COMOX VALLEY REGIONAL DISTRICT
CORPORATE ENERGY PLAN

February 4, 2011

Project delivered to:

Michael Zbarsky

Manager of Transit and Sustainability

Prepared by:

Stantec Consulting Ltd.

Summary

The Comox Valley Regional District (CVRD) has compiled a baseline inventory of energy consumption and greenhouse gas (GHG) emissions related to its corporate operations, and developed a plan to reduce and manage operations related carbon. This plan helps guide short term actions that will assist the Regional District in meeting sustainability commitments, including the:

- Comox Valley Sustainability Strategy,2010,
- Climate Action Charter, a voluntary commitment to achieve carbon neutral operations beginning in 2012, and
- Partners for Climate Protection program, a five-milestone framework that guides municipalities to reduce greenhouse gas emissions.

Corporate Energy and GHG Emissions Profile

In 2009, the Regional District consumed a total of **76,735 GJ** of energy and emitted **2,442 tonnes** of GHG emissions (expressed as tonnes of carbon dioxide equivalents, CO_2e) in the delivery of its services[1]. Energy consumption in buildings accounted for 71 % of these GHG emissions, fleet vehicles and equipment accounted for 20 %, and infrastructure accounted for 9%.

Carbon emissions are associated with energy consumption which is a cost to the operational budgets of the RD. Reducing the carbon footprint saves energy and therefore saves money. Making these reductions is a good operating practice and so is not new to the RD. This action plan strengthens the commitment to efficient operations.

GHG Emission Reduction Target [Proposed]

In support of the Comox Valley Regional District's objective of achieving operational carbon neutrality as a signatory of the Climate Action Charter, the CVRD will reduce corporate GHG emissions by **10% below 2009 levels by the end of 2015.**

This reduction target is proposed to meet the energy and GHG emission objectives of the Comox Valley Sustainability Strategy and to provide a goal against which the CVRD will measure and report on progress during implementation of this plan. Setting a carbon reduction target strengthens the commitment to energy conservation, and empowers staff to make reductions in their work activities.

Guiding Principles and Key Actions

The plan identifies 8 initiatives and action items to be implemented, and 5 activities for implementation, monitoring, and reporting. It is estimated that the CVRD could reasonably target to reduce operational GHG emissions by 10% from 2009 levels by 2015 through implementation of these reduction measures.

[1] Reported GHG emissions are those applicable to the Province of British Columbia's Climate Action Charter carbon neutrality commitment.

Table S-1. Estimated Segment Reductions

Policy Initiatives & Actions	Estimated GHG Emissions (2009)	Proposed Reduction (%)	Reduction (in tonnes)
General Building	30	10%	3
Recreation & Community Centers	1697	10%	170
Fire Halls	1	10%	0.1
Infrastructure	225	5 %	10
Fleet	489	15%	73
Total	**2,442**	Approx **10%**	**250**

Implementation

It is recommended that the Regional District designate a specific staff member as the Program Owner for energy and GHG management purposes to aid in successful implementation of this plan. This person will be responsible for working with staff from each department to initiate activities and ensure that the annual work plan is progressing. It is important that the energy management activities of the Program Owner be recognized as part of their job descriptions and performance expectations. The Regional District should also identify energy and carbon management as a consideration in staff activities in each department. The Program Owner will initiate, support and coordinate activities, while all staff will take ownership of energy and carbon reduction activities in their duties. At present, no new staff resources are anticipated.

The Regional District will need to dedicate staff time and find funding to support the implementation of initiatives in order to meet the five year target of reducing corporate emissions by 10%. A number of funding programs are outlined for the CVRD's consideration. Additionally, processes for ongoing monitoring of energy use will need to be formalized, with staff assigned responsibilities for collecting and reporting data annually in line with Climate Action Charter reporting. The Corporate Energy Action Plan should be reviewed and updated every two to three years to ensure relevance to Regional District priorities and initiatives.

Table of Contents

Figures

Tables

1 Introduction

1.1 Energy, GHG Emissions and Climate Change

There is increasing evidence that global climate change resulting from emissions of carbon dioxide and other greenhouse gases (GHGs) is having a significant impact on the ecology of the planet. In addition, climate change is expected to have serious negative impacts on global economic growth and development. In 2005, the UK government commissioned an independent economic review called the Stern Review, which states that the "costs of stabilizing the climate are significant but manageable; delay would be dangerous and much more costly".

In BC, climate change is expected to bring colder winters, hotter summers, and more extreme weather events. This could result in more seasonal variations in water availability, potential flooding and impacts to agriculture. For local governments, climate change may impact demands on the operation and maintenance of infrastructure systems, and potentially affect the energy and utility loads associated with operating facilities in increasingly variable temperatures.

Beyond the costs associated with delayed action, there are cost savings to be realized through efforts to conserve energy and to use it more efficiently, and economic opportunities available to communities that develop local energy supply and infrastructure. Actions to encourage energy efficiency and conservation and to promote implementation of renewable energy will assist local governments in developing energy resilient communities, in addition to mitigating climate change. Other benefits from increasing energy efficiency and reducing greenhouse gases may include improved ambient and indoor air quality and improved comfort in efficient buildings.

Local governments can play a critical role in reducing energy and GHG emissions and can take action by:

- Identifying opportunities to reduce consumption and GHG emissions from their operations, and;
- Implementing broader policies and programs to reduce consumption and GHG emissions throughout the community. Reducing community emissions is not in the scope of this plan, however, the Regional District can demonstrate leadership in efficiency and GHG emissions reduction by taking action in its own operations.

