

Corporate Climate Action Plan



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Sustainability Framework

In Metropolitan Vancouver climate change is expected to result in warmer temperatures, wetter winters, drier summers and more frequent extreme weather events, along with rising sea levels.

Tackling climate change will require actions to reduce GHG emissions and also to prepare for the impacts that climate change will bring to our region.

Building a Sustainable Livable Region

Since 2002 Metro Vancouver has formally placed the concept of sustainability at the centre of its operating and planning philosophy and advanced its role as a leader making the region one which is explicitly committed to a sustainable future. This comprehensive endeavour has become known as the Sustainable Region Initiative, or more familiarly as the 'SRI'.

All of Metro Vancouver's plans share a common nucleus, that is, the vision, mission, values, sustainability imperatives, and sustainability principles as set out in the Sustainability Framework. This Corporate Climate Action plan is one plan in a suite of Metro Vancouver plans.

METRO VANCOUVER SUSTAINABILITY FRAMEWORK

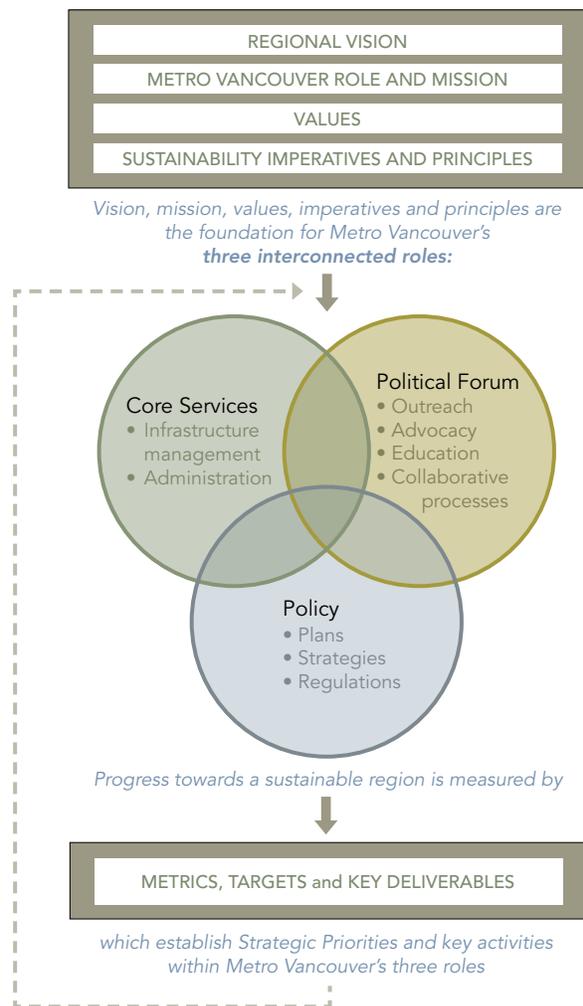


FIGURE 1: METRO VANCOUVER SUSTAINABILITY FRAMEWORK

Vision Statement

Metro Vancouver seeks to achieve what humanity aspires to on a global basis – the highest quality of life embracing cultural vitality, economic prosperity, social justice and compassion, all nurtured in and by a beautiful and healthy natural environment.

We will achieve this vision by embracing and applying the principles of sustainability, not least of which is an unshakeable commitment to the well-being of current and future generations and the health of the planet, in everything we do.

As we share our efforts in achieving this vision, we are confident that the inspiration and mutual learning we gain will become vital ingredients in our hopes for a sustainable common future.

Sustainability Imperatives

The Sustainable Region Initiative is driven by the following overarching imperatives necessary for creating a sustainable future:

- Have regard for both local and global consequences and long term impacts
- Recognize and reflect the interconnectedness and interdependence of systems
- Be collaborative

Plan Vision

Vision

A carbon neutral corporation resilient to the impacts of climate change.

Guiding Principles

Metro Vancouver will become carbon neutral by reducing corporate emissions, providing renewable energy to other parties to avoid emissions in the region, and sequestering carbon. Carbon neutrality is achieved when the amount of greenhouse gases avoided and sequestered is equal to (or more than) the emissions created. Emissions will be reduced in accordance with a successful business case using an established corporate price for GHG emissions.

