

Climate Change

Regional Sustainability Strategy Policy Options Series | Fall 2010

Climate change is a complex, multi-year challenge for our region. Addressing climate change means fundamentally re-thinking where we live, how we move, what we eat, what really makes us happy. While climate change impacts are felt locally and around the world, solutions are just as widespread. Finding new energy sources, committing to reduce emissions and making smarter decisions as consumers can help solve the problem. Our economic structures, government policies, and culture will be determined by how we deal with this challenge.

This is one of nine papers that aims to challenge our thinking about being a sustainable region. It focuses on climate change and presents three directions – the status quo, moderate change and significant change. The paper also sketches out the current context, identifies drivers of change and highlights practices from other communities.

We recognize that every decision has an impact on a sustainable future – reducing emissions and adapting to future climates are fundamental issues in land use, development, transportation and ecosystem protection. Your feedback is welcome.

A Regional Context

Energy Consumption. Energy continues to be consumed at an unsustainable rate. Our vehicles, homes, offices, schools and food systems rely mainly on fossil fuels. In 1995, energy consumption was determined to be 30.7 million Gigajoules (GJ), and by 2004, consumption had increased to 32.2 million GJ. In 2007, energy consumption was determined to be 33.8 million GJ. On a per capita basis, this was approximately 94.1 GJ. Figure 1 shows the breakdown by energy user.

Figure 1: Measured Energy Use, Capital Region 2007

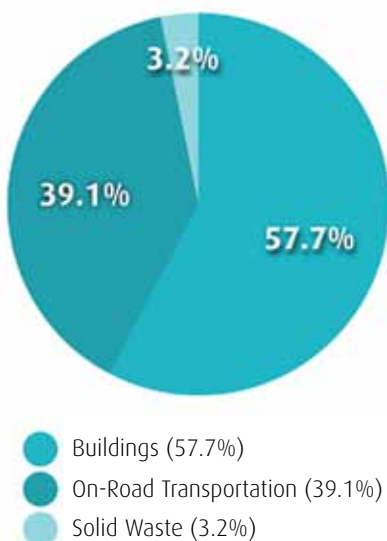
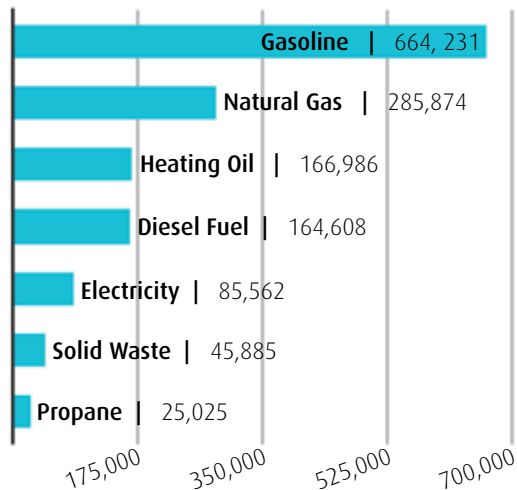


Photo: Evan Leeson

Source: BC Community Energy & Emissions Inventory (CEEI)

Figure 2: Contributors to GHG Emissions – CO₂e, tonnes, Capital Region, 2007



Source: BC Community Energy & Emissions Inventory ((CEEI)

Greenhouse Gas (GHG) Emissions. GHG emissions are expressed in tonnes of carbon dioxide equivalents (CO₂e). Over the past decade, understanding GHG sources and measuring emissions has improved dramatically. Whether we generate emissions locally or indirectly (e.g., building dams for hydro elsewhere in BC), the use of energy generates emissions. In 1995, it was estimated that 1.77 million tonnes of CO₂e were emitted in the region, declining to 1.55 million in 2004. Much of the decline was attributed to improved capture of gasses at the Hartland landfill. The 2007 levels of GHG emissions regionally were measured at 1.44 million tonnes – reflecting some progress in efficiencies and renewable energy generation. However, since the methodology and scope for determining 2007 emissions varies from previous inventories, a downward trend cannot be assumed. Figure 2 illustrates the comparative emissions by major contributors.

