil fuel non-proliferation, electrification policies, temporary restrictions and permanent restrictions on new fossil fuel infrastructure. Metro Vancouver is already considering policies and actions that are aligned with SAFE within the *Climate 2050 Roadmaps*, such as prioritizing electrification of new buildings. The *Energy Roadmap,* which is the subject of Report 5.1 in the Climate Action Committee's February 2021 meeting agenda package, will also be considering actions to limit expansion of fossil fuel infrastructure. Given that fossil fuel non-proliferation policies are already being considered within the *Climate 2050 Roadmaps*, no additional action on this item is required.

ALTERNATIVES

1. That the MVRD Board:
   a) endorse the call for a Fossil Fuel Non-Proliferation Treaty as presented in the report dated January 20, 2021, titled "Assessment of the Fossil Fuel Non-Proliferation Treaty Initiative"; and
   b) send letters urging the Canadian and BC governments to support the global initiative for a Fossil Fuel Non-Proliferation Treaty.

2. That the Climate Action Committee receive for information the report dated January 20, 2021, titled "Assessment of the Fossil Fuel Non-Proliferation Treaty Initiative", and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

There are no financial implications to this report. Under Alternative 1, Metro Vancouver would join a growing list of local governments that have endorsed the call for a fossil fuel non-proliferation treaty. The treaty itself aligns with Metro Vancouver's *Climate 2050* goals and *Roadmaps*, and has the potential to raise public awareness. Staff resources are not impacted since efforts to implement actions related to fossil fuel non-proliferation are already being considered as part of the *Climate 2050 Roadmaps*.

CONCLUSION

At its November meeting, the Climate Action Committee received a delegation from representatives of the Fossil Fuel Non-Proliferation Treaty Initiative. At the direction of the Committee, Metro Vancouver staff have conducted an assessment of the Fossil Fuel Non-Proliferation Treaty Initiative. This initiative is strongly aligned with the principles of *Climate 2050* and endorsing the call for a Fossil Fuel Non-Proliferation Treaty could have a positive effect on limiting fossil fuel non-proliferation and raising public awareness and engagement.

Staff recommend Alternative 1, that the MVRD Board endorse the call for a Fossil Fuel Non-Proliferation Treaty and send letters urging the Canadian and BC governments to support the global initiative for a Fossil Fuel Non-Proliferation Treaty.

References

Fossil Fuel Non-Proliferation Treaty Initiative

43358874

To: Climate Action Committee

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

Date: January 26, 2021 Meeting Date: February 12, 2021

Subject: **2021 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) Assessment of Carbon Capture Technology in the Metro Vancouver Region: $200,000 over two years starting in 2021;
b) Lights, Camera, Climate Action: $200,000 over two years starting in 2021;
c) Sharing Data for Zero Emission Buildings (SDZEB): $200,000 over two years starting in 2021;
d) Responding to the Climate Emergency: Enhanced Stakeholder Engagement: $200,000 over two years starting in 2021;
e) Social and Community Data Land Use Model: $60,000 in 2021;
f) Regional Land Use Assessment: $200,000 over two years starting in 2021;
g) Housing Retrofit Evolution – Pembina Institute Reframed Initiative: $200,000 over two years starting in 2021;
h) Managing Capacity and Reducing Emissions: Real-time Parking Availability in Regional Parks: $300,000 over three years starting in 2021;
i) Natural Asset Management in Regional Parks: $160,000 over two years starting in 2021; and,
j) Promoting Peatland Recovery in Areas Affected by Wildfire in Burns Bog Ecological Conservancy Area: $199,000 over two years starting in 2021.

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 ten projects recommended for funding, totaling $1,919,000 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 carbon capture, emissions reduction, and enhancements to ecological health.

PURPOSE

To present ten 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, 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, which includes air quality management, regional parks, housing, growth management, and inter-municipal initiatives such as ecological health and climate change mitigation and adaptation;
- 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; and,
- Demonstrate innovation and facilitate action.

On an annual basis 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.

2021 APPLICATION PROCESS

An internal call for proposals closed on November 6, 2020 and ten Regional District proposals were considered by the cross-departmental Sustainability Innovation Fund Steering Committee, comprised of representatives from seven different 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**
Assessment of Carbon Capture Technology in the Metro Vancouver Region	2021-2022	$200,000
Lights, Camera, Climate Action!	2021-2022	$200,000
Sharing Data for Zero Emission Buildings (SDZEB)	2021-2022	$200,000
Responding to the Climate Emergency: Enhanced Stakeholder Engagement	2021-2022	$200,000
Social and Community Data Land Use Model	2021	$60,000
Regional Land Use Assessment	2021-2022	$200,000
Housing Retrofit Evolution – Pembina Institute Reframed Initiative	2021-2022	$200,000
Managing Capacity and Reducing Emissions: Real-time Parking Availability in Regional Parks	2021-2023	$300,000
Natural Asset Management in Regional Parks	2021-2022	$160,000
Promoting Peatland Recovery in Areas Affected by Wildfire in Burns Bog Ecological Conservancy Area	2021-2022	$199,000
Total		**$1,919,000**

ALTERNATIVES

1. That the MVRD Board approve the allocation from the Regional District Sustainability Innovation Fund for the following projects:
   a) Assessment of Carbon Capture Technology in the Metro Vancouver Region: $200,000 over two years starting in 2021;
   b) Lights, Camera, Climate Action: $200,000 over two years starting in 2021;
   c) Sharing Data for Zero Emission Buildings (SDZEB): $200,000 over two years starting in 2021;
   d) Responding to the Climate Emergency: Enhanced Stakeholder Engagement: $200,000 over two years starting in 2021;
   e) Social and Community Data Land Use Model: $60,000 in 2021;
   f) Regional Land Use Assessment: $200,000 over two years starting in 2021;
   g) Housing Retrofit Evolution – Pembina Institute Reframed Initiative: $200,000 over two years starting in 2021;
   h) Managing Capacity and Reducing Emissions: Real-time Parking Availability in Regional Parks: $300,000 over three years starting in 2021;
   i) Natural Asset Management in Regional Parks: $160,000 over two years starting in 2021; and,
   j) Promoting Peatland Recovery in Areas Affected by Wildfire in Burns Bog Ecological Conservancy Area: $199,000 over two years starting in 2021.

2. That the Climate Action Committee receive for information the report dated January 26, 2021, titled “2021 Regional District Sustainability Innovation Fund Applications” and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

If the Board approves Alternative 1, $1,919,000 for the ten projects will be disbursed from the Regional District Sustainability Innovation Fund over three years. The Fund has sufficient budget 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:

- Assessment of Carbon Capture Technology in the Metro Vancouver Region
- Lights, Camera, Climate Action!
- Sharing Data for Zero Emission Buildings (SDZEB)
- Responding to the Climate Emergency: Enhanced Stakeholder Engagement
- Social and Community Data Land Use Model
- Regional Land Use Assessment
- Housing Retrofit Evolution – Pembina Institute Reframed Initiative
- Managing Capacity and Reducing Emissions: Real-time Parking Availability in Regional Parks
- Natural Asset Management in Regional Parks
- Promoting Peatland Recovery in Areas Affected by Wildfire in Burns Bog Ecological Conservancy Area

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 Services Sustainability Innovation Fund – Executive Summaries *(43396643)*

Reference

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

43375697

Sustainability Innovation Fund: Regional District
Executive Summary

Project Name: **Assessment of Carbon Capture Technology in the Metro Vancouver Region**

Amount Requested from Sustainability Innovation Fund: $200,000 (2021-2022)

Purpose:

To understand the applicability of carbon capture technology in reducing carbon dioxide emissions from industrial facilities in the Metro Vancouver region.

Project Objectives:

This carbon capture technology assessment project will:

- Explore the potential applications of technological carbon capture approaches at industrial facilities in the Metro Vancouver region to reduce carbon dioxide released to the atmosphere.
- Collaborate with regional partners to encourage the development of technological carbon capture sector to support the regional cleantech economy.

Key outcomes of this project would include the following:

- Jurisdictional scan of existing policies and regulatory framework for technological carbon capture in the region, including Metro Vancouver's role;
- Assessment of different technological carbon capture approaches (including technological readiness) and their potential application at industrial sites in the region;
- Identification of potential pilot sites to test technological carbon capture in the region; and
- Development of initial project description for a pilot project.

Contributions to Regional Sustainability:

<u>Environmental</u>

This project will explore the applicability of technological carbon capture and the deployment of innovative approaches within the region to reduce carbon dioxide concentrations in the atmosphere. Reducing these concentrations will help reduce the impacts of climate change in the region and around the world. Successful application of carbon capture technologies will be of critical importance for the region in meeting its climate action targets.

<u>Social/Community</u>

Climate projections for this region include longer, hotter and drier summers, warmer and wetter fall and winter seasons, and more extreme weather. Within the region, these impacts will harm public health, and damage communities, infrastructure and businesses. Vulnerable populations are at particular risk from climate change, given that they are generally less able to adapt to the changes. Actions related to reducing carbon dioxide concentrations play a role in preparing the region for the impacts of climate change.

This project will support collaboration to increase implementation of innovative approaches to reducing greenhouse gas emissions in the region. Carbon capture technologies will play an increasingly vital role in any pathway towards a low carbon, resilient community. This project can also demonstrate proactive leadership by identifying potential pilot application opportunities that can serve the regional community.

Economic/Financial benefits

Technological carbon capture represents a promising business opportunity, particularly given the recent federal government announcement to increase the carbon tax to $170 per tonne of greenhouse gas by 2030. This project could catalyze investment in this industry, supporting the region's already strong cleantech sector. Adopting greenhouse gas regulations that are more stringent than in neighbouring jurisdictions could have the unintended consequence of pushing industrial activity (and emissions) out of the region, impacting our local economy without actually reducing global carbon dioxide concentrations.

Innovation Element:

To date, Metro Vancouver has focused its efforts on reducing emissions of air contaminants, including greenhouse gases. Technological carbon capture approaches have not yet been considered under that emission reduction focus. However, common emission reduction approaches such as fuel switching and energy efficiency upgrades are unlikely to be sufficient to achieve carbon neutrality in the industrial sector over the next 30 years. Innovative approaches such as technological carbon capture must be explored to accelerate progress toward a carbon neutral region.

In addition, most technological carbon capture projects have focused on individual industrial sites. This project aims to better understand how to implement technological carbon capture in the region as a whole. This innovative approach should help identify the effective carbon capture approaches that are most suitable in the region.

Metro Vancouver could also explore approaches to gain access to a spectrum of cleantech experts and solutions with a focus on regional application, and to identify potential pilot sites. One innovative idea generation tool under consideration for this project is crowd-sourcing, which could identify novel carbon capture approaches that have not been previously explored.

Tangible Benefits and Outcomes:

Phase 1 (2021-2022) – Assessment of Technological Approaches

- Jurisdictional scan of existing policies and regulatory framework for technological carbon capture in the region, including Metro Vancouver's role;
- Assessment of different technological carbon capture approaches (including technological readiness and cost effectiveness) and their potential application at industrial sites in the region; and
- Identification of potential pilot sites to test technological carbon capture approaches in the region.

Phase 2 (2022) – Pilot Sites

Development of initial project description for pilot project using a technological carbon capture approach. This would consider the feasibility (e.g. operational, technical, economic and temporal elements) of a technological carbon capture application in Metro Vancouver's systems or in an industrial facility within the region.

Members and other Partners:

Sheryl Cumming, Project Engineer, Air Quality and Climate Change, Parks and Environment
John Lindner, Air Quality Planner, Air Quality and Climate Change, Parks and Environment
UBC Clean Energy Research Centre

Sustainability Innovation Fund: Regional District Executive Summary

Project Name: **Lights, Camera, Climate Action**

Amount Requested from Sustainability Innovation Fund: $200,000 (2021-2022)

Purpose:

The purpose of the *Lights, Camera, Climate Action* project is to identify alternative clean and modular power sources for portable diesel generators currently used in the film industry. The Metro Vancouver region hosts the third largest film centre in North America, and transitioning to sustainable practices has emerged as an important issue for the industry. The project will also explore the potential co-benefits for other users of portable diesel generators such as construction sites, food trucks and festivals. The portable diesel generators currently used on film sets generate greenhouse gases (GHGs), air contaminants such as diesel particulate matter (DPM), and noise pollution. This project will explore cleaner technology alternatives to the diesel generators in order to reduce GHG emissions and improve air quality, while also ensuring the alternatives recommended are viable solutions in terms of user experience, fulfilling power requirements, and being a cost effective solution.