Metro Vancouver will seek to retain credit of avoided emissions resulting from second-party use of Metro Vancouver-supplied renewable energy. All credits from avoided or sequestered emissions will be kept and applied against emissions from all corporate sources including solid waste emissions. If credits exceed emissions, Metro Vancouver will keep these credits, going beyond carbon neutral to become "carbon negative".

If carbon neutrality is not achieved, as a last resort, Metro Vancouver may purchase or create offset credits with local partners.



Purpose

The purpose of this plan is to set out strategies and actions to achieve Metro Vancouver's commitment to corporate carbon neutrality and to adapt our corporate infrastructure and activities to the anticipated consequences of climate change. This plan will focus on the BC Climate Action Charter commitment, which excludes solid waste, but mitigation actions associated with solid waste will be added following adoption of the Integrated Solid Waste and Resource Management Plan.

Links to Other Plans

Metro Vancouver Plans

Climate change and energy cut across all aspects of the Sustainable Region Initiative. Reducing Metro Vancouver's contribution to climate change, preparing for the impacts of climate change, and managing Metro Vancouver's energy use, are all important elements integrated directly into Metro Vancouver's Suite of Plans.

For example, reducing resource consumption is fundamental to the Drinking Water Management Plan (DWMP) and Integrated Solid Waste Resource Management Plan (ISWRMP). Demand management both reduces greenhouse gas emissions and improves corporate resiliency. Opportunities for energy recovery from waste streams are detailed in the DWMP, Integrated Liquid Waste Resource Management Plan (ILWRMP) and ISWRMP. Actions to recover energy and make best use of resources generated from waste streams have the additional benefit of reducing greenhouse gas emissions.

Measures in the DWMP and LWMP which prepare infrastructure for increased demand for services also protect against the impacts of climate change. An example of a significant adaptive measure identified in the DWMP is the Seymour-Capilano Filtration Project. This project makes Metro Vancouver more resilient to water quality and turbidity risks associated with the anticipated heavier rainfall and storms that climate change is expected to bring.

The Corporate Climate Action Plan serves to integrate corporate climate change and energy actions in the other management plans, but also to identify additional actions and to address the relationship of climate change and service delivery.

In addition to the long-term planning actions identified in Metro Vancouver's suite of plans, there are shorter-term service delivery actions that can be taken to address climate change. For example, this plan includes actions for corporate operations such as the management of vehicles and equipment, which may not be addressed by a specific management plan but contribute to Metro Vancouver's corporate GHG emissions.