1.2 The Climate Action Charter

The BC **Climate Action Charter**[2] is a provincial initiative introduced in September 2007 to encourage local governments to reduce energy and emissions from their operations. Signatory local governments, including the Comox Valley Regional District, have voluntarily committed to achieving

[2] http://www.cd.gov.bc.ca/ministry/whatsnew/climate_action_charter.htm

carbon neutrality in their operations beginning with the 2012 calendar year[3]. Signatories to the Climate Charter are currently eligible for an annual grant from the Province (called the Climate Action Revenue Incentive Program, CARIP) with a value equivalent to the amount of carbon tax paid. Based on the Regional District's corporate inventory, and factoring in projected increases in carbon tax rates[4], the Regional District's carbon tax liabilities may be up to $59,800 annually from 2012 onward. This amount would be refunded as a lump sum to the RD as the CARIP grant.

1.3 Carbon Neutrality and Carbon Offsets

Achieving carbon neutrality in local government operations means that the Regional District will:

- Establish a **baseline** of annual GHG emissions,
- Reduce those emissions as much as possible through **reduction measures**, and
- Purchase **carbon offsets** to net the remaining emissions to zero.

As shown in Figure 1, a project that reduces the local government's current corporate emissions is the first step towards carbon neutral. (NB these are reductions in the RDs carbon footprint and are not offsets).

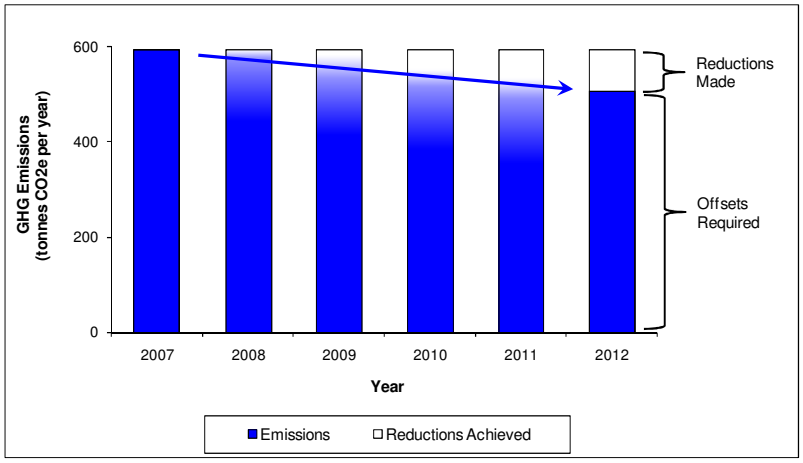


Figure 1: Hypothetical example illustrating reductions and offsets on the path to carbon neutrality

[3] Achieving carbon neutrality will involve reducing greenhouse gas emissions where possible, and then purchasing carbon offsets for the remainder.

[4] The carbon tax was initiated at $10 per tonne of carbon (about 2.5 cents per litre of gasoline or $0.50 per GJ of natural gas) and will rise by $5 per tonne each July 1 until it reaches $30 per tonne in 2012.

A **carbon offset** is a reduction in GHG emissions that is generated through an offset project (either in the community or elsewhere). These reductions are verified against an appropriately selected baseline, and can then be purchased by the local government. The Climate Action Charter does not currently require local governments to obtain offsets from any particular source or program, nor does it explicitly define requirements for quality standards of the offsets purchased by local governments.

One option for local governments is to purchase offsets from the Pacific Carbon Trust, which is a Crown corporation mandated to provide carbon offsets sourced from projects within British Columbia. Alternatively, there are a number of brokers that also provide carbon offsets each verified to certain standards such as the Gold Standard or the United Nations Clean Development Mechanism (CDM). Different standards will accept different types of offset projects, such as fuel switching from fossil fuel energy to less carbon-intensive sources, retrofit projects that reduce energy consumption, alternative energy generation, and carbon sequestration through a variety of means. Key issues in considering the quality of offsets are environmental and social impacts, permanence, additionality, and the methodology required in evaluating the projects. Many of the protocols and regulations are still under development.

The Province has indicated an expected initial price for carbon offsets to be $25 per tonne of CO2e, the market price for offsets may be expected to change with time as trading mechanisms are established and mature.

Finally, the Province is currently working to develop "reduction projects" that would allow local governments to capture the carbon reduction benefit of a number of activities in their communities. These are being designed to be more streamlined, and less costly to develop than a verified (i.e. audited) offset, while still maintaining the integrity of the carbon reductions.

1.4 Plan Development Process

The Comox Valley Regional District's Corporate Energy Action Plan was developed in a series of steps as follows:

- **Corporate inventory and forecast**: An inventory of corporate activities that consume energy and produce GHG emissions was compiled for the baseline year of 2009. A GHG emissions forecast was completed to show the projected increase in emissions to 2021.
- **Action planning workshop**: A workshop was held with staff to review and define activities that would be feasible to implement in order to reduce energy consumption and GHG emissions from corporate operations. By understanding what measures the Regional District will implement it is possible to estimate the GHG reduction potential of these measures and arrive at a proposed GHG reduction target.
- **Plan preparation**: The input received at the workshop was used to develop a draft plan. Telephone conversations with key Regional District staff helped to further refine actions during plan preparation.

While the Comox Valley Sustainability Strategy outlines objectives for the broader community, recommendations included in the Corporate Energy Action Plan are aligned with the Sustainability Strategy's goals regarding buildings and infrastructure.

1.5 The Plan as a Guide to Decision-Making

The value of the Corporate Energy Action Plan is that it articulates a *commitment* to reducing energy and emissions from Regional District operations and provides staff with the *mandate* to take action.

The actions in the Plan will undoubtedly change over time, but what stands over the long term is the Regional District's commitment to reducing energy consumption and GHG emissions. A series of higher level principles will assist the Regional District in maintaining the focus on this commitment and serve to guide decision-making over the long term.

2 Energy and GHG Inventory

2.1 Operations Profile

The Comox Valley Regional District operates the facilities, fleet and utility accounts as outlined in Table 1, either directly or through provision of funds to other agencies. This profile is the basis for the 2009 energy and GHG emissions inventory.

