



Capital Region Community Energy Plan



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Final Report
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Capital Region Community Energy Plan

**Final Report
Feb 28, 2007**

Prepared for:

The Community Energy Plan
Steering Committee and Working
Group

Project Contact:

Andy Liu,
Environmental Services Department
Capital Regional District

Prepared by:

The Sheltair Group

In association with:

The Victoria Transport Policy Institute, &
The Community Energy Association

Project Contact:

Ron Macdonald, The Sheltair Group

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Summary

Background

The Capital Region Community Energy Plan (CEP) is a strategy to manage the energy consumption and greenhouse gas emissions throughout the region. Development of the CEP is a regional initiative facilitated by the CRD in partnership with its member municipalities, utility providers, BC Transit, and other stakeholders.

The CEP follows the *Partners for Climate Protection* (PCP) framework, as developed by the Federation of Canadian Municipalities (FCM).

Funding support for the plan development has been provided by the Capital Regional District, The Federation of Canadian Municipalities (FCM), BC Hydro, the BC Ministries of Municipal Affairs and the Environment, BC Transit, and Vancity Credit Union.

A Regional Plan

The CEP was developed as a regional initiative to maximize efficiencies amongst the local governments in the region ^[1]. Many energy issues are common throughout the region and using a single process builds on the efforts of communities that have already initiated energy and GHG management or are able to contribute time and resources. A single regional plan assists the smaller communities that might not have resources to develop a plan on their own.

This approach has already shown success through a coordinated 'Energy Management and Water Conservation Project' that identified energy savings actions at over 45 local government facilities throughout the region. Already 17 of these projects have been completed and a further 15 are in progress. The coordinated approach allowed for funding to be obtained efficiently and the building audits conducted in a cost effective manner.

Implementation of this plan will continue the regional approach to find efficiencies in program development and delivery. However, the broadest implementation will be achieved and maximal benefits realized with the participation and assistance of all local governments.

Energy Consumption: Where are we now?

The starting point for managing energy is to compile a baseline energy inventory and GHG emissions profile. An inventory estimates all the energy consumption in the region according to the type of energy and the energy user.

	Total Energy Consumption		Greenhouse Gas Emissions	
	(millions of GJ)	(% change from 1995)	(million tonnes of CO ₂ e)	(% change from 1995)
1995	30.7	-	1.76	-
2004	32.2	+ 4.9	1.53	- 13.0
2012 (BAU)	34.8	+13.1	1.64	- 7.2

Table S-1: Energy Consumption and GHG Emissions in the Capital Region

[1] The term "Local governments" refers collectively to the municipalities, electoral areas, and the Capital Regional District that each has some jurisdiction within the geographic area defined as the "Capital Region".

In 1995 direct energy consumption was 30.7 million GJ and by 2004 consumption had increased to 32.2 million GJ. Under a Business-As-Usual (BAU) scenario (i.e. without any conservation actions) energy consumption is expected to increase to 34.8 million GJ by 2012 - an overall increase of 13% from 1995 to 2012².

Energy Users

The inventory shows where energy is being used in the Region. Just over one third (36%) of the energy is used in residential homes. A similar amount is used for transportation (gasoline and diesel fuels), with the remaining third used in commercial (21%) and industrial (7%) applications.

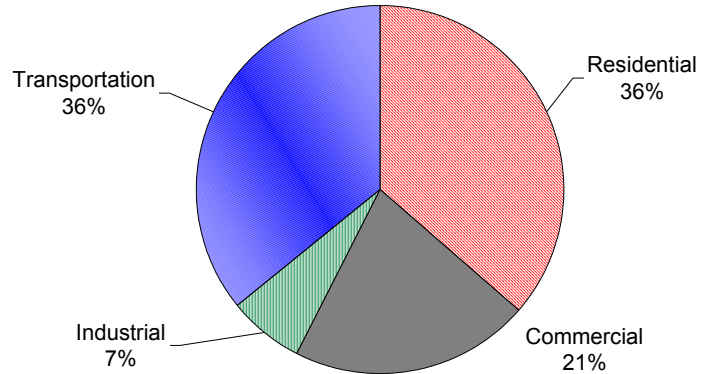


Fig S-1: Energy Use in the Region 2004

Greenhouse Gases

Greenhouse gases (GHGs) are a group of gases that contribute to the "Greenhouse Effect" which is resulting in global climate change. Most GHGs are created when fossil fuels - coal, oil, natural gas, petroleum - are burned and when solid waste decomposes in a landfill and produces methane gas. The production of electricity also produces 'indirect' GHGs if it is made from coal or gas-fired power plants.

Greenhouse Gas Emissions

The baseline inventory and forecast estimated greenhouse gas emissions at 1.77 million tonnes of CO₂ equivalent (t CO₂e) in 1995 and 1.55 million t CO₂e in 2004. This is a decline of 13%. Much of this reduction results from improved capture of landfill gases at the Hartland Landfill - where the gas is burned to generate electricity.

The Business-As-Usual scenario forecasts GHG emissions to increase from 2004 to 2012 and to reach 1.64 million tonnes of CO₂e in 2012.

The region has achieved substantial reductions in GHG emissions through the landfill gas capture program. However, in the future, the growth-based increases in other GHG emissions will

Measuring...

Energy is measured in Gigajoules (GJ) - a billion joules. This is equivalent to:

- 278 kWh of electricity (cost about \$ 18)
- 26 Litres of gasoline (about \$ 25)

Greenhouse Gas Emissions are measured in tonnes of CO₂ equivalent (t CO₂e = 1000 kg). One tonne CO₂e results from burning 410 L of gasoline.

² This estimate was made by assuming that energy consumption within the region increases in proportion to population. Ref: Greenhouse Gas and Energy Use Inventory for the Capital Regional District and Member Regions, 2004 FINAL Report, SENES Consultants, Oct 2006.

continue to increase and by 2012 emissions will be only 7.2 % below 1995 levels. Following that, GHGs emissions are expected to continue to increase if no action is taken.

Greenhouse Gas Sources

The inventory identified over half (53%) of the GHGs in the region arise from transportation activities.

Residential housing creates just under a quarter (23%) of emissions, with commercial and industrial uses generating less. Solid waste produces GHGs from the residual uncaptured methane released at the landfill accounting for 6% of total GHGs.

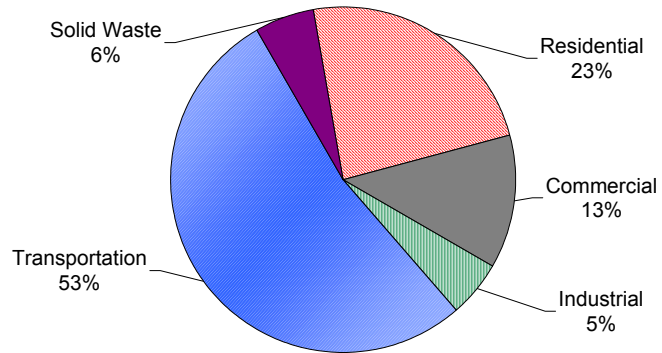


Fig S-2: GHG Emissions in the Region (2004)

Benefits of an Energy Plan

Implementing an energy plan has many benefits for the region. It provides savings to residents and businesses through reduced energy expenses. Money spent on energy conservation and transportation efficiency creates jobs in the region while money spent on supplying energy tends to leave the community. Savings on energy are typically spent by residents and businesses within the community. Finally, energy conservation reduces greenhouse gas emissions.

Creating an Energy Plan: A Vision

The plan starts from the vision defined in the Regional Growth Strategy (RGS). The “Framework For Our Future” within the RGS articulates a vision:

“...for a region that is economically vital, where communities are livable where the environment and natural resources are stewarded with care, and where residents enjoy a healthy and rewarding quality of life. Fundamental to these aspirations is a commitment to work toward regional sustainability.”

Plan Goal Areas

Drawing from the RGS vision and a statement of principles for the creation of the CEP, six goal areas were defined for action. These are to:

- Improve the Energy Efficiency of Buildings;
- Increase Transportation Efficiency;

- Encourage Energy Efficient Land Use Planning;
- Diversify the Energy Supply ;
- Educate & Engage Residents and Businesses; and to
- Demonstrate Local Government Leadership

Initiatives and Actions

Within each goal area, several initiatives have been defined. For each initiative a set of actions has been compiled. Taking steps to implement these actions will advance the goals of the plan.

The actions focus on steps that local governments in the region can initiate and implement. They emphasize the influence and powers that municipalities and the regional district have to address land use, transportation, planning and buildings. However, there are areas where local governments cannot act alone and some of these actions either advocate for action by others, or will require partnerships and cooperation with other stakeholders and governments for implementation.

Implementation Scenarios

To help understand the range of results that could be achieved, a set of scenarios have been defined. These scenarios evaluate the effect of meeting different levels of energy reduction and the associated resource requirements for program funding. The scenarios are given names that describe their primary themes. These are:

- **Business-as-Usual**
A 'do nothing' (or baseline) scenario. No actions are implemented from the plan.
- **Selective Measures**
A patchwork of actions, based on the willingness of players to participate. Some progress is made in each of the goal areas, though there remains further opportunities ^[3].
- **Hold the Line (No Net Increase in GHG Emissions)**
A coordinated effort of programs to make progress on all goal areas. The result is a forecast that 'holds the line' on GHG emissions (maintaining them near current levels) in spite of growth in the region ^[4]. This scenario still requires a considerable effort including staff and funding partner resources.
- **Comprehensive (No Net Increase in Energy Consumption)**
A leadership scenario with a concerted effort to excel in all areas. Communications and demonstration elements are coordinated and upgrades are quickly adopted across the region. Substantial staff and partner resources are required.

[3] For this action the targets established by partnering plans (e.g. the BC Buildings Plan) are not met but progress is made about 50% of the targets (i.e. number of households reached).

[4] For this action the targets established by partnering plans are met (e.g. number of households reached, etc.)

Scenario Evaluation

The Business-As-Usual, and each of the three action scenarios have been evaluated for the potential energy savings, GHG emission reductions, and resources (i.e. staff, local government, and partner costs) for implementation. (see Table S-2).

Table S-2: Energy Plan Implementation Benefits and Cost Summary

	Scenario							
	Business-As-Usual		Selective Measures		Hold the Line		Comprehensive	
Energy Benefits								
Energy Use Reduction in Community (millions of GJ per year by 2012)	0.0		0.47		1.60		2.84	
Change in Energy Consumption 1995 to 2012 (%)	13%		12%		8%		4%	
Cost Savings in the Community (1000s \$ per year by 2012)	\$0		\$8,800		\$30,100		\$54,800	
Per Capita Energy Savings (f) (\$ per capita per year)	\$0		\$26		\$89		\$161	
Greenhouse Gas Benefits								
GHG Emissions Reductions (tonnes of CO ₂ e per year by 2012)	0		23,700		82,000		149,000	
Passenger Car Equivalents (g) (number of passenger car's emissions)	0		5,600		19,500		35,500	
GHG Emissions Change 1995 to 2012 (%)	-7.2%		-8.5%		-11.8%		-15.6%	
Energy Plan Implementation Requirements								
Est Range (Lower to Upper)-->>		Lower	Upper	Lower	Upper	Lower	Upper	
Local Government Resources								
Staff: (FTE) (a), (b)	0	1	3	4	5	5	8	
Staff Costs: (1000s \$ per year) (c)	\$0	\$100	\$300	\$400	\$500	\$500	\$800	
Program Disbursements: (1000s \$ per year) (d)	\$0	\$70	\$80	\$330	\$360	\$490	\$540	
Sub-Total: Total Local Gov't Costs (1000s \$ per year)	\$0	\$170	\$380	\$730	\$860	\$990	\$1,340	
Total Local Gov't Costs per Resident (\$ per capita per year)	\$0	\$0.50	\$1.12	\$2.15	\$2.53	\$2.91	\$3.94	
Program Partner Resources								
Funding: (1000s \$ /year) (e)	\$0	\$500	\$2,000	\$2,800	\$8,200	\$6,800	\$15,100	

Notes:

(a) Program staffing requirements are estimated using review of similar plans developed for lower mainland BC communities. These assume staff are required for program management, reporting, community outreach, and program development for specific target areas such as residential buildings, commercial buildings, vehicles, and transportation. Staffing estimates do not include activities for each municipality's corporate management plan. Periodic informal support from existing local government staff is expected and has not been included in these estimates.

(b) FTE = full time equivalent staff position.

(c) Staff costs estimated based on 100 k\$ salary, benefits, and overhead per FTE.

(d) Program Disbursements are "Outreach and Engagement" plus seed funding for transportation measures.

(e) Partner costs includes all buildings incentives (grants, discounts, etc.) and transport program costs (TMAs, Trip Reductions, etc.). These do not include customer/user costs for actions.

(f) Per capita estimates based on approximate current population of 340,000

(g) "Passenger car equivalents" are the number of passenger car's tailpipe GHG emissions (per year) equal to the estimated GHG reduction. Average of 4.3 tonnes per year per car used.

Forecasts

Forecasts of energy consumption and GHG emissions under the scenarios have been made to 2012 - the plan's first cycle target date. (see Figures S-3 and S-4).

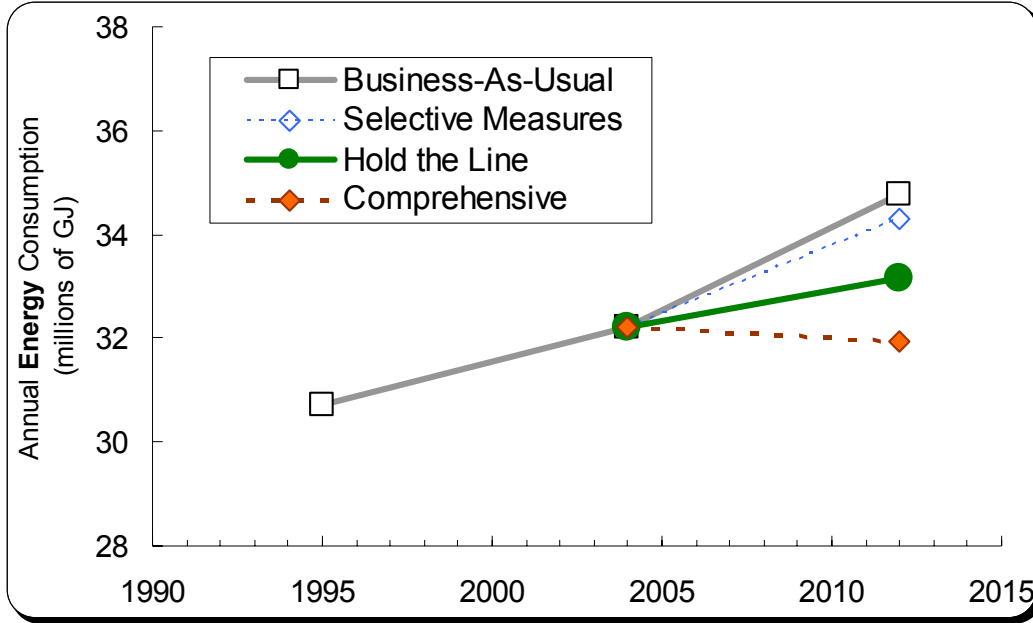


Figure S-3: Scenarios Results for Energy Consumption

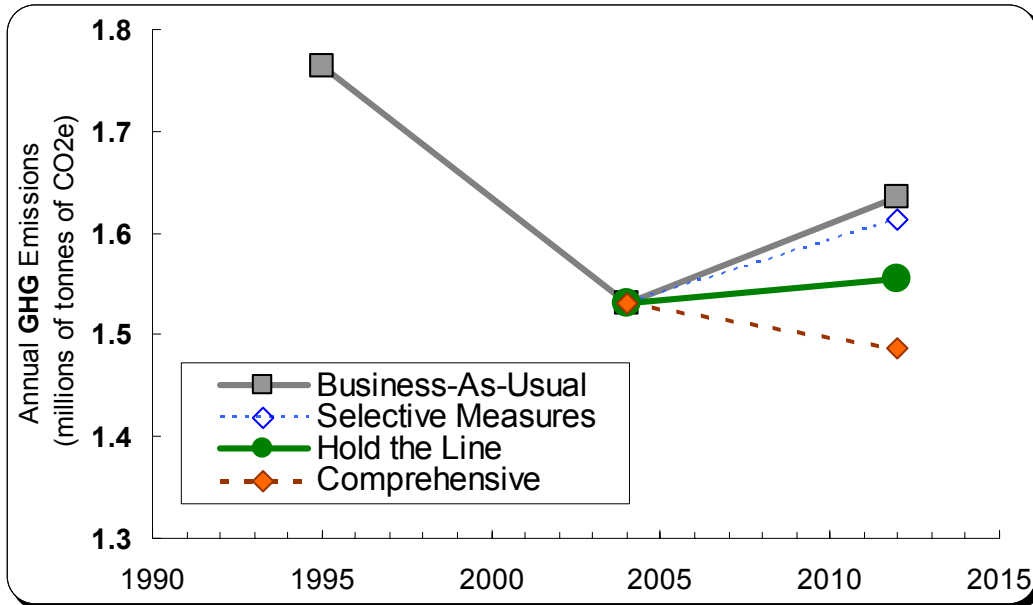


Figure S-4: Scenario Results for Greenhouse Gas Emissions

Partnering

This plan will not be achieved in isolation, or by the efforts of local governments alone. It will require the participation of many agencies, stakeholders, and consumers of energy in the region. Fortunately there are many potential partners available that have already initiated actions, developed programs, and started to make substantial energy reductions in the community.

Possible program partners include the Province, BC Hydro, Terasen, the Federation of Canadian Municipalities, and the Federal Government as well as local institutional agencies and large employers.

Implementation and Monitoring

This plan includes a strategy for implementation and a monitoring program for 2007 to 2012. It is proposed that a guiding committee will be created for the implementation of the CEP. This committee will: oversee the implementation of the plan activities; develop partnerships for implementation and funding; and monitor and report on progress.

New staff will be required to implement the plan (see Table S-1). As well a combination of funding from the participating local governments and program partners is required. Typically it is expected that local governments will contribute to outreach and engagement activities and provide seed money in the early years of new program development. Partners will be sought to provide money for financial incentives and ongoing program funding.

The monitoring program includes annual and 5-year data collection and reporting where appropriate. A timeline for plan implementation starting in early 2007 to 2012 has been proposed.

Looking Forward

The reduction potential and the forecasts shown here provide a framework for energy conservation and GHG emission reduction to the year 2012. The results shown are dependant on successful implementation with a range of partners. Over the implementation period it is assumed that actions will be refined, new lessons will be learned, and new opportunities identified. The results will be dependant on community interest, available funding, some technology and regulatory developments, support from other levels of government, and the level of political and financial commitment from local governments.

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Summary of Plan Actions

Goal #1: Improve the Energy Efficiency of Buildings

Initiative 1-1: Support the Energy Efficient Buildings Plan for BC

A- 1: Support the targets of BC Energy Efficient Buildings Plan.

Initiative 1-2: Encourage Energy Efficiency in Development and Rezoning Processes through Guidance Documents and Checklists

A- 2: Draft (or update existing) development permit and re-zoning checklists to include considerations for energy efficiency.

Initiative 1-3: Promote Building Energy Efficiency through Incentives

A- 3: Evaluate the potential to provide property tax incentives for energy efficiency improvements in buildings.

A- 4: Develop policies (e.g. building permit fee discount) that encourage residents to conduct an energy audit prior to renovating their home.

A- 5: Participate with the Energy Saving Plan (ESP) to promote the residential rebate program for detached dwellings.

A- 6: Work with partners (e.g. property owner associations, the Energy Saving Plan initiative) to formalize an incentive program for commercial building energy efficiency.

A- 7: Evaluate the opportunities for new household appliance incentive programs that can be offered through local delivery agents.

A- 8: Encourage industrial and large institutional consumers to set targets for energy conservation.

Initiative 1-4: Incorporate Energy Labeling into Buildings

A- 9: Work with realtors associations and municipalities to develop a plan for reporting building energy consumption at time of sale.

A- 10: Work with the Ministry of Energy Mines and Petroleum Resources to develop a regional program for energy performance measurement and auditing of commercial buildings.

Initiative 1-5: Lobby Federal and Provincial Governments for Funding and Regulatory Updates

A- 11: Lobby the Federal government to reinstate and maintain the EnerGuide for houses rating system as a measure for evaluating single family detached dwelling energy performance.

A- 12: Lobby the Federal government to commit to long term funding for building energy efficiency activities for new and existing commercial facilities.

A- 13: Lobby the Provincial government to continue to expand the range of energy efficiency activities eligible for a PST exemption.

Goal #2: Increase Transportation Efficiency

Initiative 2-1: Improve Transportation Options and Choices

A- 14: Promote the energy efficiency objectives of the CRD TravelChoices strategy.

A- 15: Improve regional public transit service in the region.

- A- 16: Promote ridesharing programs.
- A- 17: Develop a regional "non-motorized transportation plan" to increase walking and cycling conditions.

Initiative 2-2: Promote Efficient Transportation

- A- 18: Create Transportation Management Associations (TMAs) in major destination areas.
- A- 19: Promote trip reduction programs.
- A- 20: Implement a Transportation Demand Management (TDM) marketing program.
- A- 21: Develop local parking management programs at the municipal and/or neighbourhood level.
- A- 22: Investigate the opportunities for innovative incentives to reduce vehicle use.

Initiative 2-3: Encourage the Use of Fuel Efficient Vehicles

- A- 23: Provide preferential parking spots for selected vehicles based on fuel efficiency, size, or fuel type.
- A- 24: Investigate the opportunities for incentives for businesses that use smaller and more fuel efficient vehicles.
- A- 25: Encourage the Provincial Government to expand the PST exemption for energy efficient vehicles.

Goal #3: Encourage Energy Efficient Land Use Planning

Initiative 3-1: Incorporate Energy Efficiency into Planning Documents and Processes

- A- 26: Incorporate energy efficiency principles into municipal planning documents through regular review cycles.
- A- 27: Support the principles of "Smart Growth" and the building of "Complete Communities".
- A- 28: Require energy efficient or Green Development for large property developments where the municipalities (or other governments) have an interest (e.g., Dockside Green).

Initiative 3-2: Define Criteria for Evaluating the Energy Impact of Land Use Decisions

- A- 29: Create a definition and attribute description of a successful community (e.g., an urban village, or a 'complete community').
- A- 30: Use modeling tools to evaluate the energy impacts of developments (examples include CommunityViz, INDEX, or PLACE3S)

Initiative 3-3: Provide Incentives for Energy Efficient Land Use

- A- 31: Develop policies that would allow planning departments to provide preferential or accelerated review for development permit process for projects that meet the energy efficient criteria for developments and/or other green criteria.
- A- 32: Investigate whether property tax incentives, local improvement charges, or variable DCCs can be offered to desired energy efficient developments.

Goal #4: Diversify Energy Supply

Initiative 4-1: Encourage the Use of Alternative Energy Technologies in Buildings

- A- 33: Participate in the Solar Hot Water Acceleration Project (www.solarbc.org) with a goal to achieve 250 solar roof systems in the region by 2012

- A- 34: Investigate opportunities to provide incentives to developers or builders that will construct buildings with “solar ready” plumbing systems.
- A- 35: Encourage developers of residential and commercial developments to incorporate renewable energy technologies.
- A- 36: Support district heating systems (preferably based on renewable energy), and district energy zones.

Initiative 4-2: Explore Opportunities for Renewable Electricity Generation within the Region

- A- 37: Evaluate the potential for generating electricity from the Sooke Reservoir.
- A- 38: Improve the Hartland Landfill gas capture system to match gas capture rates of other landfills.
- A- 39: Ensure that any future sewage treatment upgrades include the highest energy efficient design and maximizes the recovery of resources.
- A- 40: Contribute to evaluation processes for other renewable electricity generation capacity within the region.

Initiative 4-3: Develop a Long-Term Renewable Energy Strategy for the Region

- A- 41: Work with partners to identify opportunities for renewable energy pilot projects.
- A- 42: Compile an inventory of the resource potential for alternative energy within the region.

Goal #5: Educate & Engage Residents & Businesses

Initiative 5-1: Implement a Public Outreach Campaign

- A- 43: Maintain the existing internet presence through the One Day Capital Region website (www.onedaycapitalregion.bc.ca).
- A- 44: Conduct a well-planned and timed CEP launch campaign
- A- 45: Develop and outreach materials to highlight energy efficiency in the community.
- A- 46: Implement an energy or climate change recognition program.
- A- 47: Encourage the local NGO community to provide input and opportunities to assist with outreach.
- A- 48: Maintain the brand presence in all other incentive programs developed through this plan.

Initiative 5-2: Implement an Energy Awareness Program for Schools

- A- 49: Promote and offer support to existing education presentations delivered by Power Smart and other CRD departmental programs.
- A- 50: Partner with a local NGO to organise school events such as energy efficiency challenges at the school and classroom level.