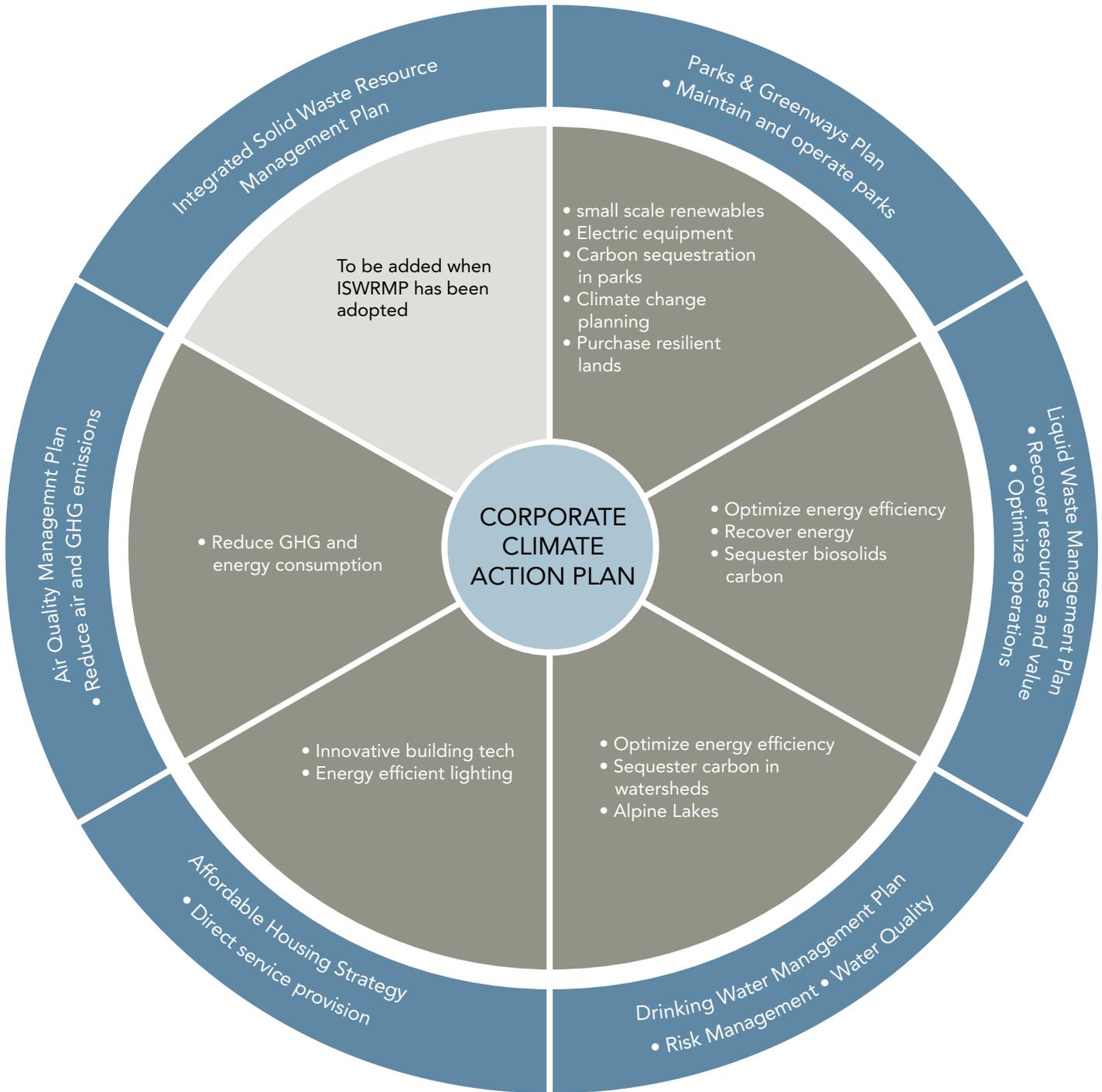


FIGURE 2: CONTRIBUTION OF THE CORPORATE CLIMATE ACTION PLAN TO THE OBJECTIVES OF THE OTHER METRO VANCOUVER MANAGEMENT PLANS

Aligning with Provincial Initiatives

Measures on the part of other levels of government have a direct impact on the ability of our region to achieve our climate change goals and targets. Some of the most significant linkages are described in this section.