Table 1. Operations profile for the Comox Valley Regional District

Type	Number
General Buildings	16
Community and Recreational Facilities	4
Fire halls	4
Vehicle Fleet*	54
Electricity Accounts**	101
Natural Gas or Propane Accounts**	7

* Number of vehicles in the corporate fleet
** Number of utility accounts available at the time of inventory compilation

2.2 2009 Energy Consumption and GHG Emissions Profile

The Regional District consumed a total of 76,735 GJ of energy in 2009 and emitted 2,442 tonnes of CO_2e in the delivery of its services. Table 2 breaks down these totals by fuel type.

Table 2. Corporate operations energy consumption and GHG emissions, 2009

Fuel Type	Energy Consumption	Energy Units	GHG Emissions (tonnes CO_2e)	Annual Energy Expenditure (Approx $)
Electricity	10,240,548	kWh	266	$716,840
Natural Gas	32,776	GJ	1,672	$393,320
Propane (facilities)	9,800	L	15	$7,840
Heating Oil	0	L	0	$0
Gasoline	53,000	L	126	$53,000
Diesel	130,000	L	363	$130,000
Propane (Fleet)	0	L	0	$0
Total			**2,442**	**$1,301,000**

The estimate of energy spending is based on approximate retail prices as of 2009. Since that time, BC Hydro has forecast that prices for electricity will increase by 50% between 2010 and 2015 (subject to regulatory approval). This would add another $350,000 to the first line in Table 2.

The rules for what is included in the carbon inventory are still under development with the Ministry and the Green Communities Working Group (see www.toolkit.bc.ca). Future revisions will include new information and 'trimming' of the inventory. The inventory captures the bulk of the RD's inventory. Future revisions may occur.[5]

The total energy consumed and GHG emissions produced are also broken down by typical operational sectors as shown in Figure 2 and Figure 3, respectively. Note that while electricity accounts for a substantial portion of energy consumption, it contributes fewer GHG emissions than fossil fuel-based energy sources (e.g. natural gas, gasoline, and diesel). Although the reporting of greenhouse gas emissions from the decomposition of solid waste is not required by the BC Climate Action Charter, they have been included here because the Regional District is a participant in the Federation of Canadian Municipalities (FCM) Partners for Climate Protection (PCP) program.

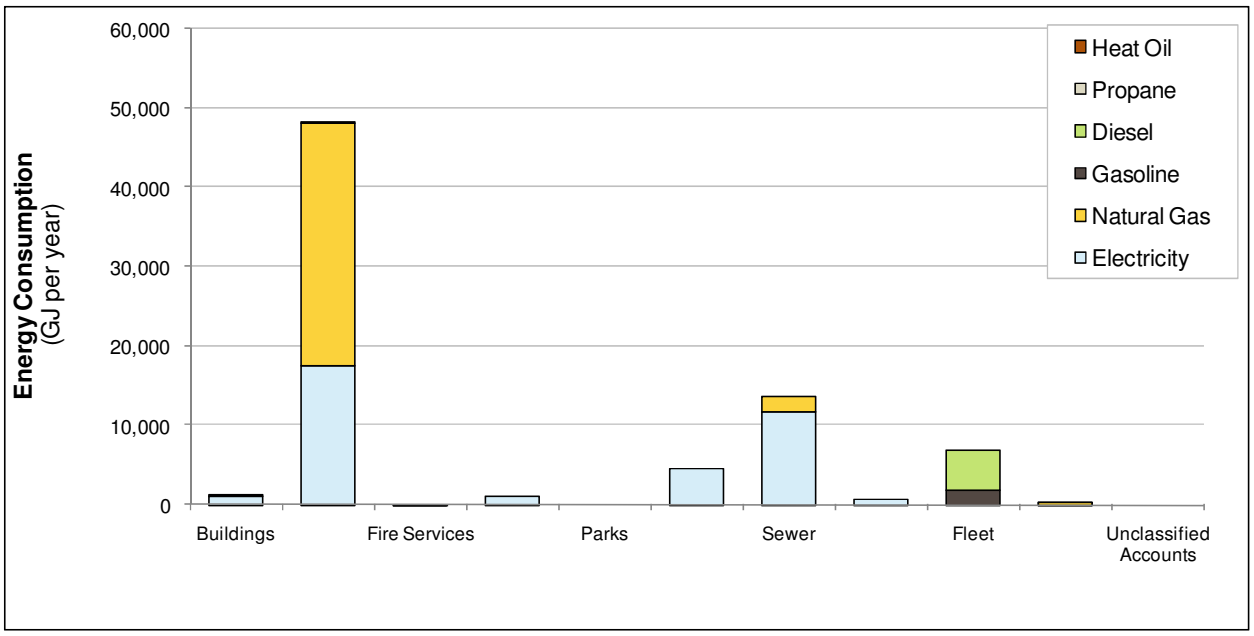


Figure 2: Energy consumption (GJ) from Comox Valley Regional District corporate operations (2009)

[5] For example, the Provincial Carbon Neutral Workbook methodology defines that shared funded facilities should be either allocated amongst the funders, or by any other agreed upon allocation. At present it is expected that the RD and member municipalities will likely accept the carbon footprint of those facilities that they operate. As such the entire footprint of the recreation centers is on this inventory, even though they are partially funded by municipal revenue. For more information about the Carbon Neutral Workbook see: www.toolkit.bc.ca/carbon-neutral-government