Initiative 5-3: Promote Energy Efficiency and Green Practices to Identified Target Markets

- A- 51: Develop a commercial building portal for the One Day Capital Region website.
- A- 52: Participate in future outreach programs designed for the commercial sector by the Ministry of Energy Mines and Petroleum Resources' Energy Savings Plan (ESP) initiative.
- A- 53: Work with local industrial consumers to expand their commitment to the community to reduce energy. (e.g. an industrial energy conservation pledge)
- A- 54: Work with the development and construction sectors to identify target markets and new avenues to reach program participants.
- A- 55: Develop an anti-idling campaign to reduce unnecessary fuel consumption.

Goal #6: Demonstrate Municipal Leadership

Initiative 6-1: Be a catalyst for Demonstration and Innovation Projects

- A- 56: Allow access to municipal property or in-kind resources for demonstration projects (e.g., geo-exchange, solar hot water heating, green roofs, biofuel programs, etc).
- A- 57: Initiate pilot projects for new approaches where identified (e.g., reserved parking spaces for car-sharing).

Initiative 6-2: Build Partnerships for Long term Program Delivery

- A- 58: Develop cooperation agreements with MEMPR, the CRD, and delivery agent to ensure the delivery of the Energy Savings Plan program.
- A- 59: Partner with non-governmental organizations to deliver education and outreach activities.
- A- 60: Develop joint proposal submissions with municipalities and stakeholders for future funding programs, such as the "New Deal for Cities" program.
- A- 61: Work with BC Hydro and Terasen Gas to deliver consistent commercial building audit and education programs.

Initiative 6-3: Implement a Corporate Energy and GHG Management Programs

- A- 62: Implement a Corporate GHG plan.

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1 Introduction

1.1 Energy and Climate Change

Canadians are amongst the most intensive users of energy in the world. On a per capita basis, Canadians use more than two times the energy used by Europeans and Japanese and six times more energy than the world average. Canada's climate, large distances, and its export- and resource-oriented economy contribute to this consumption. However, there are many areas where Canadians are not efficient when it comes to energy use.

Our economy is dependent upon non-renewable, fossil fuel energy sources. This reliance poses serious challenges to our long-term sustainability - both locally and globally. Fossil fuels are becoming more limited in supply and their prices are becoming more volatile leaving us vulnerable to price shocks. Our expenditures on energy leave our communities and do not create jobs or local economic growth. The burning of fossil fuels releases air pollutants which can have adverse health impacts. Finally, fossil fuel combustion releases greenhouse gases (GHGs) into the atmosphere that contribute to global climate change.

Climate change is a global issue requiring local action. In Canada, a large number of municipal and regional governments have voluntarily joined the Federation of Canadian Municipalities (FCM) Partners for Climate Protection (PCP) Program to take action on climate change. This group of local governments are working together to reduce local GHG emissions in their communities and achieve co-benefits of economic stability and growth.

The CRD and the member municipalities recognize their responsibility to maximize energy efficiency and explore renewable energy strategies. For years they have undertaken projects and programs that advance the sustainability of the region. This energy plan represents a continuation of these efforts.

1.2 Plan Development

The **Capital Region Community Energy Plan** was initiated by the CRD in 2003. It is a multi-year effort to develop and implement a plan for managing energy consumption and reducing GHG emissions within the region.

The Community Energy Planning initiative is being facilitated by the Capital Regional District (CRD) in partnership with its member municipalities, utility providers, and other stakeholders. CRD Environmental Services staff is coordinating the development of the CEP with oversight by a CEP Steering Committee comprised of local elected officials and senior stakeholder staff. In addition, there is a Working Group consisting of staff from various municipalities.

The planning process is following the FCM Partners for Climate Protection Five Milestone framework, namely:

1. Conduct a baseline emission analysis for municipal operations and the community.
2. Establish GHG reduction targets for both municipal operations and the community.

3. Develop a local action plan outlining action items to reduce energy use and GHG emissions from municipal operations and throughout the community.
4. Establish a program to implement adopted action items that will reduce GHG emissions.
5. Continue to monitor, verify, and report GHG reduction achievements and amend the action plan accordingly to reflect new strategies.

Milestone 1 was completed in mid-2006. This plan will meet the objectives of Milestones 2 and 3.

1.3 Benefits of Energy Planning

Energy planning has other benefits which are also important motivators for implementing an energy plan including:

Greenhouse Gas Emissions Reduction

A reduction in fossil fuel consumption reduces greenhouse gas emissions. This reduction is a primary focus of the Partners for Climate Protection (PCP) program.

Reduced Exposure to Volatile Fossil Fuel Prices

Oil and natural gas prices are becoming more volatile. Price changes can occur in a short period of time (less than a year). However, many energy consumption decisions are made with a longer term view (e.g. a furnace is selected to last for 15-20 years). Investing in energy efficiency provides some protection from future price increases.

Local Economic Development

Investments in energy conservation, public transit, and alternative energy sources result in greater job creation than do investments in supplying energy (see Table 1). A consumer dollar spent on conservation creates more jobs than a dollar spent on buying more fuel. Moreover, these jobs are more likely to be located in the region, while investment in fuel supply tends to create jobs far away from the region.

Table 1: Job Creation from Energy Related Activities

	Jobs created by Consumer Spending (PY / \$ million spending)
Energy Retrofits	30
Public Transit	21
Alternative Energy	10
General Consumer Goods	10 - 15
General Automobile Expenses	7.5
Energy Supply	4 - 6

Notes: PY = person year of employment, Sources: Bridges (2004), Litman (2005) [5]

[5] G.E. BRIDGES & Associates, 2004, Employment Impacts: Power Smart and Provincial Building Targets (Draft) March 3, 2004, Prepared for: BC Hydro Customer Care and Power Smart by G.E. BRIDGES & Associates Consulting Economists. Litman, (2005), Appropriate Response to Rising Fuel Prices: Citizens Should Demand, "Raise My Prices Now!" By Todd Litman Victoria Transport Policy Institute 13 December 2005 (www.vtpi.org).

Air Quality

A reduction in emissions of air quality contaminants is usually a co-benefit of reducing the consumption of imported fossil fuel. This is very important in areas with degraded air quality, but can be important in all communities for small localized issues (e.g. vehicle exhaust in parking lots).

1.4 Objectives of the CEP

The overall **objective of this plan** is to reduce fossil fuel use and GHG emissions by identifying energy efficiency and renewable energy opportunities. The focus is community-wide activities including residential buildings, transportation, and commercial consumption. Local governments are also encouraged to implement energy and GHG reduction measures through a "corporate level" management plan.

The Community-Wide Plan

The CEP contains actions to effectively manage community-wide energy consumption and emissions in the region. This is shaped by land use practices, transportation systems, the energy efficiency of buildings and the sources of energy. Local governments have some influence on these activities through land use designations, bylaws, development permit guidelines, and zoning requirements. Through collaborative relationships with utilities, NGOs, and others, local governments can also develop and deliver programs to provide encouragement or incentives to reduce energy. Key subject areas of the plan include:

- buildings,
- transportation,
- land use and site planning,
- energy infrastructure and supply, and
- landfill gas management.

The plan outlines actions that are already underway and those that are proposed for the CRD and member municipalities, collaboratively, with support of key stakeholders.

Local Government's Corporate Energy Planning ^[6]

In the course of providing services to residents and visitors, the CRD and member municipalities consume energy through the construction, management and delivery of municipal and regional services and operation of facilities.

Local governments can show leadership in the areas of energy management. This plan also contains a series of recommendations for corporate actions.

[6] "Corporate" in this context refers to the activities executed by the local government such as water, sewage, and waste services, vehicle fleets, buildings and municipally operated recreational facilities.

1.5 Plan Structure

The energy and GHG plan supports the vision created in the Regional Growth Strategy and subsequent TravelChoices initiative to plan for long-term sustainability in the region (see Figure 1). From the vision and consultations, six goal areas for action are defined, with subsequent initiatives, and individual actions defined to implement the plan. Based on all these actions a set of potential scenarios is created, and an implementation strategy is proposed.

The expanding pyramid is a useful mental picture to keep the plan goals, initiatives, and actions aligned in support of the higher level vision.



Figure 1: CEP Plan Framework

2 Capital Region Context

The Capital Region is located on the southern tip of Vancouver Island and includes thirteen municipalities and three electoral areas (Figure 2). The municipalities and local governments within the region vary from densely populated urban areas to rural and agricultural communities, to wilderness areas. The population of the entire region was 359,439 people in 2006. [7]

These areas are administered by a variety of local governments including municipalities, districts, electoral areas, and the regional district. The powers of these governments are defined by the provincial *Local Government Act*, and *Community Charter (2003)*.

Administratively, the execution of functions varies slightly across the region. The municipal governments have responsibility for most planning and land use activities within their borders. For the electoral areas some of these functions are performed by either the Capital Regional district (e.g. Juan de Fuca EA), or the Islands Trust (e.g. Salt Spring Island).

In the context of this document, these are referred to collectively as Local Governments and it is understood that some variation of enabling powers may exist between them.

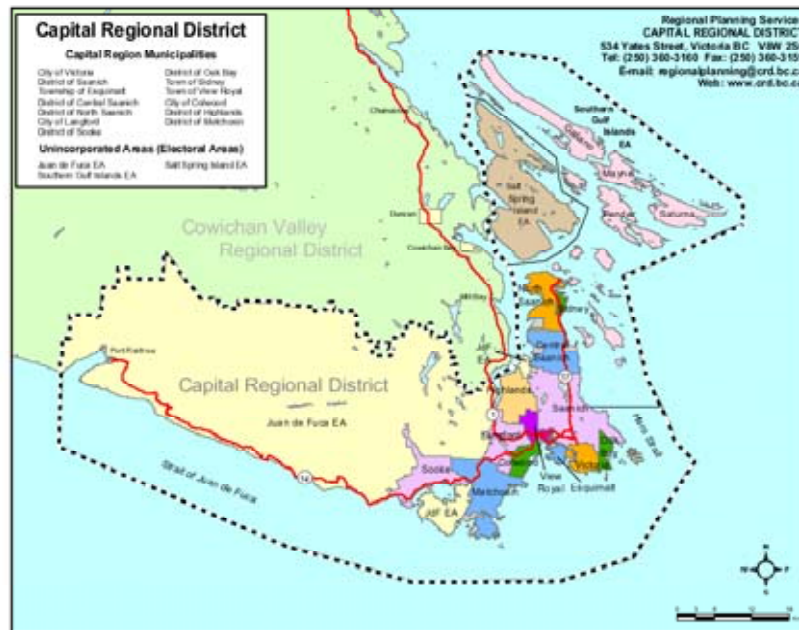


Figure 2: Location of the Capital Region

[7] From CRD Planning Factsheets (see www.crd.bc.ca/regionalplanning/facts/population/index.htm).

2.1 Location and Climate

The Capital Region enjoys the mildest weather in Canada due to the moderating influence of the Pacific Ocean, topography and latitude. Prevailing westerly winds are cool in summer and moderate the temperatures in winter.

The mountains of the Olympic Peninsula in Washington State provide 'rain-shadowing' which makes the region one of the sunniest, warmest, and driest places on the west coast of BC. For example, Victoria experiences on average about 3,000^[8] heating degree days^[9] whereas Toronto experiences 4,000. The Capital Region also has fewer cooling degree days than other parts of the country. As a result, the Capital Region has one of the lowest energy use intensities in buildings of all Canadian cities.

2.2 Population and Dwellings

The region's population was almost 318,000 in 1996 and is expected to grow to over 400,000 by 2026. The number of dwellings is expected to increase from 135,000 to almost 190,000 in the same time period (see Table 2).

Table 2: Population and Dwellings within the Growth Management Planning Area (1996-2026)

Population	1996	2012	2026
Total	317,960	365,928	407,900
Dwelling Type	1996	2012	2026
Single Detached / Duplex	82,630	90,667	97,700
Other Ground Oriented	10,400	18,347	25,300
Multi-unit	41,920	54,016	64,600
Total Number of Dwellings	134,950	163,030	187,600

Source: Regional Growth Strategy, 2004

Notes: 1996 and 2026 are the RGS Milestone years. 2012 data are estimated by interpolation^[10]

In 2001, the CRD estimated that there were 143,131 households in the region. Approximately 50% of the occupied dwellings are single-detached with 29% and 9% of dwellings listed as apartments and duplexes, respectively. The remaining 12% of occupied dwellings are split between townhouses and mobile homes.

Detached dwellings use more energy per person than multi-family units and are more likely to use fossil fuels (natural gas or fuel oil) for space heating. Conversely, new multi-family dwellings are more likely to use electrical energy for space and water heating.

[8] Source: CCME, Heating and Cooling, accessed at:

http://www.ccme.ca/assets/pdf/cc_ind_people_htng_clng_e.pdf#search=%22victoria%20heating%20degree%20days%22.

[9] Climatologists use a measurement known as heating degree-days (HDDs) to estimate heating needs more precisely. They assume that people will use at least some heat on any day that has an average outdoor temperature of less than 18°C. The heating need for each day is determined by subtracting the day's average temperature from 18. The result is the number of heating degrees for that day or HDDs. Cooling degree days are calculated in a similar way. Subtracting 18 from the day's average temperature thus gives the number of cooling degrees for that day or CDDs.

[10] The population estimates from the regional Growth Strategy are shown to be compatible with the dwelling counts data, and are for the Growth Management Planning Area only. More recent estimates for the entire region estimate the entire CRD population to be 370,484.

The large number of detached dwellings represents an opportunity to target these buildings for energy reduction activities.

2.3 CEP Principles and Regional Initiatives

Principles have been established to guide the development of the CEP plan. These are intended to maximize partnerships amongst stakeholders. Specifically, the plan intends to:

- Build partnerships with municipalities and other stakeholders;
- Capitalize on synergies that exist between other initiatives;
- Leverage investments within the region;
- Establish strategic linkages between the CEP and "core" elements of the region's values and goals; and
- Enhance environmental stewardship and social responsibility ^[11].

Regional Planning

The CRD and member municipalities are responsible for several areas of planning that have an impact on energy consumption, in particular the Regional Growth Strategy, Regional Green/Blue Spaces Strategy, the TravelChoices Plan and Official Community Plans. Provincial initiatives relevant to the CEP include the Energy Efficient Buildings Plan. These are described in more detail in Appendix A.

These planning activities are foundations that the CEP can build upon. The goals, objectives and actions of these plans are often synergistic and enabling to this planning process.

Energy and GHG Management Actions already Implemented

In addition to planning activities undertaken in the region, the CRD and member municipalities have initiated a number of actions that reduce energy consumption and GHG emissions. These include:

- The Hartland Landfill gas collection and utilization project: Landfill gas collection was initiated in 1991 and the system was upgraded in 1998 to utilize the gas to create renewable electric power. Currently, the collection and utilization of the methane gas has resulted in a reduction of 83,000 tonnes of CO₂ equivalents (CO₂e) per year.
- The Capital Region Energy Management and Water Conservation Project: The CRD initiated this project in 2003 with funding from a range partners. It audited 45 local government buildings throughout the region and identified potential savings of over 22,000 GJ of energy and 1,689 tonnes of CO₂ equivalent emissions per year.
- The Salt Spring Island Community Energy Strategy: This process was initiated in 2003 with the formation of a multi-stakeholder Steering Committee and the compilation of a baseline inventory. Subsequent review and public input through a workshop helped define an energy strategy in 2005.

[11] Retrieved from: www.onedaycapitalregion.bc.ca/documents/gmep_overview.pdf.

More than 40 other initiatives, programs, and actions have been taken through the region with the intent of decreasing energy consumption and GHG emissions. These include actions across many areas of action and locations.

A summary of known energy savings and GHG reducing activities is provided in Appendix B.

2.4 Responsibilities in Energy Management

Many of the activities of energy planning and GHG management are not within the direct control of Local Governments. These are shared by other levels of government and energy utilities. Energy pricing occurs on many levels from global (petroleum) to continental (natural gas) to regional (electricity). The market place and consumers play a role as well by defining products for purchase and by making purchasing choices. A summary of these roles is provided in Table 3.

This plan focuses on those areas where local governments are best able to act alone, to partner with other agencies, or to encourage change in other areas.

Table 3: Roles and Responsibilities for Energy Management

Activity	Local Government	Utilities	Provincial Government	Federal Government	Consumers & the marketplace
Buildings	<ul style="list-style-type: none"> - Inspections - By-law enforcement 	<ul style="list-style-type: none"> - Conservation incentives (e.g. PowerSmart) - energy pricing (via the BC Utilities commission) 	<ul style="list-style-type: none"> - Provincial Building Code - Energy efficiency Act (appliances and equipment) - Funding (e.g. Energy Savings Plan). - PST exemptions 	<ul style="list-style-type: none"> - Federal Building Code - Energy Efficiency of equipment - Labelling of appliances and equipment (EnerGuide, EnergyStar) - Funding (e.g. EnerGuide for houses). 	<ul style="list-style-type: none"> - Appliance and equipment availability & desirability. - Prioritization of home features (e.g. energy efficiency vs. decorative features)
Transportation	<ul style="list-style-type: none"> - Road and street planning. - regional transportation desires (e.g. TravelChoices) - traffic management (incl. parking, pedestrian and cycling access) 	none	<ul style="list-style-type: none"> - Funding for large capital projects Funding for BC Transit - PST exemptions 	<ul style="list-style-type: none"> - Vehicle fuel efficiency and emissions standards. - Funding for some major capital projects - Trans-Canada highway. 	<ul style="list-style-type: none"> - Vehicle purchase decisions - Transportation choices - Lifestyle choices for recreation & shopping - Energy pricing
Land Use	<ul style="list-style-type: none"> -Regional Growth strategy - Zoning and land use -Development permit applications -Re-zoning 	<ul style="list-style-type: none"> - Define service areas 	<ul style="list-style-type: none"> - Some land controls (e.g. Agricultural Land Reserve) 	<ul style="list-style-type: none"> - Control of 'Federal House' (incl. Ports, some airports, government facilities) 	<ul style="list-style-type: none"> - Marketing and perceptions of desirable lifestyle
Energy Supply	<ul style="list-style-type: none"> - Some energy recovery from facilities 	<ul style="list-style-type: none"> - Provide energy within BC utilities commission mandate. 	<ul style="list-style-type: none"> - Collect taxes of fuel sales. - Royalties on resource extraction. 	<ul style="list-style-type: none"> - Collect taxes - Gas tax transfer to municipalities. 	<ul style="list-style-type: none"> - Petroleum and natural gas pricing

3 Energy and GHG Inventory

This section summarizes the results of the greenhouse gas and energy inventory compiled for the Capital Region ^[12]. It includes estimates of petroleum, natural gas, and electricity consumption (and associated greenhouse gas emissions) for 2004. As well the inventory was 'backcasted' to make an estimate of 1995 consumption and emissions, and then evaluated a Business-As-Usual forecast to 2012 ^[13].

3.1 Energy Consumption

Direct energy consumption ^[14] within the region in 2004 was over 32 million gigajoules (GJ) of energy ^[15] (see Table 4). At recent prices this represents a spending of more than \$670 million each year - over \$1,900 per person.

Table 4: Estimated Direct Energy Consumption and GHG Emissions within the Capital Region (by energy source)

Energy Source	1995		2004		2012 (Business as Usual Forecast)	
	Energy Consumption (millions of GJ)	GHG Emissions (thousands of tonnes CO ₂ e)	Energy Consumption (millions of GJ)	GHG Emissions (thousands of tonnes CO ₂ e)	Energy Consumption (millions of GJ)	GHG Emissions (thousands of tonnes CO ₂ e)
Natural Gas	4.0	216	5.3	285	5.8	309
Fuel Oil	4.0	286	3.0	215	3.2	233
Propane	0.10	29	0.10	31	0.11	33
Wood	0.75	0	0.79	0	0.86	0
Electricity	9.8	152	11.5	105	12.4	114
Gasoline + Diesel	12.1	881	11.6	811	12.4	863
Solid Waste	--	199	-	85	-	84
Total	30.7	1,763	32.2	1,532	34.8	1,636

Source: Greenhouse Gas and Energy Use Inventory for the Capital Region 2004, Senes, Oct 2006
 Note: Numbers may not sum precisely due to rounding

This energy consumption results in emissions of 1,532,000 tonnes of CO₂e¹⁶. Per capita this is about 4.1 tonnes per person. This level of GHG emissions is low compared to other

^[12] Greenhouse Gas and Energy Use Inventory for the Capital Regional District and Member Regions, 2004 FINAL DRAFT, SENES Consultants, April 20, 2006.

^[13] The BAU scenario assumes that all energy consumption increases with in proportion to population growth.

^[14] Direct energy consumption includes the energy that is purchased within the region (e.g. fuel oil, gasoline, electricity, etc.). It does not include the energy expenses that are buried within the cost of other products (e.g., transportation for food, manufacturing energy requirements, etc).

^[15] All energy forms (Litres or kWh have been converted to GJ). Not all energy sources cost the same. For example a GJ of natural gas currently costs about \$10, a GJ of electricity about \$17, and GJ of gasoline about \$30.

^[16] tCO₂e – tonnes of carbon dioxide equivalents.

locations in Canada - due primarily to the warm climate, lower average vehicle kilometres travelled compared to other cities and regions, and the low GHG intensity of the electricity produced in BC which is mostly from hydroelectric sources ^[17].

These factors that result in low energy consumption and GHG emissions do not mean that there is no room for improvement. In fact the mild climate and historically cheap energy have meant that many of the buildings in the region are energy inefficient and could achieve substantial improvements.

Energy Uses

The inventory shows where energy is being used in the region. A breakdown for 2004 is shown in Figure 3. Just over one third of the energy is used in residential homes. Another third is used for transportation gasoline and diesel fuels, with the remaining third is used in commercial and industrial applications.

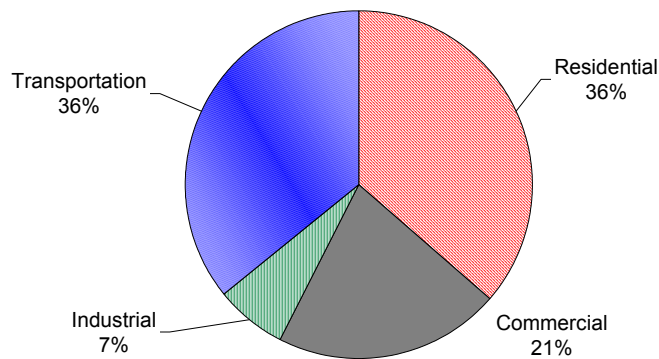


Figure 3: Energy End Uses (2004)

Forecasted Energy Consumption

A Business-As-Usual forecast has been developed in which energy consumption and associated GHG emissions increase in proportion to population growth ^[18]. Without action energy consumption is expected to increase to 2012 (see Table 5).

Table 5: Energy Consumption by End User

Energy (millions of GJ)	Residential	Commercial	Industrial	Transportation	Solid Waste	Total
1995	10.8	5.9	1.8	12.1	0	30.7
2004	11.7	6.8	2.1	11.6	0	32.2
Change from 1995 (%)	8%	15%	17%	-4%	-	4.9%
2012 (BAU)	12.7	7.4	2.3	12.4	0	34.8
Change from 1995 (%)	18%	25%	28%	2.5%	-	13.4%

Notes: Energy use in units of millions of GJ.

^[17] The generation of electricity in BC results in only about 1/30th of the GHG emissions (for the same power consumption) as the generation of electricity by coal powered plants.

^[18] Senes, (2006). Energy Baseline.

3.2 Greenhouse Gas Emissions

The GHG and Energy inventory report evaluated GHG emissions for 2004, and estimated emissions in 1995 and 2012. There has been an overall reduction of 13 % in GHG emissions from 1995 to 2004. This situation is unusual compared to other communities in southwest BC, which typically have shown an increase in GHG emissions over the past decade associated with increases in population.

Reasons reported for the reductions between 1995 and 2004 include:

- Expanded conversion from oil to natural gas fuel for residential space heating;
- A reported change in the GHG intensity of electricity;
- Gradual reductions in fuel purchases in the region; and
- Upgrades to the Hartland landfill gas capture and utilization system.

The major impact has come from the landfill gas utilization project which reduces landfill gas emissions and captures the resource value of this gas as electricity and heat. This GHG reduction is largely a 'one time' gain that cannot be repeated in the future (though incremental improvements in gas collection may occur to reduce emissions further).

GHG Sources

Each energy type has a different GHG "intensity" which means that for each unit of energy consumed, a different amount of GHGs are released. Higher GHG intensity energy sources are gasoline, diesel and fuel oil, while a lower GHG energy (for BC) is electricity.

The inventory identified that over half (53%) of the GHGs in the region arise from transportation fuel consumption (see Figure 4). Residential housing creates just under a quarter of emissions, while commercial and industrial uses generating less than 20% in total. Solid waste produces GHGs from the residual un-captured methane released at the landfill.