- **The Climate Action Charter (2008)** – In December 2007, Metro Vancouver signed the BC Climate Action Charter - a voluntary tripartite agreement between the Province, the Union of BC Municipalities (UBCM) and each individual local government signatory. This Charter aims to engage local governments in the GHG reduction effort on a voluntary basis. The key commitment of the Charter is for local governments to become carbon neutral in traditional local government services, excluding solid waste disposal by 2012.
- **Greenhouse Gas Reduction (Cap and Trade) Act (2008)** – This act enacted the Province of BC to develop a system of mandatory caps on major B.C. emitters as part of a GHG trading system in partnership with other jurisdictions. Full implementation of the regional cap and trade system is currently anticipated to occur in 2012. However, the Ministry of Environment introduced a mandatory Reporting Regulation which requires that facilities emitting more than 10,000 tonnes per year (including CO₂ biomass emissions) of CO₂E per annum will be required to report their GHG emissions to the ministry, beginning with the 2009 calendar year and annually thereafter. Based on the definition of biomass and the proposed 10,000 tonnes threshold, Metro Vancouver likely will be subject to the reporting requirement. In BC, non-combustion emissions at solid waste disposal facilities and municipal and industrial wastewater treatment plants will be addressed under separate regulations and would not fall under the cap and trade program.
- **Preparing for Climate Change: British Columbia's Adaptation Strategy (2010)** – This document establishes a framework and vision of a British Columbia that is prepared for and resilient to the impacts of climate change. This vision is supported by three strategies: (1) Build a strong foundation of knowledge and tools, (2) Make adaptation a part of the Government of British Columbia's business, (3) Assess risks and implement priority adaptation actions in key climate sensitive sectors. This Provincial Strategy includes engaging and working with partners in other levels of government and integrating adaptation into B.C. Government policies, legislation and regulations, including provincial guidelines on dyke upgrade.
- **BC Energy Plan (2007)** – This Plan establishes the energy framework for the entire province. In it, the province makes aggressive commitments, including requiring all new electricity projects developed in B.C. to have zero net greenhouse gas emissions, all existing thermal generation power plants to reach zero net greenhouse gas emissions by 2016, and 50 per cent of BC Hydro's incremental resource needs to be acquired through conservation by 2020. The Corporate Climate Action Plan assumes the Province will be successful in achieving the targets set out in the BC Energy Plan.

Greenhouse Gas Emission Reduction Strategies and Actions

Strategy 1: Reduce Energy Consumption

Minimizing energy consumption through technology and operational changes reduces costs and reliance on fossil fuels and imported electricity. Energy conservation actions typically have co-benefits beyond cost including improved services, comfort, and safety. Additionally, there are numerous programs and incentives available to facilitate implementation of these actions.

METRO VANCOUVER WILL:

1.1: OPTIMIZE UTILITY SYSTEMS ENERGY EFFICIENCY

Systematically review the utility operating systems to identify opportunities to redesign and apply new technology to optimize system energy efficiency.

1.2: EXPAND USE OF ENERGY-EFFICIENT LIGHTING SYSTEM TECHNOLOGIES

Building upon experiences at head office and two of the wastewater treatment plants, switch to less energy intensive lighting systems through design, installation of more efficient lights, ballasts, and supporting equipment and reconfiguration to zone-based and task lighting.

1.3: APPLY INNOVATIVE TECHNOLOGIES TO REDUCE HEATING AND COOLING LOAD IN EXISTING BUILDINGS AND FACILITIES

Pursue the use of reflective paints, triple-glazed windows and green rooftops to better insulate buildings to reduce heat

transfer. Use office space design, office equipment, and automated control of HVAC to minimize energy use to heat and cool spaces.

1.4: PROGRESSIVELY IMPROVE FUEL EFFICIENCY OF VEHICLE FLEET

Ensure the right vehicle is assigned to the right task (right-sizing) and invest in a highly fuel-efficient fleet, including SMART cars and hybrid vehicles. Identify and retire poor performers.

1.5: USE NEW DESIGN AND TECHNOLOGY TO MINIMIZE VEHICLE AND EQUIPMENT USE

Increase the use of remote monitoring and operation of air quality and drinking water monitoring stations to reduce the need for site visits, facilitate the use of video conferencing facilities to reduce travel, and implement low-maintenance landscape design principles to minimize off-road equipment operations.

Strategy 2: Switch to Renewable Energy

Renewable energy operates within the current natural carbon cycle unlike fossil fuels which introduce additional ancient carbon into the current carbon cycle and increase the greenhouse gas concentration in the atmosphere, leading to climate change.

METRO VANCOUVER WILL:

2.1: SWITCH TO LOWER CARBON FUEL SOURCES FOR VEHICLES AND EQUIPMENT

Seek access to fuels with renewable contents higher than provincially mandated, through means such as partnering with member municipalities to access renewable fuels at municipal fuelling stations for Metro Vancouver corporate vehicles and equipment. Investigate opportunities to use biogas as vehicle fuel.