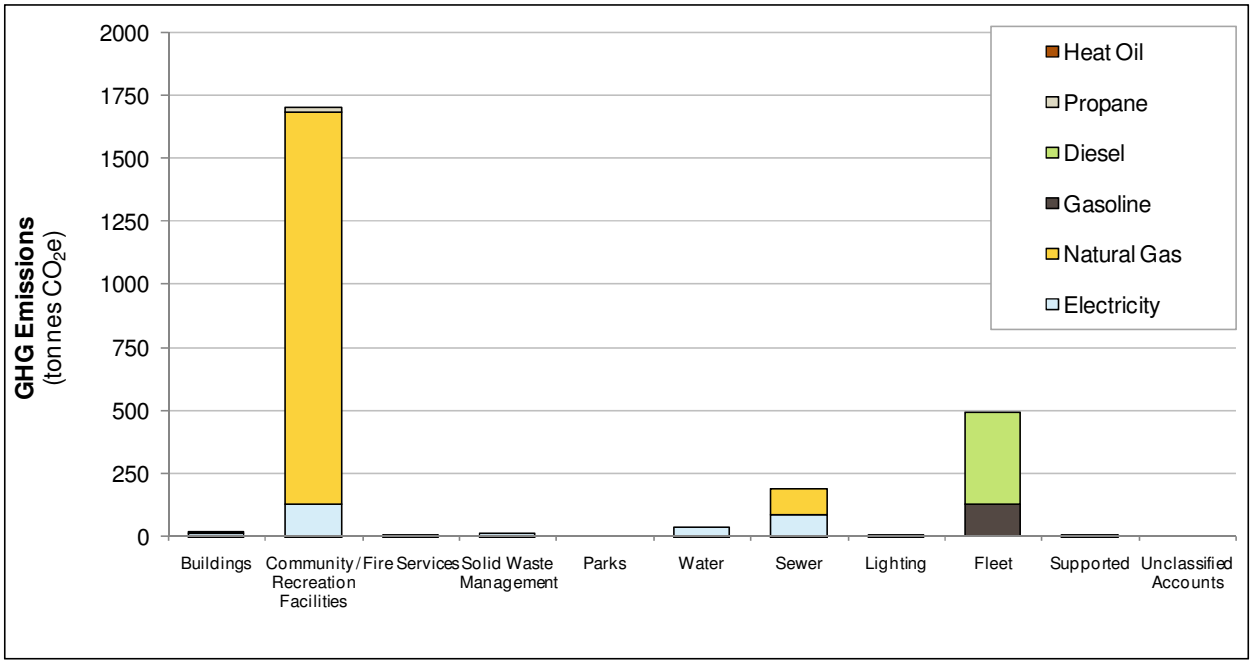


Figure 3: GHG emissions (tonnes CO_2e) from Comox Valley Regional District corporate operations[6] (2009)

2.3 Carbon Costs and Rebates

Local governments in BC now have carbon liabilities – first for the "carbon tax" associated with all purchases of fossil fuels (e.g. gasoline, diesel, natural gas, propane), and second for the voluntary purchase of carbon offsets to become carbon neutral starting in 2012. Offsets are assumed to cost $25 per tonne. Beginning in 2012 the costs for carbon offsets required to become "Carbon Neutral" is estimated at $61,000 annually at current levels of emissions.

2.4 Forecast to 2021

Increased energy consumption for local government operations is driven by growth in the community. The methods for estimating growth are shown in Table 3 and are primarily based on capital plans for major projects and population and development projections. The emissions from corporate operations in 2021 are forecast to be about 2,500 tonnes CO_2e - a 2.5% increase over 2009 emissions.

[6] Emissions from solid waste in the form of landfill gas are estimated to be 37 tonnes of CO2e. These emissions are not part of the BC Climate Action Charter commitment; however, they are a part of corporate inventory requirements for the Partners for Climate Protection (PCP) program.

Table 3. Corporate operations 2021 forecasting assumptions

Area	Consideration	Application
New Facilities	Major facilities (buildings, recreation centres) are built periodically and so the energy consumption and GHG profile shows a step increase when a new facility is created	There are capital projects valued at up to $6 million planned through 2014, including a new administration office and a new fire hall on Hornby Island. New construction was assumed to use roughly half the energy relative to existing facilities.
Existing Facilities	Existing facilities may show a slight increase in energy use and emissions as community population growth results in increased operating hours (e.g. an arena). Support facilities (e.g. administration office, works yard buildings) may see some increases as a result of planned expansions.	There are plans to expand or upgrade a number of fire halls and community / recreation facilities. However, no increase in energy use or GHGs was assumed to reflect potential improvements in building performance of new construction and retrofitted spaces.
Infrastructure	Some infrastructure energy use such as street lighting or water pumping would grow as the population grows (but likely at a lower rate). These are frequently electricity powered facilities and so do not result in substantial GHG emissions increases.	Assumed that lighting, water and sewer service grow at the rate of population growth to 2021. However, significant expansions to the Regional District's water and sewer infrastructure may be needed, including new water and sewage treatment facilities to service growth in municipal areas and Electoral Area settlement nodes of Union Bay and Saratoga in accordance with Regional Growth Strategy. These are not quantified.
Vehicle fleet	Vehicle fleets grow slowly as new activities are created, or new areas need servicing.	Assumed no increase in vehicle emissions as more efficient vehicles and fleet management activities will mitigate energy use and emissions from increases in fleet activities to service increases in population.

3 Emissions Reduction Opportunities

3.1 Past & Current Corporate Initiatives

The Regional District has implemented several initiatives to reduce energy consumption, costs and GHG emissions from its operations, including[7]:

- Energy audits of the Comox Valley Sports Centre and the Comox Valley wastewater treatment facility;
- Retrofits at Comox Valley Sports Centre, including low-E emissivity ceilings, lighting retrofits, and waste heat capture from chillers to melt snow pile from ice rink;
- Implemented almost all energy reduction measures recommended by audits of the Comox Valley Sports Centre and the Comox Valley wastewater treatment facility;
- Automated lighting controls at the Comox Valley Aquatic Centre;
- Automatic shut-offs in landfill equipment to reduce idling;
- Purchased hybrid vehicle (Honda Civic);
- Efforts to reduce paper consumption from operations;
- Installed a computer power management system to turn computers off; and
- Participated n BC Hydro PowerSmart programs.