Project Objectives:

The objective of the project is to demonstrate the viability of clean power solutions for the film industry, and other users of portable diesel generators, which could lead to widespread adoption of electrification and associated emissions reductions. The regional film industry has recognized that it has a role to play in advancing sustainability and demonstrating climate leadership through greenhouse gas reduction projects, but has limitations for coordinating and implementing zero-emissions options for providing on-site power. Best practices identified through this project on the viability of alternative clean power technology could be extended to the benefit of other portable generator users, such as public festivals, outdoor entertainment events, food trucks and the construction industry. In addition, this project will support policy development as part of Metro Vancouver's *Climate 2050 Strategic Framework* and the *Clean Air Plan*. The technical assessment of options along with the stakeholder engagement process will inform recommendations for next steps. These will include suggestions for potential regulatory mechanisms or incentive schemes that may be used to accelerate change.

Contributions to Regional Sustainability:

This project will support regional sustainability efforts to reduce GHG and other air contaminant emissions created by diesel generators on film sets in the region. According to a November 2019 Climate Action Committee delegation on low emission filming, Metro Vancouver film sets consumed an estimated 6.3 million liters of diesel in 2018, resulting in approximately 16,910 tonnes of GHG emissions. In addition to GHG emissions, diesel generators release air contaminants such as DPM, nitrogen oxides and others, which have been shown to have significant public health impacts, as well as impacts on the environment. Non-road diesel engines – a category that includes portable diesel generators – generate 41% of DPM emissions in the region, and DPM contributes to 67% of the lifetime cancer risk associated with air contaminants in our region. By transitioning to cleaner alternatives to diesel generators, the film

industry can reduce public exposure to air contaminants and improve public health. According to the Vancouver Economic Commission, the film industry spent $4.1 billion in British Columbia in 2019. Creating a model that allows for electric power access for the film industry could be a revenue generating opportunity for local governments and stimulate new jobs in the region. This model may also have financial benefits for the film industry by minimizing the cost from diesel and generator rentals. This project is considered an early action to support the implementation of *Climate 2050*.

Innovation Element:

Clean electrification efforts are currently underway by the film industry, but there is a gap in the scaling up of new technology options that will require innovation and regional support; this project will help to bridge this gap. It will explore scalable solutions that may be applicable to other users of portable diesel generators.

Tangible Benefits and Outcomes:

This project will assess the viability of portable electrical power solutions in Metro Vancouver's film industry, based on pilot implementation at one or more locations. As a starting point, the current use of diesel generators by the industry will be evaluated, including a technology assessment to understand the power supply needs, connection requirements, and metering options. This information will be used to inform the design of a pilot program to test alternative portable solutions. This initial assessment will also provide an assessment of clean portable energy option co-benefits for other portable diesel generator user groups such as construction sites and food trucks. Next, a pilot program will be established for clean power solutions and filming locations in Metro Vancouver.

This pilot will include installation of at least one power connection or modular battery solution for use by film industry or other above mentioned industries. Lastly, the project will include a report on findings and program handover to pilot location site owners. The final report will include documentation of work completed, lessons learned and cost-benefit analyses. It will also provide policy recommendations that can be applied across industry to promote cleaner energy alternatives to portable diesel generators.

Members and Other Partners:

Project partners and collaborators are expected to include member municipalities, BC Hydro and Creative BC (non-profit agency established by the provincial government that promotes film and television in British Columbia).

Sustainability Innovation Fund: Regional District
Executive Summary

Project Name: **Sharing Data for Zero Emission Buildings (SDZEB)**

Amount Requested from Sustainability Innovation Fund: $200,000 (2021-2022)

Purpose:

To develop a smart and integrated regional ground-oriented housing database that will target low carbon retrofits across the region, and act as a keystone for buildings policies and programs that will accelerate the transition to zero carbon buildings in Metro Vancouver.

Project Objectives:

The Sharing Data for Zero Emission Buildings (SDZEB) project responds to a key window of opportunity to work with the City of Vancouver, the BC Government, Natural Resources Canada, the Township of Langley and other partners to support the development of Vancouver's *Housing Database and Retrofit Decision Support Tool Project*, and scale it to a regional tool. This work will demonstrate the potential of data analysis technology to inform policy, build accurate and helpful online support tools for residents to undertake high impact, low carbon building renovations.

The long-term objective of the SDZEB project is to create a buildings database with high quality data. Such a database would underpin decision support tools that transform the homeowner experience of undertaking deep carbon retrofits in existing single family homes in Metro Vancouver and ultimately more broadly in BC.

Contributions to Regional Sustainability:

Environmental Benefits

Urgent and accelerated action is required in the buildings sector to achieve our regional carbon neutral goal, requiring thousands of homes to complete low-carbon retrofits every year. Increasing energy efficiency in buildings has direct positive impacts on occupant health and comfort, including:

- increased draft protection and thermal comfort;
- reduced noise; and,
- consumer protection and preservation of the existing housing stock.

Social and Economic Benefits

The alignment and integration of the SDZEB project and the *Housing Database & Retrofit Decision Support Tool Project* creates economies of scale by building upon an existing database. The combination of better building data and targeted retrofit opportunities can result in:

- improved occupant health through better indoor air quality and reduced moisture/mold;
- reduced energy costs and more informed real estate transactions for homes with higher energy efficiency;
- more awareness of the return on investment of low carbon home renovations; and,
- a housing stock that is more resilient in the face of a changing climate.

Equity indicators in the database will be used to:

- identify positive cash-flow homes where retrofits will save money;

- identify opportunities that will lead to better health outcomes for low income or disadvantaged residents; and,
- target programs to specific neighbourhoods or communities that may be identified as living in energy poverty.

Additionally, the SDZEB project and resulting database can support regional COVID-19 recovery through increased market demand for deep carbon retrofits, which can stimulate the green buildings economy – a blossoming industry with significant opportunity for expansion in the Metro Vancouver region.

Innovation Element:

In order to effectively manage the shift to zero carbon buildings, we need better data. Many datasets already exist, but have not been brought together to realize their full potential for climate action. This project seeks to create a new database that will unlock these data and target customized retrofit opportunities for owners of similar homes in the region. It will also yield invaluable information for developing accurate and effective policies and programs that are critical to achieving deep carbon reductions. Without this data, government and homeowner action will simply not be fast enough to meet our GHG targets.

In recent years, research and software development focusing on using building data to target energy and carbon emission reduction opportunities has started to take root. A small number of leading jurisdictions in the United States have done this work to positive results.

In BC, there is now strong alignment on climate policy and goals at all levels of government and with utilities, matched by innovative regulations such as the BC Energy Step Code and the forthcoming BC Alterations Code. Together with local government climate emergency responses, now is the time to complete this fundamental task for tackling emissions in buildings.

Tangible Benefits and Outcomes:

The SDZEB project will capitalize on a unique opportunity to scale-up the City of Vancouver's development of a city-level database to a *regional* ground-oriented housing stock database. A region-wide database will be a powerful tool that supports Metro Vancouver and its member jurisdictions to undertake informed policy-making for single family homes, allowing the creation of replicable retrofit packages that can be implemented efficiently and at scale.

The SDZEB project will ensure that Metro Vancouver and its members have access to a regional database that forms the basis for a homeowner decision software tool. Coordinating data, tools, and programs across the different partners involved in this suite of projects will result in a streamlined experience for an information-seeking homeowner through an online interface, backed by the database.

Members and other Partners:

Brady Faught, Green Buildings Engineer, City of Vancouver
Tess Rouse, Manager Climate Action, Township of Langley
Megan Lohmann, Community Energy Manager, Regional District of East Kootenay
Chris Frye, Senior Policy Advisor, Natural Resources Canada
Nat Gosman, Executive Director, Built Environment, Ministry of Energy, Mines and Low Carbon Innovation

Sustainability Innovation Fund: Regional District
Executive Summary

Project Name: **Responding to the Climate Emergency: Enhanced Stakeholder Engagement**

Amount Requested from Sustainability Innovation Fund: $200,000 (2021-2022)

Purpose:
Given the climate emergency, Metro Vancouver needs a public and stakeholder engagement strategy that builds a constituency who will champion Climate 2050 and the actions in it. This requires an innovative strategy, over and beyond what a normal engagement strategy would entail. And it must include innovative ways to engage new audiences (e.g., youth, previously non-engaged groups including the creative community) to build a larger constituency supportive of effective climate actions.

Project Objectives:
- Working with Metro Vancouver member jurisdictions, seed on-going outreach and engagement that will enhance buy-in, including champions, for effective climate action in the region;
- Create a vocal constituency of residents who will to articulate their support for climate action.

Contributions to Regional Sustainability:
Environmental – This proposal supports innovative and deeper engagement on climate action, one of the key priorities to protect people and the environment in this region.

Social/Community – The proposal will implement an ambitious public and stakeholder engagement strategy, with collaboration between Metro Vancouver and local governments, to develop an active constituency of residents that will support effective actions to address the climate emergency.

Economic/ financial –Broader public engagement will be conducive for innovators and entrepreneurs interested in local solutions in clean energy, circular economy and other carbon neutral solutions as well as initiatives to increase climate resiliency.

Innovation Element:
The ambitious nature of Climate 2050 requires a similarly ambitious, creative and strategic public and stakeholder engagement strategy – to build momentum to implement a climate plan for our region. Metro Vancouver needs to stretch beyond the regular public and stakeholder engagement strategies, and to build an constituency to champion the actions in Climate 2050. Innovations are;

- The mapping exercise with NGOs active in climate outreach in this region to highlight gaps and opportunities, and develop common messaging, priorities and communications.
- Integration of deliverables in innovative ways. For example, the youth outreach strategy might include creating space for youth to generate social content for Metro Vancouver.
- Organizing “solution labs” through a community advisory group to explore how best to implement actions identified in Climate 2050.

- Engaging with the creative community will open a new door for Metro Vancouver in our ongoing climate outreach. Art has demonstrated a pathway to opening up climate action conversations with new audiences, and acknowledges emotions related to change and loss.

Tangible Benefits and Outcomes:

Through this project, Metro Vancouver will rely on its role as a convener on issues of regional importance, specifically as it relates to climate action. This will include:

- Initiating a Community Advisory Group (individuals and organizations with knowledge on climate action to work through pathways to implementation);
- Creating a Blue Ribbon Panel (composed of subject matter experts who can validate the importance of Climate 2050);
- Building an engaged and vocal constituency of residents who support effective action on climate change; including supporting innovative actions of Metro Vancouver; and
- Other deliverables that include: convening community organizations, a climate outreach mapping exercise, a peer group for member municipalities, and engaging youth.

To ensure the public and stakeholders have a greater knowledge and understanding of what is being done now to reduce regional emissions and make the region more climate resilient, deliverables include: developing a strategic presence on social media, and taking inventory of existing outreach channels available to Metro Vancouver (i.e., parks visitations, construction outreach, fleet vehicles, facility signage) that could carry messaging on Metro Vancouver climate actions. A potential deliverable to be explored is a climate action recognition program with a climate action logo or tagline applied to publically visible assets and information signage.
One tangible demonstration of the effectiveness of Responding to the Climate Emergency project will be the size and diversity of the participants present, in-person or on-line, in a Metro Vancouver Climate Forum planned for 2022.

Staff are currently developing Metro Vancouver's climate literacy initiative (SIF 2019) and a series of Climate 2050 Roadmaps, which will provide content to many of the activities in this proposal.

Members and other Partners:

Member staff have expressed interest in Metro Vancouver convening and coordinating enhanced stakeholder engagement around climate action, including residents. Consistent messaging will help a range of audiences see and feel a cohesive movement. There are no formal partners, but there is an understanding among the team responsible for this project that to be successful, any dialogue on climate action must reflect organizations working together, and intersectional goals. A range of people will be engaged as speakers, interviewees, panel participants, and as advisors. This will create an integrated look at climate action in the Metro Vancouver region and open opportunities to partner among organizations.

Sustainability Innovation Fund: Regional District Executive Summary

Project Name: Social and Community Data Land Use Model

Amount Requested from Sustainability Innovation Fund: $60,000 (2021)

Purpose:

This project aims to fulfil the following two tasks: 1) to compile and evaluate the findings of existing research projects, surveys, and statistics about people's preferences of where to live and where to work in the region, what triggered their choices about preferable housing types, neighbourhood and municipality to live in; and 2) to identify the gaps in those research projects, surveys or existing statistics (from Task 1) relevant to the Metro Vancouver regional context.

Both tasks will assist in the future preparation of a regional behavioural model (next phase of this project), which will help to influence regional growth and urban design patterns.

Project Objectives:

The main objective of this project is to develop the foundation for a regional behavioural model that seeks to understand housing and neighbourhood choices. To achieve this goal, we need to firstly examine how usable the existing research, surveys, and statistics are from the perspective of modeling. The next stage is identifying areas that previous studies did not cover to establish a framework for the additional research necessary to prepare an accurate tool for the Metro Vancouver context.