2.2: PURSUE ELECTRIC VEHICLES AND EQUIPMENT

Evaluate the use of electric vehicles and equipment across Metro Vancouver operations, and consider installing recharging outlets, purchasing electric off-road and low speed vehicles and participating in test conversions. This action assumes the Province will be successful in implementing the targets in the BC Energy Plan (2007).

2.3: TRANSITION HOT WATER APPLICATIONS TO SOLAR WATER HEATING

Use experience of solar hot water heater at the corporate head office to evaluate use of solar hot water heating in other buildings.



2.4: PURSUE SMALL-SCALE RENEWABLE ENERGY OPPORTUNITIES

Investigate the use of small-scale renewable energy applications at parks, air quality and pumping facilities in remote locations. Pursue demonstrations of such equipment to increase corporate expertise.

Strategy 3: Maximize Energy Recovery

Metro Vancouver systems produce more energy than is currently used; this excess energy has not been productively usable by traditional methods. An emerging market for clean energy is lessening the technical and financial challenges associated with recovering this energy. A number of projects are in development that would supply recovered energy for use by Metro Vancouver or other parties.

METRO VANCOUVER WILL:

3.1: RECOVER HEAT FROM WASTE-WATER COLLECTION AND TREATMENT SYSTEMS FOR USE BY NEARBY BUILDINGS AND FACILITIES

Investigate opportunities to extract heat from sewage for nearby developments and pursue opportunities to recover heat from wastewater treatment effluent.

3.2: RECOVER EMBEDDED ENERGY IN BIOSOLIDS

Work with high energy industrial users in the region, such as cement kilns, to evaluate the potential to use biosolids to replace more carbon intensive fuels.

3.3: PRODUCE AND USE MORE DIGESTER GAS

Continue to investigate innovative processes and technologies to increase production of digester gas, optimize the treatment process and biogas production to increase gas utilization, explore opportunities to market digester gas to other users to replace more greenhouse gas intensive fuels.

3.4: GENERATE HYDRO-ELECTRICITY FROM WATER AND WASTE-WATER SYSTEMS

Pursue opportunities for generating hydro-electricity at the Cleveland dam, the Seymour dam, and the pipeline from the Capilano-Seymour filtration plant to Capilano Reservoir.

Strategy 4: Sequester and Remove Carbon

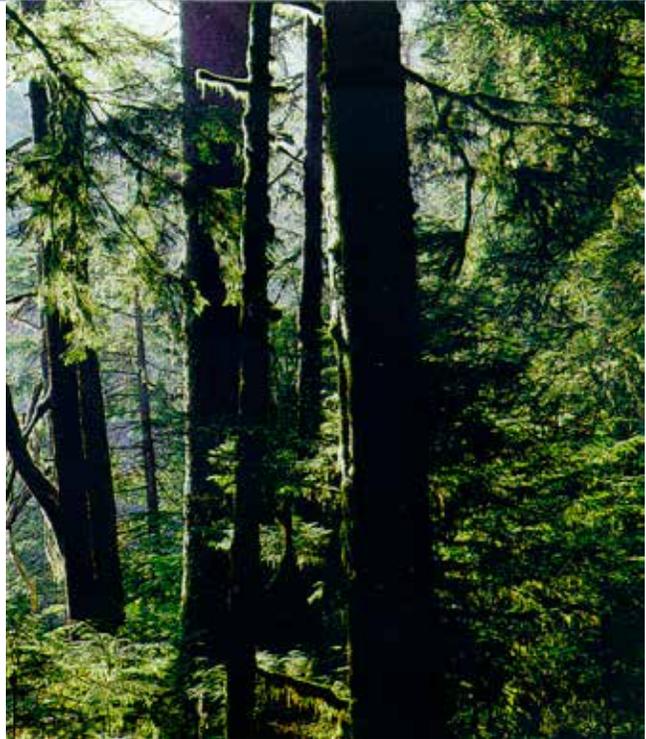
This strategy includes locking up greenhouse gas emissions to prevent their release to the atmosphere and facilitating their removal from the atmosphere.