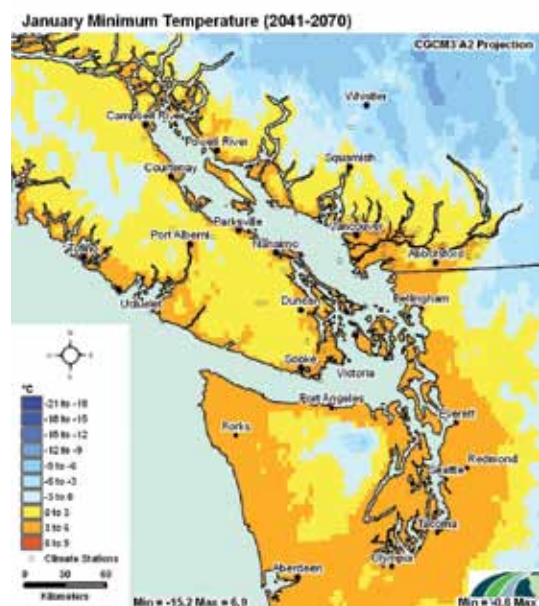
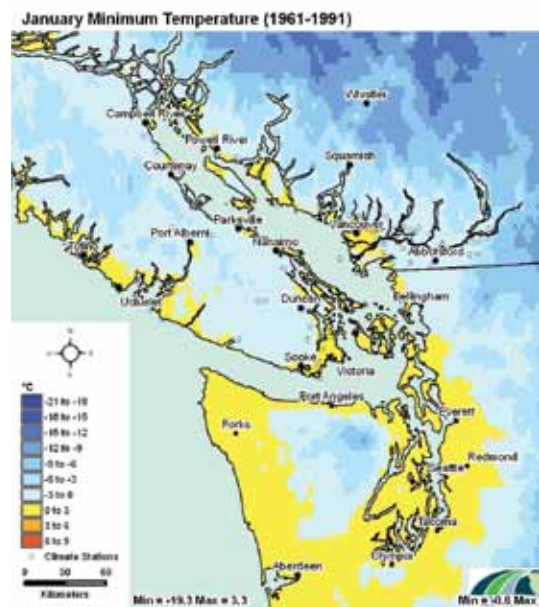
Climate Impacts. The warming of the climate system is evident from the rise in air and ocean temperatures, widespread melting of snow and ice and rising sea levels. Already, average global surface temperature has risen more than 0.7°C above pre-industrial levels. Anything more than 2°C will bring severe and irreversible damages.

Adapting to climate change and dealing with the impacts presents significant implications for local and regional governments, public institutions and communities. Projected impacts include:

- Increased intensity/frequency of storm events; widespread damage to buildings, infrastructure and the environment;
- Sea level rise and storm surges; flooding and slope failure;

- Hotter/drier summers; agricultural crop losses; sickness and death for vulnerable people;
- Reduced availability/quality of potable water; low groundwater recharge rates; reduced stream flow/ lake levels;
- Increased droughts; reduction of summer water supplies;
- Increased stress/damage to habitat and ecosystems; and
- Prolonged exposure to invasive species and pests.

The Pacific Climate Impacts Consortium (PCIC) is working to bridge climate research and projections. One of PCIC's tools helps assess local impacts of climate change through maps, graphs and data tables. Looking to the future, the maps below show that average temperatures could increase by *several degrees* for the Georgia Strait/Puget Sound area.



What's Driving Government Involvement in Climate Change?

All levels of government are taking action on climate change. There are fundamental economic, social and environmental benefits in improving energy security and reducing our dependency on fossil fuels. Climate change is connected to how we plan, develop, and interact with both the built and natural environments.