Contributions to Regional Sustainability:

This project has a strong contribution to regional sustainability, mainly from the social/community perspective. The social component of sustainability generally does not have enough data to incorporate these aspects into overall planning and region building activities. Therefore, this project aims to bridge this gap and supply our future regional growth model with social/community data.

Innovation Element:

Having social/community data georeferenced in one geodatabase across the region is a big task and assists with the development of a regional behavioural model. This modelling tool is an innovative and advanced approach that will test how different people's choices will impact land-use change. We aim to link people's living choices to land use, transportation, and hazard modelling, while incorporating pertinent demographic data, into this model. By creating these links, it will ensure more robust data to both, assist with the long range planning for the region and the monitoring of our success in implementing the goals of the Regional Growth Strategy.

Tangible Benefits and Outcomes:

This project will summarise all existing research projects, surveys, and statistics about the regional population's social/behavior characteristics. All the data will be explored and standardised/converted into a geodatabase.

Members and other Partners:

SIF funding will be used to hire a consultant to conduct research on existing social/community projects. The outputs of their research will support the development of a regional behavioural model. The Planning Analytics team (Regional Planning) will work closely with the consultant. It is estimated that the Planning Analytics will invest 240 hours in this project over 2021. There is also an opportunity to involve TransLink and the Province as partners in this project since spatially determined social/community data might also support their various regional activities.

Sustainability Innovation Fund: Regional District Executive Summary

Project Name: Regional Land Use Assessment

Amount Requested from Sustainability Innovation Fund: $200,000 (2021-2022)

Purpose:

Completion of a regional land use assessment is a priority implementation action in the Metro Vancouver Regional Industrial Lands Strategy and supports Regional Growth Strategy policies.
The project will comprise preparing a regional 'land budget' model of current supply and anticipated demand by land use category. The technical assessment, to be prepared in collaboration with member jurisdictions and other stakeholders, will look to identify the 'best' locations for uses / typologies based on land capacity and a co-developed set of criteria (current and future).

The comprehensive regional land use assessment will further enhance our understanding of the limited lands in the region by attribute, use potential (current supply) and land needs criteria (long term demand), so as to support regional growth planning. The assessment will identify opportunities for more optimized locations and uses of land to support regional policy objectives, infrastructure investments, refine growth targets, and inform policy changes.

Project Objectives:

The challenge is to balance the legitimate and competing needs for land in a growing region with a limited land base. The project results would be a rigorous land supply / demand model, contributing to separate work associated with a forecasting model, and assist with communicating analysis to planners, decision-makers and other parties.

Through this project and associated data, research, advocacy, convening and collaboration, the results would enhance achievement of regional objectives that advance sustainability through efficient land uses as well as support member municipal efforts to advance local / community objectives. This tool would also inform growth targets, making sure they are realistic relative to the use, intensity, and form. It would provide added value to member jurisdictions as it would provide robust data to assist with planning in local areas (e.g. area plans), Official Community Plans (OCP), and zoning bylaw updates, etc. The tool would also assist with utility planning to understand land use and intensity, and where those infrastructure investments would be priorities.

Contributions to Regional Sustainability:

Sound and efficient land use planning directly supports sustainability in terms of using land and resources as efficiently as possible, and advances all three measures of a triple bottom line analysis: environmental – energy consumption and GHG emissions; social – affordable housing placement and access to jobs; economic – cost effective infrastructure and transportation system.

The land use framework would set the stage for improvements in reducing trip lengths, encouraging transit usage, reducing commuting costs, guiding efficient locations for infrastructure investments, reducing energy consumption and GHG emissions, and supporting a prosperous regional economy. Success for this project, is an improved means to consider and plan for an efficient regional land use and growth pattern that balances the limited land supply with competing demands.

Innovation Element:

This project is innovative in several ways. It is outside the regular Regional Planning work program, pushes beyond established regional and municipal policies, requires strong partnerships with member jurisdictions, several regional agencies and the Province. This is a unique and innovative approach to land use planning, and will support informed decision-making for regional growth management and planning across the region.

By stepping outside of the existing policy framework, the tool will provide a unique and relevant lens to support land use change decisions and to align transportation, utility, and land use infrastructure.

Tangible Benefits and Outcomes:

Having improved criteria (by use type and capacity) for considering the distribution / allocation of land uses will make for a more efficient regional system, with improved performance and cost effectiveness. Given the limited land supply, growing population and economy of the region there is an expectation that pressures on land and its respective use will only continue to increase over time. Therefore, the project will:

1. Help to address conflicts between competing land uses and pressures to convert lands.
2. Define common development pattern typologies and associated characteristics by land uses.
3. Through separate later work, help to establish a framework / criteria for evaluating proposals for land use re-designation amendments.
4. Support regional objectives for use of lands, specifically the most efficient use of lands and intensification / densification opportunities.
5. Place related or supportive / complementary uses closer together, and competing or conflicting uses further apart.
6. Support more efficient infrastructure investment, where planning is based on more rigorous growth planning methods / targets.

Benefits include achieving improved efficiency in regional land use growth patterns, with commensurate transportation, housing, environmental, and economic improvements.

Members and other Partners:

- Possible Partners (level of involvement and possible funding co-contribution to be determined):
- TransLink, Province (Agri-Tech Land Use Secretariat, Ministry of Municipal Affairs and Housing, Ministry of Transportation & Infrastructure), Agricultural Land Commission, Port of Vancouver, Transport Canada, member municipalities.

Sustainability Innovation Fund: Regional District
Executive Summary

Project Name: **Housing Retrofit Evolution – Pembina Institute Reframed Initiative**

Amount Requested from Sustainability Innovation Fund: $200,000 (2021-2022)

Purpose:

Background: Metro Vancouver Housing (MVH) is a member of the "Reframed" Initiative, a joint initiative of the Pembina Institute, BC Housing, BC Non-Profit Housing Association, and the City of Vancouver. Members will work together to demonstrate the technical and economic feasibility of whole-building deep resiliency retrofits that include reduction of energy use intensity by at least 50% from the pre-retrofit baseline, decarbonisation, and upgrades relating to climate adaptation, seismic, and fire safety.

With support from technical experts on climate change, energy efficiency, and health; multi-disciplinary teams will participate in an Exploration Lab to define the deep retrofits. This SIF application requests funding to support the additional consulting services associated with the Exploration Lab and the implementation of the findings into the 3 deep energy retrofit projects within our existing housing stock.

Project Objectives:

This project involves deep energy retrofit of 3 demonstration projects to reduce energy use intensity by at least 50% from the pre-retrofit baseline. The demonstration retrofits aim to decarbonize building operations to eliminate climate pollution, reduce energy waste to keep the bills low and improve tenant comfort, increase resiliency to extreme weather events like heat waves, flooding, and forest fires, seismically upgrade the structures, and create healthier homes.

Contributions to Regional Sustainability:

To reach the pace and scale needed to meet climate targets, retrofits must shift from a process that is revisited with each building to a product that offers repeatable, predictable performance at a set price. By collaborating with Reframed, the outcomes of these projects will help accelerate development and adoption of emergent retrofit technologies. It will also increase uptake of design and construction of deep retrofits by engaging a wide range of stakeholders such as municipalities, financiers, insurers, and ultimately property owners.

A key challenge to fostering innovation in multi-stakeholder environments is that no single entity is responsible for changing the ecosystem to create new outcomes. Given the complexity of the retrofit ecosystem, this will not happen organically. The emergence of deep retrofit products will simplify decision-making, procurement, and permitting, and enable continuous engineering to reduce costs through automation and vertical integration. These real-world demonstrations will help validate the feasibility and impact of deep retrofits for the Region.

Innovation Element:

Reduce energy demand and drive down carbon emissions through novel combinations of electrification and energy conservation measures that may include:

- Heating: central air-to-water heat pump
- Ventilation: in-suite heat recovery ventilators, reduction of make-up air unit flowrate
- Domestic hot water: central air-to-water heat pump
- Walls: add exterior wall insulation, e.g. with prefabricated panels
- Windows: upgrade to triple glazed, low conductivity windows
- Roof: add exterior insulation, e.g. with prefabricated panels
- Partial mechanical cooling by tempering overheating through make-up air unit
- Solar PV
- Passive shading: fixed exterior shades

Deep energy retrofits can result in projects that are cutting edge but costly and not easily replicable, failing to create a new normal. To find the right balance between ambition and replicability, and to create a critical mass necessary to push through barriers to innovation, these demonstration projects are advancing in a cohort and scoped through the multi-stakeholder Reframed Innovation Lab.

Tangible Benefits and Outcomes:

The Reframed Initiative presents an opportunity to undertake a comprehensive whole-building retrofit that examines all components of the building: heating, lighting, structure, windows, exterior and plumbing - and considers how the building interacts with other energy systems (integrating on-site generation and storage, EV charging infrastructure, etc.). We anticipate that these comprehensive upgrades will also improve tenant comfort, well-being and safety, extend the life of the asset, and reduce operational costs.

By participating in the Reframed Initiative, we will have access to sophisticated integrated design that can facilitate the long-term asset planning needed to improve energy efficiency, reduce greenhouse gas emissions, and future-proof this critical affordable housing while tenants remain in place. This in turn protects vulnerable renters in a state of climate AND housing vulnerability.

Integrated solutions that deliver deep resiliency retrofits exist today, but they are routinely dismissed because of uncertain returns, competing priorities, procurement rules, and financing practices that discourage innovation. The demonstration projects will provide costed and peer-validated designs to test these alternate propositions. By first understanding early market costs, we will be able to identify funding gaps and R&D needs to help drive down the costs and create market confidence in undertaking deep energy retrofits. They also create urgency to develop workarounds to permitting or financing barriers, and that set the wheels in motions for long term removal of these barriers.

Members and other Partners:

MOU with Pembina Institute, BC Housing, BC Non-Profit Housing Association and the City of Vancouver
Participation and potential funding from other organizations (e.g. BC Hydro, FortisBC, Federation of Canadian Municipalities, CleanBC, NRCan) is actively being pursued.

Sustainability Innovation Fund: Regional District
Executive Summary

Project Name:
Managing Capacity and Reducing Emissions: Real-time Parking Availability in Regional Parks

Amount Requested from Sustainability Innovation Fund: $300,000 (2021-2023)

Purpose:
The purpose of this project is to design and implement an advanced electronic real-time parking availability system for key Metro Vancouver regional parks experiencing over capacity issues.

Project Objectives:
The primary goal of the project is to bring about a change in practices by park visitors who arrive to a regional park by personal vehicle. Providing information on when parking lots are at capacity before visitors leave their home allows them to make decisions about how to access the park, when to access the park, or to consider another destination. A communications strategy will be advanced to promote the product to the public. Outreach will include crafting and publication of key messages and collateral including: website and social media content, presentations, and videos. Learnings from this project will inform changes to how Metro Vancouver addresses capacity issues throughout the parks system, for example, potentially offering shuttle services at certain times and sites.

Contributions to Regional Sustainability:
Environment

This project will help alleviate traffic congestion problems within parks thus reducing vehicle pollution and related greenhouse gas emissions. Approval of this proposal will help Metro Vancouver achieve its Climate 2050 goals for the region by conveying information on parking stall availability at high-demand lots, thereby contributing to healthy neighborhood air quality and promoting climate change resilient communities. The platform will play a part in achieving the target of a 45% reduction in emissions from 2010 levels, by 2030. It will also help the region in its efforts to become carbon neutral region by 2050.

Society

A real-time parking availability system will reduce disruption to neighbours from crowding and traffic volumes on local access roads and from within parks. It will also reduce the need for local government involvement given municipal responsibility for traffic flows outside the parks. This new platform will offer an opportunity to share lessons learned with municipal and provincial peer agencies dealing with similar demand issues.

Economy

Real-time parking availability information can provide a foundation for future work on advanced traffic/park planning, traffic flow modelling and engineering designs. It means lower energy use and improved parking infrastructure performance will reduce park operating and traffic control costs.

Learnings will influence decisions regarding pay parking / pay in advance parking reservation systems which could result in revenue enhancements.

Innovation Element:

This project will develop novel or customized case-specific operational monitoring technologies using adapted vehicle remote sensors and a supporting digital platform. It represents an innovative approach to increasing productivity and efficiency of Metro Vancouver services by improving the management of public parking lot infrastructure. Public use of the platform will allow visitors to preferentially access amenities based on parking availability and individual perceptions of social carrying capacity, provided by online real-time parking stall inventories.