3.2 Energy and GHG Emissions Policy Statement

This action plan develops a number of activities for the Regional District to pursue. However, there will always be new ideas and opportunities that present themselves in the future. As such, the key principles of the plan can be used to evaluate and direct those future initiatives.

Policy statement:

> The Comox Valley Regional District will conduct its operations with the objective to achieve: (i) high energy efficiency, (ii) fiscally responsible operations, and (iii) continually reduced GHG emissions. These objectives will help us meet the financial and environmental expectations of our residents.
>
> These will be achieved by:

[7] The potential impacts of these initiatives have been considered in the forecast of the Regional District's corporate emissions through the year 2021 (Section 2.4). The Regional District has also initiated a number of programs that address community GHG emissions, but those impacts are not in the scope of this discussion.

- Explicitly defining energy efficiency and GHG emission considerations as part of our capital spending and operational activities;
- Building strong business cases to demonstrate that energy savings, GHG reduction, and operational improvements are cost effective;
- Instilling in our staff a culture of conservation; and
- Reporting on our progress and activities.

3.3 Action Plan

The proposed initiatives can be categorized as several 'types' of actions depending on how they impact consumption and emissions:

(i) **Direct** actions – by which the Regional District (RD) identifies and implements specific activities which will conserve energy in their operation. These include building audits and retrofits, vehicle right-sizing and usage optimization, etc.

(ii) **Policy** initiatives – whereby the RD defines key principles and activities for guiding future action. These initiatives may not achieve immediate impacts, but through board endorsement they guide future activities of the RD. These policies can be a guide to future decision making, such as requirements to asses energy efficiency and alternative energy opportunities in all major capital projects, or requiring evaluations of energy implications in all purchasing considerations.

(iii) **Catalyst** measures. These actions are demonstration actions which serve to enhance a culture of conservation, waste reduction and sustainability which is broader than exclusively energy management or GHG emissions. Some of these actions may have small emissions savings but a substantial demonstration value, or may reduce emissions amongst staff or in the community that are not formally included in the Regional District's inventory. Such measures often involve changing staff behaviours, and instilling an awareness of energy efficiency in their daily responsibilities.

Summary of Opportunities

In order to become carbon neutral by 2012, the Regional District will need to undertake a combination of emissions reduction measures and carbon offset purchases. Opportunities for reducing emissions were identified through analysis of the Regional District's corporate inventory, a review of activities in similar jurisdictions, and consultation with key staff. The actions are summarized below in Table 4.

Table 4. Summary of emissions reduction opportunities

Actions
Buildings:
1. Conduct recommissioning assessments of large recreational facilities
2. Require an evaluation of energy efficiency for all new facilities, major capital projects, and existing facilities
3. Require an evaluation of alternative energy sources for new construction, major renovations, and existing facilities
Fleet:
4. Initiate fleet management activities
Infrastructure:
5. Investigate opportunities to generate offset credits from landfill
6. Investigate opportunities for energy conservation and alternative energy generation from infrastructure systems
Leadership and Engagement:
7. Develop an energy efficiency purchasing policy
8. Encourage and recognize energy efficient efforts in the workplace

As well a number of activities have been identified for the implementation (Table 5).

Table 5. Plan Implementation Activities

Implementation Activities
A. Identify Staff Member as the Owner of the Plan
B. Explore options to support an Energy Manager
C. Create a fund to support energy efficiency projects
D. Develop relationships with potential program partners
E. Report on progress

3.4 Buildings

Proportion of corporate GHG emissions from existing buildings in 2009:	71%
2009 GHG emissions from existing buildings (tonnes CO_2e):	1,727 tonnes
Target Reductions:	10% - 15%

Action 1: Conduct re-commissioning assessments of large recreational facilities

Action Type: Direct

The Regional District will conduct recommissioning studies of the Comox Valley Sports Centre and Aquatic Centre, with consideration of eligibility for BC Hydro's Continuous Optimization Pilot Program.

The Aquatic Centre was built in 1999 and has had a number of energy efficiency improvements, including energy efficient lighting, automated lighting controls, water saving fixtures, and upgraded mechanical equipment. A detailed BC Hydro energy audit of the Comox Valley Sports Centre was completed in 2002, and a number of measures recommended in that study have been implemented.

While building energy audits focus on the condition and type of mechanical equipment servicing the building, recommissioning and continuous optimization seek to ensure the building's systems are being operated at maximum efficiency. Recommissioning focuses on the operating parameters to ensure that the building's systems are operating efficiently. Continuous optimization processes constantly monitor building systems to ensure operating efficiencies are consistently maximized.

Recommendations:

- Immediately pursue eligibility of the Aquatic Centre for the BC Hydro Continuous Optimization Program[8].
- Pursue eligibility of the Comox Valley Sports Centre for the BC Hydro continuous optimization program after the completion of the planned expansion project[9].

[8] BC Hydro has a program that funds the initial assessment, monitoring equipment, software, and training for the continuous optimization process. To participate, the facility manager must commit to completing any recommendations with a 2-year payback or less. There is no obligation for recommendations with longer payback periods.

[9] To be eligible for the BC Hydro continuous program, major capital improvements must be completed.

Action 2: Require an evaluation of energy efficiency opportunities for all new facilities, major capital projects, and existing facilities.

Action Type: Policy

The BC building code has been recently updated (September 2009) to require greater energy efficiency in new construction, and further improvements to code requirements may occur over the next few years. Developments in technologies and building practices allow for the construction of buildings that are more energy efficient. Additionally, replacing end of service life equipment provides opportunities to invest in newer technologies that may be more efficient. Maximizing operating energy efficiency reduces energy costs over the lifetime of the building, and minimizing GHG emissions reduces the carbon liabilities that the Regional District may be responsible for on an annual basis.