Provincial Government – Highlights

In Canada, BC is at the forefront of climate change policy. The province has proactively addressed climate change and positioned British Columbians to take advantage of opportunities of an emerging low-carbon global economy. BC's climate actions and policies are enshrined in law. While substantial efforts are still required, the past five years have shown considerable progress:

- 2006** | Introduction of new Green Building Code with some of the highest energy-efficiency standards in Canada. Requires all new public buildings be built to LEED® Gold Standards.
- 2007** | Legislation of 33% reduction of GHGs from 2007 levels by 2020 and 80% by 2050; requires core areas of government to be carbon neutral by 2010.
- 2007** | Legislation of local governments to move towards more sustainable, healthy communities by requiring GHG targets, policies and actions to be included in official community plans (OCPs) by 2010.
- 2007** | Legislation of tailpipe emissions standards to achieve reduction targets of 6% by 2012, 18% by 2016.
- 2007** | Adoption of a zero net deforestation policy to optimize the carbon and storage value of the province's forests.
- 2008** | Implementation of the world's first broad-based carbon tax on fossil fuels.

“Climate change is happening even faster than previously estimated; global CO₂ emissions since 2000 have been higher than even the highest predictions, Arctic sea ice has been melting at rates much faster than predicted, and the rise in the sea level has become more rapid. Feedbacks in the climate system might lead to much more rapid climate changes. The need for urgent action to address climate change is now indisputable.”

National Science Academies of the G8+5 Nations Call to Action (May 2009)

Incentive Programs to Reduce GHGs

BC Hydro Power Smart Sustainable Communities

This program offers a range of services to help municipalities and regional districts make smart choices about energy management and efficiency community-wide. Funds and resources are available for: community energy and emissions planning, hiring community energy managers, and developing district energy systems.

ecoENERGY Retrofit Incentive for Buildings Natural Resources Canada's Office of Energy Efficiency offers a financial incentive for retrofitting local government buildings. The maximum incentive is \$50,000 per project and \$250,000 per recipient.

SolarBC

Funded by the province and delivered in cooperation with Natural Resources Canada, this program offers an incentive of up to \$40,000 for municipalities installing solar hot water in municipal buildings.

VanCity Community Grants

Funding of up to \$10,000 is available for projects that focus on “acting on climate change”, plus grants of up to \$50,000 support initiatives for building retrofits, regulatory change that advance green building practice and education to increase the understanding and use of practical green building strategies.

Taking Steps Regionally

The CRD and member municipalities have a long history of taking action to reduce energy use and emissions on southern Vancouver Island. In 2007, the CRD Board adopted a Community Energy Plan that set a strategy to manage the on-going energy consumption and greenhouse gas emissions in our region. Since then a number of key activities have taken place:

- The CRD, member municipalities and the Island’s Trust signed the BC Climate Action Charter and committed to becoming carbon neutral in their corporate operations beginning in 2012. While corporate emissions only represent about 4% of the region’s total emissions, this commitment ensures that emissions from services, infrastructure and buildings are accounted for, reduced and offset each year.
- The CRD and local governments have adopted a series of bylaws, practices, and programs that focus on creating compact, complete communities, improving air quality and enhancing transportation choice.
- In 2008, the CRD Board adopted a regional goal of reducing GHG emissions by 33% over 2007 levels by 2020.
- Throughout 2009 and 2010, member municipalities adopted specific reduction targets for integration in their official community plans. Some have also developed climate action plans to identify opportunities, goals, actions and priorities specific to their community. While each local target and plan is unique, they all depend on a combination of citizens, businesses, service providers, and other levels of government taking action to achieve goals.

“To meet emissions reduction targets and enhance our resiliency, we not only require shifts in our attitudes and behaviours, but also our policies, technologies and systems. We will have to work together to achieve progress towards a green, healthy, and vibrant region.”

<quote from elected official>

To continue to be successful in reaching both local and regional objectives, aggressive, coordinated and long-term action focusing on people, land use, systems and technology will be required. The region will also have to actively work with senior levels of government to ensure that climate change continues to be a key issue in decision making and spending.