The system will be innovative in the sense that it will influence visitor behavior by allowing people to explore alternative less busy parks or entrances based on the real-time reporting of facilities at or above lot capacity, helping to balance the supply-demand equation.

Tangible Benefits and Outcomes:

When complete, the project will assist with reducing greenhouse gas emissions and other adverse environmental impacts from wasted trips and undesirable vehicle idling. Feedback will be available to the public who may wish to engage in trip planning by referencing a digital platform to view current stall availability prior to leaving their home or while en route. Improvements to the visitation experience by limiting overcrowding and congestion will also be realized.

Staff will be able to monitor and track stall inventory and relative demand which will aid in administering parking lots and controlling traffic. The ability to monitoring inventory and demand will be valuable for park planning and development projects, leading to improved management, cost-savings and social, economic and environmental benefits.

Members and other Partners:

Once approved, the proposal lays the foundation for fostering collaboration and developing partnerships enabling synergies among project participants to leverage the expertise of each stakeholder. Phase I will see collaboration with industry experts and vendors to identify best practices and leading-edge innovation/technologies. In Phase II staff will work closely with City of Delta, District of North Vancouver, Port Moody, Belcarra and Anmore to implement the system and evaluate the changes made to address neighborhood conflicts.

Sustainability Innovation Fund: Regional District Executive Summary

Project Name: Natural Asset Management in Regional Parks

Amount Requested from Sustainability Innovation Fund: $160,000 (2021-2022)

Purpose:

The 'Natural Asset Management in Regional Parks' project seeks to make significant advances in the integration of natural assets to the regional parks asset management program. Effort will focus initially on a high-level quantification and valuation of ecosystem services for the regional park system. This will be followed by a detailed study of natural assets and ecosystem services at a pilot location to determine maintenance, monitoring and restoration needs and costs, along with an assessment of risks including climate change. The final phase of the project will develop a prioritization framework for management actions that can be used over time to plan and prioritize work, and ensure the cost-effective application of park budgets. Work is focused on the regional parks system but the methods and processes developed will have broader application. In order to maximize knowledge transfer, a project advisory committee will be established with interested staff from member jurisdictions and other Metro Vancouver departments, and updates will be provided to applicable advisory committees.

Project Objectives:

- Advance the integration of regional parks natural assets into an asset management system, with the aim of ensuring that natural assets are managed and maintained for long-term ecological health, integrity and resilience, and sustainable delivery of ecosystem services.
- Complete an ecosystem services assessment and valuation for natural assets in regional parks;
- Develop a tool and/or methodology to support ongoing ecosystem service assessment and valuation for additional areas (e.g. new park acquisitions);
- Develop a framework to be used on an ongoing basis to prioritize management actions for natural assets, based on ensuring ecological function, and maximizing ecosystem service provision and cost effectiveness;
- Understand the risks facing natural assets now and in the future;
- Advance natural asset management practices in Metro Vancouver, the corporation and the region; and,
- Increase understanding of the importance of natural assets and regional parks, and their contribution to climate resilience and regional liveability.

Contributions to Regional Sustainability:

Environmental benefits: The purpose of including natural assets into asset management is to ensure their long term health and resilience, and their ability to deliver services in a sustainable manner. The project will consider risks to natural assets and incorporate this into prioritizing management actions.

Social and community benefits: This project will increase understanding of how ecosystems provide services that benefit humans. This knowledge can be incorporated into regional park planning and management.

Financial benefits: The purpose of structured asset management is to ensure service, asset and financial sustainability. Incorporating natural assets into asset management processes will ensure they are considered and incorporated into long term plans, including financial plans. Valuation of ecosystem services will provide a deeper understanding of the importance of regional parks natural assets. Developing a prioritization framework for management actions will enable an analysis of the costs and benefits of actions, and support multi-year financial planning of natural asset management.

Innovation Element:

This project seeks to make significant advances in natural asset management in the Metro Vancouver region, contributing to the growing body of knowledge on this topic. The last 5 years has seen increasing innovation in the valuation of ecosystem services and the incorporation of natural assets into a structured asset management system. But there is still a long way to go before natural asset management is standard practice and there are currently only a handful of Canadian municipalities who have made serious advances. To date, work in the natural asset management realm has been focused primarily on municipalities and services such as stormwater management that clearly overlap with services provided by local governments. As a parks service with a focus more on conservation and recreation, this project will help to expand and diversify knowledge to a broader range of ecosystem services.

Tangible Benefits and Outcomes:

- A high-level ecosystem services quantification and valuation for natural assets in the regional parks system. This will include the documentation of methods used.
- Results from a detailed study of ecological function and ecosystem services at a pilot location to inform management, monitoring and restoration. The information gained will be used to scale-up the approach to other locations in the regional park system.
- A decision-making framework to prioritize management actions in regional parks.
- Deeper understanding of the risks faced by natural assets, now and in the future, and the benefits provided by regional parks to visitors and the region.
- Significant advancement to regional parks' natural asset management program.
- Knowledge sharing opportunities with member jurisdictions interested in advancing natural asset management.

Members and other Partners:

Considerable interest in natural asset management has been demonstrated both within other Metro Vancouver departments, and by member jurisdictions. To provide review and input on the project, and maximize knowledge sharing, Regional Parks would establish a natural assets advisory team with representation from Water Services, Regional Planning, and interested staff from member jurisdictions. To date, staff from the District of West Vancouver and City of Delta have expressed interest in being involved. If the project goes ahead, an invitation to participate in the advisory team would be shared with members of the Regional Planning Advisory Committee Environment Sub-Committee (RPAC-Env) and the Regional Parks Advisory Committee (RPC) who have both expressed interest in this topic.

Sustainability Innovation Fund: Regional District
Executive Summary

Project Name: **Promoting peatland recovery in areas affected by wildfire in Burns Bog Ecological Conservancy Area**

Amount Requested from Sustainability Innovation Fund: $199,00 (2021-2022). Additional funding sources are being pursued

Purpose:
The purpose of this project is to conduct research on post-fire management of forested peatlands at an operational scale to identify effects of tree seedling removal on peatland succession, recovery and greenhouse gas emissions.

Project Objectives:
This project will identify and confirm management practices that improve peatland health and potentially contribute to meeting greenhouse gas targets. By understanding how wildfire sites in forested peatlands can be manipulated to reach desired ecological states we can contribute to wider scale restoration of degraded ecosystems. This project will evaluate whether tree removal will improve water table levels as well as carbon uptake and storage in an area affected by a wildfire in 2016.

Contributions to Regional Sustainability:
This project will contribute to regional sustainability by identifying and confirming management practices that improve peatland health and contribute to meeting greenhouse gas targets. Conservation and restoration of regional peatlands has already been proven to provide these benefits.

Results of this project will influence how wildfire zones in the Burns Bog Ecological Conservancy and other forested/compromised peatlands might be managed in the future. Early interventions following wildfire in forested peatlands may identify more cost effective management options relative to postponing actions. It is anticipated that costs associated with tree cover reduction in older wildfire zones will be magnitudes of order higher than young ones. Confirming the feasibility of tree reduction to meet desired objectives at a lower cost, smaller scale and earlier stage of growth would inform management decisions.

Innovation Element:
Ditch blocking and tree removal from drained peatlands are well known approaches to restore peatland function to damaged bogs across the globe. In this project we will take advantage of an accidental wildfire having “removed” the trees from a compromised peatland area. Prevention of tree canopy renewal from natural germination of the large pine seedbank on site is a novel approach to guiding the recovery of the site along an ecological trajectory that will promote the desired raised bog species on site.

Tangible Benefits and Outcomes:

This project will contribute to restoring desired ecological conditions on 37 ha of peatland affected by a wildfire within the Burns Bog Ecological Conservancy Area. In the process, research will contribute knowledge on peatland function and potential for long-term carbon benefits. Results will guide future management of other similarly affected peatlands across the region.

Members and other Partners:

- City of Delta
- Burns Bog Ecological Conservancy Area Scientific Advisory Panel
- UBC Micrometerology Lab
- SFU Remote Sensing

43396643

To: Climate Action Committee

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

Date: January 26, 2021 Meeting Date: February 12, 2021

Subject: **2021 Water Sustainability Innovation Fund Applications**

RECOMMENDATION

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

a) Building Information Modeling (BIM): Transforming Utilities Information Management: $800,000 over two years starting in 2021;
b) Microplastics Study in Source Waters and Water Treatment: $150,000 over two years starting in 2022;
c) Next Generation Snowpack Monitoring, Phase 2: $400,000 over two years starting in 2021;
d) Visual Documentation of Key Water Services Infrastructure: $700,000 over two years starting in 2022; and,
e) Industrial, Commercial & Institutional Sector Migration – Impact on Water Services: $150,000 over two years starting in 2021.

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 five projects recommended for funding, totaling $2,200,000 over three years, which will be funded through the Water Sustainability Innovation Fund. The projects cover a range of areas including water supply, water quality and infrastructure.

PURPOSE

To present five 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 GVWD Board adopted the *Water Sustainability Innovation Fund Policy* in 2014, with further amendments in 2016, 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 *Drinking Water Management Plan* and/or the *Board Strategic Plan;*
- 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; and,
- Demonstrate innovation and facilitate action.

On an annual basis 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.

2021 APPLICATION PROCESS

An internal call for proposals closed on November 6, 2020 and five Water proposals were considered by the cross-departmental Sustainability Innovation Fund Steering Committee, comprised of representatives from seven different 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**
Building Information Modeling (BIM): Transforming Utilities Information Management	2021-2022	$800,000
Microplastics Study in Source Waters and Water Treatment	2022-2023	$150,000
Next Generation Snowpack Monitoring, Phase 2	2021-2022	$400,000
Visual Documentation of Key Water Services Infrastructure	2022-2023	$700,000
Industrial, Commercial & Institutional Sector Migration – Impact on Water Services	2021-2022	$150,000
Total		**$2,200,000**

ALTERNATIVES

1. That the GVWD Board approve the allocation from the Water Sustainability Innovation Fund for the following projects:
   a) Building Information Modeling (BIM): Transforming Utilities Information Management: $800,000 over two years starting in 2021;
   b) Microplastics Study in Source Waters and Water Treatment: $150,000 over two years starting in 2022;
   c) Next Generation Snowpack Monitoring, Phase 2: $400,000 over two years starting in 2021;
   d) Visual Documentation of Key Water Services Infrastructure: $700,000 over two years starting in 2022; and,
   e) Industrial, Commercial & Institutional Sector Migration – Impact on Water Services: $150,000 over two years starting in 2021.

2. That the Climate Action Committee receive for information the report dated January 26, 2021, titled "2021 Water Sustainability Innovation Fund Applications" and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

If the Board approves Alternative 1, $2,200,000 for the five projects will be disbursed from the Water Sustainability Innovation Fund over three years. The Fund has sufficient budget 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:

- Building Information Modeling (BIM): Transforming Utilities Information Management
- Microplastics Study in Source Waters and Water Treatment
- Next Generation Snowpack Monitoring, Phase 2
- Visual Documentation of Key Water Services Infrastructure
- Industrial, Commercial & Institutional Sector Migration – Impact on Water Services

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 – Executive Summaries *(43397633)*

Reference

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

43375910

Sustainability Innovation Fund: Water Services
Executive Summary

Project Name: **Building Information Modeling (BIM) - Transforming Metro Vancouver Utilities Information Management**

Amount Requested from Sustainability Innovation Fund: $800,000 (2021-2022)

Purpose:

> 'Building Information Modeling (BIM) is the process of designing, constructing or operating a building or infrastructure assets using object-oriented design.' (British Standards Institute, 2013)

This SIF project is intended to explore and advance the potential of BIM for Metro Vancouver Utilities.

Specifically, it is proposed that the project be conducted in three phases over 6 years, each stage-gated for review and approval to proceed. The initial Phase I request for funding is $800,000 and the total estimated cost for all three proposed phases is $2.2 M.