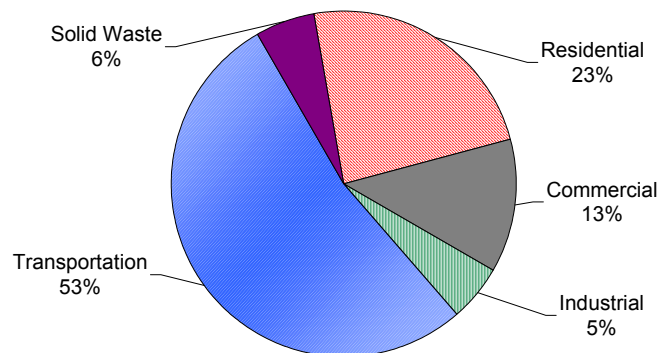


Figure 4: GHG Sources (2004)

Forecasted GHG Emissions

In the future, GHG emissions are expected to increase from 2004 to 2012. This will offset the reductions achieved from 1995 to 2004 though total emissions will still be 7.2% below 1995 levels by 2012 ^[19]. (see Table 6).

The factors that resulted in a decrease of GHG emissions from 1995 to 2004 are not assured to continue their current trend. For example, the electrical system may not become less GHG intensive; more consumers may not switch from fuel oil to natural gas, and vehicle fuel purchases may not decline further.

Table 6: Greenhouse Gas Emissions by End User

GHGs (thousands of † CO2e)	Residential	Commercial	Industrial	Transportation	Solid Waste	Total
1995	402	200	80	882	199	1763
2004	360	193	83	811	85	1532
Change from 1995 (%)	-10%	-4%	4%	-8%	-57%	-13.1%
2012 (BAU)	389	209	90	864	84	1636
Change from 1995 (%)	-3%	5%	13%	-2%	-58%	-7.2%

Notes: GHG emissions in units of thousands tonnes of CO2e.

^[19] The forecast to 2012 assumes that the average fuel efficiency of vehicles will not change and that the proportion of homes heated by fuel oil, electricity, and natural gas will not change (SENES, 2006).

4 Energy Plan Goals

The CRD and member municipalities have expressed their commitment to sustainability through the adoption of the *Framework for Our Future* within the *Regional Growth Strategy*. This framework articulates a vision:

"...for a region that is economically vital, where communities are livable where the environment and natural resources are stewarded with care, and where residents enjoy a healthy and rewarding quality of life. Fundamental to these aspirations is a commitment to work toward regional sustainability."

The CEP is guided by this vision as well as a set of principles established at the outset of this plan development process (Section 2.3). The CEP builds on existing efforts of the CRD, municipalities, and the community in areas such as land use planning, transportation, and solid waste. Through a workshop and interviews with key stakeholders, including the CEP Steering Committee and Working Group, six main goal areas and a series of supporting initiatives were identified.

Goal #1: Improve the Energy Efficiency of Buildings – *by developing or participating in energy conservation programs for existing and new building energy efficiency*

Goal #2: Increase Transportation Efficiency – *by providing alternatives to vehicle travel, and in particular to single occupancy vehicle travel.*

Goal #3: Encourage Energy Efficient Land Use Planning - *by integrating energy and GHG emission considerations into planning processes and land use decisions.*

Goal #4: Diversify Energy Supply - *by fostering the development of renewable energy in the Capital Region.*

Goal #5: Educate & Engage Residents & Businesses – *about renewable energy and energy efficiency opportunities and promote energy efficient activities.*

Goal #6: Demonstrate Municipal Leadership - *by improving the energy efficiency of municipal operations.*

The following section outlines a set of initiatives that will provide progress towards these goals. It is important to note that these different goals are inter-related. It is helpful to think of them as distinct areas of activity for planning and program development. However, actions in one area affect the others: efficient land use planning promotes efficient transportation options; education promotes uptake of energy efficiency and conservation programs; demonstrations of energy efficient practices creates an expectation for future developments, etc.

5 Community Energy Plan: Initiatives and Actions

This section details actions that will reduce energy use and GHG emissions in the community. Initiatives, and subsequent actions are defined within six goal areas, will be led by the CRD and member municipalities. The actions, grouped by goal, are listed below.

Goal #1	Improve the Energy Efficiency of Buildings 1-1: Support the Energy Efficient Buildings Plan for BC 1-2: Encourage Energy Efficiency in Development and Rezoning Processes through Guidance Documents and Checklists 1-3: Promote Building Energy Efficiency through Incentives 1-4: Incorporate Energy Labelling into Buildings 1-5: Lobby Federal and Provincial Governments for Funding and Regulatory Updates
Goal #2	Increase Transportation Efficiency 2-1: Improve Transportation Options and Choices 2-2: Promote Efficient Transportation 2-3: Encourage the Use of Fuel Efficient Vehicles
Goal #3	Encourage Energy Efficient Land Use Planning 3-1: Incorporate Energy Efficiency into Planning Documents and Processes 3-2: Define Criteria for Evaluating the Energy Impact of Land Use Decisions 3-3: Provide Incentives for Energy Efficient Land Use
Goal #4	Diversify Energy Supply 4-1: Encourage the Use of Alternative Energy Technologies in Buildings 4-2: Explore Opportunities for Renewable Electricity Generation within the Region 4-3: Develop a Long-Term Renewable Energy Strategy for the Region
Goal #5	Educate and Engage Residents and Businesses 5-1: Implement a Public Outreach Campaign 5-2: Implement an Energy Awareness Program for Schools 5-3: Promote Energy Efficiency and Green Practices to Identified Target Markets
Goal #6	Demonstrate Municipal Leadership 6-1: Be a catalyst for Demonstration and Innovation Projects 6-2: Build Partnerships for Long term Program Delivery 6-3: Implement a Corporate Energy and GHG Management Programs

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Goal 1: Improve the Energy Efficiency of Buildings

Description

Buildings consume 64% of the energy consumed in the region, producing 42% of the GHG emissions. The most GHG intensive energy uses are often space heating and domestic water heating.

To meet this goal, the CRD and member municipalities will develop new or partner with existing programs and incentives to reduce the energy consumed by residential and commercial buildings. Industrial energy users will be encouraged to also implement actions specific to their industry type.

These actions will support the provincial government's *Energy Efficient Buildings Plan for BC*. This plan has established six targets for reduced energy consumption in detached, multi family, and commercial buildings - both new buildings and to achieve upgrades to existing buildings ^[20]. This plan - endorsed by cabinet - is an initiative to achieve reductions in energy consumption throughout the province. Aligning the CEP actions to help meet those plan goals provides an opportunity for partnering, sharing resources, and teamwork between agencies and stakeholders.

A challenge in advancing this goal is the limited area of regulatory authority that local governments have to control energy consumption in buildings (e.g. building codes are Federal and Provincial jurisdictions). Local governments have the ability to encourage energy efficient design through the property development and rezoning processes.

Actions to reduce energy consumption will lower operating costs for building owners and reduce building related GHG emissions. Building retrofits creates jobs in the local economy for energy auditors, engineering firms, contractors, and building and equipment suppliers.

Creating a community of energy efficient buildings requires the cooperation of many participants. The actions described here focus on areas where the municipalities can most effectively play a role.

Initiatives

Initiative 1-1: Support the Energy Efficient Buildings Plan for BC

Initiative 1-2: Encourage Energy Efficiency in Development and Rezoning Processes through Guidance Documents and Checklists

Initiative 1-3: Promote Building Energy Efficiency through Incentives

Initiative 1-4: Incorporate Energy Labelling into Buildings

Initiative 1-5: Lobby Federal and Provincial Governments for Funding and Regulatory Updates

^[20] For a description of the BC Energy Efficient Buildings Plan targets, see Appendix A: Planning Initiatives Related to the Community Energy Plan. The plan document can be viewed at: www.em.gov.bc.ca/AlternativeEnergy/Alt_Energy_%20Home.htm

Initiative 1-1: Support the <i>Energy Efficient Buildings Plan for BC</i>	
DESCRIPTION	<p>Two components of the <i>Energy Efficient Buildings Plan</i> are already underway: the Energy Savings Plan, which provides grants and rebates for improvements to owners of single family residential, multi family residential and small commercial/industrial buildings; and the Community Action on Energy Efficiency (CAEE) which provides grants to support municipalities to develop energy efficient policies for land use and planning.</p> <p>Support for the plan is a pre-requisite for participation in these cost sharing opportunities. Several local communities within the region have already joined the CAEE including Victoria, Saanich, Central Saanich, and Salt Spring Island. The CRD has also received funding to identify steps to bring the different initiatives together.</p>
ACTIONS ^[21]	A- 1: Support the targets of BC Energy Efficient Buildings Plan.
RESPONSIBILITY	Municipal staff & councils. Support can be accomplished through adoption of the CEP, or by a separate resolution by council to support (one or more of) the targets.
IMPLEMENTATION CONSIDERATIONS	Support is registered through a council or board resolution.

Initiative 1-2: Encourage Energy Efficiency in Development and Rezoning Processes through Guidance Documents and Checklists	
DESCRIPTION	<p>Municipalities will encourage property owners to meet minimum energy standards when developing properties and reviewing re-zoning applications. For consistency, the municipalities should utilize a known third party standard for performance (e.g., the EnerGuide for Houses rating system).</p> <p>This initiative can be accomplished through the inclusion of energy efficiency within development permit or re-zoning application materials such as guidance documents or voluntary checklists.</p>
ACTIONS	A- 2: Draft (or update existing) development permit and re-zoning checklists to include considerations for energy efficiency.
RESPONSIBILITY	A prototype could be drafted by CEP Implementation Committee ^[22] for distribution to partner municipalities. Alternatively, as some municipalities currently have their own checklists established, these could be revised.
IMPLEMENTATION CONSIDERATIONS	<ul style="list-style-type: none"> • Energy efficiency is only weakly mentioned in the <i>Local Government Act</i>, any requirements must be clearly voluntary ^[23]. • Examples exist including New Westminster, which has a Smart Growth development checklist that includes energy considerations ^[24]. Typically these ask that the developer "comment upon" energy efficiency considerations in the development. This allows developers freedom to consider a wide suite of measures.

[21] Implementing Actions are sequentially numbered A-1, A-2, through the entire set of actions.

[22] The CEP Implementation Committee is expected to replace the CEP Steering Committee and Working Group as the plan moves to implementation.

[23] Transparency in the development approval process is an important consideration. A municipality could face a challenge if it was perceived to be making these requirements mandatory (i.e. a municipality cannot do "indirectly what

Initiative 1-2: Encourage Energy Efficiency in Development and Rezoning Processes through Guidance Documents and Checklists

Initiative 1-3: Promote Building Energy Efficiency through Incentives

DESCRIPTION	<p>Incentive programs can be established to encourage owners to construct or retrofit their buildings to higher energy efficiency standards. Incentives may include partial property tax holidays; permit fee waivers for energy efficient development, or direct rebate programs.</p> <p>Providing incentives to developers and owners that construct or retrofit their buildings to exceed the minimum standards will facilitate a reduction in energy use. These incentives can be developed for both residential buildings or commercial and industrial buildings as energy efficiency standards are available for both types of buildings.</p>
ACTIONS	<p>A- 3: Evaluate the potential to provide property tax incentives for energy efficiency improvements in buildings ^[25]. For example, this could be a percentage discount or a partial holiday on the 'improved value' if a renovation met energy efficiency criteria.</p> <p>A- 4: Develop policies (e.g. building permit fee discount) that encourage residents to conduct an energy audit prior to renovating their home.</p> <p>A- 5: Participate with the <i>Energy Saving Plan</i> (ESP) to promote the residential rebate program for detached dwellings.</p> <p>A- 6: Work with partners (e.g. property owner associations, the Energy Saving Plan initiative) to formalize an incentive program for commercial building energy efficiency. The ESP pilot program for commercial and light industrial buildings could be continued.</p> <p>A- 7: Evaluate the opportunities for new household appliance incentive programs that can be offered through local delivery agents. Currently there are incentive programs through BC Hydro (refrigerators, windows) but other opportunities may exist ^[26].</p> <p>A- 8: Encourage industrial and large institutional consumers to set targets for energy conservation. Many large consumers already have energy management programs in place and are being recognized for their efforts (e.g. PowerSmart certification). They should be encouraged to expand their efforts and share their experience through the region.</p>
RESPONSIBILITY	<p>Municipalities, with coordination from the CRD or other local government. Province of BC through the Energy Efficient Buildings Program. Support from the province, BC Hydro and Terasen. There may be potential to find private sector partners (e.g., Home Depot, RONA, etc).</p>
IMPLEMENTATION CONSIDERATIONS	<ul style="list-style-type: none"> • Tax based incentives should be established to not place an undue burden on the remaining tax base. • Local governments must be careful that any benefits they offer to a business

it is not authorized to do directly" - see *Opportunities for Local Government Action on Energy Efficiency in New Buildings* available at <http://www.bccclimateexchange.ca/index.php?p=caee>.

[24] <http://www.newwestcity.ca/cityhall/planning/06publications/10housing/pdf/Smart%20Growth%20Development%20-%20Checklist%202004.pdf>

[25] The City of Victoria offers a 10 year property and school tax holiday for heritage building preservation. The local government act allows this activity for heritage preservation. A legal opinion of the Act would be required to determine if energy efficiency could be provided some tax relief as well.

[26] An example is the CRD water services "SmartWash" program which offers rebates for the purchase of high efficiency clothes washing machines (www.crd.bc.ca/water/conservation/rebates/smartwash.htm).

Initiative 1-2: Encourage Energy Efficiency in Development and Rezoning Processes through Guidance Documents and Checklists

	<p>are for a business sector, and not to any one specific business. A clear policy statement should be developed.</p> <ul style="list-style-type: none"> • Building permit discounts alone may not be sufficient to inspire a property owner to do a retrofit but are targeted at those already applying for building permits as a mechanism for them to consider energy efficiency at a time when performing construction activities. • Local governments should encourage funding partners to deliver direct financial incentives while providing staff and programmatic support to these initiatives. • Use of the EnerGuide rating system is expected to continue under the new ecoEnergy initiative that has replaced the EnerGuide for Houses program. • Renovation contractors and trades could be partnered with to provide the outreach for these incentives as they are regularly interacting with consumers. (This had been occurring for the EnerGuide program whereby contractors informed consumers of the existence of the grant program). • While incentives may make interested consumers take action, the level of incentive may not be enough to instigate action by uninterested consumers. An ongoing outreach program would still be required to motivate consumers to undertake retrofits. • Coordinate efforts with the utilities to ensure that any incentive programs are complementary.
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Initiative 1-4: Incorporate Energy Labelling into Buildings

DESCRIPTION	<p>Energy labelling builds both consumer knowledge and building operator expertise in managing energy consumption. Providing energy information to purchasers allows them to best understand the long term operating requirements of their home.</p> <p>Energy labelling can be used at the time of home renovations. If a consumer receives an energy evaluation combined with advice on how to improve the energy rating of their building prior to conducting a renovation, they would be more likely to incorporate these suggestions into their renovation.</p> <p>For the commercial sectors, building operator associations (e.g., BOMA) can be partnered with to improve operator awareness and of best operating practices, etc.</p>
ACTIONS	<p>A- 9: Work with realtors associations and municipalities to develop a plan for reporting building energy consumption at time of sale.</p> <p>A- 10: Work with the Ministry of Energy Mines and Petroleum Resources to develop a regional program for energy performance measurement and auditing of commercial buildings.</p>
RESPONSIBILITY	<p>The CEP Implementation Committee working with the local real estate board and realtor's association.</p>
IMPLEMENTATION CONSIDERATIONS	<ul style="list-style-type: none"> • Energy labelling requirements for the sale of residential homes would need to be phased in and may be outside of the jurisdiction of the CRD and

Initiative 1-4: Incorporate Energy Labelling into Buildings	
	<p>member municipalities. Further research is required. Most likely a program would initially be voluntary ^[27]. The BC <i>Energy Efficient Buildings Program</i> is working to improve energy labelling – developments in this program should be monitored to ensure efforts are not duplicated.</p> <ul style="list-style-type: none"> • The costs of an evaluation like the EnerGuide system are about \$150 to \$200. Opposition to paying this cost by the home seller may hinder participation and a subsidy system may be required. One option may be to encourage the Provincial government to provide a reduction of the property transfer tax for audited houses. • There is not a comparable energy evaluation system for multi-family dwellings. Individual dwellers of multi-family units would likely not be included. • Commercial operators may have been already well served through the Power Smart programs and their operating practices. The reduction potential here is uncertain.

Initiative 1-5: Lobby Federal and Provincial Governments for Funding and Policy and Regulatory Changes	
DESCRIPTION	Municipalities are encouraged to work with higher levels of government to receive funding assistance to administer programs as well as to achieve regulatory changes which will have a long term effect.
ACTIONS	<p>A- 11: Lobby the Federal government to reinstate and maintain the EnerGuide for houses rating system as a measure for evaluating single family detached dwelling energy performance.</p> <p>A- 12: Lobby the Federal government to commit to long term funding for building energy efficiency activities for new and existing commercial facilities.</p> <p>A- 13: Lobby the Provincial government to continue to expand the range of energy efficiency activities eligible for a PST exemption ^[28].</p>
RESPONSIBILITY	The CEP Implementation Committee to draft letters for council and board endorsement.
IMPLEMENTATION CONSIDERATIONS	<ul style="list-style-type: none"> • Lobbying government to change regulations and to reinstate or increase funding to programs is typically a long term action. In the short term, this action may have a benefit as the federal government has cancelled its building assistance programs (EnerGuide, CBIP). In the fall of 2006, a new proposed Clean Air Act was announced, but it is not certain yet what form it will take, and whether there will be supporting programs to replace the cancelled programs.

[27] The Energy Efficient Buildings Program is working to improve energy labelling and this might result in a Provincial requirement for energy labelling.

[28] At the provincial level, the Social Service Tax Act provides an exemption from PST for prescribed energy conservation materials and equipment that prevent heat loss from a building, for prescribed residential energy efficient furnaces, boilers and heat pumps, for prescribed alternative energy sources, and for natural gas and propane conversion kits for internal combustion engines. The BC Energy Efficient Buildings Plan will evaluate other components eligible for this exemption.

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Goal 2: Increase Transportation Efficiency

Description

In 2004, transportation accounted for 36% of energy consumed and 53% of the GHG emissions in the region. In this goal area energy savings will be achieved by increasing the use of alternative forms of transportation (e.g., cycling, transit, etc.) over vehicle use, in particular single occupancy vehicles. In addition, promoting the use of fuel-efficient vehicles will reduce energy consumption and associated GHG emissions.

Strategies that improve **transportation options** (e.g., walking and cycling conditions, ridesharing, and public transit service quality, etc.) and encourage the use of **efficient transportation** (such as incentives for commuters to shift from driving to alternative modes when possible) provide many benefits in addition to energy conservation, including congestion reduction, road and parking cost savings, consumer cost savings, reduced accidents, improved mobility for non-drivers, and increased community livability.

Strategies that increase walking and cycling activity also provide public fitness and health benefits. These additional benefits can justify far greater implementation of these strategies than just the energy and GHG benefits pursued in this CEP.

The regional TravelChoices strategy includes many actions that support both efficient transportation and smart growth land use policies. The TravelChoices Strategy includes an objective to:

"Significantly increase the proportion of people walking, cycling, using transit, ride-sharing or using other alternatives to driving alone".

TravelChoices has been approved as a strategy document and a plan is being developed to define the implementation program.

The initiatives under this goal incorporate and build upon the TravelChoices strategy. The specific focus in this energy plan is to develop and implement actions that reduce energy consumption and associated GHG emissions. The CEP defines actions that can be advanced both within the TravelChoices framework and independently of the status of the TravelChoices initiative.

Initiatives

Initiative 2-1: Improve Transportation Options and Choices

Initiative 2-2: Promote Efficient Transportation

Initiative 2-3: Encourage the Use of Fuel Efficient Vehicles

Initiative 2-1: Improve Transportation Options and Choices	
DESCRIPTION	<p>The CRD and its member municipalities are developing an implementation plan for the TravelChoices strategy. This will define a prioritized list of actions that require attention and enable municipalities to define their capital spending priorities and seek out higher governmental assistance.</p> <p>The CEP Implementation Committee should seek to encourage those activities which maximize energy conservation and GHG emissions reductions in the TravelChoices process.</p>
ACTIONS	<p>A- 14: Promote the energy efficiency objectives of the CRD TravelChoices strategy.</p> <p>A- 15: Improve regional public transit service in the region. Specifically, to provide appealing choices, programs should focus on efforts that improve service quality, transit priority measures to increase transit speeds, improved stations and stops, real-time arrival information, and improved payment options (such as more discounted fares) and the potential for rail transit-development. This effort may require lobbying of the Provincial Government to provide increased funding for transit related initiatives.</p> <p>A- 16: Promote ridesharing programs. In particular, vanpooling services for longer-distance commuting should be considered with improved coordination and support comparable to what is provided to transit trips.</p> <p>A- 17: Develop a regional "non-motorized transportation plan" to increase walking and cycling conditions.</p>
RESPONSIBILITY	Municipalities, the CRD, BC Transit, the CRD TravelChoices Working Group
IMPLEMENTATION CONSIDERATIONS	<ul style="list-style-type: none"> • Providing 'options and choices' focuses on developing the system and infrastructure for transportation. These actions are typically large capital projects which may take many years to fund and implement. The CEP supports those activities but recognizes that much of that activity will occur through a range of processes and funding mechanisms. • The TravelChoices Strategy includes many actions that are not explicitly energy reducing but are intended to increase transportation effectiveness. The intent of the first action (A-14) is to advocate for energy efficiency and GHG emissions reductions to be considered when directing TravelChoices resources. • These actions could be implemented through the TravelChoices strategy but might also be promoted independently from TravelChoices.

Initiative 2-2: Promote Efficient Transportation	
DESCRIPTION	<p>A large proportion of commuters travel to work in single occupancy vehicles (SOVs). In this action, the CRD and member municipalities will promote and develop programmatic alternatives to SOV travel and improve transportation alternatives. The actions defined to promote transportation efficiency are typically program based or involve incentives that move residents to other forms of transportation.</p>
ACTION REQUIRED	<p>A- 18: Create Transportation Management Associations (TMAs) in major destination areas. TMAs for major areas such as downtown, shopping malls, campuses and medical centres can develop and administer programs to their defined audience.</p>

Initiative 2-2: Promote Efficient Transportation	
	<p>A- 19: Promote trip reduction programs. The region includes several large employers (government, education, medical) that have the size to justify efforts on CTR. Such programs can include ridesharing, car sharing, guaranteed ride programs, transit pass discounts, telecommuting, and compressed or reduced work weeks. Ideal candidates to pilot test these include the provincial government, the CRD, the City of Victoria, and the University of Victoria.</p> <p>A- 20: Implement a transportation Demand Management (TDM) marketing program. This would use direct and targeted marketing to promote the user benefits of alternative modes of transport ^[29]. Preferably this would be in-conjunction with promotional events (e.g. free trial of vanpooling, or transit pass discounts).</p> <p>A- 21: Develop local parking management programs at the municipal and/or neighbourhood level. These should evaluate both the private and public (street) parking. These programs can aim to reduce the amount of parking needed, encourage more efficient use of parking facilities, and reward travelers who reduce their vehicle trips or eliminate their need for parking.</p> <p>A- 22: Investigate the opportunities for innovative incentives to reduce vehicle use. This could include:</p> <ul style="list-style-type: none"> - Vehicle Ownership Reduction Incentives: These would adjust development fees, utility rates or tax policies to reward households that own fewer than average vehicles to reflect the reduced roadway facility and traffic service costs they impose on their communities ^[30]. - Location-based Incentives: These would adjust development fees, utility rates or tax policies to reflect how the costs of providing public services varies by location, with lower fees for more accessible locations. - Insurance Premium Incentives: An example would include policy changes (required by the Province) for actions such as "pay-as-you-drive" vehicle insurance or registration fees.
RESPONSIBILITY	The CEP Implementation Committee with input from major employers (e.g., the provincial government, the CRD, DND), BC Transit.
IMPLEMENTATION CONSIDERATIONS	<ul style="list-style-type: none"> • Start-up funding for TMAs may be required from the Regional District though long term operational funding would be expected to be shared by the participating members ^[31]. The TMA would work with employers, schools and campuses, and facility managers to develop programs to enhance commuting, travel, and transit systems. An institution-based or geographic based TMA can focus on the specific needs of the target audience. • Commute Trip Reduction (CTR) programs in other jurisdictions range from informal and voluntary to the mandated. Further evaluation is required whether local governments can require a CTR program. Most likely these would be 'encouraged' through municipal planning process (for example a parking spot variance could be allowed in exchange for an implemented

[29] For example the lower mainland has a "Go Green" program (see www.gogreen.com).

[30] For example, municipal roadway funding could be a separate budget category, and discounts offered to households that do not own an automobile as a method to reward non-car owners.