GOALS – Capital Region 2007 Community Energy Plan	
1	Improve the energy efficiency of buildings.
2	Increase transportation efficiency.
3	Encourage energy efficient land use planning.
4	Diversify energy supply.
5	Educate and engage residents and businesses.
6	Demonstrate municipal leadership.
Source: www.crd.bc.ca.climatechange/documents/crdenergyplan.pdf	

FOCUS – CRD Climate Change Action Program 2009	
1	Provide support to local governments in developing and implementing climate action plans.
2	Increase public awareness of climate change impacts and strategies for emissions reductions through partnerships with public and private sectors, NGOs and community organizations.
3	Liaise with senior levels of government on climate related programs, policies and legislation.
4	Support the CRD becoming carbon neutral in its own operations by 2012.
Source: www.crd.bc.ca.climatechange/documents/crdenergyplan.pdf	

What's Happening Elsewhere?

Just as the impacts of climate change are felt around the globe, cities worldwide have taken big steps to respond to climate change. There are many solutions and approaches. The following examples show a range of practices that cities are taking to implement significant local change.

Community Energy | Växjö, Sweden

After a significant commitment to reducing emissions in this city of 80,000, Växjö has seen substantial results in less than two decades. In 2009, 51% of Växjö's energy came from biomass, renewable electricity, geothermal and solar. Since 1993, CO₂ has been reduced by 32%. Integrated collaboration between government, public sector and private business have been key.

Congestion Pricing in London | London, UK

Since 2003, London has charged a fee for driving vehicles in its central area to reduce congestion and raise revenue to fund transport improvements. Prior to congestion pricing, about 12% of peak-period trips were by private automobile. During the program's first few months, automobile traffic declined about 20%, a reduction of about 20,000 vehicles per day.

Organics Collection | San Francisco, USA

By instituting curbside organics collection, San Francisco became the first large city in the US to collect food scraps citywide. The "Fantastic Three Program" gives each household a green cart for organic waste, a blue cart for comingled recyclables and a black cart for all remaining trash. Food scraps and yard trimmings are composted at a regional facility. In 2004, the city reached an overall 67% garbage diversion rate.

Retrofit Program | Chicago, USA

Since 2000, the City has retrofitted 15 million square feet of public building space with efficient equipment for heating, cooling, lighting and ventilation. These spaces include police stations, libraries, fire stations, park facilities, transit facilities, health centres, community/cultural centres, colleges and other facilities. When the project is complete, annual energy savings to the City, and its sister agencies, are estimated to be \$6 million, with approximate reductions of 30,000 tonnes of CO₂, and 84 tonnes of nitrous oxides, and 128 tonnes of sulfur dioxide.

Waste-to-Energy | San Diego, USA

The energy savings achieved by the City's Metropolitan Wastewater department maintain low sewer rates, while providing renewable electric energy to the region. Eight "digesters" at the Point Loma Wastewater Treatment Plant use heat and bacteria to break down organic solids. Methane gas, a by-product of this biological process, is piped to the on-site Gas Utilization Facility, which powers two continuously running generators, each producing up to 2.25 megawatts of electricity.

Light Rail System | Portland, USA

The TriMet Metropolitan Area Express (MAX) light rail system, serves 64 stations on over 44 miles of track, with 97,000 trips each weekday in the Portland metropolitan area. More than \$3 billion in development has occurred along MAX lines since the decision to build was made in 1978. Ridership, which has increased by 75% since 1990, now eliminates 22.2 million car trips per year, offsetting an estimated 26,400 tonnes of CO₂ annually, while reducing traffic, improving air quality, and preserving neighbourhood livability.

Better Buildings Partnership | Toronto, Canada

The City works with owners, managers and builders to ensure that buildings achieve high energy performance and low environmental impact. Twelve million dollars in zero-interest loans has financed 636 building retrofit projects, saving \$19 million per year. The results speak for themselves:

- 45% more efficient condos.
- 63% more efficient office buildings.
- 20–30% return on investment.
- Approximately \$1.2 billion in savings over 25 years.