Project Objectives:

The long term objectives of this project are to fully evaluate and integrate BIM best practices into Metro Vancouver operations. The specific Phase I objectives are:

- To research and develop BIM policies and standards applicable for the Utilities environment
- To explore BIM templates for discipline specific content and incorporate component Tag/Equipment Location Number data
- To review existing procedures to incorporate 3D review processes throughout the infrastructure lifecycle
- To incorporate laser scanning standards and capabilities to enable creation of BIM models for existing infrastructure

Contributions to Regional Sustainability:

The project supports the aims of the Board Strategic Plan, the Resilient Region Strategic Framework, the Drinking Water Management plan, and the Liquid Waste Management Plan. It promotes sustainability practices in utilities infrastructure design, development, operations and maintenance. BIM utilization will not only add lifecycle value to capital projects but also enhance sustainable operations and maintenance of the overall infrastructure. This includes:

- More efficient and quality driven design employing sustainable BIM driven processes
- More collaborative environment for the Architecture-Engineering-Consulting (AEC) teams to communicate / share
- Faster, safer, less wasteful construction
- More cost-effective, sustainable operation and maintenance of water and liquid waste infrastructure

Innovation Element:

BIM offers an innovative approach to integrated design, construction, operation and maintenance of utilities infrastructure. The successful introduction and integration of BIM into Metro Vancouver will begin to yield:

- Up to 10% cost reduction during design of projects (e.g. reduce rework)
- Up to 10% cost reduction on change orders during construction
- Greater ease in compliance with safety regulations (e.g. meeting Confined Space Entry requirements)

Tangible Benefits and Outcomes:

The Phase I deliverables will include:

- BIM policies and standards, including owner's information requirements from AEC teams
- Templates, procedures, work flows and checklists for design and review with BIM 3D models
- Pilot BIM 3D model tools with trained and knowledgeable staff
- Laser scanning standards and capabilities for creating BIM models for existing infrastructure

The Phase I benefits will be from projects that support collaborative use of 3D technologies and data, combined with BIM design workflows, resulting in:

- Improved design quality and reduced field engineering
- Clear insight into constructability issues and required sequencing
- Reduction in construction delays due to contractor misinformation around site conditions
- Improved ability to relay design intent to contractors

Phase II (future application pilots) would further the utility of BIM beyond initial project design to include:

- Field-based, mobile access to BIM 3D models, contract specifications and drawings
- Workflow configurations to support RFI's, CO's, Submittals and Shop Drawings
- Dashboard reporting tools

Phase III (future SIF application) would involve piloting of a Digital Twin environment that explores integration with Enterprise Asset Management (EAM), GIS and other corporate systems to optimize infrastructure management, including planning, performance benchmarking, asset management, and business intelligence.

Members and other Partners:

Based on the BIM strategy development work completed in 2020, the Metro Vancouver BIM Utilites Steering Committee will continue to provide oversight on this project. The Steering Committee has senior management representatives from the Water, Liquid Waste, Project Delivery and Corporate Services departments and is well positioned to support this project.

Lessons learned from each phase will be shared with member municipalities, for their consideration in adopting best practices in utilities infrastructure information management.

Sustainability Innovation Fund: Water Services
Executive Summary

Project Name: **Microplastics Study in Source Water and Water Treatment**

Amount Requested from Sustainability Innovation Fund: $150,000 (2022-2023)

Purpose:
This study will evaluate the presence and concentration of microplastics in Metro Vancouver's source waters (Capilano, Seymour, and Coquitlam), treatment residuals from the Seymour Capilano Filtration Plant (SCFP) and within the water treatment train at SCFP and the Coquitlam treatment plant.

Project Objectives:
The long-term objective of this project is to provide Metro Vancouver and member municipalities with additional information on microplastics within the drinking water treatment and transmission system. Key objectives include:

- To provide additional information on the presence or absence of microplastics in source reservoirs.
- To determine the concentration of microplastics throughout the water treatment process and in water treatment residuals at the Seymour Capilano Filtration Plant.
- To determine the potential vertical distribution of microplastics (if identified during the pilot project) in the water column.
- To develop a base understanding of the role atmospheric deposition plays of microplastics within Metro Vancouver's protected watersheds.
- To develop a foundation for further microplastic study within the drinking water treatment and transmission systems as well as within other departments such as Liquid Waste Services.

Contributions to Regional Sustainability:
Environmental Benefits – determining an elementary understanding via background review of how microplastics in Metro Vancouver source waters may impact the environment, specifically zooplankton up to larger animals such as fish.

Social/Community Benefits – improving the understanding of contaminants within Metro Vancouver source waters to ensure drinking water is treated suitably. This has region-wide benefits for Public Health in maintaining water quality.

Economic/Financial Benefits – there are significant economic benefits to the region by providing increased knowledge of: source water quality, water treatment efficiency of microplastics, and the potential for consideration needing to be given to future treatment processes.

Gaining further knowledge on the presence of potential emerging contaminants will help Metro Vancouver to better prepare and anticipate possible changes necessary at the treatment plants. This knowledge facilitates the maintenance of a reliable and resilient regional water supply.

The results of this project will help inform planning of future water treatment processes as well as assessment of potential sources of contamination for Liquid Waste Services processes.

Innovation Element:

This project would be Metro Vancouver's first evaluation of microplastic contamination in source water and within the treatment process. The evaluation will solicit the best available local expertise for the most current technologies for sample collection and analysis.

Tangible Benefits and Outcomes:

The results of the Pilot Project will be compiled into a technical report providing the concentration of microplastics in one water sample collected from the Seymour reservoir and within one water treatment residual sample from the SCFP. The technical report will be used to support long-term planning for both the operations and maintenance of the SCFP as well as to provide LWS with background atmospheric deposition data of microplastics in the region.

If a full study is warranted, a second technical report will be completed that will provide the concentrations of microplastics at discrete locations within the water column samples from the Capilano, Seymour, and Coquitlam reservoirs as well as within the treatment train at both the SCFP and Coquitlam treatment plant. This will provide preliminary data on the distribution of microplastics vertically throughout the reservoirs and how efficiently the treatment process removes microplastics from source water.

The results of both studies can be used to inform the 2019 SIF project '*Treating Emerging Contaminants of Concern*' that aims to determine the ability of the SCFP to treat emerging contaminants (including microplastics) and obtain recommendations for new treatment processes and/or changes to plant operations.

Members and other Partners:

A dialogue with three organizations UBC, Vancouver Aquarium and Ocean Wise, who are able to complete the sample collection and analysis methodology will be initiated upon approval of the project.

Sustainability Innovation Fund: Water Services
Executive Summary

Project Name: **Next Generation Snowpack Monitoring, Phase 2**

Amount Requested from Sustainability Innovation Fund: $400,000 (2021-2022)

Purpose:

The first phase of the Next Generation Snowpack Monitoring project (NGSM) was approved for funding by the Sustainability and Innovation Fund in 2019. Initially, the goal of this project was to investigate emerging remote sensing technologies, and look for ways to integrate them into the existing watershed snowpack monitoring program. Satellite imagery and snow cover algorithms, and aerial Light Detection and Ranging (LiDAR) surveys showed the most promise in our specific mountain environment. These tools were tested during the 2019 and 2020 winters. One goal of the project was to validate data collected remotely through additional manual snow measurements. Unfortunately, this work was very limited do to COVID-19 physical distancing requirements.

LiDAR surveys have shown great promise for improving our understanding of snow depth and distribution across the watershed areas. We hope to continue and build on this work over the next two winter seasons. Our primary objective is to refine the data collection and processing workflows, and start to produce operational products for water supply planning. In addition, we plan to continue exploring other remote sensing tools that have the potential to fill important data gaps.

Project Objectives:

This project has the following objectives:

- Enhance the watershed snowpack monitoring program by utilizing emerging technologies and processes;
- Increase the spatial and temporal density of snow observations;
- Use the collected data to more accurately estimate stored water volume in the snowpack for water supply planning, research, climate change monitoring, and education; and
- Reduce the reliance on manual observations, which will result in a safer more cost effective snow monitoring program.

Contributions to Regional Sustainability:

This project can potentially contribute to regional sustainability by providing the following benefits:

1. Ongoing satellite analysis of snow conditions in the watersheds for climate change studies and resilience. Historical satellite imagery (back to ~1990) can be analyzed to show change and variability over time. This information can then be used to advocate for water conservation or changes in current water supply planning targets.
2. Images, and particularly images that show change over time, tell a much more compelling story than numbers and graphs. Images can be used to educate partners and citizens on how source water in monitored and managed, and what implications a changing climate might have for our water supply. It may be possible to use developed data and graphics for Climate 2050 Reporting and Communication.

3. LiDAR data can be used for other studies. Some possibilities include forest health monitoring, and landslide analysis and monitoring. Recent research has demonstrated how our watershed LiDAR data can be used to quantify current forest composition and ecosystem components.
4. Once remote monitoring processes are established, it may be possible to partially reduce the reliance on manual snow observations. This could reduce staff and helicopter time involved, which in turn would reduce overall program costs.

Innovation Element:

This project is an attempt to integrate cutting edge technology into the existing snow monitoring program. It uses an innovative and balanced approach to measuring and monitoring snowpack conditions in our watersheds. Many of the tools proposed have been well researched but have not been used collectively in an operational snow monitoring program.

Tangible Benefits and Outcomes:

Benefits and outcomes from this project include:

1. Updated and refined snow reports and graphics for water supply analysis;
2. Data will be used to more accurately quantify the contribution of seasonal snow to the region's water supply, which is of particular importance with changing climate;
3. Additional data will be incorporated into hydrological models to improve/refine current products like the Capilano and Seymour Reservoirs stop-spill prediction, alpine lake refill models, and snowmelt runoff forecasts;
4. Additional data to be incorporated into climate change models and climate change predictions; and
5. Detailed and accurate satellite and 3D snow maps of the watersheds to be used for education and communication purposes.

Members and other Partners:

Water Services, Watershed and Environmental Management (WEM), will lead this project. Much of the manual validation data will be collected by WEM staff.

WEM has partnered with researchers from Vancouver Island University, the University of Northern British Columbia, and the Hakai Institute to collect and process LiDAR and drone-based photogrammetry from watershed areas.

This group works with BC Hydro and several other regional districts to collect, process, and analyze LiDAR data, and to model stored water in the seasonal snowpack.

Sustainability Innovation Fund: Water Services
Executive Summary

Project Name: **Visual Documentation of Key Water Services Infrastructure**

Amount Requested from Sustainability Innovation Fund: $700,000 over 2 years (2022: $600,000; 2023: $100,000)

Purpose:

This project would create a visual database of some of Metro Vancouver's key pieces of drinking water infrastructure, including dams and water treatment plants. The visual database would result in a potential number of services, including 360° site walk-throughs that allow for remote management and visualization and measurable 2D and 3D images that document existing conditions, as well as accurate and representative floorplans. Having an accurate inventory of Metro Vancouver's infrastructure is crucial to effectively managing assets and making informed decisions about future development.

Project Objectives:

The long-term objectives of this project are to:

- Construct a visual database of Metro Vancouver's key pieces of drinking water infrastructure that can be accessed remotely.
- Develop a detailed infrastructure inventory to promote resilient design and innovation as well as provide a base assessment of infrastructure for asset management.
- Help create an accurate foundation for modelling platforms such as Building Information Modelling (BIM).

Contributions to Regional Sustainability:

The project supports the aims of the Drinking Water Management Plan and Integrated Liquid Waste and Resource Management Plan. The project deliverables can be incorporated into a strong foundation for better asset management, as well as:

- Supporting Environmental Impact Assessments
- Potentially providing 3D walkthroughs of public areas, such as the top of the Capilano Dam, on the Metro Vancouver website.
- Can save time and money on future construction or modification projects of scanned infrastructure.
- Can support sustainable construction, especially when integrated with BIM (or similar platform).

Innovation Element:

This project would be the first of its type at Metro Vancouver. Some of the technology used to create a visual database is relatively new. For instance, while 2D imagery can provide very useful information and record keeping, the newer technology of 3D imagery can allow users to accurately calculate measurements of any object captured in that image in seconds.

This type of work goes beyond the basic as-built drawings for a facility, which can easily include inaccuracies and therefore become out of date. Creating visual documentation of an existing building and

allowing for this data to be built upon over time, provides an innovative and new way of creating records, minimizing risk and liability, and supporting decision making for future construction and modifications.

Tangible Benefits and Outcomes:

This project would result in the following:

- 3D virtual walkthroughs of scanned infrastructure
- Accurate and representative 2D and 3D floorplans
- 3D building models based on real physical building information
- Measurable 2D and 3D images

Integration with BIM

The raw data from this project, as well as the constructed 3D building models, will have the ability to be integrated into BIM for assimilation into larger asset management tools. The comprehensive data that laser scanning collects, called Point Cloud data, enables projects to realize clear benefits associated with the following:

- Improved design quality and reduced field engineering
- Better design co-ordination with existing plant layout
- Reduced reliance on facility documentation for existing conditions
- Clear insight into constructability issues and required sequencing
- Reduction in construction delays due to contractor misinformation around site conditions
- Improved ability to relay design intent to contractors

This project will provide not only advantages to Water Services by creating benefits to Engineering and Construction as well as Operations and Maintenance, but it will provide Metro Vancouver with larger-scale benefits by providing accurate 3D models for inclusion into Metro Vancouver's BIM platform.