[31] The Cambie Corridor Consortium (CCC) is the first Transportation Demand Management Association in Canada consisting of 21 member companies and organizations situated in downtown Vancouver. By conducting a survey the CCC identified key barriers for employees to take alternative modes of transportation (i.e., walking or public transportation) to work and developed an initiative focused on removing some of those barriers. They offered multiple solutions such as a shuttle bus service, discounted public transportation passes, a van pooling program, emergency ride home and improvements to locker and shower facilities in the workplace. (www.fhio-ifppe.gc.ca/default.asp?lang=En&n=8C5EA976-1).

Initiative 2-2: Promote Efficient Transportation

	<p>CTR program).</p> <ul style="list-style-type: none"> • CTR programs are effective and economic for small organizations so they should not be thought of as solely large employer activities. • The innovative incentives may require policy changes at the Provincial Government level (e.g. insurance systems) or the development of policy or bylaw changes at the local government level.
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Initiative 2-3: Encourage the Use of Fuel Efficient Vehicles

DESCRIPTION	Promoting the purchase of fuel-efficient vehicles will capitalize on recent increases in energy prices to motivate consumers to use smaller vehicles through the development of mechanisms and incentives.
ACTIONS	<p>A- 23: Provide preferential parking spots for selected vehicles based on fuel efficiency, size, or fuel type. (e.g. the City of Victoria's 3 metre parking spots in the downtown core.</p> <p>A- 24: Investigate the opportunities for incentives for businesses that use smaller and more fuel efficient vehicles (e.g. business licence reduction, parking considerations)</p> <p>A- 25: Encourage the provincial government to expand the PST exemption for fuel efficient vehicles. This currently is available for the purchase of gasoline-electric hybrid vehicles but could be expanded to vehicles that meet defined performance standards ^[32].</p>
RESPONSIBILITY	The CEP Implementation Committee with input from the municipalities. Provincial government action would also be required.

[32] The definition of a fuel efficient vehicle can be based on the technology (e.g. a gasoline-electric hybrid) or on the performance (e.g. a defined fuel consumption rating).

Goal 3: Encourage Energy Efficient Land Use Planning

Description

Land use planning is one of the single most important determinants of a community's energy footprint. Integrating energy use and GHG emission considerations at early stages in land use planning processes will have long term benefits in terms of reducing energy consumption and increasing the liveability of the region. Actions in this section will result in:

- Increased use of the urban village concept which will decrease transportation needs by enabling residents to live close to work and by providing more needs within a short distance of home. This is achieved by increasing density and mixed use zoning.
- More efficient infrastructure through the development of compact communities which reduce roadways and utility service requirements.
- Increased development of energy efficient buildings.
- Provision of alternatives to vehicle-based transportation through site design and facilities that assist in pedestrian and bicycle mobility.

The initiatives here build upon, and are complementary to, existing land use strategies in the region such as the *Regional Urban Containment and Servicing Boundary* and the *Build Complete Communities* strategies within the Regional Growth Strategy.

Land use planning activities take many years for the ideas and actions to become implemented. Most of the activities here are expected to have long term benefits, though some benefit is expected to occur in the period to 2012 (CEP target year).

Initiatives

Initiative 3-1: Incorporate Energy Efficiency into Planning Documents and Processes

Initiative 3-2: Define Criteria for Evaluating the Energy Impact of Land Use Decisions

Initiative 3-3: Provide Incentives for Energy Efficient Land Use

Initiative 3-1: Incorporate Energy Efficiency into Planning Documents and Processes	
DESCRIPTION	<p>Municipalities and the CRD will incorporate energy efficiency as a key objective of their municipal Official Community Plans (OCPs), the Regional Growth Strategy (RGS), and other land use policies. The documents will specifically define energy efficiency and GHG emission reduction as desired principles of community development. Energy efficiency principles include densification, mixed use, and support of energy efficient transportation.</p> <p>Over time, property developers will become more familiar with energy conservation requirements. Consumers will value energy efficiency in their housing decisions.</p>
ACTIONS	<p>A- 26: Incorporate energy efficiency principles into municipal planning documents through regular review cycles. This could include OCPs, local area plans, and development permit guidelines. Specific reference may be made to large site development where economies of scale make energy efficiency more affordable.</p> <p>A- 27: Support the principles of "Smart Growth" and the building of "Complete Communities". This development has energy efficiency value but also a range of other benefits.</p> <p>A- 28: Require energy efficient or green development for large property developments where the municipalities (or other governments) have an interest (e.g., Dockside Green).</p>
RESPONSIBILITY	<p>Municipalities</p> <p>CEP Implementation Committee can compile examples and case studies.</p>
IMPLEMENTATION CONSIDERATIONS	<ul style="list-style-type: none"> • It is ideal to develop one set of policies and definitions of energy efficient land use for the region, although it is recognized that each municipality has its own needs and requirements. • Incorporation of energy efficiency into planning documents does not require extra resources as this will occur through the regular revision process. • Special project sites may require additional effort from existing municipal planning departments as there is often substantial effort in the scoping and definition phase. • The use of re-zoning processes is also an option for encouraging improved energy efficiency. This often occurs on a lot-scale and is discussed within Initiatives 1-2 and 1-3 for buildings.

Initiative 3-2: Define Criteria for Evaluating the Energy Impact of Land Use Decisions	
DESCRIPTION	<p>Criteria will be defined that can be used to evaluate land use decisions for their impact on energy efficiency. While terms like Smart Growth and Complete Communities seem apparent when used, there may not be a consistent understanding of the definitions.</p> <p>Guidelines incorporating the definitions and criteria will be developed, and tools (e.g. GIS, modeling) evaluated to assist planning decisions.</p>
ACTIONS	<p>A- 29: Create a definition and attribute description of a successful community (e.g., an urban village, or a 'complete community'). The definition of these criteria could include targets and benchmarks for energy consumption in subdivision scale developments. This can be expanded at a later date to include commercial developments.</p>

Initiative 3-2: Define Criteria for Evaluating the Energy Impact of Land Use Decisions	
	A- 30: Use modeling tools to evaluate the energy impacts of developments (examples include CommunityViz, INDEX, or PLACE ³ S)
RESPONSIBILITY	CRD Planning department or RGS monitoring group.
IMPLEMENTATION CONSIDERATIONS	<ul style="list-style-type: none"> This may be difficult to implement in each municipality but if coordinated by the CRD it may be possible over the long term.

Initiative 3-3: Provide Incentives for Energy Efficient Land Use	
DESCRIPTION	Municipalities work to provide incentives to the development community as a method to encourage energy efficient developments. However, incentives alone will not promote energy efficient land use – education and regulation are both useful instruments in the long term for meeting the land use goal.
ACTIONS	<p>A- 31: Develop policies that would allow planning departments to provide preferential or accelerated review for the development permit process for projects that meet the energy efficient criteria for developments and/or other green criteria ^[33].</p> <p>A- 32: Investigate whether property tax incentives, Local Improvement Charges (LICs), or variable Development Cost Charges (DCCs) can be offered to desired energy efficient development ^[34].</p>
RESPONSIBILITY	The CEP Implementation Committee will review the legal requirements and propose options that the municipalities may then decide how to incorporate into their processes.
IMPLEMENTATION CONSIDERATIONS	<ul style="list-style-type: none"> The first step in implementing this action is the education of residents and developers. Education is a key component of this action (see Education Goal). Without education and promotion of energy efficiency in the community, it will be difficult to encourage the adoption of energy efficient principles in land use decisions, once the incentive programs end. May be controversial within some communities. A coordinated implementation approach is recommended. Not all municipalities are required to adopt the incentive programs - individual municipalities have the option to customize the program. The primary incentives available are procedural (e.g. a fast-track permit review process). Any financial incentive (tax reduction, cash rebates) must be carefully structured and a clear policy established for implementation. Local governments could be challenged if there is a perception that a benefit is selectively applied.

[33] Some work is already being done in this area in Saanich through a grant from the Community Action on Energy Efficiency (CAEE) program.

[34] Note that as an example, variable Development Cost Charges (DCCs) can only be used to encourage energy conservation as part of an overall package of water and sewage reduction (local governments' traditional areas of responsibility).

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Goal 4: Diversify Energy Supply

Description

A large part of the current energy supply systems in the region are based on the provision of non-renewable fossil fuels. Automotive transportation is dependant on petroleum fuels and buildings are also substantial consumers of natural gas and fuel oil. The current electricity system is generally based on renewable hydroelectricity; continued growth on the Island and in the rest of the Province might require more fossil fuel-based electrical generation.

Renewable energy technologies provide heat or electricity from renewable sources. This includes active solar, biomass sources, wind power, micro-hydro electricity, and in the future potentially wave and tidal power. There are also 'alternative technologies' which can provide heat or electricity and produce fewer GHGs than current practices. These include heat pumps, district heating and/or cogeneration based on renewables or biomass.

By identifying renewable and alternative sources of energy, the region will reduce overall dependence on fossil fuels as well as begin to insulate consumers from price volatility and fuel shortages. In addition, by increasing the diversity of the energy supply, the region is less dependent on the mainland gas line and electrical transmission lines and therefore has a more resilient energy supply. These actions will help build the Capital Region's renewable energy sector, stimulate local economic development and help to retain energy dollars in the local economy.

Increasingly, local governments are taking an interest in utilities and/or partnerships to support development of local renewable energy supplies ^[35].

Initiatives

Initiative 4-1: Encourage the Use of Alternative Energy Technologies in Buildings

Initiative 4-2: Explore Opportunities for Renewable Electricity Generation within the Region

Initiative 4-3: Develop a Long-Term Renewable Energy Strategy for the Region

[35] For example the City of North Vancouver is a co-owner of a district heating system in the Lonsdale area.

Initiative 4-1: Encourage the Use of Alternative Energy Technologies in Buildings	
DESCRIPTION	Support and promote the use of alternative energy technologies. Specifically this initiative aims to advance ground source heat pumps, district heating systems, and solar water heating.
ACTIONS	<p>A- 33: Participate in the Solar Hot Water Acceleration Project (www.solarbc.org) with a goal to achieve 250 solar roof systems in the region by 2012 ^[36].</p> <p>A- 34: Investigate opportunities to provide incentives to developers or builders that will construct buildings with "solar ready" plumbing systems.</p> <p>A- 35: Encourage developers of residential and commercial developments to incorporate renewable energy technologies. This includes solar space heating, geo-exchange heating and solar hot water heating.</p> <p>A- 36: Support district heating systems (preferably based on renewable energy), and district energy zones. This would be accomplished through land use policies and development guidelines.</p>
RESPONSIBILITY	The CEP Implementation Committee, with support from CRD, member municipalities.
IMPLEMENTATION CONSIDERATIONS	<ul style="list-style-type: none"> • It will be important to work with developers and the contracting community to ensure new technologies are acceptable under the BC Building Code. • A high standard of craftsmanship is required to prevent a failed system from reducing public interest ^[37]. • It will be important to showcase the use of alternative energy systems in the Capital Region once some systems were installed. These can demonstrate the cost savings and personal and social benefits of using these technologies. Success stories should be publicly announced via the One Day Capital Region website and other media.

Initiative 4-2: Explore Opportunities for Renewable Electricity Generation within the Region	
DESCRIPTION	Within the Capital Region, opportunities for renewable electricity generation projects will be explored. These may be executed by Local governments or other groups. As a start, local governments will continue their efforts at energy recovery as an example to the community. Local governments will also work with others seeking to develop renewable electrical generation capacity in the region.

[36] The target for the current solar hot water program is the installation of 50 within BC in 2006. About half of these will be located in the Capital Region.

[37] For example the Solar Hot Water Acceleration program is using only a select list of experienced solar water contractors. At the same time they are providing training to contractors to improve the overall knowledge level.

Initiative 4-2: Explore Opportunities for Renewable Electricity Generation within the Region

ACTIONS	<p>A- 37: Evaluate the potential for generating electricity from the Sooke Reservoir.</p> <p>A- 38: Improve the Hartland Landfill gas capture system to match gas capture rates of other landfills ^[38].</p> <p>A- 39: Ensure that any future sewage treatment facilities include the highest energy efficient design and maximize the recovery of resources.</p> <p>A- 40: Contribute to evaluation processes for other renewable electricity generation capacity within the region.</p>
RESPONSIBILITY	CEP Implementation Committee
IMPLEMENTATION CONSIDERATIONS	<ul style="list-style-type: none"> • Some alternative technologies for electricity generation are not commercially available yet as many technologies are in the “near-commercial” stage of development. These technologies may be available for demonstration projects. • Funding for pilot projects may be available from provincial and federal agencies.

Initiative 4-3: Develop a Long-Term Renewable Energy Strategy for the Region

DESCRIPTION	<p>The CRD and its members, with support from other levels of government, utilities, and the private sector will develop and implement a CRD Renewable Energy Strategy. The objective will be to reduce the use of fossil-fuel based energy in the region. The scope would certainly include all building and electricity energy consumption, and could include transportation fuels as well.</p> <p>The strategy will look beyond the immediate plan target year (2012) to envision the next two decades and ensure that the region's energy systems are prepared to meet the desired outcomes of sustainability and energy security. The finite nature of fossil fuels will require that future energy supplies comprise more renewable energy sources.</p> <p>Stakeholders within the region will engage the renewable energy sector, utilities, and senior levels of government to define a long term strategy for the region. A first step would be to identify renewable energy supply opportunities for the region. The CRD Renewable Energy Strategy will define ways to:</p> <ul style="list-style-type: none"> • facilitate the uptake of renewable energy technologies in the community (i.e., beyond pilot scale and ‘pioneer’ adopters), and • foster local economic development of renewable energy technologies and resources within the region. <p>CRD and member municipality officials could participate in the 2007 Vancouver Island Energy Forum, and seek to move the region (and Vancouver Island overall) toward long-term renewable energy strategies.</p>
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³⁸ Recent evaluation indicates that the gas capture rate at the Hartland Landfill could be improved through a review of the well field design and well conditions.

Initiative 4-3: Develop a Long-Term Renewable Energy Strategy for the Region

ACTIONS	<p>A- 41: Work with partners to identify opportunities for renewable energy pilot projects. These can demonstrate technologies and act as catalysts for broader implementation of technologies within the region.</p> <p>A- 42: Compile an inventory of the resource potential for alternative energy within the region. This would include applications for renewable electricity generation, but would also explore the overall potential (both technical and market acceptance) of other technologies such as solar heating, geo-exchange, sewer heat recovery, localized biomass opportunities, etc.</p>
RESPONSIBILITY	<p>CRD, with support from the renewable energy sector and utilities.</p>
IMPLEMENTATION CONSIDERATIONS	<ul style="list-style-type: none"> • This type of activity is not within the influence or traditional jurisdiction of local governments and will require participation and mandate from the province. However, local governments might be best suited to lead or chair such a process. • A first step would be to identify the unique renewable energy supply opportunities of the region. • This would be a multi-year process with many stakeholders involved. • CRD is best positioned to manage this process, potentially in partnership with the Province and other regions of Vancouver Island.

Goal 5: Educate & Engage Residents and Businesses

Description

Essential to the community energy planning process is a set of actions that focus on engaging residents and businesses about the goals of the CEP, and on increasing their awareness of energy efficiency and renewable energy opportunities. This awareness will help to foster community-wide support and ensure uptake of the various actions contained in the CEP. Educational programs will be designed to educate, raise awareness, and spur action as appropriate.

Recent volatile energy prices have raised the awareness of energy costs to a greater segment of the population. The degree to which this awareness has evolved into action is uncertain. However, developing a plan now can capitalize on this recent awareness.

Engagement activities must be designed not solely to raise awareness but to initiate action. It is important to recognise that in today's busy society workers and consumers are overwhelmed with activities, promotions, and requests for attention. The task of changing consumer behaviour should not be considered trivial.

Many factors create inertia that prevents consumers from taking action - even though they may know it to be 'the right thing' to do. Changing individual behaviour is a complex process that can only be tackled by a thoughtful, strategic approach. There will be a need to undertake rigorous techniques of behaviour education and change sometimes described as Community-Based Social Marketing (CBSM), which has its roots in behavioural psychology. CBSM takes each behaviour and in detail analyzes the barriers and benefits to change. It can help focus first on those behaviours that are easiest to change and will have the most positive effect.

Engagement activities are considered 'foundational' and do not result in direct impacts themselves generally. The efforts here are supportive to all the other goal areas.

Initiatives

Initiative 5-1: Implement a Public Outreach Campaign

Initiative 5-2: Implement an Energy Awareness Program for Schools

Initiative 5-3: Promote Energy Efficiency and Green Practices to Identified Target Markets

Initiative 5-1: Implement a Public Outreach Campaign	
DESCRIPTION	<p>A public outreach and engagement campaign will be implemented using the "One Day Capital Region" website as its internet portal, with other media and venues for reaching target audiences.</p> <p>Key messages will be defined through the development of the program, though expected themes could include: energy planning has many benefits; energy efficiency is a sound business decision, the region is a leader in sustainability.</p> <p>While primarily focusing on the general public, this campaign can also include targeted information for specific audiences.</p>
ACTIONS	<p>A- 43: Maintain the existing internet presence through the One Day Capital Region website (www.onedaycapitalregion.bc.ca). The internet presence will be used as a reference portal for information.</p> <p>A- 44: Conduct a well planned and timed CEP launch campaign. This would occur following the plan approval, and include a program of activities over the 24 months following the launch. These could include ribbon cuttings, or funding announcements, etc. These should be designed to attract local media attention to the CEP and help the public realize that continuous progress is being made.</p> <p>A- 45: Develop outreach materials to highlight energy efficiency in the community. A variety of media should be considered including local or community newsletters, municipal service or community calendars, and media stories and newspaper advertisements.</p> <p>A- 46: Implement an energy or climate change recognition program. This could include a board award, or a 'mayor's challenge', etc. The award should recognise efforts that go 'above and beyond', to inspire the community. Allowing award recipients to promote their awards creates profile for their actions, and credibility for the award.</p> <p>A- 47: Encourage the local NGO community to provide input and opportunities to assist with outreach. This could include providing sponsorship funds for relevant events (e.g. Earth Day, Clean Air Day), conducting periodic consultation to define new program elements, etc. Whenever possible, local, established NGOs should be used as delivery agents for program components. Doing so not only allows these bodies to build capacity, but it also reduces the administrative burden on the CEP Implementation Committee. Moreover, these organizations are in touch with their audience and will have valuable expertise about how to reach them.</p> <p>A- 48: Maintain the brand presence in all other incentive programs developed through this plan.</p>
RESPONSIBILITY	Energy plan outreach coordinator.
IMPLEMENTATION CONSIDERATIONS	<ul style="list-style-type: none"> • There are substantial barriers to achieving long-term change in consumer behaviour. These include perception of the issue, awareness of programs, convenience and cost (either real or perceived), ownership of the issue, and others. These barriers should not be underestimated and a substantial commitment for multi-year funding is required to ensure that these programs have time to enact behavioural change. • One component of a public awareness campaign is dependent on

	<p>implementing a consistent 'branding strategy' for energy conservation in the region ^[39]. Individual municipal activities should link to or present through this brand (i.e. logo and format etc.)</p> <ul style="list-style-type: none"> • Passive programs such as a website or promotional materials alone cannot be relied upon to achieve change. They are an important complementary tool but must be part of a larger, proactive outreach program.
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Initiative 5-2: Implement an Energy Awareness Program for Schools	
DESCRIPTION	<p>A classroom education program for schools will educate school children on issues of energy conservation and climate change. The Implementation Committee should seek to partner with Power Smart to co-deliver presentations at schools (e.g. the Power Smart at Schools programs teaches kids about energy conservation, the environment and electrical safety.)</p> <p>An energy efficiency challenge would raise awareness in the classroom and motivate children to be involved with energy conservation on a personal level.</p>
ACTIONS	<p>A- 49: Promote and offer support to existing education presentations delivered by Power Smart and other CRD departmental programs.</p> <p>A- 50: Partner with a local NGO to organise school events such as energy efficiency challenges at the classroom and school level. For the classroom-to-classroom challenge, students would be encouraged to document the things they do at home to save energy (e.g., replacing incandescent bulbs with compact fluorescents). The class with the most savings over a month wins a prize. The school-to-school challenge would be similar, rewarding the school that reduced its energy consumption in the most environmentally friendly way. Prizes could include money or field trips to Science World in Vancouver or to the Royal Museum of BC in Victoria.</p>
RESPONSIBILITY	Energy plan outreach coordinator.
IMPLEMENTATION CONSIDERATIONS	<ul style="list-style-type: none"> • The success of this action is dependent on the ability to engage students. • Utilities such as BC Hydro and Terasen Gas should be approached to sponsor the programs and assist with delivery. • Local NGOs would be effective partners to deliver messaging, conduct school visits, develop teach material, etc.

Initiative 5-3: Promote Energy Efficiency and Green Practices to Identified Target Markets	
DESCRIPTION	<p>A consolidated program that helps homeowners, builders, developers, and building operators understand the array of programs available would be useful. A specific example for buildings is the BC <i>Energy Efficient Buildings Plan</i> which includes actions for harmonized program delivery.</p>
ACTIONS	<p>A- 51: Develop a commercial building portal for the One Day Capital Region website. This could serve as an information resource for helping busy</p>

[39] In the City of Edmonton, the stakeholders established a common delivery agent to administer incentive programs.

	<p>professionals navigate the array of programs. This website would provide links to information on existing programs such as BC Hydro's Power Smart programs and BOMA BC's Go Green program ^[40].</p> <p>A- 52: Participate in future outreach programs designed for the commercial sector by the Ministry of Energy Mines and Petroleum Resources' Energy Saving Plan (ESP) initiative.</p> <p>A- 53: Work with local industrial consumers to expand their commitment to the community to reduce energy. (e.g. an industrial energy conservation pledge)</p> <p>A- 54: Work with the development and construction sectors to identify target markets and new avenues to reach program participants.</p> <p>A- 55: Develop an anti-idling campaign to reduce unnecessary fuel consumption. Prime targets for reaching drivers include school and daycare drop-off areas, recreational centres, and shopping malls ^[41].</p>
RESPONSIBILITY	Energy plan outreach coordinator.
IMPLEMENTATION CONSIDERATIONS	<ul style="list-style-type: none"> Industrial consumers are often aware of their energy consumption if it becomes a significant cost in their operations. BC Hydro and Terasen have developed targeted conservation programs towards these consumers.

[40] The Building Owners and Managers Association of BC Go Green program is a voluntary real estate industry program for all commercial buildings and facilities that have demonstrated compliance with 10 key measures of good practice.

[41] A key message for marketing anti-idling in these areas is the health effects of vehicle exhaust on children rather than the climate change impacts.

Goal 6: Demonstrate Municipal Leadership

Description

Displaying regional and municipal leadership in energy and GHG management will encourage other sectors to undertake energy efficiency and renewable energy actions. Leadership will also act to further demonstrate local government commitment to sustainability.

These activities include:

- providing support for demonstrations, pilot tests, and innovations. These may not always achieve large reductions in the short term but are part of developing a local culture of energy conservation and efficiency and can stimulate the uptake of new technologies and practices throughout the community;
- developing long-term partnerships with utilities, other agencies and governments, industry organizations, and the NGO sector to facilitate efficient program delivery; and to
- take the first steps by implementing comprehensive energy management programs within the municipality's and the CRD's own operations.

Initiatives

Initiative 6-1: Be a catalyst for Demonstration and Innovation Projects

Initiative 6-2: Build Partnerships for Long term Program Delivery

Initiative 6-3: Implement a Corporate Energy and GHG Management Programs

Initiative 6-1: Be a catalyst for Demonstration and Innovation Projects	
DESCRIPTION	Municipalities will act as catalysts for other stakeholders – encouraging action wherever possible. Endorsement of these principles provides a political mandate for staff to include these considerations in their daily work and to take managed risks to explore sustainable progress.
ACTIONS	<p>A- 56: Allow access to municipal property or in-kind resources for demonstration projects (e.g., geo-exchange, solar hot water heating, green roofs, biofuel programs, etc).</p> <p>A- 57: Initiate pilot projects for new approaches where identified (e.g., reserved parking spaces for car-sharing).</p>
RESPONSIBILITY	Individual municipalities; CRD
IMPLEMENTATION CONSIDERATIONS	<ul style="list-style-type: none"> These activities do not override the need for appropriate risk management and safety preservation. However, carefully managed, these activities can build relationships within the community while providing a profile for innovative energy conservation activities.

Initiative 6-2: Build Partnerships for Long term Program Delivery	
DESCRIPTION	Many of the actions in this plan require partnerships with other agencies such as the provincial government and utilities. Successful long-term partnerships are essential for the ongoing success of the CEP. One strategy is to develop long-term cooperation agreements between stakeholders. This could include funding or in-kind support for other program components defined in the plan.
ACTIONS	<p>A- 58: Develop cooperation agreements with MEMPR, the CRD, and delivery agents to ensure the delivery of the Energy Savings Plan program.</p> <p>A- 59: Partner with non-governmental organizations to deliver education and outreach activities.</p> <p>A- 60: Develop joint proposal submissions with municipalities and stakeholders for future funding programs, such as the “New Deal for Cities” program ^[42].</p> <p>A- 61: Work with BC Hydro and Terasen Gas to deliver consistent commercial building audit and education programs.</p>
RESPONSIBILITY	CEP Implementation Committee, municipal and CRD staff
IMPLEMENTATION CONSIDERATIONS	<ul style="list-style-type: none"> Some partners may be hesitant or unable to commit to certain types of partnerships (e.g. multi-year agreements.)