Business case development for major renovation and construction projects should include a demonstration of the life cycle cost benefits[10] or triple-bottom analysis[11]. When appropriate, consider payback periods to 10 or 20 years when evaluating energy efficiency measures over the lifetime of the building.

Key projects for consideration may be installing air to air heat recovery systems and any other future projects at the Comox Valley Aquatic Centre and Comox Valley Sports Centre, and the planned Hornby Island fire hall.[12]

Recommendations:

- Strive within all major capital projects to include an evaluation of the opportunities to maximize energy efficiency and minimize GHG emissions.

Should the Regional District wish to pursue projects incorporating broader elements of green buildings, third-party rating systems such as LEED (Leadership in Energy and Environmental Design)[13,14] or GreenGlobes[15] may be evaluated to determine whether the public recognition and profile of building to such standards are aligned with the Regional District's objectives for each project.

[10] Life Cycle Costing considers the total capital and operating costs over the lifetime of the purchase. For example, a more expensive pump that uses less energy than conventional pumps may save more money over its lifetime.

[11] Triple Bottom Line (TBL) methodologies consider how an initiative meets economic, environmental, and social objectives in an integrated evaluation. For example, an energy efficient ventilation system may reduce energy consumption, reducing infrastructure costs and GHG emissions, while also improving indoor air quality and occupant comfort.

[12] The Comox Valley Sustainability Strategy identifies a target of reducing energy and water use by 25% - 30% from 2008 levels in 50% of all existing local government buildings by 2020, and 100% of existing buildings by 2030.

[13] The Comox Valley Sustainability Strategy identifies a target of having all new local government buildings over 500 m^2 meeting LEED Silver standards for building performance by 2015, and LEED Gold standards by 2020.

[14] The Province of BC, through the BC Energy Plan, is considering a requirement that all new provincially owned or funded buildings (with over 600m^2 of non-residential floor space) must be LEED Gold certified.

[15] Green Globes website: http://www.greenglobes.com/about.asp

Action 3: Require an evaluation of alternative energy sources for new construction, major renovations and existing facilities.

Action Type: Policy

New construction, the replacement of equipment at the end of its service life, and major renovations represent key opportunities to incorporate alternative energy systems at the lowest possible cost. This action specifically focuses on alternative energy systems such as:

- Solar hot water
- Heat recovery from refrigeration and other waste heat sources (e.g. ice chillers, infrastructure, waste water systems)
- Geo-exchange – using heat pumps and water circulated through an earth pump system to drive heating or cooling systems
- Heat recovery from neighbouring facilities
- District energy opportunities: may be potential in the long-term if future development is concentrated near a "hub" of community facilities.

This would include a technical and financial evaluation of potential alternative energy sources for space and hot water heating. The assessment should account for both the capital and operational costs over an extended period (life cycle costing) as alternative energy systems may require higher up-front capital costs, but reduce operating costs (including fuel costs) over the lifetime of the building. When appropriate, consider payback periods to 10 or 20 years when evaluating alternative energy options over the lifetime of the building.

Key candidates worthy of consideration may be future projects at the Comox Valley Sports Centre and the Comox Valley Aquatic Centre, and the planned Hornby Island fire hall. Costs for a study vary depending on the scope (e.g. scoping, pre-feasibility, business case). A simple walk through audit (also called an "opportunities assessment") would be a couple thousand dollars.[16] A detailed energy audit for a major facility would cost in the range of $10,000 to $20,000.

Recommendations:

- Include an evaluation of the opportunities to utilize alternative energy sources all new construction, major equipment replacement, and major renovations.[17]

[16] BC Hydro and Terasen may provide funding for opportunities assessments.

[17] The successful implementation of alternative energy projects in local government facilities is aligned with the Comox Valley Sustainability Strategy objective of promoting on-site renewable energy systems.

3.5 Fleet

Proportion of corporate GHG emissions from fleet in 2009:	20 %
2009 GHG emissions from fleet (tonnes CO_2e):	490
Target Reductions::	15 %

Action 4: Initiate fleet management activities

Action Type: Direct / Policy

The corporate fleet consists of 54 vehicles, most of which are distributed throughout the Regional District's fire departments. Where appropriate, the Regional District will implement sustainable fleet management activities in the following areas:

Vehicle "right-sizing" and life-cycle costing

- Conduct periodic reviews of fleet requirements, including fire protection service vehicles, to guide the purchase of appropriate vehicles for the required usages. This will identify opportunities to replace underutilized vehicles with more appropriate vehicle types. In 1998, the City of Victoria undertook efforts to improve the efficiency of its fleet and reduce GHG emissions. In the first two years the City reduced the overall size of its fleet by 10% each year, then continued to improve efficiency through right-sizing, developing standardized vehicle specifications, and several other actions[18].
- Evaluate:
  - Anticipated usage requirements (e.g. average load capacity, average passenger capacity, average operational terrain).
  - Life cycle considerations such as residual costs/values of vehicle being replaced and anticipated capital/maintenance/fuel costs.

Utilization Management

- Ensure that staff use appropriate vehicles for respective tasks and trips. Tracking trip details such as objectives and destinations when vehicles are signed out encourages staff to think about their vehicle selections and provides data to inform future vehicle purchasing decisions

Fuel Data Management

- Consistent compilation of comprehensive fuel data allows for thorough analysis of energy and GHG costs while facilitating accurate applications for CARIP carbon tax rebates. Data for Regional District funded fuel consumption used for Fire Department vehicles should be included to maximize the rebate the Regional District is entitled to.