Benefits of Climate Action?

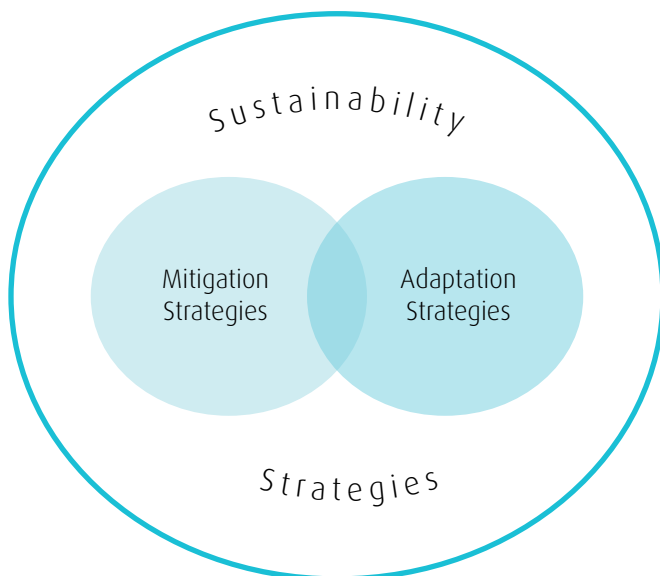
Reducing GHGs:

- Improves air quality and reduces health costs.
- Achieves more complete, compact communities.
- Increases transportation choice and reduces congestion.
- Lowers energy costs in transportation, infrastructure and building systems.
- Creates new revenue streams from sustainable energy production.
- Generates more energy locally and supports growth industries.
- Protects fragile ecosystems and agricultural land.
- Improves fiscal sustainability of infrastructure.
- Reduces infrastructure risk from extreme weather events.

Adapting to climate change:

- Prompts increased government and public awareness of vulnerabilities to people, property and infrastructure.
- Anticipates and quantifies risks.
- Analyzes mitigation and adaptive options.
- Develops increased adaptive capacities within local communities.

It is important that mitigation actions do not increase the impacts of near-term climate change and that adaptation activities avoid contributing to greater GHG emissions.



Setting the Policy Options Framework

The CRD and member municipalities have been actively addressing climate change for almost a decade – developing GHG emissions inventories and initiating a regional energy planning process. The 2007 Community Energy Plan set a strategy to manage energy consumption and GHG emissions throughout the region. It identified six goals for action and described these within a policy context of four scenarios: Do nothing; Introduce selective measures; Coordinate efforts to achieve no net increase in GHG emissions; and a leadership scenario to achieve no net increase in energy consumption.

The goals and policy options on the following pages have their foundations in the 2007 Community Energy Plan, but have been updated to take into account more recent information and policy perspectives.

Climate change does not stand on its own. The level in which emissions reductions and climate adaptation are considered and integrated into existing policy fields is a key issue to address.

Climate change adaptation “involves making adjustments in our decisions, activities and thinking because of observed or expected change in climate, in order to moderate harm and to take advantage of new opportunities”.

Natural Resources Canada, 2007

Policy Options: Where Are We Now? Where Could We Go?

Since the adoption of the 2007 Community Energy Emissions Plan, the CRD and member municipalities have implemented numerous policies that aim to reduce energy consumption and GHG emissions. While a range of actions have been undertaken, many of the more challenging initiatives remain outstanding. The following policy options present a range of approaches – from a gradual approach under Status Quo to more direct and proactive actions under Moderate and Significant Change.