[42] An existing example might be the recently approved Douglas Street Priority Transit project that is jointly funded by BC Transit, the Ministry of Transportation, the City of Victoria, and the District of Saanich.

Initiative 6-3: Implement Corporate Energy and GHG Management Programs	
DESCRIPTION	Municipalities can aggressively reduce energy consumption in their own buildings, vehicle fleets, and other operations through a directed energy reduction plan. The CRD and many member municipalities have already initiated these types of activities through the municipal buildings audit program. The implementation of building retrofit opportunities identified in the audit program has already been completed in many buildings. Appendix C details a generic “menu” of program components for a corporate energy reduction plan.
ACTIONS	A- 62: Implement a Corporate GHG plan. This typically would include actions in the areas of: <ul style="list-style-type: none"> • Existing Buildings • New Buildings • Vehicle Fleets • Utility Services • Purchasing Activities • Education and “In-reach”
RESPONSIBILITY	Individual Municipalities
IMPLEMENTATION CONSIDERATIONS	Many components will be common across the region. An effort should be made to coordinate these.

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6 Scenarios for Action

6.1 Scenarios

To help evaluate the energy savings potential, GHG emissions reductions, and program costs from the Initiatives and Actions defined in Section 5, three scenarios for action are evaluated. The scenarios are given names that describe their primary themes. These are:

- **Business-as-Usual**

A 'do nothing' (or baseline) scenario. No actions are implemented from the plan.

- **Selective Measures**

A patchwork of actions, based on the willingness of players to participate. Some progress is made in each of the goal areas, though not all actions are implemented.

- **Hold the Line (No Net Increase in GHG Emissions)**

A coordinated effort of programs to make progress on all goal areas. The result is a forecast that 'holds the line' on GHG emissions (maintaining them at near current levels) in spite of growth in the region⁴³. This scenario still requires a considerable effort including staff and funding partner resources.

- **Comprehensive (No Net Increase in Energy Consumption)**

An ambitious program targeting reductions in all end-use areas as well as a concerted effort of communications and demonstration projects. Efforts are made to ensure a substantial uptake of programs occurs quickly and are adopted across the region. Substantial staff and partner resources are required. This scenario achieves reductions approximately equivalent to the growth in demand in the region and so the total energy consumption in the region does not increase from 2004 to 2012. GHG emissions decrease as a result of these measures.

Each of these scenarios contains (i) an increasing number of Initiatives and Actions from the six goal areas and/or (ii) an increasing level of effort and resource commitment to actions that are included in all scenarios.

The creation of these scenarios is subjective but is used to highlight the range of results that could be achieved and the resources required. An overview of the key features of each scenario is shown in Table 7. A more detailed quantification of the results and costs within each goal area is provided in Appendix D.

⁴³ For this action the targets established by partnering plans (e.g. the BC Buildings Plan) are met (i.e. number of households reached, etc.)

Table 7: Description of the Scenario Packages

Goal Initiative	Key Features & Assumptions of the Scenarios ^[44]		
	Selective Measures	Hold the Line	Comprehensive
Goal 1: Improve the Energy Efficiency of Buildings			
Actions are implemented towards the BC Energy Efficient Buildings Plan (EEBP) objectives	40% to 50% of target value is met	Targets are met in 2012	Targets are exceeded by 50% by 2012
Goal 2: Increase Transportation Efficiency			
-Reduction in total fuel consumption through provision of transportation alternatives =	1%	2%	3%
- Share of employees in the region benefiting from TDM activities (CTRs and TMAs) =	15%	35%	50%
- Reduction in total fuel consumption through the promotion of fuel efficient vehicles. =	0%	1.0%	2.0%
Goal 3: Encourage Energy Efficient Land Use Planning			
Share of new (i.e. growth related) residential energy consumption that is characteristic of "Smart Growth" & achieves incremental energy savings.	10%	50%	80%
Goal 4: Diversify Energy Supply			
Share of Total Energy that arises from New Renewable Sources	0%	0.25%	0.5%
Goal 5: Educate & Engage Residents and Businesses			
Website:	Maintained	Maintained	Maintained
Campaign Launch:	Meagre	Strong	Strong
Ongoing media:	None	Some	Some
Event Sponsorship / Participation:	Few	Several	Many
Awards and Recognition:	None	Single	Several
Outreach:	None	General population and target audiences	General population and target audiences
Goal 6: Demonstrate Municipal Leadership			
Reduction of Local Government's Corporate Consumption & Emissions (% of corporate inventory)	5%	15%	20%

Notes:

(a) This Table is intended to highlight the primary characteristics of each scenario and represents a combination of assumptions, calculations, and qualitative assessments. Detailed quantification can be found in Appendix D.

(b) CTR = Commute Trip Reduction programs, TMAs = Transportation Management Association

(c) Smart Growth development is assumed to achieve a 20% reduction in the new growth energy consumption (in addition to what has been estimated for buildings and transportation) - primarily through reduction in non-commuting vehicle travel.

[44] Many other assumptions are included for these calculations. Full details of calculations and assumptions are shown in Appendix D.

6.2 Scenario Results and Requirements

Summary Results

Each of the three action scenarios, reductions in energy consumption and GHG emissions reductions as well as resource requirements have been estimated. The procedure used is to first estimate the potential energy and GHG reductions, by goal area, and then estimate the corresponding resource requirements.

Resources are defined as personnel time and indicate the range of FTEs that might be required. No assessment is made of which agency might be the best place to provide the staff ^[45]. The financial resource requirements are defined based on the types of incentives required for past or current incentives programs (buildings), literature cited costs for TDM measures in other jurisdictions (transportation), and cited costs for other community's plans (outreach and engagement ^[46]). These results should be considered scoping-level and not 'budget-ready'.

Results by Goal Area

A breakdown of the Scenario results according to Goal Area is provided in Table 9 (Energy Savings), Table 10 (GHG emissions Reductions), and Table 11 (Program and Incentives Estimates).

[45] A range of options exists for deploying staff to execute the plan. While some portion of an FTE (full time equivalent) would be required within the CRD for monitoring, coordinating, and reporting, other personnel time could come from a variety of sources. Examples 1) A buildings program incentive program could utilize current governmental and NGO initiatives through the Energy Efficient Buildings Plan; 2) Transportation Management Associations would be funded through their respective institutions / employers; 3) Outreach programs could utilize existing NGO agencies to deliver programs.

[46] Notably, the City of Vancouver plan was reviewed to determine the typical staffing requirements for programs of this nature, and the estimated costs for outreach and education.

Table 8: Energy Plan Implementation Benefits and Cost Summary

	Scenario							
	Business-As-Usual		Selective Measures		Hold the Line		Comprehensive	
Energy Benefits								
Energy Use Reduction in Community (millions of GJ per year by 2012)	0.0		0.47		1.60		2.84	
Change in Energy Consumption 1995 to 2012 (%)	13%		12%		8%		4%	
Cost Savings in the Community (1000s \$ per year by 2012)	\$0		\$8,800		\$30,100		\$54,800	
Per Capita Energy Savings (f) (\$ per capita per year)	\$0		\$26		\$89		\$161	
Greenhouse Gas Benefits								
GHG Emissions Reductions (tonnes of CO2e per year by 2012)	0		23,700		82,000		149,000	
Passenger Car Equivalents (g) (number of passenger car's emissions)	0		5,600		19,500		35,500	
GHG Emissions Change 1995 to 2012 (%)	-7.2%		-8.5%		-11.8%		-15.6%	
Energy Plan Implementation Requirements								
Est Range (Lower to Upper)-->			Lower	Upper	Lower	Upper	Lower	Upper
Local Government Resources								
Staff: (FTE) (a), (b)	0		1	3	4	5	5	8
Staff Costs: (1000s \$ per year) (c)	\$0		\$100	\$300	\$400	\$500	\$500	\$800
Program Disbursements: (1000s \$ per year) (d)	\$0		\$70	\$80	\$330	\$360	\$490	\$540
Sub-Total: Total Local Gov't Costs (1000s \$ per year)	\$0		\$170	\$380	\$730	\$860	\$990	\$1,340
Total Local Gov't Costs per Resident (\$ per capita per year)	\$0		\$0.50	\$1.12	\$2.15	\$2.53	\$2.91	\$3.94
Program Partner Resources								
Funding: (1000s \$ /year) (e)	\$0		\$500	\$2,000	\$2,800	\$8,200	\$6,800	\$15,100

Notes:

(a) Program staffing requirements are estimated using review of similar plans developed for lower mainland BC communities. These assume staff are required for program management, reporting, community outreach, and program development for specific target areas such as residential buildings, commercial buildings, vehicles, and transportation. Staffing estimates do not include activities for each municipality's corporate management plan. Periodic informal support from existing local government staff is expected and has not been included in these estimates.

(b) FTE = full time equivalent staff position.

(c) Staff costs estimated based on 100 k\$ salary, benefits, and overhead per FTE.

(d) Program Disbursements are "Outreach and Engagement" plus seed funding for transportation measures.

(e) Partner costs includes all buildings incentives (grants, discounts, etc.) and transport program costs (TMAs, Trip Reductions, etc.). These do not include customer/user costs for actions.

(f) Per capita estimates based on approximate current population of 340,000

(g) "Passenger car equivalents" are the number of passenger car's tailpipe GHG emissions (per year) equal to the estimated GHG reduction. Average of 4.3 tonnes per year per car used.

Table 9: Estimated Energy Savings by Goal Area

Energy Savings (GJ / y)			
	Scenario		
	Selective Measures	Hold the Line	Comprehensive
Buildings Total	259,000	677,000	1,104,000
Transport	198,000	700,000	1,363,000
Land Use	0	82,000	131,000
Energy Supply	0	87,000	174,000
Educate and Engage	-	-	-
Municipal Leadership	17,000	52,000	70,000
Total Reductions	474,000	1,598,000	2,842,000

Note: Reductions are measured against the Business-As-Usual Scenario

Table 10: Estimated GHG Reductions by Goal Area

GHGs (t CO ₂ e / year)			
	Scenario		
	Selective Measures	Hold the Line	Comprehensive
Buildings Total	8,000	20,900	34,100
Transport	13,800	48,800	95,000
Land Use	1,100	5,300	8,400
Energy Supply	0	4,100	8,200
Educate and Engage	-	-	-
Municipal Leadership	800	2,500	3,300
Total Reductions	23,700	81,500	149,000

Note: Reductions are measured against the Business-As-Usual Scenario in 2012.

Table 11: Estimated Program Costs to Local Governments

Local Government Costs: Staff and Disbursements						
	Scenario					
	Selective Measures		Hold the Line		Comprehensive	
	lower	upper	lower	upper	lower	upper
Staff Requirements (estimated)	1	3	4	5	5	8
Staff Costs (\$1000s per year)	\$100	\$300	\$400	\$500	\$500	\$800
Buildings Total	-	-	-	-	-	-
Transport	-	-	\$50	\$50	\$50	\$50
Land Use	-	-	-	-	-	-
Energy Supply	-	-	-	-	-	-
Educate and Engage	\$70	\$80	\$280	\$310	\$440	\$490
Municipal Leadership	-	-	-	-	-	-
Total (Annual \$)	\$170	\$380	\$730	\$860	\$990	\$1,340

Notes: Local Government Disbursements estimated as all Outreach and Education Activities plus seed funding for Transportation TMA activities

Table 12: Estimated Partner and Incentive Costs by Goal Area

Partner and Incentives Funding Costs						
(\$1000s per year)	Scenario					
	Selective Measures		Hold the Line		Comprehensive	
	lower	upper	lower	upper	lower	upper
Buildings Total	\$370	\$1,320	\$1,330	\$3,790	\$2,660	\$6,730
Transport (a)	\$130	\$630	\$1,430	\$4,390	\$4,180	\$8,410
Land Use	-	-	-	-	-	-
Energy Supply	-	-	-	-	-	-
Educate and Engage	\$0	\$0	\$0	\$0	\$0	\$0
Municipal Leadership (b)	?	?	?	?	?	?
Total (Annual \$)	\$500	\$2,000	\$2,800	\$8,200	\$6,800	\$15,100

Notes: a) Costs do not include Travel Choices Capital Projects

b) "-" = costs not estimated; "?" = costs dependant on the types of activities implemented - not yet identified.

c) Numbers may not add precisely due to rounding

Per Capita Costs and Benefits

The program costs shown define a range of possible costs which depend upon both the scenario and how the scenario is implemented (e.g. the types of incentive packages etc.) These are generally based on examples of other existing programs (e.g. EnerGuide for Houses, etc.).

The program spending is intended to catalyze end-user spending for energy conservation - and are not expected to cover the full cost of retrofits and DSM activities. For example the former EnerGuide for Houses (EGH) grant program (taken into the new Provincial Energy Savings Plan) provides typical grants in the range of \$750 to homeowners. These program incentives result in retrofits of \$5,000 to \$7,000 per household. The resulting energy savings - average 28 % per household - which over the 25 year life of a furnace or window installation is about \$15,000 to \$20,000 ^[47].

A summary of the estimated program savings and reductions is shown in Table 13. The per capita energy savings across the scenarios is estimated at 1.3 to 7.7 GJ per person annually by 2012. Local government costs are estimated at anywhere from \$0.35 per person to \$2.75 per person depending on the scenario and the lower/upper estimate.

The total scenario reductions can be compared against the total scenario program and incentive costs ^[48]. The estimated program and incentive costs for all of these scenarios range from \$2 to \$5 per GJ of annual energy savings Other programs like the Federal Energy Innovators, the Commercial Building Incentive Program (CBIP), and the BC Energy Savings Plan have program costs (including incentives) in the range of \$10 to \$20 per GJ of annual energy savings ^[49].

[47] Source: CityGreen, personal communication

[48] A detailed cost-benefit analysis of each action item is not possible as many are inter-related or unquantifiable.

[49] See Appendix D for details and sources.

Note that these costs shown are the program and incentive costs and do not include the investments in retrofits and conservation made by the energy consumers.

Table 13: Estimated Range of per capita Program Costs and Results

Estimated per Capita Program Results (a)						
	Scenario					
	Selective Measures		Hold the Line		Comprehensive	
	lower	upper	lower	upper	lower	upper
Energy Savings (GJ per capita annually)	1.3		4.3		7.7	
Program Costs [Local Gov't] (\$ per capita annually)	\$ 0.40	\$ 0.70	\$ 1.50	\$ 1.80	\$ 2.10	\$ 2.80
Program Costs [Partners] (\$ per capita annually)	\$ 1.30	\$ 5.40	\$ 7.60	\$ 22.10	\$ 18.40	\$ 40.80
Total Program Costs per Energy Savings (b) (\$ / GJ of annual savings)	\$ 1.30	\$ 4.80	\$ 2.10	\$ 5.50	\$ 2.70	\$ 5.70

Notes:

(a) Assumes CRD population of 370,484 residents in 2012 (BC Stats estimate)

(b) Program costs include only the local government and partner costs for programs and incentives. Investments made by energy consumers are not included in this estimate.

Looking Forward

The results shown are dependant on successful implementation with a range of partners. Over the implementation period it is assumed that actions will be refined, new lessons will learned, and new identified. The actual results will be dependant on community interest, available funding, some technology developments, regulatory support from other governments, and the level of political and financial commitment from local governments.

The Scenario results are shown graphically in Figure 5 (Energy Consumption) and Figure 6 (GHG Emissions).

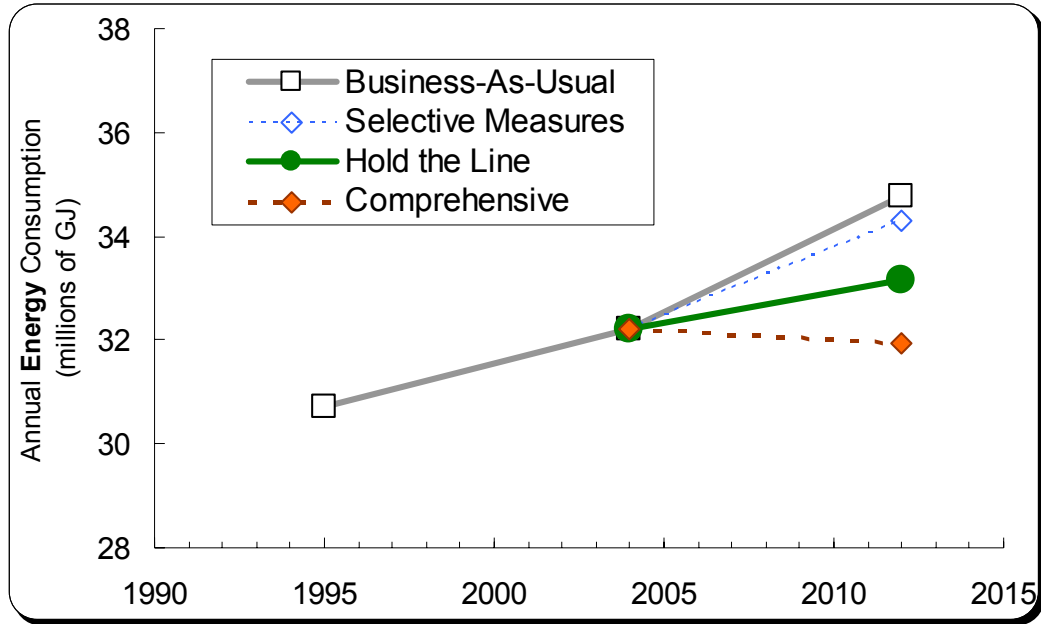


Figure 5: Scenario Results for Energy Consumption

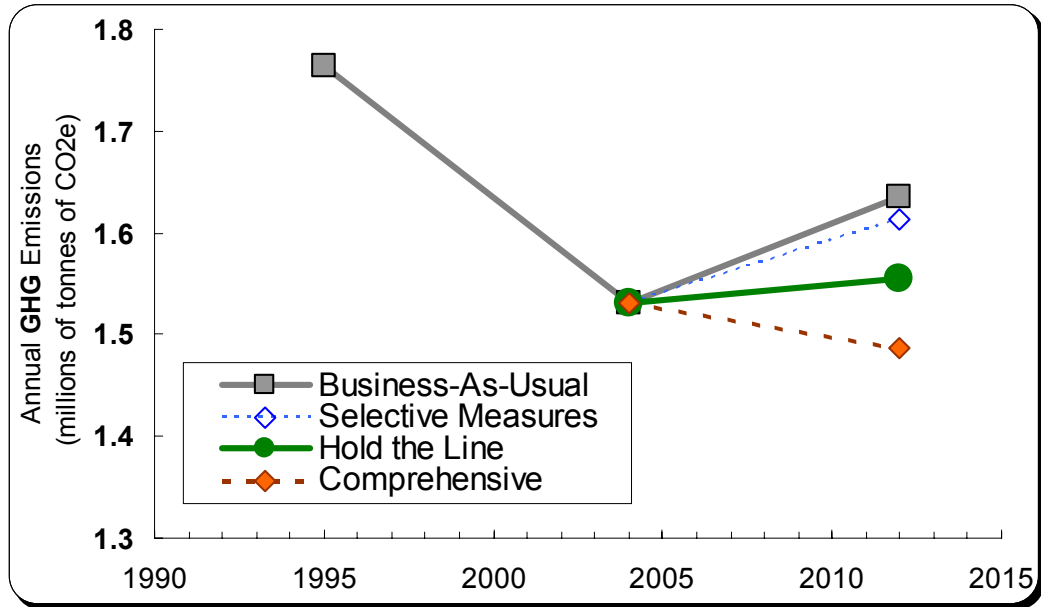


Figure 6: Scenarios Results for GHG Emissions

7 Implementation and Monitoring

This section describes the plan for implementing the CEP. It also details estimated financing requirements, human resource time required, the monitoring program and reporting on the success of the CEP as it moves forward.

7.1 Prioritization of Actions

This section provides some ideas as to the recommended early focus of the plan. Specific guiding concepts for the plan implementation include:

- **Continue (and Expand) in-house measures:** Local governments have shown their leadership by initiating the regional buildings audit and energy review. This effort should be continued and expanded to other components of the corporate level energy plan and the catalyzing activities of Goal 6.
- **Maintain Continuity and Momentum:** There are several current programs which have already been established. Initial efforts should be made to swiftly partner with these and possibly expand them (Actions A-7) and to ensure their continuity (e.g. The Energy Savings Plan and CAEE - which are currently only pilot programs). As such, an initial focus should be pursued towards encouraging the return of the EnerGuide buildings programs (Action A-11) and the continuation and expansion of the Energy Savings Plan activities (Actions A-1, 5, 6).
- **Be Opportunistic:** The TravelChoices Implementation Plan is being formalized and provides an opportunity to implement some of the TDM measures that would advance the objectives of both this plan and TravelChoices. Efforts should be made to identify those links and encourage appropriate funding for TDM priorities within the TravelChoices implementation schedule.
- **Learn and Modify:** The consumer, stakeholder, and even political environment for energy management has evolved rapidly in recent years as a result of rising energy prices. The plan implementation should evolve year to year in order to capitalize on this awareness and support.

7.2 Governance

Implementation Committee

The CRD Board's current mandate includes the creation of the CEP including reduction targets and an action plan⁵⁰. It is expected that further board support will be received to commence implementation of the plan.

⁵⁰ CRD board report October 22, 2003.

It is proposed that the CRD Board convening a committee to replace the Steering Committee and Working Group that will be dissolved upon the completion of the CEP. This committee, here referred to as the "CEP Implementation Committee" will include representatives from:

- Municipality and CRD,
- Utilities (BC Hydro and Terasen Gas),
- Local NGOs,
- Academia and Research
- Building associations such as BOMA and CHBA, and
- Interested members of the public.

Responsibilities of this committee will include:

- Ensure that the goals of the plan are met through the implementation of the actions;
- Actively promote the plan through public outreach and education;
- Coordinate actions in the community; and
- Report annually and on a five year cycle on the progress of the plan.

Program Coordinator

The Implementation Committee would be supported by staff. In municipal plans, typically the municipality identifies or hires a full time staff person to coordinate the implementation of the CEP. This plan has a regional basis and so may be more complex. One option is for the CRD to assume the role of Energy Plan Implementation Coordinator. The CRD would create one (or more) full time positions and hire a full time person to coordinate the implementation of the plan under the guidance of the CEP Implementation Committee.

Another option is for participating municipalities identify staff representatives who are responsible for segments of the plan implementation and have acknowledged time and resources allocated. This option could become cumbersome to keep track of individual responsibilities.

7.3 Monitoring and Reporting

A monitoring program will enable the CRD and member municipalities to assess progress of the region towards or away from the defined targets. Indicators, also called performance measures, will help the Capital Region determine if the actions that have been implemented are having the desired effect and to identify where changes are needed.

The following performance measures are suggested for monitoring the progress of the Community Energy Plan:

- Per capita community-wide GHG emissions (tCO₂e/capita/year)

"What gets measured tends to get done. If you don't measure results, you can't tell success from failure. If you can't recognize success, you can't reward it. If you can't recognize failure, you can't learn from it."

Source: David Osborne & Ted Gaebler, cited in the CRD Regional Growth Strategy Monitoring Program Report, January 2005.

- Per capita GHG emissions from municipal operations (tCO₂e/capita/year)
- Per capita energy use (GJ/year)
- # of buildings built to high energy efficiency, LEED, or BuiltGreen BC standards (buildings/year)
- energy generated (or number of projects) of new alternative technology or renewable energy projects.
- % of commuters travelling by SOVs (SOVs/year) and number using alternate modes

Annual Reporting

It is proposed that brief annual progress reports be prepared by the Implementation Committee to monitor progress of CEP implementation. The annual CEP report will:

- Describe implementation progress and report on activities implemented;
- Define an annual action plan for implementing activities of the plan;
- Identify areas of change and provide an opportunity to update the plan by adding new actions or modifying existing actions; and
- Provide a high level update to the energy and GHG inventory assessment.

Five Year Reporting

Since 1995 is the baseline year for the CEP and the inventory data are up to date for 2004, it is proposed that the community-wide inventory be updated every five years starting in year 2008. This will include:

- A detailed review of the activities and their success
- An updated energy and GHG baseline
- Recommendations for plan improvement.

Synergies with Other Reporting

A program of brief annual reports and more in depth five year reports will reduce the resource strain associated with compiling monitoring data on an annual basis. It should be noted that data for some of the performance measures may be easily obtained from other programs, such as the Regional Growth Strategy Monitoring Reports.

7.4 Resource Requirements

Personnel

The Energy and GHG management plan represents a new service of local governments in the region. Some new funding and staff resources will be required. However, for many initiatives existing staff will be called upon to contribute to the initiatives (e.g. land use planning, transportation planning, communication and outreach).