Members and other Partners:

This project would require the technical consultants to conduct the work, analyze the data, and create the project deliverables. Metro Vancouver staffing would be sufficient to provide project management and will work closely with the Metro Vancouver BIM Utilities Steering Committee throughout the project.

Sustainability Innovation Fund: Water Services
Executive Summary

Project Name: **Industrial, Commercial & Institutional Sector Migration – Impact on Water Services**

Amount Requested from Sustainability Innovation Fund: $150,000 (2021-2022)

Purpose:

Land use patterns are changing rapidly as increasing growth pressures in the region and rising land value has driven industry and other businesses to move to more cost-effective areas within and outside the GVWD. Industry uses large volumes of water in their product or in manufacturing and migration factors can also include not only the cost of land but needing; more land space for expansion or for lower lease rates, access to major highways or ports or to be near labour pool and public transportation for employees.

This project will look at how future Industrial, Commercial & Institutional (ICI) sector development/buildout in the region may occur and its potential to shift water demand in the region and impact water system servicing infrastructure.

Project Objectives:

At its core, the project will look for local causes of business migration and develop both a 100 year ICI sector buildout scenarios and a long-range ICI water demand forecasting tool. A consultant will be selected through an RFP process and as part of the work will:

- Compare historical ICI sector water usage and water rates across GVWD members.
- Compare current ICI sector water usage and water rates to other jurisdictions (Abbotsford, Calgary, Toronto and Montreal).
- Review past 20-year migration of ICI sector within and from Metro Vancouver.
- Identify any correlation between ICI sector migration with water rates and land availability and cost.
- Based on Regional Growth Strategy, study the potential changes in land-use and project how this may impact the ICI sector - the types of business it will support.
- Develop ICI sector buildout scenarios and their impact on water demand as it aligns with MV Water Supply Outlook 2120.
- Investigate water conservation/efficiency potential within the ICI sector.
- Assess the potential impacts of climate change on estimated future ICI sector water demand.
- Develop a water demand forecasting tool for the ICI sector.

Contributions to Regional Sustainability:

The work will use Metro Vancouver 2040: Shaping our Future, the regional growth strategy and its goal's i.e. "Support a Sustainable Economy". Several ICI build out scenarios to year 2120 will be developed and water demand modeled.

This project does not supersede Metro 2040 and is not intended to be used for Economic Development.

Innovation Element:

The ICI project is innovative because similar evaluation has not been completed by other jurisdictions and it builds upon the 2016 SIF funded Densification project that assessed residential water demand and determined relationships with land use developments.

Tangible Benefits and Outcomes:

Migration of the ICI sector has not been assessed and has the potential to shift water demand in the region. This project will estimate future ICI water demand and how it may impact planning of future water supply infrastructure.

Members and other Partners:

MV Regional Planning will participate and support the project. WS will reach out to partner with businesses, associations and municipalities.

To: Climate Action Committee

From: Paul Kadota, Collaborative Innovations Manager, Liquid Waste Services Department

Date: February 1, 2021 Meeting Date: February 12, 2021

Subject: **Hydrothermal Processing Demonstration Facility – Additional Sustainability Innovation Fund Funding Request**

RECOMMENDATION

That the GVS&DD Board approve additional funding of $6.13 million from the Liquid Waste Sustainability Innovation Fund for the Hydrothermal Processing Biofuel Demonstration Facility.

EXECUTIVE SUMMARY

The Hydrothermal Processing Biofuel project has previously received funding from the Liquid Waste Sustainability Innovation Fund (SIF), as well as from external partners. With the initiation of work on the Hydrothermal Processing Biofuel Demonstration Facility, the revised cost estimate is now $19.38 million. This first-of-its-kind project has proven not surprisingly, to be difficult to scope. With design now complete, a budget shortfall of $6.13 million exists, based on a number of necessary additional requirements identified by the design consultants. Approval of additional funding would bring the total allocation to this project from the Liquid Waste Sustainability Innovation Fund to $14.38 million over 6 years. The balance of the costs will be covered by $5 million of external funds secured from project partners, Parkland Fuel Corporation and the Province of BC.

PURPOSE

To update the Climate Action Committee on the Hydrothermal Processing Demonstration Project cost estimate revised in 2020 and seek GVS&DD Board approval for additional allocation of Sustainability Innovation Funds from reserves.

BACKGROUND

Hydrothermal Processing (HTP) is an emerging technology that can produce low carbon transportation fuels from wastewater biomass, aligning well with the Climate 2050 energy roadmap. At its September 28, 2018 closed meeting, the GVS&DD Board adopted the following resolution, which has subsequently been made public:

> *That the GVS&DD Board:*
> *a) Approve funding from the Liquid Waste Sustainability Innovation Fund in an amount up to $8.25 million for the Hydrothermal Processing Biofuel Demonstration Facility.*

If HTP is proven effective at full scale, there are a number of potential benefits. Given its significantly smaller footprint, HTP should cost less to build, allow for faster processing time, and will dramatically reduce overall residuals, resulting in considerable cost savings when compared against conventional anaerobic digestion. Net present value savings of more than $60 million have been conservatively estimated for HTP at the Iona Wastewater Treatment Plant alone. The savings do not include a

monetized carbon price, despite HTP being expected to triple the carbon dioxide offsets compared to anaerobic digestion.

Since initial approval, $5 million in external funding has been secured: $750,000 from the Province of BC and $4.25 million from Parkland Fuel Corporation for a currently available total of $13.25 million.

This first-of-its-kind project involves the design, fabrication, implementation, and testing of a demonstration scale facility to be located at the Annacis Island Wastewater Treatment Plant. Staff and our design consultants underestimated the initial cost of the HTP demonstration during preliminary design, largely due to the wastewater industry's unfamiliarity of a thermochemical rather than a biochemical process for carbon conversion. The project team is learning and implementing a number of items to take advantage of potential synergies and take additional steps and include redundancies to adapt HTP for the wastewater treatment setting.

One learning example is that some of the non biocrude output of HTP appears well-suited for input to existing anaerobic digesters to produce greater quantities of biomethane, which can be used to displace conventional natural gas. Enabling this concept in the Demonstration Project requires redesigning additional flexibility for returning the non biocrude output to multiple points at the Annacis Island Wastewater Treatment Plant, with associated cost increases.

Another learning example is the need to undertake additional precautionary activities for enhanced safety due to conditions that are more typical for steam refineries than ambient conditions of wastewater bioreactors. To reduce onsite risks, the HTP system will be housed in a temporary enclosure for the purposes of the demonstration, which is not envisioned for a full-scale system. Further, as a demonstration and test facility, the broader range of operating conditions and corresponding safe-guards will need to be accommodated with additional contingencies in the revised budget.

The result of the front end engineering and design completed in 2020 is a project schedule that now extends to 2024 and a revised cost estimate and funding shortfall as follows:

Item	**Cost**	**Funding**
Engineer's Estimate	$19,380,000	
Province of BC		$750,000
Parkland Fuel Corp.		$4,250,000
Sustainability Innovation Fund		$8,250,000
Current funding		$13,250,000
Shortfall		$6,130,000

The $19.38 million in project budget and previously approved reserve applications have been included in the approved 2021-2025 financial plan.

ALTERNATIVES

1. That the GVS&DD Board approve additional funding of $6.13 million from the Liquid Waste Sustainability Innovation Fund for the Hydrothermal Processing Biofuel Demonstration Facility.

2. That the GVS&DD Board suspend further work on the Hydrothermal Processing Biofuel Demonstration Facility and direct staff to report back with options for an alternate course of action.

FINANCIAL IMPLICATIONS

If HTP proves a capable alternative to conventional anaerobic sludge digestion, an attractive financial case will exist given the smaller footprint of HTP versus digesters, near zero residual production and shorter processing times. For a full scale HTP system at the Iona Island Wastewater Treatment Plant, the positive business case is conservatively estimated at $60 million.

An additional contribution of $6.13 million from the Sustainability Innovation Fund would bring the total allocation for this project to $14.38 million over 6 years, an average of $2.4 million per year. There are sufficient balances in the Fund to accommodate this expenditure. Given that Sustainability Innovation Funds are held in reserves, there will be no impact on the sewer levy.

Upon completion of the Demonstration Project, the transportable equipment is expected to have salvage value and several smaller communities have expressed interest in potentially purchasing a successfully operating system. If the GVS&DD is able and wishes to dispose of the asset, one option is for proceeds of the sale be used to offset contributions from the Sustainability Innovation Fund.

OTHER IMPLICATIONS

As a means to increase the generation of renewable energy beyond that of current means (anaerobic digestion), HTP is included as a future technology for the new Iona Island Secondary Treatment facility.

The HTP Demonstration Project is gaining international interest as Metro Vancouver received the 2020 Outstanding Subscriber Award for Applied Research and, organizations such as the Commercial Aviation Alternative Fuels Initiative views this technology to align well to their goal of increasing the availability of sustainable aviation fuels.

CONCLUSION

In 2020, the front end engineering and design for the Hydrothermal Processing Demonstration Facility was completed with new information. The project schedule now extends to 2024 and the revised project cost estimate of $19.38 million has resulted in a funding shortfall. Staff recommends that Alternative 1 be approved.

References

Liquid Waste Committee Meeting Agenda, July 16, 2020:

a) Item 5.1: Hydrothermal Processing Biocrude Oil for Low Carbon Fuel (Video)
b) Item 5.2: Iona Island Wastewater Treatment Plant Project Definition Concept

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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Climate Action Committee

From: Marcin Pachcinski, Division Manager, Electoral Area and Environment
Regional Planning and Housing Services Department

Date: January 22, 2021 Meeting Date: February 12, 2021

Subject: **Endorsement of Host Society for the Howe Sound Ocean Watch Action Committee**

RECOMMENDATION

That the MVRD Board endorse the Howe Sound Biosphere Region Initiative Society as the host society for the Ocean Watch Action Committee.

EXECUTIVE SUMMARY

At its January 2021 meeting, the Climate Action Committee directed staff to assess Metro Vancouver's potential involvement and representation on the Howe Sound Ocean Watch Action Committee. The Ocean Watch Action Committee brings together local elected officials and others to advance actions identified in the Ocean Wise Report - Ocean Watch Átl'ka7tsem/Txwnéwu7ts/Howe Sound Edition 2020 (Reference 1). Metro Vancouver is the local government for Electoral Area A and participates in Howe Sound initiatives, including the Howe Sound Community Forum, primarily because portions of Electoral Area A are located in the Howe Sound region. The Howe Sound Community Forum recently recommended that local governments endorse the Howe Sound Biosphere Region Initiative Society as the host society for the Ocean Watch Action Committee. Several local governments around Howe Sound, including Bowen Island Municipality, the Village of Lions Bay, and District of West Vancouver, have endorsed this structure. Staff also recommend this structure as it relies on an existing society that is closely linked to ongoing work to protect the environment in Howe Sound and regularly provides updates to the Howe Sound Community Forum.

PURPOSE

To provide the Climate Action Committee and MVRD Board with the opportunity to consider endorsing the Howe Sound Biosphere Region Initiative Society as the host society for the Ocean Watch Action Committee.

BACKGROUND

At the January 15, 2021 Climate Action Committee, following a presentation by Ruth Simons, the Project Lead for the Howe Sound Biosphere Region Initiative Society, the Committee passed the following motion:

> *That the Climate Action Committee direct staff to report back on the Ocean Watch Action Committee at the February meeting, with an assessment of Metro Vancouver's potential involvement and representation.*

This report provides an assessment of Metro Vancouver's involvement in Howe Sound initiatives and addresses the recommendation put forward by the Howe Sound Community Forum, of which Metro Vancouver is a member, that local governments endorse the Howe Sound Biosphere Region Initiative Society as the host society for the Ocean Watch Action Committee.

OCEAN WATCH ACTION COMMITTEE

The Ocean Watch Action Committee brings together elected officials, government staff, and advisors to advance government actions identified by the Ocean Wise Report - Ocean Watch Átl'ka7tsem/Txwnéwu7ts/Howe Sound Edition 2020 (Reference 1).

The report highlights seven key action areas:

1. **Research**: Increase knowledge of the local area and species through research.
2. **Protect and Restore**: Protect and restore marine species, habitats and ecosystem services.
3. **Educate and Engage**: Increase awareness and education and ensure consistent messaging on environmental issues.
4. **Legislation**: Drive high-level change using official channels (e.g., guideline, policy, bylaw) appropriate to the circumstances.
5. **Funding**: Financially support conservation actions and ensure stricter enforcement.
6. **Monitor**: Collect long-term data to identify trends, support decision making, and evaluate the outcome of actions taken.
7. **Greenhouse Gas Reductions**: Decrease greenhouse gas emissions and move towards zero carbon municipalities to align with recommended reductions in global greenhouse gas emissions.