4.1: USE BIOSOLIDS TO SEQUESTER CARBON

Land application of biosolids locks up potential greenhouse gases as carbon in the biosolids are bound into a new soil medium, avoiding the potential release of this carbon as carbon dioxide. Expand opportunities to sequester the carbon in biosolids both at mine sites and in other land applications.

4.2: MAXIMIZE CARBON STORED ON METRO VANCOUVER LANDS

Increase the amount of carbon stored on our lands by converting, acquiring, protecting and restoring property owned and operated by the corporation, and by pursuing accreditation of the emissions reductions associated with sequestration projects.



Climate Change Adaptation Strategies and Actions

A number of activities to improve corporate resiliency to climate change are outlined in other plans, such as the DWMP and LWMP. Corporate resiliency to climate change is also closely linked to the actions of others. Municipal actions in implementing green infrastructure, reducing inflow and infiltration and separating combined sewers will all reduce loading on corporate wastewater infrastructure, increasing corporate resiliency in adapting to climate change. Provincial and local government actions to raise dykes to protect vulnerable communities from rising sea levels are critical in protecting corporate infrastructure. Reducing demand for potable water also increases the corporate resiliency by limiting the need to upgrade infrastructure.

Strategy 5: Adapt Existing Infrastructure and Operations

Modify existing infrastructure to reduce its vulnerability to climate change impacts (see Appendix A for “Local Climate Change Hazards and Impacts”).

5.1: INCREASE POWER RELIABILITY AT KEY VULNERABLE FACILITIES.

Assess the potential threats to continuity of service power by extreme weather and install appropriate power reliability measures.

5.2: RETROFIT EXISTING INFRASTRUCTURE VULNERABLE TO FLOODING

Reduce the vulnerability of key low-lying pump stations and components of wastewater treatment plants, by actions such as raising minimum structure elevations or adding local dykes to reduce the need for operational response.

Strategy 6: Plan and Build Resilient New Infrastructure and Facilities

Infrastructure and facilities will need to be planned, designed and constructed with the impacts of climate change, including sea level rise, in mind.

6.1: SECURE NECESSARY PROPERTY FOR FUTURE ADAPTIVE INFRASTRUCTURE REQUIREMENTS

Secure necessary property for anticipated upgrades such as local dykes, new wastewater pump stations and additional peaking reservoirs for potable water.

6.2: INCREASE USE OF ALPINE LAKES FOR WATER SUPPLY

Increase the use of alpine lakes for water supply where that will increase resiliency to climate change, such as temperature control and reserve supply.

Supportive Organizational Changes

A number of changes will take place within our organization to ensure that the causes and effects of climate change are considered as part of our every day decision-making. These changes support the successful implementation of this plan.

Action S.1 Integrate climate change adaptation and mitigation into the decision making process

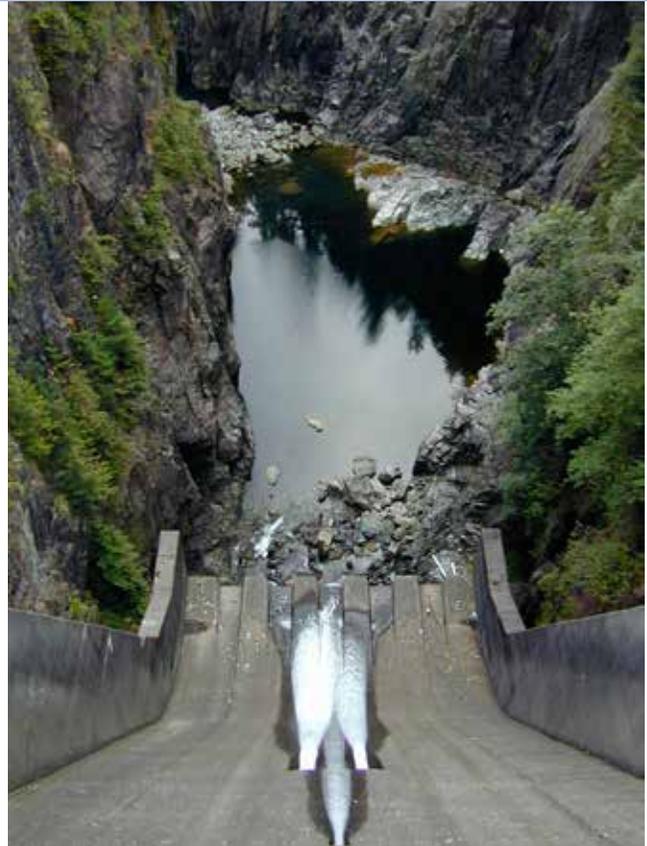
Establish an internal price for GHG emissions at a level which will encourage lower GHG emitting projects. All decisions will account for the price of GHGs beginning in 2011. Integrate energy use and GHG emissions into the assessment of capital projects.