The coordinator role would be funded by the CRD's annual operating budget and through a partnership funding arrangement.

The CEP Implementation Committee will be responsible for the delivery of the community portion of the Local Action Plan, with individual municipal departments managing their defined corporate plans. The Implementation Committee could also play a facilitation

role in the delivery of the corporate programs. This type of activity has already occurred through the municipal buildings retrofit program that has been implemented.

7.5 Financing and Assistance

Direct Funding

Some of the initiatives may incur direct costs. This could include rebates, costs for program design and promotional material development, etc. It is expected that plan participants will provide funds from annual budgets to execute the program activities.

Most local governments are limited in the resources they have to offer. Moreover, local governments have limitations in the nature of the incentives that they can offer^[51]. In particular - some incentives - which are a 'benefit' cannot be offered to some community members without being offered to all (this could be problematic for pilot testing programs if only limited funds are available). To maintain simplicity, it is expected that the local governments will be able to provide personnel and program administration resources, while other agencies must be partnered with to provide incentive components^[52].

Partner Programs: Community

There are a number of programs currently offered by partnering or other agencies that can be used to target these segments. A summary of available programs is summarized in Table 14 for community emissions. The CRD and municipalities should make extensive use of these programs to deliver GHG savings in the community.

A guiding principle of the CEP is cost sharing and partnering. Implementation of the CEP using these existing initiatives will reduce the cost of program design and allow the Implementation Committee to focus its efforts on areas where it can secure new funding.

Deferred Revenue Funding

Some of the programs may develop as "deferred income" incentives for the municipalities. For example a discounted building permit fee for a pre-renovation energy audit or a property tax break structure could result in foregone revenue for the municipality. On an annual basis the remaining tax base does pick-up the 'burden' of these incentives and they could be considered a cost to the municipality. On a long term basis, if these incentives result in more valuable buildings, this will result in an increase of tax revenue in the future. As such the revenues are deferred and not foregone. The design of these programs should consider this consideration in establishing a business case.

Debt Financing

It is not expected that any of the initiatives will require debt financing (e.g. as would a large capital project). Some of the community participants may define their own method of financing their contribution to projects (e.g. a building retrofit).

[51] The Community Action on Energy Efficiency (CAEE) is currently conducting a range of exploration studies with numerous communities to evaluate the tools and policies that local governments have available to them.

[52] This is not a trivial commitment as the incentives constitute the largest part of the program funding in some areas (e.g. buildings).

Funding Sources

To support program efforts, it is recommended the City apply for funding from federal and provincial organisations. It is expected that these funding sources will partially or completely cover program costs. Ranges of funding options exist to support implementation of the LAP, including:

- Access funds from BC Hydro to hire a community energy co-ordinator as was recently done in Whistler, and
- Obtain Green Municipal Funds, Opportunities Envelope funding or Infrastructure Canada programs
- Partnership agreements with municipalities.
- Community Action on Energy Efficiency (CAEE) is developing programs to fund energy efficient planning and implementation for communities.

Table 14: Programs Available to Manage Community Emissions

Area	Source Funding and Partner Type				
	NGO	Region	Province	Federal (a)	Utility
Transportation	Canada Fleet Challenge	TravelChoices Implementation Funds		Green Municipal Funds	
Land Use Planning	Smart-growth BC	RGS	Community Action on Energy Efficiency (CAEE)		
Residential Buildings		BC Building Code Update	Energy Saving Plan PST exemptions	ecoENERGY	-Powersmart -High Efficiency Furnace Rebate
Commercial Buildings			Green Buildings BC PST exemptions	ecoENERGY	-Powersmart PIP -Commercial Boiler Upgrade
Energy Systems				Green Municipal Funds	

Notes: The Federal Programs shown shaded are undergoing re-evaluation by the Federal Government and typically only have funding to complete existing projects to March 31, 2007. However, some of these may be replaced with similar programs as the federal government is expected to develop a new Environment and/or Climate Change Plan in 2006 or 2007.

7.6 Timeline

The timeline below outlines a proposed schedule for implementation and identifies responsibilities.

Table 15: CEP Implementation Plan and Major Activities 2007 -2012

	Major Activities	Tasks & Responsibility		Resources
		CRD and Municipaliities	CEP Implementation Committee	
Q1 2007	Plan Finalization	- CRD Board Endorses the plan. - Endorsement of plan by interested municipalities.	- Committee is formed through board resolution	Existing staff Resources.
Q2 2007	- Development of a CEP launch strategy. - Plan is launched. - Building Partnerships and Seeking Outside Funding		- Terms of Reference are defined. - Coordinator role is defined & hired	1/2 FTE
Q3 2007	- Initial Actions are defined. - Program design for 2008 activities. - Inclusion in municipal and CRD budgets for 2008 activities.	- Create the CEP coordinator position -Encourage Municipalities to endorse CEP and adopt plan for corporate actions	- Prioritize initial actions w/ CEP coordinator - Implement high priority actions	1 FTE
Q4 2007		- Budget for next 2008 programs	- Implement high priority actions	1 FTE (con't)
2008	- First year of funded CEP. - Define annual cycle of actions review and budgeting	- Budgeting and Implementation	- Continue to phase in implementation of programs and actions. - Prepare first annual report	- Several FTE depending on scenario targeted.
2009 - 2011	- Ongoing implementation and program development.	- Budgeting and Implementation	- Support actions & continue monitoring progress - Prepare annual report	- Several FTE depending on scenario targeted. - Potential for additional staff or consultant advisors
2012	- Ongoing implementation and program development. - Review of the CEP plan - 5 year reporting cycle - Establish targets and actions for post 2012 period (5 yr)	- Budgeting and Implementation	- Review of plan implmentation. Successes and challenges (Q2/Q3) - Prepare 5 Year Report - Recommendation for a target post 2012	- Several FTE depending on scenario targeted. - Potential for additional staff or consultant advisors
post 2012	- Major review of plan activities. - Development of strategy for continued program activity.	- Ongoing funding	- Implement the recommendations of the CEP review	

Appendices

Appendix A: Planning Initiatives Related to the Community Energy Plan

Appendix B: Actions Already Taken or Underway

Appendix C: Elements of a Corporate Energy and GHG Plan

Appendix D: Assumptions and Calculations to Evaluate Scenarios

Appendix E: Overview of GHG Reduction Targets

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Appendix A: Planning Process in the Capital Region which Affect the Community Energy Plan**Appendix A: Planning Initiatives Related to the Community Energy Plan**

Several planning processes are inter-twined with this energy plan. Many of the objectives and goals of those plans will achieve savings in energy. The alignment of the CEP with those plans will provide added support for the implementation of the Energy Plan.

Table A-1: Summary of Plans and Strategies that Assist the Capital Region Energy and GHG Plan

Plan / Activity	Creating Agency	Implementation	Status
Regional Growth Strategy (RGS)	CRD	CRD & Municipalities	Approved in 2003
TravelChoices (TC)	CRD	CRD & Municipalities	Approved in 2005 Implementation plan under development
OCPs	Municipalities	Municipalities	Ongoing
Salt Spring Island Community Energy Strategy (CES)	Salt Spring Island	Salt Spring Island	Strategy document developed in 2005. Implementation Task Force established in 2006.
Community Action on Energy Efficiency (CAEE)	Provincial Government	Province, Municipalities	Funding research in 16 communities in BC, four within the CRD, to explore policy and regulatory measures to improve the energy efficiency of buildings. CRD participants include Saanich, Central Saanich, Victoria, & Salt Spring Island. The CRD is also participating to define bridges between these efforts.
Energy Efficient Buildings Plan	Provincial Government	Province, Municipalities, Partners	Pilot funding to March 2007 for home and commercial building retrofits.

Regional Growth Strategy

The Regional Growth Strategy (RGS) process was initiated in 1996 by the CRD in partnership with its member municipalities. The RGS is the result of six years of public and intergovernmental consultation.

A regional vision was first defined in the *Framework for Our Future* Agreement (1996). The vision and guiding principles together express a desire for a region that is economically vital, livable, and where the environment and natural resources are stewarded with care, and where residents enjoy a healthy and rewarding quality of life.

Appendix A: Planning Process in the Capital Region which Affect the Community Energy Plan

The purpose of the Regional Growth Strategy is to help realize this vision through the commitment of the Capital Regional District and its member municipalities to a twenty-five year plan of action, to guide regional growth and change toward common goals. The RGS outlines eight strategic initiatives that through specific actions will assist the CRD and member municipalities in achieving the regional vision. These initiatives are:

- Keep Urban Settlement Compact
- Protect the Integrity of Rural Communities
- Protect Regional Green and Blue Spaces
- Manage Natural Resources and the Environment Sustainably
- Build Complete Communities
- Improve Housing Affordability
- Increase Transportation Choice
- Strengthen the Regional Economy

“TravelChoices”: A Regional Transportation Strategy (2005)

The TravelChoices strategy was developed by the region in consultation with municipalities and stakeholders. It evaluated future needs for transportation within the region to 2026. The overall goal of the strategy is to achieve the transportation vision established in the RGS.

The TravelChoices Strategy includes a vision to *“significantly increase the proportion of people walking, cycling, using transit, ride-sharing or using other alternatives to driving alone”*.

The strategy outlines six categories of transportation issues and develops goals and strategies to achieve progress towards this vision. The six categories are walking, cycling, transit, travel demand management, roadway network, and commercial vehicles.

To be implemented, the TravelChoices strategy requires a combination of efforts from many agencies. In 2006, the CRD and members are working to develop an implementation strategy to define responsibilities and funding for this strategy.

Official Community Plans (OCPs)

Municipalities are required to maintain Official Community Plans (OCPs) to guide planning decisions. Each municipality maintains its own OCP and periodically updates this document ^[53].

Salt Spring Island Community Energy Strategy (2005)

The community of Salt Spring Island has developed an energy strategy. A baseline inventory was compiled in 2004 and a strategy document developed in 2005. It includes actions to reduce GHG emissions in transportation, buildings, energy generation, and food production (www.saltspringenergystrategy.org).

[53] Update cycles for OCPs are typically every 5 to 10 years.

Appendix A: Planning Process in the Capital Region which Affect the Community Energy Plan**Community Action on Energy Efficiency**

This program from the Ministry of Energy, Mines, and Petroleum Resources aims to improve the energy efficiency in communities throughout the project. Begun with three communities, it is currently working with more than a dozen communities on two major initiatives. The first is a policy and regulatory initiative, whereby communities have received funding to develop policy tools to encourage energy efficient development and construction. The second is an Energy Savings Plan (ESP) designed to provide incentives from energy efficient upgrades to buildings. Three pilot initiatives have been developed including single family residential, multi-family residential and small scale commercial operations. The incentives include cash-back grants for energy savings achieved and assistance with audits and opportunities evaluations.

BC Government Energy Efficient Buildings Plan

The Provincial Government has developed an “Energy Efficient Buildings Plan”⁵⁴. The plan has 10 initiatives in four major areas, listed below.

Area: Information, education, and capacity building

1. Community energy planning and leadership
2. Energy performance measurement and labelling
3. Industry training
4. Smart metering

Area: Pricing and Incentives

5. Harmonized energy efficiency program delivery
6. Provincial sales tax exemption
7. Province-wide, building energy performance incentives

Area: Voluntary Measures

8. Energy efficiency in provincially funded buildings
9. Industry Leadership

Area: Regulation

10. *Energy Efficiency Act* amendments for building components and equipment

It is designed to reduce energy consumption in residential commercial and industrial buildings across the province. The plan has six targets, to reduce energy consumption in existing and new developments for single family, multi-unit, and commercial and industrial buildings. The plan targets are shown in Table A-1.

⁵⁴ The Buildings Plan is a Provincial Plan (authorized by council) but was created in the Ministry of Energy, Mines, and Petroleum Resources. (see www.em.gov.bc.ca/AlternativeEnergy/Alt_Energy_%20Home.htm).

Appendix A: Planning Process in the Capital Region which Affect the Community Energy Plan**Table A-2: BC's Energy Efficient Buildings Plan Targets**

Sector	Target	Target Date
New Development		
New detached single-family and row houses	Achieve EnerGuide rating of 80 in all new developments	2010
New multi-unit residential buildings	Energy performance 25% better than the MNECB	2010
New commercial, institutional and industrial buildings	Energy performance 25% better than the MNECB	2010
Existing Buildings		
Existing single-family and row houses	Reduce energy consumption in 12% of buildings by an average of 17%	2010
Existing multi-unit residential buildings	Reduce energy consumption in 16% of buildings by an average of 9%	2010
Existing industrial, commercial, and institutional buildings	Reduce energy consumption in 20% of buildings by an average of 14%	2010

Note: MNECB = Model National Energy Code for Building

Achieving the targets of the BC Buildings plan is a long term objective that will require sustained effort from many stakeholders. The Province provided initial funding to March 2007 ^[55], and in July 2006, the Federal Government announced \$11 million of funding to support this program. The funding supports the implementation of energy-efficiency actions contained in the strategy.

The Ministry of Energy, Mines, and Petroleum Resources (MEMPR) is encouraging the creation of partnerships and initiatives within this plan.

⁵⁵ Initial actions included the creation of the Community Action on Energy Efficiency (CAEE) which aids municipalities and the Energy Savings Plan (ESP) (see www.saveenergynow.ca) which provides rebate grants to home owners that improve the energy efficiency of their homes (using the Federal EnerGuide for Houses rating system).

Appendix B: Actions Already Taken to Reduce Municipal and Community Energy Consumption & Greenhouse Gas Emissions in the Region

Appendix B: Actions Already Taken or Underway to Reduce Energy Consumption and GHG Emission in the Region

A broad range of actions have already been initiated to reduce energy consumption and to reduce emissions of GHGs in the region. The list below highlights actions, grouped by goal area, that are already underway.

Improve the Energy Efficiency of Buildings

- Community Action on Energy Efficiency (CAEE): a BC Government initiative to facilitate municipal action – Salt Spring, Saanich, Central Saanich, Victoria, and the CRD are participants.
- Water Conservation Plumbing Regulation, effective September 2005.
- BC Hydro Power Smart Incentives (including residential, industrial, commercial & new buildings programs).
- BC Hydro Design Assistance Program for cost-effective and energy efficient commercial buildings.
- A Victoria City building retrofits (20 – 40 % reductions).
- Green Buildings BC Program.
- BOMA Go Green Program.
- EnerGuide for Houses (NB: currently suspended) delivered by CityGreen.
- Technology Park – 1st LEED Gold building in Canada.
- City of Langford - Westhills Green Community setting Leadership in Energy and Environmental Design (LEED) standards for 5000 new residential units and neighbourhood design.
- Town of View Royal – 1st EnerGuide 80 neighbourhood.
- Terasen Gas - Energy Bandit and Yank the Tank energy efficiency programs.
- Provincial tax exemptions – energy efficient residential furnaces, boilers and heat pumps.

Increase Transportation Efficiency

- The Douglas Street Priority Transit Project – initiated through the cooperation of Victoria, the District of Saanich, BC Transit, and the Ministry of Transportation.
- TravelChoices plan, adopted in 2005; implementation plan develop in 2005.
- The Strategic Priorities Fund and recently announced Regional Strategic Priorities Fund under the New Deal for Cities and Communities (the Gas Tax money) has received \$11,313,208 allocated to the CRD for Regionally Significant Projects

Appendix B: Actions Already Taken to Reduce Municipal and Community Energy Consumption & Greenhouse Gas Emissions in the Region

- Transit Pass purchases – eligible to receive a 15.25% federal tax credit for purchases of a monthly pass.
- Provincial Sales tax reduction for the purchase of hybrid vehicles.
- BC Transit participation in biodiesel evaluation program.
- BC Transit pilot testing six diesel-electric hybrids in BC - three within the Capital Region.
- Capital Region bus driver's fleet is the first within BC to have entire driving staff trained and refreshed in "Fuel Sense" training programs.
- Car share cooperative has been initiated in the region (Victoria Car share Cooperative).
- Bike-to-Work Week Program.
- Salt Spring Island Bikeway Initiative.
- UVic Transportation Demand Management program.
- UPass program for post-secondary students.

Encourage Energy Efficient Land Use Planning

- Regional Growth Strategy has started the process to define regional planning infrastructure requirements. From this has stemmed the "TravelChoices" strategy.
- Dockside Green is a 10-year development plan for a large green development in downtown Victoria.
- Built Green (CHBA) – for residential construction.
- New LEED projects for institutional buildings – examples include: CRD head Office, the UVic Medical Science Building, UVic Math Building, Dockside Green Development, and the Vancouver Island Technology Park.
- Redevelopment of Short Street in Saanich – provides bus passes to tenants and membership to car share co-op (on-site parking for one vehicle, bought by developer); both are conditions of the development permit.
- Developing and prototyping LEED ND (New Development) in Langford (e.g. WesthillsGreen Community).
- Saanich – Green Building policy for new institutional buildings and retrofits; developing Smart Growth checklist.

Diversify Energy Supply

- BC Sustainable Energy Association's 100,000 Solar Roofs Initiative - CRD and the District of Saanich support this project.
- BC Hydro's 2003 Call for Power – eight of 38 renewable energy projects on Vancouver Island.
- Hartland Landfill Gas Power Generation project.
- BC Hydro Power Smart Industrial project 'buying back' capacity.
- Innovative energy planning for renewables in other communities (e.g., Whistler).

Appendix B: Actions Already Taken to Reduce Municipal and Community Energy Consumption & Greenhouse Gas Emissions in the Region

Educate and Engage Residents and Businesses

- One Day Capital Region – website and outreach materials.
- Utilities – BC Hydro and Terasen Gas education and advertisement campaigns.

Demonstrate Municipal Leadership

Many initiatives and actions listed under other goals demonstrate municipal leadership. Some of these are highlighted briefly below.

- Capital Region Energy Management and Water Conservation project – audited 45 municipal buildings and identified potential annual savings of 2,800 MWh of electricity, 35,000 GJ of oil and natural gas with a value of over \$300,000.
- City of Victoria – 3 metre parking spots and anti-idling bylaw.
- District of Saanich – Green Building Policy.

**Appendix B: Actions Already Taken to Reduce Municipal and Community Energy Consumption
& Greenhouse Gas Emissions in the Region**

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Appendix C: Elements of a Corporate Energy and GHG Plan

A corporate plan for municipal energy consumption and GHG emissions targets the activities of the municipalities in the delivery of their services. This includes the municipal buildings, vehicle and equipment fleets, utility services such as water and sewer services, street and traffic lighting, and recreational services.

The Partners for Climate Protection (PCP) framework allows for the development of corporate and community plans in tandem or independently. Implementation of a corporate plan is typically a first step for a municipality because corporate actions are frequently within the municipality's control, whereas many community actions require the development of partnerships within the community.

At present, complete energy baselines are not available for most communities. It is difficult then to assess which actions will be the most successful in each community.

However, other communities in the Lower Mainland (e.g., North Vancouver, Township of Langley) have compiled corporate inventories and typically the major consumers of energy are:

- municipal buildings,
- recreation centres,
- vehicle and equipment fleets, and
- utility services.

Commonly the buildings (and especially the recreation centres) and fleet are the largest source of GHG emissions, largely because they use fossil fuels while much of the utility services use electricity - which in BC has a relatively low GHG intensity.

This section describes a "menu" of components that could form a corporate energy and GHG plan. Described are a slate of actions and the ranges of energy consumption or GHG emissions reduction that are possible.

Municipalities will also need to set a reduction target. Typically corporate targets (see Table C-1) are greater than community-wide targets because the municipalities have more direct control over these actions.

Table C-1: Examples of Corporate GHG Reduction Targets for Select Municipalities

Corporate GHG Reduction Targets			
Municipality	Reduction (%)	From (baseline year)	By when
North Vancouver	20	1995	2010
Township of Langley	10	2000	2010
Whistler	10.5	2000	2010
Calgary	6	1990	2012
Edmonton	16	1990	2008

Corporate Energy and GHG Plan Opportunities

1) Existing BuildingsC-3
Action A-1: Implement identified building energy savings C-3

2) New BuildingsC-3
Action A-2: Establish energy efficiency requirements for new buildings C-3

3) Vehicle FleetsC-4
Action A-3: Improve fleet vehicle performance through driver training and education C-4
Action A-4: Improve Fuel Efficiency of Fleet Vehicles through "Right Sizing" C-5
Action A-5: Evaluate Biofuels for Suitability to the Capital Region C-5
Action A-6: Encourage car-pooling, transit, alternative transportation, and trip-reduction activities by staff C-6

4) Utility ServicesC-7
Action A-7: Street & Traffic Lighting C-7
Action A-8: Water and Wastewater Operations C-7
Action A-9: Solid Waste Operations C-7

5) Purchasing Activities.....C-8
Action A-10: Develop an Energy Efficient Purchasing Policy C-8

6) Education and "In-reach"C-9
Action A-11: Develop Internal Education Programs C-9

1) Existing Buildings

Action A-1: Implement identified building energy savings.	
DESCRIPTION	Implement energy saving opportunities identified in the Capital Region Energy Management and Water Conservation Project (September 2004). The report identified energy savings opportunities at 45 largest facilities in the Capital Region. These opportunities represent an estimated savings in operating costs of \$307,000. Of these 45 potential projects, 17 projects have been completed, 15 are in progress, and the remaining 13 to date have not proceeded.
RESPONSIBILITY	CRD and Municipal Operations Managers
BARRIERS & CHALLENGES	•
BENEFITS	
Energy Consumption	↓ Completing all identified energy saving retrofits would decrease annual energy consumption by 10% or 22,732 GJ.
GHG Emissions	↓ An estimated reduction 1,689 tonnes of CO ₂ e emissions.
Level of effort	Further work is required to budget for and implement the efficiency measures identified. This will require effort at the municipal level.

2) New Buildings

Action A-2: Establish energy efficiency requirements for new buildings	
DESCRIPTION	<p>Develop an energy efficient building policy. Municipalities may declare a policy that all new buildings above a specified size (e.g. 500 m²) are built to high-energy efficiency standards. This could be accomplished through:</p> <ul style="list-style-type: none"> • a requirement to defined level of energy performance (e.g. the B.C. Energy Efficient Buildings Plan defines a target of 25% better performance than the Model National Energy Code. • a requirement for buildings to be built to a Green standard (e.g. the LEED standard). Green buildings requirements include energy efficiency but also address a range of environmental and air quality issues. • a requirement that all major new facilities evaluate the opportunities for GeoExchange (i.e. ground source heat pumps) for meeting heating requirements. • A requirement that all new affordable housing provided or built by CRD Housing be built to the energy efficiency standards in the <i>BC Energy Efficient Buildings Plan</i> <p>In addition, green buildings may produce less waste material during</p>

	construction and often have improved occupant comfort.
RESPONSIBILITY	Municipal Councils, CRD Board to establish requirement CRD and Municipal Operations Managers to implement
BARRIERS & CHALLENGES	<ul style="list-style-type: none"> Perception that energy efficient requirements are substantially more costly. In practice, building to LEED standards, when implemented from the outset of the design stage can be accomplished for a premium of about 2% of capital costs, which can be recouped through operating cost savings for energy and water.
BENEFITS	
Energy Consumption	↓ Lower energy costs for operations; at least 20% reduction in energy consumption over standard buildings.
GHG Emissions	↓ This action will contribute to reducing GHGs from energy consumed in the building.
Level of effort	Municipalities would need to include this specification within engineering and construction tenders.

3) Vehicle Fleets

Action A-3: Improve fleet vehicle performance through driver training and education	
DESCRIPTION	<p>Implement driver education and training workshop such as NRCan's FleetSmart Smart Driver training or Fleet Challenge BC's Green Fleet Accreditation program.</p> <p>Developed by Natural Resources Canada, the Smart Driver program offers free practical advice on how energy-efficient vehicles and business practices can reduce operating costs, and improve productivity.</p> <p>The Green Fleet is fleet accreditation program being piloted by Fleet Challenge BC and the Province of BC. It is a benchmarking system available to all transportation sectors that will encourage and recognize improvements in energy efficiency and emissions performance. This system will include a variety of different emission reduction solutions such as best practices, tools, and services.</p> <p><u>Resources:</u> Fleet Smart: http://oee.nrcan.gc.ca/transportation/in-the-city.cfm?attr=16 Green Fleet: http://www.fleetchallenge.ca/en/programs/bc.html</p>
RESPONSIBILITY	CRD and Member Municipalities Fleet Managers and vehicle operations departments
BARRIERS & CHALLENGES	<ul style="list-style-type: none"> Training time To be successful, staff engagement must be carefully targeted.
BENEFITS	
Energy Consumption	↓ A 10% reduction in fuel consumption has been achieved in other municipalities through similar programs.
GHG Emissions	↓ GHG emissions reductions correspond to fuel consumption reductions.
Level of effort	Requires sustained effort by fleet operations departments and commitment by management to be successful.