[18] http://www.victoria.ca/cityhall/pdfs/engrng_envrnm_inttvs_fleet.pdf

Trip and Route Planning	• Reduce energy and maintenance costs by reducing excess vehicle usage resulting from inefficient travel. Good route planning, trip consolidation and car-pooling are examples of strategies that should be promoted. Trip reduction strategies such as coordinating work scheduling and video / phone conferencing can be encouraged to minimize unnecessary travel.
Training and Awareness	• Staff education for driving techniques that maximize fuel efficiency can have significant impacts on fuel and maintenance costs. Simple measures such as checking tire pressure before trips and ensuring that vehicles are regularly maintained can save fuel and prolong the lifespan of fleet vehicles.
Operations and Maintenance	• Ensuring regular comprehensive maintenance of fleet vehicles maximizes their operating fuel efficiency and prolongs their operating lifespan.
Idling Reduction	• Adopt and enforce formal anti-idling policies that are supported with vehicle operator education and promotion through outreach and signage in vehicles. Such a policy may read as follows: *All fleet vehicle operators will not idle for more than 30 seconds after starting the vehicle once the windows are clear, and should be encouraged to turn off the vehicle if stopped for more than 10 seconds unless the vehicle is:* • *In traffic,* • *In the course of performing a specific duty that requires the vehicle to be left running,* • *If the temperature is below 10°C, or* • *If doing so would compromise human safety or the mechanical integrity of the vehicle.* • Activities to support the idling reduction policy include education with reminders to staff. Other supporting materials may include: • Bumper Stickers: vehicles can be labelled with rear facing bumper stickers indicating to the public the Regional District's commitment to reducing vehicle idling. • Pay slip inserts: key messages for idling reduction. • Reminder to Managers: communicate messages to staff.

The E3 Fleet Management Program provides a comprehensive framework with which to evaluate, monitor and manage corporate vehicle fleets. While it may not be cost-effective to evaluate the Regional District's limited and widely distributed fleet through E3's fleet rating and management

planning services, the program offers resources and support for independently managed green fleet activities.[19]

Consulting with staff about their vehicle needs and usage behaviours is often helpful for informing fleet management activities, and the outreach assists with changing behaviours. This can be accomplished through workshop style meetings with different departments where staff can provide input and ideas, and also be informed about changes in policies and practices.

Recommendations:

- Commit to a program of fleet management activities to reduce fuel use and emissions from fleet vehicles.

[19] Fees for E3 membership and programs may cost up to $10,000 for the CVRD's fleet. www.e3fleet.com

3.6 Infrastructure

Proportion of corporate GHG emissions from infrastructure in 2009:	9 %
2009 GHG emissions from infrastructure (tonnes CO_2e):	**225**
Target Reductions::	5%

Action 5: Investigate opportunities to generate offset credits from landfill

Action Type: Direct

Under provincial legislation, the Comox Valley Waste Management Centre is required to capture landfill gas by 2016. It is currently expected that installation of a landfill gas capture system in advance of the regulatory requirement would be eligible to generate carbon offset credits.

The Regional District should evaluate available options for the installation of a landfill gas capture system prior to 2016 and processes for managing potential carbon offset credits.[20] Models may include partnerships with third party offset aggregators, or the Regional District may consider handling such a project in-house. The captured gas can be used to generate heat or power[21] for nearby facilities, potentially displacing the usage of natural gas and reducing community-wide emissions accordingly.

Recommendations:

- Investigate the potential to generate offsets credits from the Comox Valley Waste Management Centre, in consultation with the Province of BC, the Pacific Carbon Trust, and/or private sector offset developers.

[20] A landfill gas capture system at the Comox Valley Waste Management Centre would be aligned with the Comox Valley Sustainability Strategy objective of harnessing energy from waste sources in the community.

[21] Current economic evaluations indicate that large amounts of landfill gas are typically needed for viability of electricity generating projects.

Action 6: Investigate opportunities for energy conservation and alternative energy generation from infrastructure systems

Action Type: Direct / Policy

Although operation of the infrastructure systems generates a relatively small percentage of the CVRD's overall GHG emissions, it comprises a more significant portion of the total energy use. There are two key strategies that can be employed to conserve energy in infrastructure systems:

- optimization of system design and controls (e.g. variable speed drives on pumps and fans, soft starts and capacitors for motors), and
- demand management (e.g. water conservation).

There may also be potential opportunities for heat recovery from wastewater treatment effluent streams and from the compost processing of wastewater treatment solid wastes. This recovered heat may be used on-site or to service facilities in the immediate vicinity of the waste water treatment plant or the composting facility, displacing the usage of other purchased or more carbon intensive energy sources and reducing emissions accordingly. Projects such as the one supplying hot water to the Panorama Recreation Centre in the Capital Regional District using recovered heat from the Saanich Peninsula Waste Water Treatment Plant may provide guidance for opportunities in the Regional District.

The Regional District should evaluate the potential for in-stream electrical generation in gravity fed water systems. The power generated by the installation of micro-turbines may offset electricity used by the Regional District's current and future water systems. Other communities operating similar projects include Lake Country and the District of North Vancouver.

Recommendations:

- Identify opportunities to conserve energy through design, controls and demand management
- Investigate the potential for alternative energy generation from existing and future infrastructure systems

3.7 Leadership and Engagement

Action 7: Develop an energy efficiency purchasing policy

Action Type: Policy / Catalyst

Adopting an energy efficiency purchasing policy enables an organization to consistently consider energy use/GHG emission criteria in addition to financial and quality criteria when making a purchase. Organizations may define various types of criteria which may include: recycled content, energy ratings, product lifespan, presence of toxic materials, packaging, etc. Agencies that have undertaken this initiative include Metro Vancouver and the City of Richmond. There is now a BuySmart Network that has been developed by the Fraser Basin Council to provide support for organizations pursuing these efforts. [22]

The purchasing policy may include:

- Guidelines for selecting appropriate fleet vehicles ("right-sizing"),
- Listing labelling programs to look for (e.g. Energy Star, Environmental Choice),
- Requiring recycled content in paper purchases,
- Setting vehicle standards for contractors,
- Requiring reporting of energy consumption and greenhouse gases for contracted services included in the Climate Action Charter, and
- Including energy conservation targets in facility management contracts and possibly providing incentives or requirements for conservation.