Goal	Status Quo	Moderate Change	Significant Change
Climate change in relation to all decision-making.	In decision-making, consider energy & emissions in tandem with other policy aims & priorities and include such language in regional plans and initiatives.	Establish a formal framework so that energy and emissions considerations form a key basis for decision-making and link to other policy aims & priorities.	Energy and emissions considerations are key drivers for decision-making and lead related policy aims, priorities and regulatory measures.
Climate change in relation to diversification of energy supply.	Provide information and encourage businesses & residents to employ renewable energy systems.	Remove regulatory barriers and create environments that support district energy and heating systems.	Provide incentives for households & businesses to employ renewable energy; establish energy requirements.
Climate change in relation to adaptation in the built environment.	Address climate adaptation issues as needed, through information sharing & capacity building among local governments, where time and funding permit.	Climate change considerations to guide public sector investments and regulations. Identify risks and reduce vulnerability through strategic investment in land use, buildings and infrastructure.	Integrate climate change adaptation measures into all decision-making, such as business planning processes, budgets, staffing, performance and communications plans through policies, plans and regulatory measures.
Climate change in relation to adaptation for the natural environment.	Support coordinated efforts to plan for and protect the region's urban forests and environmentally sensitive and significant areas.	Expand and protect environmentally sensitive and significant areas as well as urban forests through acquisition and planning. Minimize the impact of invasive species.	Use climate considerations to strengthen policies toward the preservation, protection and management of natural systems that improve the adaptive capacity of the natural environment.
Climate change in relation to community education and engagement.	Continue information sharing among citizens, universities, colleges, businesses and non-profit organizations about mitigation and adaptation actions and strategies through public education campaigns.	Enhance communications and targeted behaviour change strategies on mitigation & adaptation with citizens, universities, colleges, businesses and non-profit organizations by increasing reach and methods of engagement.	Develop comprehensive communications and strategic partnerships to engage citizens, universities, colleges, businesses and non-profit organizations on an on-going basis through incentives and funding.
Climate change in relation to sustainable development.	Use the market to promote more sustainable development. Prices of some goods and services increase to reflect the real costs of the natural resources they use and to repair any environmental damage they create.	Enact policies to guide transportation and land use to create more dense and walkable towns, cities and villages and conserve and enhance natural areas.	Adopt & implement policies and regulations to make sustainable development a top priority for the region by increasing public spending on environmental protection and measures identified in the Community Energy Plan.
Emergency planning in response to climate change impacts.	Hazard, risk and vulnerability analysis is based on historical data and trends.	Emergency plans measure & project risk due to climate change.	Climate change is a key driver in emergency response planning .

**The Significant Change approach builds upon and enhances the options presented under Moderate Change. The effect is often cumulative, with policies under Moderate Change generally assumed to be included under Significant Change.*

What Do You Think?

The current level of action will not enable the CRD to achieve its goal of reducing emissions by 33% below 2007 levels by 2020. Our economic, social and ecological systems and services will be impacted by a changing climate and significant policy changes will be required to both reduce emissions today and prepare for climates of tomorrow.

Emissions reduction and climate adaptation strategies should be considered in a larger sustainability context and should focus on residential, commercial, institutional and industrial sectors. What is an appropriate response to this situation?

- How can we better use our commitment to the BC Climate Action Charter and the CRD Community Energy Plan as a guidepost to our policy and planning decisions?
- What do the CRD and municipalities need to do to prioritize energy and emissions considerations?
- Should the CRD and municipalities develop climate change criteria to guide public investments and regulations?

Notes:

Feedback

The CRD values your input in developing the Regional Sustainability Strategy. Please submit your comments on this policy paper via sustainability@crd.bc.ca.

For in-depth information, **visit www.crd.bc.ca/sustainability** to view notices on upcoming consultations, discussion papers, and the overall progress of the Regional Sustainability Strategy.

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Making a difference...together

Regional Sustainability Strategy

The CRD, together with member municipalities, stakeholder groups and residents, is working to developing a vision and a planning framework to promote sustainability and create a lasting legacy for future generations. This will lead to the CRD's first Regional Sustainability Strategy, a broadly ranging document that charts a course to a complete and inclusive community, committed to sustainable practices socially, environmentally, economically and financially.

The Strategy has its foundations in earlier commitments by the CRD Board and member municipalities through the Regional Growth Strategy, adopted in 2003.