Action A-4: Improve Fuel Efficiency of Fleet Vehicles through “Right Sizing”	
DESCRIPTION	<p>Establish a right-sizing program for fleet vehicles. Selecting the most fuel-efficient vehicle for the job can reduce operating costs as well as GHGs. This action would apply to on-road vehicles such as bylaw officer vehicles and other fleet vehicles. It would not include specialized vehicles such as street cleaners, or construction equipment.</p> <p>A right-sizing program is implemented as the vehicle stock turns over. Each vehicle purchase is evaluated and the most fuel-efficient vehicle possible is defined for the role. This may mean that staff vehicle provided by the municipalities become smaller. (Note that some fleet components may have performance or safety requirements that prevent a reduction in vehicle size).</p> <p>A performance standard could also be enacted that would allow for a selection of vehicle to be deployed, provided that they meet an efficiency standard. (e.g. minimum fuel efficiency rating of 8L/100km city). As vehicles become more efficient in the future, the minimum fuel efficiency acceptable could be revised to reflect this</p>
RESPONSIBILITY	CRD and Municipal Fleet Managers, Purchasing departments
BARRIERS & CHALLENGES	<ul style="list-style-type: none"> • Replacing fleet vehicles is a slow process – a complete changeover may take years. • Staff perception of smaller vehicles being less safe. • Management or staff reluctance to accept small vehicles in areas where larger vehicles have traditionally been issued. This may not have a performance basis but may be related to issues of rank and seniority.
BENEFITS	
Energy Consumption	↓ Reduction in energy consumption is highly dependent on the type and number of vehicles replaced.
GHG Emissions	↓ Reduction in GHG emissions is highly dependent on the type and number of vehicles replaced.
Level of effort	Requires creation of a policy or practice for vehicle right sizing.

Action A-5: Evaluate Biofuels for Suitability to the Capital Region	
DESCRIPTION	<p>Biofuels - primarily ethanol blended gasoline and bio-diesel fuel - are being pilot tested to evaluate their performance to reduce emissions of GHGs from vehicle activity. Typically biofuels are considered <i>carbon-neutral</i> if the source material is harvested sustainably - i.e. through a balanced cycle of harvest and re-growth. In this case, the biofuel does not contribute to climate change.</p> <p>Biodiesel is currently undergoing evaluations. A typical program may start with a blend of 5% biodiesel with 95% regular diesel (called “B5”). Through experience the blend may be increased to 20% (B20). Biodiesel may be unsuitable for very old engines or for cold wintertime conditions (not expected to be a problem in the Capital Region).</p> <p>Several agencies within the Capital Region have already been involved with biodiesel. In 2004 and 2005 the Vancouver Island Biodiesel Evaluation Study (VIBES) was conducted to pilot test biodiesel blends. Participating groups</p>

	<p>included BC Mail Plus, BC Transit, Canada Post, the City of Victoria, Columbia Fuels, the District of Saanich, Sooke School District 62, and Vancouver Island Powerline.</p> <p>In 2005, Fleet Challenge BC launched a biodiesel pilot program with six municipalities within BC.</p> <p>Ethanol is a common additive to gasoline as E10 (10% ethanol). These are available at the retail and commercial level. Current commercial ethanol blends (10%) carry no cost premium. Higher ethanol content blends may cost a slight premium.</p> <p>Resources: Fleet Challenge BC Biodiesel Program (http://bcbiofleet.ca/) Vibes Report: (www.fleetchallenge.ca/en/library/reports/Vibes_final_report.pdf)</p>
RESPONSIBILITY	CRD and municipal fleet managers, Purchasing departments.
BARRIERS & CHALLENGES	<ul style="list-style-type: none"> • Current bio-diesel carries a cost premium of about three cents per litre. • Biodiesel may not be suitable for some older engines because of the risk of damage to rubber components in the fuel systems. Newer engines do not have problems.
BENEFITS	
Energy Consumption	↔ Biofuels are not expected to reduce energy consumption.
GHG Emissions	<p>↓ Full implementation of B20 (20% biodiesel) can reduce GHG emissions by 10% to 15% for the same fuel consumption.</p> <p>GHG reductions through ethanol consumption are the subject of debate. Reduced tailpipe emissions may be offset by increased upstream emissions in processing.</p>
Level of effort	Biodeisel requires some preparation for storage tank cleaning prior to usage. May require increased vehicle monitoring during early implementation stages.

Action A-6: Encourage car-pooling, transit, alternative transportation, and trip-reduction activities by staff	
DESCRIPTION	Implement in-house trip reduction programs
RESPONSIBILITY	CRD and municipal fleet managers, Purchasing departments.
BARRIERS & CHALLENGES	<ul style="list-style-type: none"> • Staff time for coordination may be limited.
BENEFITS	
Energy Consumption	↓ Reduction of single occupancy vehicle travel reduces energy consumption.
GHG Emissions	↓ Reduction of single occupancy vehicle travel reduces GHG emissions.
Level of effort	Requires coordinator time, may require assistance of building operations managers etc.

4) Utility Services

Action A-7: Street & Traffic Lighting	
DESCRIPTION	<p>Monitor and identify opportunities to improve energy efficiency in street and traffic lighting. This action will build off of existing work in the CRD and continue to examine and identify opportunities to improve the energy efficiency of street and traffic lighting.</p> <p>Many municipalities retrofitted their streetlights in the early 1990's. For example, in 1992 the City of Victoria changed out all streetlights from mercury bulbs to high-pressure sodium bulbs of 100 and 150 W. There may be opportunities in other municipalities to install higher efficiency lighting.</p> <p>Much of the existing traffic lighting has been retrofitted to use LED lights though BC Hydro's LED traffic light change out program in 1999.</p>
RESPONSIBILITY	Municipal Engineering departments
BARRIERS & CHALLENGES	<ul style="list-style-type: none"> • Long payback period due to low electricity prices and up front costs for changing fixtures. • Some lighting is maintained by municipalities and some by BC Hydro.
BENEFITS	
Energy Consumption	↓ This action will decrease energy consumption street and traffic lighting.
GHG Emissions	↓ This action will contribute to reducing GHGs from electricity consumed.
Level of effort	Requires a one time, or periodic review of existing lighting stock.

Action A-8: Water and Wastewater Operations	
DESCRIPTION	<p>Monitor and identify opportunities to improve energy efficiency in water and wastewater operations.</p> <p>This action will build off of existing work in the CRD by continuing to examine and identify opportunities to improve the energy efficiency of water and wastewater operations. Opportunities may include replacement of equipment with more energy efficient models or plant building retrofits.</p> <p>The CRD will continue to monitor emerging technologies and identify future energy efficient opportunities.</p>
RESPONSIBILITY	CRD and municipal engineering departments.
BARRIERS & CHALLENGES	Long payback period due to low electricity prices and high change out costs. Most likely no business case can be made for changing out existing pumps for improved energy efficiency. However, energy efficiency should be included as a consideration for retrofits and new facilities.
BENEFITS	
Energy Consumption	↔ Savings occur slowly over time.
GHG Emissions	↔ GHG reductions are expected to be small.
Level of effort	Minimal – equipment replaced during retrofit.

Action A-9: Solid Waste Operations	
DESCRIPTION	Maximize the cost effective diversion of waste materials from municipal and CRD facilities. The CRD will work to maximize the capture and beneficial reuse of landfill gas at the Hartland Landfill. (NB Landfill gas capture reduces emissions from the entire waste stream and not just the municipally generated waste so this is also a large community action).
RESPONSIBILITY	CRD Solid Waste Services
BARRIERS & CHALLENGES	- Landfill gas capture is now proven at the Hartland landfill.
BENEFITS	
Energy Consumption	↓ LFG can be used to generate electricity and hot water if required.
GHG Emissions	↓↓↓ GHG reductions are large. Landfill gas capture results in one of the single most substantial reductions in GHG emissions.
Level of effort	System is currently established.

5) Purchasing Activities

Action A-10: Develop an Energy Efficient Purchasing Policy	
DESCRIPTION	Purchasing departments can develop and implement an energy efficient purchasing policy, which will specify the minimum energy performance requirements for major products. For example, a policy could dictate that wherever available, then Energy Star rated equipment should be purchased. Resources: Energy Star: http://oee.nrcan.gc.ca/energystar/
RESPONSIBILITY	CRD Environmental Services
BARRIERS & CHALLENGES	<ul style="list-style-type: none"> • Staff acceptance
BENEFITS	
Energy Consumption	↓ As old equipment is replaced with new energy efficient equipment, energy consumption will decrease. For example, LED exit signs use 1-3 W of electricity and last 10 years whereas an incandescent exit sign may use 50 W and last less than a year.
GHG Emissions	↓ This action will contribute to reducing GHGs from electricity consumed. NB: electricity consumption is not a significant source of GHG emissions in BC due to the large proportion of hydro electric generation.
Level of effort	Requires development, and possible management approval of a purchasing policy.

6) Education and “In-reach”

Action A-11: Develop Internal Education Programs	
DESCRIPTION	<p>Develop education and outreach material for staff on energy efficiency and the Capital Region Community Energy Plan and build off the existing website One Day Capital Region.</p> <p>The education material will help staff to make informed decisions on energy efficient options available to them, update them on progress that is being made on the plan, and allow them to identify areas for energy conservation in the region.</p> <p>Education materials may include:</p> <ul style="list-style-type: none"> • updates on Plan progress through email newsletters and notice board postings. • an Energy Aware Award to be given to staff that have demonstrated energy awareness through their work.
RESPONSIBILITY	CRD and municipal fleet managers, Purchasing departments.
BARRIERS & CHALLENGES	<ul style="list-style-type: none"> • None.
BENEFITS	
Energy Consumption	Education and outreach programs are important enabling tools but it is difficult to quantify their energy reduction potential.
GHG Emissions	Education and outreach programs are important enabling tools but it is difficult to quantify their GHG reduction potential.
Level of effort	Easy to implement. Some programs already developed, many example program framework to draw from.

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Appendix D: Methodology and Assumptions Used to Estimate Reduction Potentials

This section describes the assumptions and calculations used to determine the energy savings, GHG emissions reductions, and scoping level program costs.

The calculations are performed at a "Goal" Level - sometimes at any "Initiative" level. It is not suitable to estimate the implications of each individual action since many of the individual actions are not quantifiable directly, or work in coordination with others. As well, many actions can be executed in various degrees of intensity - which would achieve different results for different levels of resources. This means the scenarios are not based so much on which actions are implemented, but rather on how aggressively each one is pursued.

Example:

For existing single family residential buildings (including ground level units), the Provincial Energy Efficient buildings Plan Target is to upgrade 12% of buildings by an average of 17%. The calculations proceed as:

- 12% target implies upgrades to 12,360 buildings (single family plus ground level) or 2472 per year over a 5 year period.
- The energy and GHG reduction is:
Total Energy (or GHG) for (SF+GL) x * (12% of homes) x (17% average reduction)

The program costs are estimated based on an EnerGuide style grant program - now used by the Energy Savings Plan.

- Typical grant = \$750
- Admin, Overhead, energy audit subsidy = 30% of grant cost.
- Then annual program costs = 2472 homes x \$750 x (130%)

To evaluate the different scenarios, then different levels of market penetration are defined. These are:

- Selected Measures = 5% of homes reached by 2012
- Hold the Line = 12% of homes reached
- Comprehensive = 20 %of homes reached

To acknowledge the planning level analysis of these estimates, and the many unknowns in this type of activity, program costs have been estimated using a lower and upper range of assumptions and input variables. These are presented in the Tables that follow.

Goal 1: Improve the Energy Efficiency of Buildings

Description:

Building stock in the Capital Region is retrofitted to achieve savings similar to those defined in the BC Energy Efficient Buildings Plan (EEBP) by 2012 (see Table D- 1). Note that for this effort it is assumed that the targets are met in 2012, rather than 2010.

The level of achievement used to define each scenario is then:

- **Business as Usual:** No substantive retrofits are achieved.
- **Selective Measures:** About 1/3 to ½ of the EEBP market penetration is achieved.
- **Hold the Line:** The BC Energy Efficient Buildings Plan (EEBP) targets are met in 2012.
- **Comprehensive :** The targets (number of homes or total energy reduction) are exceeded by 25% to 50%.

Table D- 1: BC's Energy Efficient Buildings Plan Targets

Sector	Target	Target Date
New Development		
New detached single-family and row houses	Achieve EnerGuide rating of 80 in all new developments (32% below status quo)	2010
New multi-unit residential buildings	Energy performance 25% better than the MNECB (37% below status quo)	2010
New commercial, institutional and industrial buildings	Energy performance 25% better than the MNECB (20% below status quo)	2010
Existing Buildings		
Existing single-family and row houses	Reduce energy consumption in 12% of buildings by an average of 17%	2010
Existing multi-unit residential buildings	Reduce energy consumption in 16 % of buildings by an average of 9 %	2010
Existing industrial, commercial, and institutional buildings	Reduce energy consumption in 20 % of buildings by an average of 14 %	2010

Note: MNECB = Model National Energy Code for Building

Methodology for evaluating CEP Scenario Estimates

- Existing buildings (SF and MF): The 'total reduction' is the "per building reduction" multiplied by the penetration rate. The 2006 (interpolated) total energy consumption is multiplied by the 'total reduction'. For example a 17% reduction in 12% of homes results in a 2% overall reduction in existing building energy use ($0.17 * 0.12 = 0.02$)
- New Buildings (SF and MF): All increases in energy and GHG emissions for the BAU scenario are assumed to arise from new buildings (not increases in existing building use). Thus the new building BAU energy consumption is

Appendix D: Assumptions and Calculations Used to Estimate Scenario Reductions Potential

BAU 2012 consumption minus the 2004 baseline consumption. The reduction is then the new consumption multiplied by the reduction potential. For example, if the SF residential sector consumption is forecast to grow by 100,000 GJ, and meeting an EnerGuide 80 target can achieve a 32% savings in each building, then if implemented in 1/2 of new buildings, the savings are 100,000 GJ * 32% savings * 1/2 of buildings reached = 16,000 GJ.

- All savings are assumed to occur equally between all energy forms and GHGs. That is a 10% savings in energy is not differentiated between which energy source is most likely to be reduced. It is assumed that both total energy and GHGs will be reduced by 10%. This is an approximation but is not unreasonable at the planning level and for the CRD context because there is a mix of electricity and fossil fuels used for both space heating and/or hot water.
- For the Commercial sector it is not known how many buildings are in the region. Reduction estimates are based simply a fraction of the total energy consumption being conserved.

Residential Buildings (SF and MF) Assumptions:

Grant incentives were assumed. Values were given a lower and upper range depending on the energy savings achieved. The assumed incentives are:

- SF - existing:
Lower Bound: a \$200 token incentive for conducting an energy audit.
Upper: \$750 cash grant (equivalent to a typical ESP grant in the region).
- SF - new:
Lower: No incentives - assumed voluntary compliance
Upper: Builders incentive \$500 per dwelling incentive (i.e. same as View Royal EnerGuide development).
- MF -existing; Comm -existing;
(Incentives are in \$ per GJ of annual energy savings)

Scenario ->	<u>BAU</u>	<u>Selective</u>	<u>Hold</u>	<u>Comprehensive</u>
Lower :	\$ 0	\$ 2	\$ 5	\$ 7
Upper:	\$ 0	\$ 5	\$ 7	\$ 10
- MF - new, Comm - new:
(Incentives are in \$ per GJ of annual energy savings)

Scenario->	<u>BAU</u>	<u>Selective</u>	<u>Hold</u>	<u>Comprehensive</u>
Lower :	\$ 0	\$ 5	\$ 10	\$ 15
Upper:	\$ 0	\$ 10	\$ 15	\$ 20

For comparison, there are a broad range of existing (or former) incentive programs. A sampling includes for existing buildings:

- The EnerGuide for Houses program in the lower mainland had grants on the order of \$400 - \$600 for furnace upgrades, and if renovations were included often reached \$900 - \$1000.⁵⁶

⁵⁶ Jeff Murdoch, Building Insight Technologies, pers comm. 2006

Appendix D: Assumptions and Calculations Used to Estimate Scenario Reductions Potential

- The Energy Innovators (became EnerGuide for Existing Buildings) provided **\$7.50 per GJ** of annual energy savings ^[57].

For new buildings, some examples include:

- The ESP MF and Commercial incentives are estimating incentives of about \$20 per GJ or annual savings (though this includes audits and administration)
- The Federal CBIP - Commercial Buildings Incentive Program - provided two times the annual cost savings as a one time grant. (i.e. saving \$10/yr would provide a \$20 grant) ^[58].
- Seattle provides incentives for electricity saving devices that range from \$0.10 to \$0.25 per kWh annual savings (\$27.80 to \$70.00 per GJ of annual electricity savings ^[59])

Some of those programs have grants capped at fixed dollar amounts so the incentive may not be realized for each unit of energy savings. This was not accounted for in this scoping.

A summary of the calculations for each scenario are shown in Table D- 2 (residential), Table D- 3 (multifamily) and Table D-4 (commercial).

[57] see <http://oee.nrcan.gc.ca/commercial/financial-assistance/existing/retrofits/implementation.cfm?attr=20>

[58] see <http://oee.nrcan.gc.ca/commercial/financial-assistance/new-buildings/how-cbip-works.cfm?attr=20#costs>

[59] see http://www.seattle.gov/light/Conserve/Business/cv5_fi.htm#asterisk2

Appendix D: Assumptions and Calculations Used to Estimate Scenario Reductions Potential

Table D- 2: Scenario Reductions and Costs for Single Family Residential

Single Family Residential	Scenario				Comments
	Business as Usual	Selective Measures	Hold the Line	Comprehensive	
SF Residential (Existing) EEBP Target = 17% improvement in 12% of homes					
Description	no action	Reach 5 % of 2004 building stock	Reach 12 % of 2004 building stock EEBP Target	Reach 20 % of 2004 building stock	12% is EEBP Target. Vancouver plan proposes to reach 25% of homes.
Total (SF + Ground level) Energy 2006 (GJ)	9,639,954	9,639,954	9,639,954	9,639,954	From Baseline, interpolated to 2006
Total (SF + Ground level) GHG 2006 (t CO2e)	296,115	296,115	296,115	296,115	From Baseline, interpolated to 2006
Number of Existing SF + ground level	103,020	103,020	103,020	103,020	Interpolated from RGS
Homes to be reached (% of total)	0%	5%	12%	18%	Assumed levels of effort. 12% is the EEBP target.
Number of Homes retrofitted (Total over 5 years)	0	5151	12362	18544	Calculated
Number of Homes retrofitted (average annual over 5 years)	0	1030	2472	3709	Calculated
Administrative & Auditing/evaluation overhead (% of incentive cost)	30%	30%	30%	30%	Assumption (Current ESP covers audit subsidy - closer to 50%)
Energy Saving per home	0%	17%	17%	17%	EEBP average reduction Target
Annual Energy Reduction at 2012 (GJ)	0	81,940	196,655	294,983	Calculated
Annual GHG Reductions at 2012 (t CO2e)	0	2,517	6,041	9,061	Calculated
Lower Incentive Cost per home.	\$0	\$200	\$200	\$200	Assumption of a token incentive
Annual Cost of Incentives	\$0	\$267,852	\$642,845	\$964,267	Calculated
Upper Incentive Cost per home -average grant (estimate) (Note a)	\$0	\$750	\$750	\$750	Estimate from current ESP
Annual Cost of Incentives	\$0	\$1,004,445	\$2,410,668	\$3,616,002	Calculated
SF Residential (new) EEBP Target = all new homes to EnerGuide 80 by 2010 (about a 20% reduction consumption). (NB Target is for incremental construction - estimate about 1/2 homes will be build this way from 2007 to 2012.)					
Estimated Number of New (SF +GL) 2006-2012	5,994	5,994	5,994	5,994	
Description	no action	10 % of new dwellings are EnerGuide 80	50 % of new dwellings are EnerGuide 80 - i.e. Linear increase to 100% by 2012. Approx EEBP Target.	100 % of new dwellings are EnerGuide 80	To get to 100% of new buildings being EnerGuide 80 by 2012, assumed a linear increase 20% in year 1, 40% in year 2, etc. average over 5 years is half of the new buildings are EnerGuide80.
NEW (SF + Ground level) Energy in 2012 BAU (GJ)	497,541	497,541	497,541	497,541	From Baseline, interpolated to 2006
NEW (SF+Ground level) GHG in 2012 BAU (t CO2e)	15,731	15,731	15,731	15,731	From Baseline, interpolated to 2006
Share of new homes reached	0%	10%	50%	100%	Assumption
Number of new homes reached (5 yrs)	0	599	2997	5994	Calculated
Administrative & Auditing/evaluation overhead (% of incentive cost)	30%	30%	30%	30%	Assumption
Energy Savings per home (%)	0%	20%	20%	20%	From EEBP
NEW (SF + Ground level) Energy Reduction - 2006-2012 (GJ)	0	9,951	49,754	99,508	Calculated
NEW (SF + Ground level) GHG Reduction - 2006-2012 (t CO2e)	0	315	1,573	3,146	Calculated
Lower Incentive Cost per home. Lower bound = 0 (voluntary / regulatory)	\$0	\$0	\$0	\$0	Assumption
Total Cost of Incentives (over 5 years)	\$0	\$0	\$0	\$0	Calculated
Annual Cost of Incentives	\$0	\$0	\$0	\$0	Calculated
Upper Incentive Cost per home -average grant (estimate) (Note b)	\$0	\$500	\$500	\$500	Assumption
Total Cost of Incentives (over 5 years)	\$0	\$389,610	\$1,948,050	\$3,896,100	Calculated
Annual Cost of Incentives	\$0	\$77,922	\$389,610	\$779,220	Calculated

Notes:

- a) upper incentive Value is based on estimated Energy Savings Plan (ESP) Grant.
- a) Upper grant incentive for EnerGuide80 based on current ESP pilot project builder's incentive of \$500 per dwelling (e.g. View Royal)
- c) EEBP = BC's Energy Efficient Buildings Plan

Appendix D: Assumptions and Calculations Used to Estimate Scenario Reductions Potential

Table D- 3: Scenario Reductions and Costs for Multi Family Residential

Multi Family Residential	Scenario				Comments
	Business as Usual	Selective Measures	Hold the Line	Comprehensive	
MF Residential (Existing) EEBP Target = 9% improvement in 16% of units					
Description	no action	Reach 5 % of 2004 building stock	Reach 16 % of 2004 building stock EEBP Target	Reach 20 % of 2004 building stock	16 % is EEBP Target.
Total MF Energy 2006 (GJ)	2,311,492	2,311,492	2,311,492	2,311,492	From Baseline, interpolated to 2006
Total MF GHG 2006 (t CO2e)	71,005	71,005	71,005	71,005	From Baseline, interpolated to 2006
Number of Existing MF Units	49,480	49,480	49,480	49,480	Interpolated from RGS
Homes to be reached (% of total)	0%	5%	16%	20%	Assumed levels of effort. 16% is the EEBP target.
Number of Units reached(average annual over 5 years)	0	495	1,583	1,979	Calculated
Administrative & Auditing/evaluation overhead on incentives (% of incentive cost)	30%	30%	30%	30%	Assumption
Energy Saving per unit	0%	9%	9%	9%	EEBP Target
Energy Reduction by 2012 (GJ/yr)	0	10,402	33,285	41,607	Calculated
GHG Reductions by 2012 (t CO2e / yr)	0	320	1,022	1,278	Calculated
Lower Incentive Cost (\$ / GJ)	\$0	\$2	\$5	\$7	Assumptions: CBIP Range
Total Cost of Incentives (over 5 years)	\$0	\$27,044	\$216,356	\$378,622	Calculated
Annual Cost of Incentives	\$0	\$5,409	\$43,271	\$75,724	Calculated
Upper Incentive Cost (\$ / GJ)	\$5	\$5	\$7	\$10	Assumptions: CBIP Range
Total Cost of Incentives (over 5 years)	\$0	\$67,611	\$302,898	\$540,889	Calculated
Annual Cost of Incentives	\$0	\$13,522	\$60,580	\$108,178	Calculated
MF Residential (new) EEBP Target = All new units 25% better than MNECB by 2010 (about a 20% reduction (NB Target is for incremental construction - estimate about 1/2 units will be build this way from 2007 to 2012.)					
Estimated Number of New MF Units 2006-2012	4,536	4,536	4,536	4,536	Interpolated from RGS
Description	no action	10 % of new units meet target	50 % of new units meet target - i.e. Linear increase to 100% by 2012. Approximates EEBP Target.	100 % of new units meet target	To get to 100% of new buildings by 2012, assumed a linear increase.
NEW MF Energy in 2012 BAU (GJ)	211,902	211,902	211,902	211,902	From Baseline, interpolated to 2006
NEW MF GHG in 2012 BAU (t CO2e)	6,619	6,619	6,619	6,619	From Baseline, interpolated to 2006
Share of new units reached	0%	10%	50%	100%	Assumption
Number of new units reached	0	454	2,268	4,536	Calculated
Administrative & Auditing/evaluation overhead on incentives (% of incentive cost)	30%	30%	30%	30%	Assumption
Energy Savings per unit (%)	-	37%	37%	37%	From EEBP
New MF Energy Reduction by 2012 (GJ)	0	7,840	39,202	78,404	Calculated
New MF GHG Reduction by 2012 (t CO2e)	0	245	1,225	2,449	Calculated
Lower Incentive Cost (\$ / GJ)	\$0	\$5	\$10	\$15	Assumption
Total Cost of Incentives (over 5 years)	\$0	\$50,963	\$509,625	\$1,528,876	Calculated
Annual Cost of Incentives	\$0	\$10,193	\$101,925	\$305,775	Calculated
Upper Incentive Cost (\$ / GJ)	\$0	\$10	\$15	\$20	Assumption
Total Cost of Incentives (over 5 years)	\$0	\$101,925	\$764,438	\$2,038,501	Calculated
Annual Cost of Incentives	\$0	\$20,385	\$152,888	\$407,700	Calculated