Action S.2: Expand purchasing procedures to include energy efficiency and greenhouse gas emissions

Add energy efficiency specifications for commonly purchased equipment and office supplies, incorporate a minimum fuel efficiency standard for the fleet and for energy intensive equipment, require or provide incentives for high efficiency options.

Action S.3: Increase energy and greenhouse gas expertise

Integrate energy and emission information into existing training and communications opportunities.



Performance Indicators

Performance measures document progress in achieving the goals of the CCAP and are useful for the adaptive management process.

Climate Change Mitigation

- Emission reductions & offsets (tonnes)
- Net energy generation (GJ)

Strategy 1: Reduce Energy Consumption

- Energy conserved by sector (GJ)
- Emission reductions by sector (tonnes CO₂E)
- Energy conservation investments by sector (\$)

Strategy 2: Switch to Renewable Energy

- Renewable Energy consumed (GJ)
- Percentage of energy consumed that is renewable (%)
- Average carbon content of fuel

Strategy 3: Maximize Energy Recovery

- Energy recovered by type (GJ)
- Percentage of recovered energy used by Metro Vancouver (%)

Strategy 4: Sequester and Remove Carbon

- Carbon sequestered by sequestration method (tonnes of CO₂E)

Strategy 5: Adapt Existing Infrastructure and Operations

- Report on progress
- Percentage of water and sewer pump stations with backup power
- Percentage of existing infrastructure vulnerable to climate change (%)

Strategy 6: Plan and Build Resilient New Infrastructure and Facilities

- Percentage of annually renewable alpine lake capacity used
- Report on progress of resiliency of new infrastructure

APPENDIX A – Local Climate Change Hazards and Impacts

The following table summarizes the observed and projected climate change risks for the metropolitan Vancouver region. These hazards will have a host of potential impacts on our ecosystems, economy, and infrastructure.

Change	To date (2000 from 1950)	By 2050	Potential Impacts
Mean annual temperature	+1°C to +2°C	+2°C to +3°C	Poorer air quality Higher energy use in summer
Mean spring temperature	+1.5°C to +3°C	+2°C to +3°C	Heat stroke risk Invasive species Wildfires Insect infestations Drought
Frost free days	+10 per decade	+10 per decade	Insects and disease
Growing degree days	+5% to +16% per century	+10%	Better harvests
Precipitation – Annual	+10% to +25%	+5-10%	
Precipitation - Spring	+30% to 40% South	+5%	
Rain intensities (Heavy precipitation days)	+5%/decade	+5% to +15%	Flash flooding Landslides
River flows	Increased in winter and spring; Declined summer and fall	Peak 15 to 40 days earlier Trends to continue	Flooding Fish impacts
Snowpack, April 1	-20% to -60% decline	-15%	Reduced skiing / snow activities
Glaciers	Rapid decline 1965 to 2005	Mostly disappear by 2100	Tourism impacts
Sea Level Rise	Rise 4 to 12 cm over century	1 meter (by 2100)	Dike breach Public safety Inundate wastewater treatment plants Loss of ecosystems / beaches
Significant wave heights	+1 cm / decade	More than +1 cm/ decade	Dike breach
Intense winter storms	+10% Increased frequency	+25% Increased frequency	Power outages Infrastructure / property damage Public safety

Source: *Adapting to Climate Change: A Risk-based Guide for Local Governments in British Columbia* (2010) and discussions with authors (2010).



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