The Ocean Watch Action Committee seeks to advance those actions and keep track of progress. The Howe Sound Biosphere Region Initiative Society is the coordinator and convener of this Committee.

METRO VANCOUVER INVOLVEMENT AND REPRESENTATION

Involvement in Howe Sound Initiatives

Metro Vancouver has been an active member of the Howe Sound Community Forum since 2002 and signed the latest version of the Forum's Principles for Cooperation in 2014 (Reference 2). It was through this forum that a request was made in late 2016 for Forum members to pass a resolution in support of the initiative to nominate Howe Sound as a UNESCO biosphere reserve.

In July 2017, the MVRD Board passed a resolution supporting the UNESCO biosphere reserve nomination in principle. The MVRD Board's support represented both regional and local support for the nomination, as the MVRD is the local government for Electoral Area A, a portion of which is located in Howe Sound. Prior to the MVRD Board's resolution, the councils of the member jurisdictions of Bowen Island Municipality, the Village of Lions Bay, and the District of West Vancouver had also passed resolutions in support of the nomination.

Involvement in the Ocean Watch Task Force and Action Committee

The Howe Sound Community Forum, of which Metro Vancouver is a member, supported the creation of the Ocean Watch Task Force in 2017 when the first edition of Howe Sound Ocean Watch report was published. Following the completion of the Howe Sound Ocean Watch Strategic Plan in 2019

(Reference 3), the Howe Sound Community Forum supported the Task Force becoming the Ocean Watch Action Committee to continue collective local government efforts to protect marine and coastal environments in the Sound. Additional background is provided in Attachment 1.

Metro Vancouver Electoral Area Services staff have regularly attended meetings of the Ocean Watch Task Force (now the Ocean Watch Action Committee), as portions of Electoral Area A are located in Howe Sound, and Metro Vancouver has local land use authority over these lands (e.g. zoning, building permit, official community plan). The Electoral Area A Director has received updates on the meetings and has also attended the most recent meeting of the Ocean Watch Action Committee.

Host Society for the Ocean Watch Action Committee

The Howe Sound Community Forum, of which Metro Vancouver and other Howe Sound local governments are members, recommended that the Howe Sound Biosphere Region Initiative Society serve as the host society for the Ocean Watch Action Committee. Bowen Island Municipality, the Village of Lions Bay, and District of West Vancouver, as well as several other local governments around Howe Sound, have recently endorsed this structure. Metro Vancouver staff also support this structure, as it relies on an existing society that is closely linked to ongoing work to protect the environment in Howe Sound and regularly provides updates to the Howe Sound Community Forum.

ALTERNATIVES

1. That the MVRD Board endorse the Howe Sound Biosphere Region Initiative Society as the host society for the Ocean Watch Action Committee.

2. That the Climate Action Committee receive for information the report dated January 22, 2021, titled "Endorsement of Host Society for the Howe Sound Ocean Watch Action Committee", and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

There are no financial implications associated with this report.

CONCLUSION

The ongoing work of the Howe Sound Community Forum, the Howe Sound Biosphere Region Initiative Society, and the Ocean Watch Action Committee broadly align with Metro Vancouver's environmental, climate change, and reconciliation goals. Local governments from around Howe Sound, including three MVRD member municipalities (Bowen Island Municipality, the Village of Lions Bay, and District of West Vancouver) actively participate in this ongoing work and have endorsed the Howe Sound Biosphere Region Initiative Society as the host society for the Ocean Watch Action Committee. Metro Vancouver staff also support this structure, as it relies on an existing society that is closely linked to ongoing work to protect the environment in Howe Sound and regularly provides updates to the Howe Sound Community Forum, of which Metro Vancouver is a long-standing member. Staff recommend Alternative 1.

Attachment

1. Recommendation for Howe Sound Community Forum (HSCF) from Ocean Watch Action Committee *(43472441)*

References

1. Ocean Wise Report - Ocean Watch Átl'ka7tsem/Txwnéwu7ts/Howe Sound Edition (2020)
2. Howe Sound Community Forum Principles for Cooperation (signed 2014)
3. Howe Sound Ocean Watch Strategic Plan (2019)

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October 23, 2020

Recommendation for Howe Sound Community Forum (HSCF) from Ocean Watch Action Committee

1. Background
2. Three Recommendations
3. Suggested Council Resolution

1. Background:

In 2017 The Coastal Ocean Research Institute (Vancouver Aquarium), produced the Ocean Watch Howe Sound Report. This comprehensive report was a culmination of collaboration and engagement supported by the HSCF. It provided a snapshot assessment of the health of the Howe Sound marine area and action items to be taken in order to improve ocean health. The Howe Sound Community Forum members supported the creation of the Ocean Watch Task Force (OWTF) with a mandate as stated in the Terms of Reference (Nov. 2017) to:

- Identify which actions in the Ocean Watch: Howe Sound Action Plan are within the mandate and reach of member communities.
- Focus on the identifying selected actions by Local Governments for implementation and highlight potential actions that include policy integration and collaboration between member Local governments and First Nations;
- Contribute information on what action local governments and Squamish Nationare already undertaking toward the goals.
- Recommend a process through which the selected actions get done
- Complete its work within six months.

Local governments appointed staff and elected representatives to participate in task force meetings. The task force met approximately every six weeks and Co-Chair Trustee Stamford reported to the HSCF in May 2018. A request to extend the term of the Task Force was supported, the Terms of Reference updated (Jan. 2019). The deliverables were a) bring forward recommendations and processes to Howe Sound Community Forum members that target selected actions for local governments to achieve and b) report at the Howe Sound Community Forums on recommendations, timelines and progress to-date on the Action Plan.

An example of supported actions by local governments was funding and leadership of the Marine Reference Guide Marine Reference Guide. This project is on track to complete in 2021.

Co-Chair Stamford reported on the strategic plan as part of the deliverable at the HSCF April 2019. The Task Force continued to meet regularly concluding with targeted selected actions for local governments to achieve. The final report and recommendations were presented by Co-Chair Doug Race at the HSCF October 2019 with the following recommendations:

1. A new Terms of Reference be developed by members of the Howe Sound Community Forum that defines a governance structure for a new Ocean Watch Task Force (or similar body) that provides for a more focused follow-up of the Strategic Plan actions, continues the role as Leadership Team for the Marine Reference Guide, and provides opportunities to advocate on marine issues on a regional basis;

2. This new Terms of Reference be developed in a ½ day workshop, tentatively hosted by the Town of Gibsons at a date to be determined (before the end of the year), with representation from Forum members and participating NGOs; and

3. Consideration be given to the provision of ongoing financial support to the Ocean Watch Task Force from Forum members to enable appropriate coordination of strategic actions.

In September 2020, Ocean Wise (formerly known as Vancouver Aquarium) undertook an update on action items and produced the Howe Sound Ocean Watch 2020 Edition. New information and actions items will amend the Task Force strategic plan.

The Howe Sound Biosphere Region Initiative Society (HSBRIS), striving for Howe Sound to be designated a UNESCO Biosphere Region, has been an active participant in the Ocean Watch Task Force, along with David Suzuki Foundation and Ocean Wise representatives. HSBRIS convened the former members of the Ocean Watch Task Force, now the *Ocean Watch Action Committee* on October 4th. Full list of participants and copies of meeting minutes are available at www.howesoundbri.org.

It is acknowledged that continued collaboration, commitment and resourcing by local governments are important to fulfill the strategic plan, the completion and transition of ongoing management of the Marine Reference Guide.

2. Three recommendations:

The HSCF Members:

1. Support continued appointment and participation of staff and elected officials in a renewed Ocean Watch Action Committee, a working group and network of organizations dedicated to advancing governmental actions.

2. Agree to the Howe Sound Biosphere Region Initiative Society act as the host society for the network and committees.

3. Receive the Ocean Watch 2020 Edition and support the seven recommended actions.

3. Suggested local government resolution:

WHEREAS continued collaboration, commitment and resourcing by governments are important to advance local, regional and national actions to support ocean marine health in the Átl'ka7tsem/Howe Sound bioregion, be it resolved:

THAT the Ocean Wise Ocean Watch 2020 Edition and resulting Action Items be received;

AND THAT participation by (*insert gov't name*) representatives, (*title*) staff member(*s*) and (*insert elected representative title*) in the Ocean Watch Action Committee be supported in order to continue to advance identified recommended actions in the Ocean Wise Howe Sound Ocean Watch 2020 Edition.

AND THAT the Howe Sound Biosphere Region Initiative Society be recommended as host society for the Ocean Watch Action Committee.

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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Climate Action Committee

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

Date: January 22, 2021 Meeting Date: February 12, 2021

Subject: **Manager's Report**

RECOMMENDATION
That the Climate Action Committee receive for information the report dated January 22, 2021, titled "Manager's Report".

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

CLIMATE ACTION HIGHLIGHTS
Development of the Metro Vancouver Region Low Carbon Cities Canada Centre
At the January 15, 2021 meeting, the Climate Action Committee received a staff update on the establishment of the Metro Vancouver Region Low Carbon Cities Canada (LC3) Centre, including the selection of team led by Simon Fraser University's Renewable Cities Program to set up the new LC3.

Mr. Alex Boston of SFU Renewable Cities will be speaking to the Committee as an invited presentation at its February meeting. One of the key objectives of the presentation is to establish the Climate Action Committee and its members as a touchstone for Metro Vancouver involvement in setting up the LC3, and to facilitate the exchange of information and feedback.

The SFU team is initiating engagement on the set up of the LC3, and it is expected that there will be a number of opportunities for Climate Action Committee members to provide their input. Attachment 2 to this report sets out an interview guide which will be used to guide the process of gathering feedback from a variety of stakeholders. Climate Action Committee members can refer to this guide to frame their input on the LC3, and if any members wish to participate in an interview, they are asked to contact the Committee Manager to make arrangements.

Township of Langley Climate Action Strategy
On January 25, 2021, Township of Langley's Climate Action Strategy was unanimously endorsed by the Township Mayor and Council. The Strategy will help set the path forward for achieving the Township's climate action targets of 45% reduction in greenhouse gas (GHG) emissions by 2030 and carbon neutrality by 2050.

The Climate Action Strategy considers both mitigation and adaption, and includes specific targets referred to as the five big moves, which will contribute to emission reductions and progress on

climate action priorities. Township staff provided an overview of the Strategy within their report to Council, and have identified that it will be an evolving Strategy that is periodically reviewed, and will also include annual reporting on the Township's climate action progress.

In July 2020, Council had directed staff to proceed with public consultation on the draft Climate Action Strategy (CAS), prior to bringing forward the final CAS for Council's consideration. The public survey received a total of 1,649 responses, and showed that:

- 72% expressed they were supportive of the CAS and the required investment,
- 15% were neutral, and
- 13% were unsupportive.

The Metro Vancouver Board had expressed its support for the Township's Climate Action Strategy, which aligns well with Metro Vancouver's regional climate goals as established in the *Climate 2050 Strategic Framework*. Staff will continue to collaboration with the Township of Langley, as well as other member municipalities to advance the region's shared climate action goals.

CleanBC Electrification Initiatives

A number of programs to support the acceleration of electrification of buildings, transportation, and industry have been announced by the BC Government in the last couple of months, some as part of the COVID-19 response. The initiatives described below are expected to support progress toward CleanBC and *Climate 2050* greenhouse gas reduction goals.

Buildings:

- CleanBC Better Homes New Construction Program – Rebates up to $15,000 for the construction of new high-performance, electric homes (single-family, laneway, duplex or row/townhome). Additional rebates are available for new homes that have no fossil fuel connection (i.e., fossil natural gas, propane, oil). The new home must be located in BC Hydro or New Westminster Electrical Utility service territory.
- CleanBC Commercial Express Program – Capital incentives up to a maximum of $100,000 to install equipment that helps reduce greenhouse gas emissions. The commercial building must be located within the BC Hydro service territory, including New Westminster.
- CleanBC Better Home Retrofits – Rebates are doubled for homeowners looking to switch from fossil fuel heating and water systems to electric technologies. Registration must be completed by March 31, 2021, and upgrades must be completed by June 30, 2021.
- CleanBC Better Homes Low-Interest Financing Program – This program provides loans with interest rates as low as 0% for switching from a fossil fuel (oil, propane or natural gas) heating system to a heat pump, for a five-year repayment period.

Transportation:

- CleanBC Specialty-Use Vehicle Incentive (SUVI) – The existing CleanBC SUVI vehicle has been strengthened. Existing rebates have been doubled and purchasers will have access to 33% of the cost, up to a maximum of $100,000 per vehicle, up from a $50,000 maximum. To support the most impacted sectors, tourism companies, including restaurants and other hospitality businesses, are eligible for double the rebates and can access 66% of the cost.