EEBP = BC's Energy Efficient Buildings Plan

Appendix D: Assumptions and Calculations Used to Estimate Scenario Reductions Potential

Table D- 4: Scenario Reductions and Costs for Commercial / Industrial Buildings

Commercial / Industrial		Scenario				Comments
		Business as Usual	Selective Measures	Hold the Line	Comprehensive	
Commercial (Existing) EEBP Target = 14% improvement in 20% of buildings						
Description	no action	Reach 10 % of 2004 building stock	Reach 20 % of 2004 building stock EEBP Target	Reach 25 % of 2004 building stock	20 % is EEBP Target.	
Total COMM Energy 2006 (GJ)	9,129,263	9,129,263	9,129,263	9,129,263	From Baseline, interpolated to 2006	
Total COMM GHG 2006 (t CO2e)	281,972	281,972	281,972	281,972	From Baseline, interpolated to 2006	
Buildings to be reached (% of total)	0%	10%	20%	30%	Assumed levels of effort. 20% is the EEBP target.	
Administrative & Auditing/evaluation overhead on incentives (% of incentive cost)	30%	30%	30%	30%		
Energy Saving per building	0%	14%	14%	14%	EEBP Target	
Energy Reduction by 2012 (GJ/yr)	0	127,810	255,619	383,429	Calculated	
GHG Reductions by 2012 (t CO2e / yr)	0	3,948	7,895	11,843	Calculated	
Lower	Incentive Cost (\$ / GJ)	\$0	\$2	\$5	Assumptions: CBIP Range	
	Total Cost of Incentives (over 5 years)	\$0	\$332,305	\$1,661,526	Calculated	
	Annual Cost of Incentives	\$0	\$66,461	\$332,305	\$697,841	Calculated
Upper	Incentive Cost (\$ / GJ)	\$0	\$5	\$7	Assumptions: CBIP Range	
	Total Cost of Incentives (over 5 years)	\$0	\$830,763	\$2,326,136	Calculated	
	Annual Cost of Incentives	\$0	\$166,153	\$465,227	\$996,916	Calculated
Comm NEW (new) EEBP Target = All new units 25% better than MNECB by 2010 (about a 20% reduction consumption).						
(NB Target is for incremental construction - estimate about 1/2 units will be build this way from 2007 to 2012.)						
Description	no action	10 % of buildings achieve defined reductions	50 % of buildings achieve defined reductions - i.e. Linear increase to 100% by 2012. Approximates EEBP Target.	100 % of buildings achieve defined reductions	To get to 100% of new buildings by 2012, assumed a linear increase.	
NEW COMM Energy in 2012 BAU (GJ)	555,811	555,811	555,811	555,811	From Baseline, interpolated to 2006	
NEW COMM GHG in 2012 BAU (t CO2e)	17,168	17,168	17,168	17,168	From Baseline, interpolated to 2006	
Share of new units reached	0%	10%	50%	100%	Assumption	
Administrative & Auditing/evaluation overhead on incentives (% of incentive cost)	30%	30%	30%	30%	Assumption	
Energy Savings per unit (%)	0%	37%	37%	37%	From EEBP	
New COMM Energy Reduction by 2012 (GJ)	0	20,565	102,825	205,650	Calculated	
New COMM GHG Reduction by 2012 (t CO2e)	0	635	3,176	6,352	Calculated	
Lower	Incentive Cost (\$ / GJ)	\$0	\$5	\$10	Assumption	
	Total Cost of Incentives (over 5 years)	\$0	\$102,825	\$1,028,250	\$3,084,750	Calculated
	Annual Cost of Incentives	\$0	\$20,565	\$205,650	\$616,950	Calculated
Upper	Incentive Cost (\$ / GJ)	\$0	\$10	\$15	Assumption	
	Total Cost of Incentives (over 5 years)	\$0	\$205,650	\$1,542,375	\$4,113,000	Calculated
	Annual Cost of Incentives	\$0	\$41,130	\$308,475	\$822,600	Calculated

EEBP = BC's Energy Efficient Buildings Plan

Goal 2: Increase Transportation Efficiency

The reductions and costs are estimated according to initiative. It is acknowledged that any reductions in transportation will be the integrated result of all these actions and that they cannot be easily separated.

Assumptions:

- Initiative 2-1: Increased Choices. Many of the increased choices will arise through the implementation of the TravelChoices process and costs are considered external to this plan. The expected results are assumed to be a reduction of total fuel consumption of 1 %, 2 %, and 3 % for the Selective Measures, Hold the Line, and Comprehensive scenarios, respectively.
- Initiative 2-2: Promotion of Alternatives: Trip reduction programs can achieve 5% to 15% reductions without financial incentives and 15% to 30% reductions if they include some form of financial incentives. Commuters are about 20% of the total trips taken.
- Initiative 2-1: Promotion of fuel efficient vehicles: Assumed to reduce overall consumption by 0.5 %, 1.0 %, and 1.5 % for the Selective Measures, Hold the Line, and Comprehensive scenarios, respectively. These are subjective values - included more as desired targets.

Additional factors which will accentuate the effect of the previous efforts are i) a natural decline in fuel consumption and ii) potential consumer responses to changing prices.

- i) From 1995 to 2004 combined gasoline and diesel sales in the region have been declining at about 2.2 million litres per year (from a total of about 300 million). This is a 0.7% annual reduction. Extrapolating for 5 years results in a 3.5 % reduction.
- ii) Gasoline price elasticity is about -0.15 (Litman, 2006) - indicating that for every 10% increase in price there will be a 1.5 % decrease in consumption in the short term. For a 30% increase in prices this could translate into a 4.5% decrease. Gasoline prices in Victoria have risen about 25% in the past 12 months (e.g. from \$0.91 to \$1.20 per litre - see www.victoriagasprices.com) and even more compared with 3-5 years ago. Moreover, in the long term, these price increases may reduce consumption further if they trigger changes in purchasing decisions.

This analysis assumes some scoping level assumptions about employer-based commute trip reduction and TMA-based reductions. There are indicative and not sufficient for program delineation. A summary of the assumptions and estimates made for Transportation reductions is shown in Table D - 5.

Appendix D: Assumptions and Calculations Used to Estimate Scenario Reductions Potential

Table D- 5: Scenario Reductions and Costs for Transportation Measures

Transportation	Scenario				Comments
	Business as Usual	Selective Measures	Hold the Line	Comprehensive	
Total Transportation Energy 2012 (GJ)	12,387,578	12,387,578	12,387,578	12,387,578	From Baseline
Total Transportation GHG 2012 (t CO2e)	863,631	863,631	863,631	863,631	From Baseline
Initiative 6-1: Improve Transportation Options (note a)					
Assumed Reduction through provision of better choices actions (% of total)	0%	1%	2%	3%	Assumption or Target (arbitrary)
Total Energy Reduction (GJ)	0	123,876	185,814	371,627	Calculated
Total GHG Reduction (t CO2e)	0	8,636	12,954	25,909	Calculated
Initiative 6-2: Promote Efficient Transportation					
Costs: Travel Demand Management					
Employed population (FT + PT) 2005	169200	169200	169200	169200	Stats Can
Fraction of Employed Impacted by TDM programs (%)	0%	15%	35%	50%	Assumption: Employment stats see Note (a) Item "A"
Employed population benefitting from TDM measures	0	25,380	59,220	84,600	Calculated
Cost per employee (low)	\$0	\$5	\$25	\$50	Assumed: See Note (b)
Annual Cost of TDM	\$0	\$126,900	\$1,480,500	\$4,230,000	Calculated
Cost per employee (low) (note b)	\$0	\$25	\$75	\$100	Assumed: See Note (b)
Annual Cost of TDM	\$0	\$634,500	\$4,441,500	\$8,460,000	Calculated
Reductions 1: Employer-only Commute Trip Reduction Programs					
Travel affected by CTR (% of employee total travel)	20%	20%	20%	20%	Assumption (Item "B")
Employees impacted by CTR (% of total travel)	0%	15%	35%	50%	Item "A"
Reduction per commuter	0%	5%	20%	30%	5%-15% no \$ incentives; 15% - 30% with \$ incentives
Total Energy Reduction (% of total)	0.00%	0.15%	1.40%	3.00%	Calculated
Total Energy Reduction (GJ)	0	18,581	173,426	371,627	Calculated
Total GHG Reduction (t CO2e)	0	1,295	12,091	25,909	Calculated
Reductions 2: Incremental Area-based Transportation Management Associations (Shuttles, area wide programs - incremental to employer programs) (Note c)					
Travel targetted by TMA (% of total consumption)	0.0%	3.0%	7.0%	10.0%	Calculated Items "A" + "B". Share of employees times share of travel
Employee Workday Reduction (trips avoided per year)	0%	15%	25%	30%	
Total Energy Reduction (% of total)	0.00%	0.45%	1.75%	3.00%	Calculated
Total Energy Reduction (GJ)	0	55,744	216,783	371,627	Calculated
Total GHG Reduction (t CO2e)	0	3,886	15,114	25,909	Calculated
Initiative 6-3: Promotion of Fuel Efficient Vehicles					
Assumed reduction in consumption	0%	0.0%	1.0%	2.0%	Assumption
Total Energy Reduction (GJ)	0	0	123,876	247,752	Calculated
Total GHG Reduction (t CO2e)	0	0	8,636	17,273	Calculated
Total Energy Reduction (GJ)	0	198,201	699,898	1,362,634	Calculated
Total GHG Reduction (t CO2e)	0	13,818	48,795	94,999	Calculated

Notes:

a) About 35% of employment in the CRD is in Government services (14%), Educational Services (8%) and Health and Social Services (13%) = 35% which are often large employers suitable for initiating CTR programs and TMAs.

b) Estimates from Travel Choices Working Paper No6 "TDM Strategy", August 2006 TMA range from \$5 to \$15 per employee while comprehensive CTR programs range from \$50 to \$100 per employee.

c) There is an admitted overlap between Employer CTR programs and TMAs. This calculation attempts to account for an 'incremental' impact.

Goal 3: Encourage Energy Efficient Land Use Planning

Description:

Energy efficient land use planning is assumed to generate additional reductions in energy consumption - incremental to those already described through building or transportation measures. For example close proximity to services would encourage walking and reduce transportation additional vehicle travel.

Quantifying this effect is difficult. Two identified examples include:

- *“the National Resources Defence Council compared two Nashville area towns, Hillsboro and Antioch. Though both towns were suburban and automobile oriented, residents of Hillsboro, with higher land-use density and better transportation accessibility than Antioch, emitted 25 percent less greenhouse gases per capita than residents of Antioch. This was principally a result of less vehicle travel in Hillsboro.*
- *An EPA assessment estimated that a smart growth community in midtown Atlanta, called Atlanta Station, would create 62 percent less greenhouse gas emissions than a sprawl development”⁶⁰*

These results span a broad range and imply that some dramatic reductions can be achieved. These may not be representative of the CRD situation because of the relatively low cooling requirements here and the low GHG intensity of BC electricity. As well, these stated results include effects of buildings and transit that are, in this work accounted for in Goals #1 and Goal #2.

Note that these reductions are not achieved across the entire region, but only to the new development (or infill development) that is developed in a “Smart Growth” fashion or achieves some level of “Compact Community” threshold.

To account for potential incremental reductions associated with effective land use planning that is not accounted for in the buildings or transport sections - such as trips to school (walking not driving), trips for small groceries, etc. some modest reductions are proposed. These are subjective, but are intended to indicate an order of magnitude of reductions.

The level of achievement used to define each scenario is then:

- **Business as Usual:** No additional energy or GHG reductions.
- **Selective Measures:** 10% of new development achieves Smart Growth characteristics that result in reduced transportation consumption. A reduction of 20% of this new transportation consumption is assumed.
- **Hold the Line:** 50% of new development achieves Smart Growth characteristics that result in reduced transportation consumption. A reduction of 20% of this new transportation consumption is assumed.
- **Comprehensive :** 80% of new development achieves Smart Growth characteristics that result in reduced transportation consumption. A reduction of 20% of this new transportation consumption is assumed.

The impact of these levels of achievement is shown in Table D- 6.

⁶⁰ Source: “State and Local Net Greenhouse Gas Emissions Reduction Programs” available from the Pew Centre at www.pewclimate.org/states.cfm?ID=49

Appendix D: Assumptions and Calculations Used to Estimate Scenario Reductions Potential

Table D- 6: Scenario Reductions from Energy Efficient Land Use Planning and “Smart Growth”

Land Use Planning							
Total Transportation Energy 2004 (GJ)	11,566,110	From Baseline					
Total Transportation Energy 2012 (GJ)	12,387,578	From Baseline					
Incremental Transportation Energy 2004-2012 (GJ)	821,468	From Baseline					
Total Transportation GHG 2004 (t CO2e)	810,930	From Baseline					
Total Transportation GHG 2012 (t CO2e)	863,631	From Baseline					
Incremental Transportation GHG 2004-2012 (t CO2e)	52,701	From Baseline					
			Scenario				
			Business as Usual	Selective Measures	Hold the Line	Comprehensive	Comments
Share of new Development that is “Smart Growth” (%)	0	10%	50%	80%	Assumption		
Reduction in “Growth” consumption (%)	0	20%	20%	20%	Assumption		
Total Energy Reductions (GJ)	0	16,429	82,147	131,435	Calculated		
Total GHG Reductions (t CO2e)	0	1,054	5,270	8,432	Calculated		
Total Cost of Incentives	-	?	?	?			

Notes:

a) This analysis assumes that all growth in consumption is related to residential growth that can be reduced through smart growth activities (i.e. not commercial consumption)

Goal 4: Diversify Energy Supply

Description:

Renewable energy technologies provide heat or electricity from renewable sources. This includes active solar, biomass sources, wind power, micro-hydro electricity, and in the future potentially wave and tidal power. There are also 'alternative technologies' which can provide heat or electricity - using existing energy supplies but more efficiently and producing fewer GHGs. These include heat pumps, district heating and/or cogeneration based on biomass.

A long term transition to a renewable energy future requires many years. However, in the short term (i.e. the first 5 year cycle of this plan), there is an opportunity to achieve some reductions that can be demonstrations for further reductions ^[61].

The level of achievement used to define each scenario is then:

- **Business as Usual:** No additional energy capture or GHG emissions reductions through increased use of renewable energy.
- **Selective Measures:** No substantial savings realized. While some solar water heater roofs may be installed, there is no coordinated effort to install any renewable energy technologies.
- **Hold the Line:** There is a coordinated effort to increase some uptake of pilot scale solar roofs. Landfill gas energy capture is increased through additional infrastructure of extra optimized within the existing infrastructure. New, renewable energy equivalent to 0.25% of total energy consumption (about 86,000 GJ annually) is installed.
- **Comprehensive :** There is some uptake of pilot scale solar roofs. Landfill gas energy capture is optimized within the existing infrastructure. New, renewable energy equivalent to 0.5% (about 174,000 GJ or about 5 MW) of total energy consumption is installed.

The impact of these levels of achievement is shown in Table D-7.

[61] Note that this measure does not include efforts by BC Hydro to secure new power on Vancouver Island. Those activities may alter the overall GHG intensity of the electricity purchased within the region. However, these actions are not likely to have a significant impact before 2012. As well, it is not known whether these will increase or decrease the GHG intensity.

Appendix D: Assumptions and Calculations Used to Estimate Scenario Reductions Potential

Table D- 7: Scenario Reductions from Renewable Energy Supply Initiatives

Energy Supply	Scenario			
	Business as Usual	Selective Measures	Hold the Line	Comprehensive
BAU Energy Consumption in 2012 (GJ)	34,758,298	34,758,298	34,758,298	34,758,298
BAU GHG Emissions in 2012 (t CO2e)	1,636,218	1,636,218	1,636,218	1,636,218
Share of total Energy from "New Renewables" (%)	0%	0.00%	0.25%	0.5%
Energy "reduction" i.e.New Renewable Energy (GJ)	0	0	86,896	173,791
GHG Reduction (t CO2e)	0	0	4,091	8,181
Total Cost of Incentives	-	-	-	-

Notes:

a) Incentive amounts are not estimated.

b) This includes only new renewables developed in the region by the actions related to this plan (e.g. solar roofs, heat pumps, utility generation at landfill and/or reservoir). Efforts by BC Hydro to obtain new electricity which may or may not alter the the renewable content of electricity are not included here.

Goal 5: Educate and Engage Residents and Businesses**Description:**

An outreach and education program is crucial to the success of the program. This effort must be sustained and targeted to each of the sectors for reductions.

The level of achievement used to define each scenario is then:

- **Business as Usual:** No outreach or engagement.
- **Selective Measures:** A modest program including a website and brochure
- **Hold the Line:** as for "Selective Measures" PLUS a structured **community based social marketing** campaign and contracted outreach programs to schools, businesses, public events.
- **Comprehensive :** As per "Hold the Line" but expanded version of outreach.

The cost impact of these levels of achievement is shown in Table D-8. **Note that these are demonstration level costs and not a program budget.**

Appendix D: Assumptions and Calculations Used to Estimate Scenario Reductions Potential

Table D- 8: Scenario Expenses for Outreach and Engagement

Outreach & Engagement	Scenario			
	Business as Usual	Selective Measures	Hold the Line	Comprehensive
One Time Expenses				
Website Development	\$0	\$25,000	\$25,000	\$25,000
Energy Plan Branding and Materials	\$0	\$50,000	\$50,000	\$50,000
Launch Event and Promotions	\$0	\$0	\$50,000	\$50,000
Development of Community-Based Social Marketing Campaign	\$0	\$0	\$50,000	\$50,000
Brochures etc	\$0	\$10,000	\$20,000	\$20,000
Total Cost of One-time Expenses	\$0	\$85,000	\$195,000	\$195,000
Annualized Cost (over 5 years)	\$0	\$17,000	\$39,000	\$39,000
Annual Expenses				
Website Maintenance	\$0	\$20,000	\$20,000	\$20,000
Media Ads, PSA development	\$0	\$0	\$30,000	\$30,000
Propromotional materials - ongoing	\$0	\$20,000	\$20,000	\$50,000
Event Sponsorship (Clean Air Day, Enviro-week, etc.)	\$0	\$25,000	\$75,000	\$100,000
Energy Award sponsorship and administration	\$0	\$0	\$25,000	\$50,000
Outreach Programs (schools, businesses, malls) Contracted	\$0	\$0	\$100,000	\$200,000
Sum of Annual Expenses	\$0	\$65,000	\$270,000	\$450,000
Energy Reductions (GJ)	0	0	0	0
GHG Emission Reductions (t CO2e)	0	0	0	0
Total Annualized Cost of Outreach & Engagement	\$0	\$82,000	\$309,000	\$489,000

Notes:

- a) One time Expenses have been averaged over 5 years
- b) These are representative costs. No program has yet been developed. Actual costs would depend on the final program design.

Appendix D: Assumptions and Calculations Used to Estimate Scenario Reductions Potential

Goal 6: Demonstrate Municipal Leadership

Most of the municipal leadership activities are catalyzing actions or partnership building actions that lead to reductions in some of the other areas. However, "Initiative 6-3: Implement a Corporate Energy and GHG Management Program" can achieve real and measurable reductions.

Complete municipal energy inventories could not be compiled during the compilation of the inventory. However, based on other communities (e.g. Vancouver, North Vancouver) some simplified assumptions about reduction potential can be made.

For this work it is assumed that the municipal energy and GHG inventory is **1 %** of the community inventory. Based on experiences with other communities it is reasonable that a municipal corporate plan could achieve as much as a **20%** reduction in municipal consumption. This corresponds to a 0.2% reduction in community consumption and emissions.

The level of achievement used to define each scenario is then:

- **Business as Usual:** No reductions.
- **Selective Measures:** There is some uptake to reduce some vehicle fleet and building energy consumption. Assume a **5 %** reduction in corporate energy use and GHG emissions.
- **Hold the Line:** There is a sincere effort to reduce energy. Estimate a 15% reduction in energy and GHG. Assume a **15 %** reduction in corporate energy use and GHG emissions.
- **Comprehensive :** Advanced effort to replace heating systems with ground source heat pumps in recreation centres, new buildings are built as green buildings, existing buildings are retrofitted, and the vehicle fleet is right-sized with an aggressive fleet management program implemented. Assume a **20%** reduction in corporate energy use and GHG emissions.

Table D- 9: Scenario Reductions from Corporate Energy Plan Actions

Corporate (Municipal Operations)	Scenario			
	Business as Usual	Selective Measures	Hold the Line	Comprehensive
BAU Energy Consumption in 2012 (GJ)	34,758,298	34,758,298	34,758,298	34,758,298
BAU GHG Emissions in 2012 (t CO2e)	1,636,218	1,636,218	1,636,218	1,636,218
Share of Community Energy used in Municipal Operations	1.0%	1.0%	1.0%	1.0%
Reduction of Corporate Consumption / Emissions	0%	5%	15%	20%
Energy Reductions (GJ)	0	17,379	52,137	69,517
GHG Emission Reductions (t CO2e)	0	818	2,454	3,272
Total Cost of Grant Implementation	-	-	-	-

Notes:

a) Incentive amounts are not included. However, there will be some funding requirements for implementation.

Appendix E: Overview of GHG Reduction Targets

Partners for Climate Protection (PCP) Recommended Targets

The Federation of Canadian Municipalities recommends targets for reduction of GHG emissions for participants in the Partners for Climate Protection (PCP) program of:

- A 20 per cent reduction below baseline year GHG emissions for municipal operations within 10 years; and
- A six per cent reduction below baseline year GHG emissions for the community within 10 years.

The larger corporate target reflects the fact that municipalities have direct control over their own energy consumption and GHG emissions, and some, but a lesser level of control over the community emissions.

Two communities in the region have joined the PCP program - the District of Saanich (in 1996) and the City of Victoria (in 1994), but they have not yet reported any of the program milestones to the FCM⁶².

Adopted GHG Reduction Targets by Municipalities

Many municipalities have established targets for GHG Emissions reduction. Through the PCP program, municipalities can establish targets for **corporate** emissions (i.e., due to the municipality's direct activities) and **community-wide** emissions.

Participation in the PCP is voluntary, and so municipal government's may (and do) choose targets based on their own community issues as they establish Action Plans. Some examples are shown in Table E-1 (community targets) and Table E-2 (corporate targets)

The corporate target is often a higher percentage value than the community target reflecting that these emissions are under the direct control of the municipalities. Note that since energy use and GHG emissions from municipal operations is typically no more than 1% of the total community emissions, the community reductions usually have a greater total effect.

Table E-1: Examples of Community GHG Reduction Targets for Select Municipalities

Community GHG Reduction Targets			
Municipality	Reduction (%)	From (baseline year)	By when
North Vancouver	6	1995	2010
Whistler	6	2000	2010
Vancouver	6	1990	2012
Portland, Oregon	10	1990	2010

[62] From the FCM website (www.fcm.ca) take links to sustainable communities initiatives, and partners for climate protection to (www.sustainablecommunities.ca/Capacity_Building/Energy/PCP/Milestone_Status.asp)

Table E-2: Examples of Corporate GHG Reduction Targets for Select Municipalities

Corporate GHG Reduction Targets			
Municipality	Reduction (%)	From (baseline year)	By when
North Vancouver	20	1995	2010
Township of Langley	10	2000	2010
Whistler	10.5	2000	2010
Calgary	6	1990	2012
Edmonton	16	1990	2008

Considerations

Considerations when setting a target include:

Consistency: When defining a community target(s) for the region or municipalities it is worthwhile to consider the communication and outreach strategies, and messaging that will be required for implementation of a plan. These would be best served through the establishment of a common target definition for the region and municipalities.

Baseline Year: A Community Inventory has been conducted for 2004 with a forecast to 2012, and a 'backcast' to 1995. These milestone dates are commonly used in current energy planning and GHG reduction plans. This plan recommends using 1995 as the baseline year⁶³.

⁶³ Moving the baseline to a more recent year may not result in any improvement in data accuracy. As well, it may hide the impacts of conservation efforts that have been conducted over the past few years.