- CleanBC Commercial Vehicle Pilot Program – Organizations in B.C. can access $11 million in support of unique or large deployments of medium- and heavy-duty or very large electric vehicles such as domestic air, marine or rail transportation.
- CleanBC's Go Electric EV Charger Rebate and EV Ready Programs – Rebates have been doubled for buying and installing electric vehicle charging stations at home or work.

Industry:

- CleanBC Industrial Electrification Rate – Discounts will be available to BC Hydro's transmission service customers. They apply to new clean industries setting up or expanding operations in BC, eligible existing customers that install new equipment that uses electricity rather than fossil fuels, and eligible new customers that can demonstrate they could have used fossil fuels rather than electricity. The discounted rates last for a period of seven years, with a 20% discount for the first five years, 13% for year six and 7% for year seven.
- Facilities Electrification Fund – This fund is available to BC Hydro customers looking to pursue fuel switching projects from carbon-based fuels to BC Hydro's clean electricity and will help reduce the cost of connecting to BC Hydro's clean electricity grid.

AIR QUALITY AND CLIMATE CHANGE ENGAGEMENT UPDATE

Clean Air Plan and *Climate 2050*

The first phase of engagement on the *Clean Air Plan* closed at the end of 2020. Staff continue to receive feedback in the form of emails and letters. This valued feedback is being reviewed and considered during development of the draft *Clean Air Plan*, which is expected to be presented to this Committee in the coming months.

A public climate action webinar series began in late January, with the first topic**:** A *Carbon Neutral Region by 2050: what will it take to get there?* The webinar series runs on Tuesdays until March 9. There will be six webinars that will allow people to learn about climate actions already underway, and what is coming next. Remaining topics will include energy, agriculture, infrastructure, nature and ecosystems and the draft *Clean Air Plan*.

Proposed Expansion of the Non-Road Diesel Engine Emission Regulation (Bylaw No. 1161)

Consultation events on potential expansion of the Non-Road Diesel Engine Emission Regulation were conducted throughout the fall and completed in December 2020. Staff hosted two well-attended public webinars, and gave presentations to municipal representatives and other agencies on the proposals. Information about the potential expansion of the regulation was sent out to those that may be affected, through emails, advertisements in English and non-English print media, social media posts and a postcard mailed to industrial addresses within the region.

Staff are currently reviewing all of the feedback and preparing a consultation report and feedback summary. The feedback is being considered in the development of draft amendments to Bylaw No. 1161 for consideration by the MVRD Board. It is anticipated that the consultation report and the proposed Bylaw amendments will be presented to the Climate Action Committee later this year.

Managing Emissions from Cannabis Production and Processing Facilities

Additional engagement is now underway with several key stakeholders, in order to reach a common understanding of key issues, better align with Provincial initiatives, and explore industry-based solutions to managing emissions form cannabis production facilities. Staff hosted a public webinar in January, which was well-attended by both residents and cannabis producers. A second webinar is scheduled to be held on February 17th.

Staff continue to meet regularly with the Ministry of Environment and Climate Change Strategy and the Ministry of Agriculture, Food and Fisheries to discuss alignment of potential policies and initiatives. Staff have also met with staff from other orders of government, including Health Canada, cannabis producers and other stakeholders in order to discuss the four key issues identified for additional engagement in the report presented to the Climate Action Committee in October 16, 2020.

Proposed Amendments to Air Quality Permit and Regulatory Fees

Staff are proceeding with engagement on potential amendments to the air quality permit and regulatory fees defined in *Greater Vancouver Regional District Air Quality Management Fees Regulation Bylaw No. 1083, 2008* (Bylaw 1083). Following a public opinion survey late last year, staff have prepared a questionnaire and other engagement materials on the proposed amendments to collect feedback on the proposals, including from businesses that are currently permitted or regulated and other interested stakeholders.

Three public webinars are being hosted in February and March. The first two will cover all potential Bylaw amendments and the final webinar will focus on odorous air contaminants and the Measured Discharge Program.

FRASER VALLEY REGIONAL DISTRICT AIR QUALITY SERVICE AGREEMENT

Metro Vancouver operates a network of air quality monitoring stations that provide the basis for air quality planning, including determining compliance with air quality objectives and standards, tracking air quality trends, and providing information to the public. The Lower Fraser Valley Air Quality Monitoring Network comprises 31 stations that continuously monitor air contaminants throughout the airshed. Recognizing the shared nature of the airshed, six of the stations are located in the Fraser Valley Regional District (FVRD) in Abbotsford (2), Mission, Chilliwack, Agassiz and Hope, and these stations have been operated by Metro Vancouver under a service agreement with the FVRD.

Metro Vancouver and the Fraser Valley Regional District have executed a renewed agreement for the provision of air quality services to the FVRD, that is in place from January 1, 2021 to December 31, 2030. The renewed agreement addresses:

- operation and maintenance of the six monitoring stations in the FVRD, to ensure consistent practices, technology and equipment across the network;
- public access to data for all 31 stations using a consistent platform (airmap.ca), preparation of annual reports, cooperation on the analysis of data, and issuance of air quality advisories;
- planning services including the compilation of inventories of sources and emissions of air contaminants and greenhouse gases, for the Metro Vancouver region and the FVRD; and

- phased increase in the annual payment made by FVRD to Metro Vancouver for these services, commensurate with the addition of two new monitoring stations (in Mission and Agassiz) in recent years, and inflation.

Attachments *(43721292)*

1. Climate Action Committee 2021 Work Plan
2. Greater Vancouver Low Carbon Innovation Centre Stakeholder Interview Guide

References

Township of Langley Report to Mayor and Council- Climate Action Strategy- January 25, 2021

43358158

Climate Action Committee 2021 Work Plan
Report Date: January 22, 2021

Priorities

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

Greater Vancouver Low Carbon Innovation Centre Stakeholder Interview Guide

Interviewee:	
Interviewer:	Date:

INTRODUCTION

1. Thank you for making the time for this interview. Your input and ideas will be really valuable as we set up the new GVLCIC organization.
2. The purpose of these interviews is: *To seek input from key stakeholders and partners on the creation of the new Metro Vancouver LC3 (Low Carbon Cities Canada) organization, including input on main roles, desired outcomes, program ideas, investment strategies, and current assets and gaps in the low carbon ecosystem.*
3. The interview will take 45-60 minutes, and I'll be taking notes during the interview.
4. I'll start by providing a brief background and overview of the project, then ask a series of xx questions. Feel free to ask questions at any time.

BACKGROUND

The Low Carbon Cities Canada (LC3) initiative is a new partnership between the Federation of Canadian Municipalities (FCM) and seven urban centres across Canada, whose purpose is to accelerate urban climate solutions and help urban centres reach their full emissions reduction potential through impact investment, grant funding, and programming.

The City of Vancouver is being tasked with being the administrator for the new GVLCIC, and SFU Renewable Cities, in partnership with Rhiza Capital, Don Lidstone and Company, and WCS Engagement + Planning is responsible for the creation and set-up of the new LC3 organization. This work includes:

- conducting stakeholder, partner and community interviews and workshops to inform the creation of the new entity
- undertaking all the legal work in the formation of the new organization
- setting up the startup board of directors and hiring an executive director
- setting up the Investment Committee and investment policies and strategy
- developing a five-year strategic plan, budget and cash flow
- incorporating ZEBx into the new MVLC3 organization

The GVLCIC is required to, within 10 years, raise matching funding of $21m to put towards the endowment. Aside from raising additional funding, the GVLCIC will be seeking private capital for financing or investing into projects.

QUESTIONS

General (all)

1. The purpose of each LC3 organization in Canada is to "accelerate urban climate solutions." What do you think are the main roles of the GVLCIC in achieving a low-carbon future in Metro Vancouver (e.g. invest in new solutions; build capacity in each sector; policy innovation; public literacy)?
2. What outcomes would you like to see as a result of GVLCIC in 5 years? 10 years?

3. What are the main assets and gaps in advancing low carbon initiative in the region? Which sectors have a real climate action gap?
4. Do you have any suggestions for us to leverage the endowment to raise more $? (Who to approach, strategy to approach them?)

Programmatic Approach and Focus

1. What would be the most helpful tools to help you/your company/organization accelerate lower carbon solutions?
2. How important is it for GVLCIC to support education and training for advancing low carbon? What are some specific tactics?
3. What strategies should be considered for strengthening the ecosystem for low carbon innovation across the region?

Impact Investment & Finance

1. What are some innovative financing models you've seen for advancing low carbon initiatives?
2. What are the finance gaps (e.g. grants, debt, equity, etc.) for low-carbon built environment and transportation in Metro Vancouver?
3. And, per the previous question, what would be a blue-sky asset allocation model?
4. What are realistic return profiles of those respective asset allocation segments?
5. And, risk profiles?
6. How much deal flow of truly carbon-valuable projects exist?
7. Where (geographically) is low carbon building tech most easily landing with respect to jurisdictional regulations, policies, etc.?
8. Are there tools, strategies, programs that the public sector can use to finance low carbon building initiatives? Which level of government is most apropos?

Organizational development

Present our proposed org model (National NPO, with a wholly owned for-profit investment company).

1. Do you have any feedback on the proposed model?
2. Do you have any suggestions for prospective board, Investment Committee, Technical Committee members?

Other

Would you be willing to participate in a 4-hour stakeholder workshop next month?

January 22, 2021

Sav Dhaliwal, Board Chair
Metro Vancouver Regional District
4730 Kingsway
Burnaby BC V5H 0C6

Reference: 297534
Your File: CR-12-01
RD 2020 Oct 2

Dear Chair Dhaliwal:

Re: Ride-hailing

Thank you for your letter of December 4, 2020, sharing Metro Vancouver's support of greenhouse gas emission requirements for the ride-hailing and taxi industries.

Our government is committed to fighting climate change. Through our CleanBC plan, we are taking action to reduce congestion and emissions and help people get around in ways that lead to better health outcomes and cleaner, more livable communities.

As you know, the Passenger Transportation Board (Board), which is responsible for ride-hailing and taxi licensing in B.C., has required taxi companies in the Lower Mainland and Capital Regional District to use low emissions vehicles for all new and additional taxis approved since 2007.

The Board is currently collecting data from both the ride-hail and taxi industries. The data collected includes trip information such as pick-up and drop-off locations as well as the number of vehicles on the road at any given time. This data will guide any future decisions about requirements for the ride-hail industry and allow B.C. to address issues with congestion, safety and emissions that some jurisdictions have experienced with ride-hailing.

Currently, the Passenger Transportation Regulation requires that all ride hail vehicles be less than 10 years old to ensure that the vehicles have the latest safety and fuel efficiency measures. This regulation was recommended by the Select Standing Committee on Crown Corporation's report on ride hailing in 2019, which further stated that "consideration of adopting low-carbon measures should wait until the transportation network services industry is established."

The Passenger Transportation Branch intends to engage with stakeholders on the regulations in the future to hear concerns and key issues. You can be sure Metro Vancouver will be part of this outreach.

…/2

Ministry of Transportation and Infrastructure

Office of the Minister

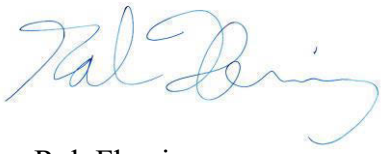
Mailing Address:
Parliament Buildings
Victoria BC V8V 1X4

As we recover from COVID-19, continuing our work to modernize the passenger-directed transportation industry and support fairness and economic sustainability for the taxi industry will be vital. I look forward to supporting these efforts and achieving further progress.

If you have any questions about this work, please do not hesitate to contact Steven Haywood, the ministry's Executive Lead for Taxi Modernization and Ride-Hailing. He may be reached at 604 220 7176 or by email at Steven.Haywood@gov.bc.ca and would be pleased to assist you.

Thank you again for taking the time to write.

Sincerely,



Rob Fleming
Minister

Copy to: Honourable George Heyman
Minister of Environment and Climate Change Strategy
Minister Responsible for TransLink
MLA, Vancouver-Fairview

Honourable Josie Osborne
Minister of Municipal Affairs
MLA, Mid Island-Pacific Rim

Honourable Bruce Ralston
Minister of Energy, Mines and Low Carbon Innovation
Minister Responsible for the Consular Corps of British Columbia
MLA, Surrey-Whalley

Kaye Krishna, Deputy Minister
Ministry of Transportation and Infrastructure

Steven Haywood, Executive Lead for Taxi Modernization and Ride-Hailing
Passenger Transportation Branch