The emissions associated with the delivery of core Regional District services, whether or not they are delivered by CVRD staff, must be captured in the CVRD emissions inventory. To enable the Regional District to capture and monitor the emissions associated with contracted delivery of services; the CVRD will need to include emission tracking requirements in all contracts with private sector service providers renewed after January 1, 2012. It is recommended that the Regional District review its purchasing processes and consult with contracted service providers about emissions reporting in advance of the 2012 deadline. It is expected that the Province will provide some guidance in this area during 2010 and 2011.

Recommendations:

- Develop a procurement policy that considers energy and GHG emissions.

[22] The Sustainability Purchasing Network website provides several tools and examples: http://www.buysmartbc.com/spn-resources/tools.html. The City of Richmond's policy is available at: http://www.buysmartbc.com/UserFiles/File/SPN%20Tendering%20Toolkit-Sample%20Policy%20City%20of%20Richmond.pdf

Action 8: Encourage and recognize energy efficient efforts in the workplace

Action Type: Catalyst

The staff that operate facilities and equipment have the best understanding of the needs and requirements and are frequently the best able to conceive ideas for new efficiencies. This action commits the CVRD to actively pursue these ideas for new efficiencies from staff. Activities might include:

- Promotions within staff to capture ideas and opportunities.
- Recognition at the management and board level for staff that develop and implement conservation activities.
- Periodic updates to this action list.
- Distribution of information about the successes of the plan to highlight staff contribution.

In small organizations, this type of activity frequently occurs informally. This action is intended to formalize and elevate the prominence of this activity to develop a sense of responsibility in staff to use energy efficiently and effectively in their daily responsibilities. The Regional District will develop an outreach program aimed at changing behaviours and actions in the workplace to favour energy efficiency and conservation.

Developing a staff outreach program that fosters a culture of energy conservation can focus on a number of initial strategies to encourage energy efficient behaviours such as reducing paper use, installing workstation controls that shut down systems after a certain amount of time, participating in public initiatives like Earth Hour, and procuring sustainable or energy efficient products. The program does not need to be an onerous task for staff. Instead, simple tools such as stickers and email prompts reminding staff to shut down workstations and stop idling vehicles, and easy-to-organize activities such as monthly staff lunch and learns about energy efficiency technologies and practices, could form the basis of a corporate outreach program. These activities will support new staff responsibilities for reducing energy consumption in all departments.

Recommendations:

- Develop a strategy to engage staff in energy conservation behaviours in the workplace.

4 Next Steps for Implementation

4.1 Implementation Activities

A number of activities will be executed by RD staff to implement this plan. These include:

Implementation Activity A: Identify Staff Member as the Owner of the Plan

The Comox Valley Regional District will identify a specific Program Owner responsible for coordinating the initiatives recommended in this Plan. The designated permanent staff person will take ownership of the Plan and will coordinate with staff in each department charged with specific actions to support progress toward reduction targets. These responsibilities may be tied into the mandate of the Energy Manager if the Regional District decides to create such a position.

Recommendations:

- Assign a staff member the responsibilities of a Program Owner, and ensure that position has sufficient support structures and resources to effectively coordinate the implementation of the Plan.

Implementation Activity B: Support an Energy Manager

Action Type: Direct / Catalyst

BC Hydro's PowerSmart program offers support to local governments for 50% of an Energy Manager's salary for communities that may have sufficient savings potentials. A number of communities have participated in BC Hydro funding program to energy managers, including Richmond, Surrey, North Vancouver, Saanich, the Regional District of Nanaimo.

Given the size of the communities in the Comox Valley Regional District, the Regional District may consider participating in this program collaboratively with its member municipalities. The Regional District may also participate in partnership with the School District, potentially increasing this support up to 100%. As public sector organizations, School Districts have legislative requirements under the Greenhouse Gas Reductions Target Act (GHGRTA) to be carbon neutral in their operations by 2010. The District of Mission is currently sharing an Energy Manager with School District No. 75.

The Energy Manager will play a key role in implementing the Corporate Energy Action Plan, and in partnership with BC Hydro and potentially with neighbouring communities, will assist in advancing energy reduction and climate action in the community more broadly.[23]

Recommendations:

- Identify opportunities to provide support for an Energy Manager.

Implementation Activity C: Create a fund to support energy efficiency projects

The Regional District will explore opportunities to create a dedicated fund for energy management activities.

One model may be to create a fund that collects the savings from energy efficiency projects to provide a dedicated funding source for future energy management initiatives. Combining energy savings across department into a single fund would provide a larger pool of resources that can fund future initiatives. It also provides the opportunity for the Regional District to assess which initiatives will provide the greatest reductions from a holistic point of view, and facilitates the exploration of interdepartmental solutions.

Alternatively, the Regional District may commit to assign the money received from the Province's CARIP (Carbon Action Revenue Program) grant to a reserve fund used for the evaluation and implementation of energy and emissions reduction activities. The CARIP grant is provided to all communities that sign the climate action charter and is equivalent to the amount of carbon tax paid by the signatory local government. The carbon tax was initiated at $10 per tonne of emissions beginning in 2009, and will increase 5% each July 1. By July 1, 2012, the tax will be $30 per tonne and the Comox Valley Regional District's total grant may be about $ 59,800 annually.

The Regional District may choose from one or any combinations of funding mechanisms as appropriate.

Recommendations:

- Develop an operating budget or reserve fund specifically dedicated for energy efficiency activities within its corporate operations. Consider dedicated the CARIP grant directly to this fund.

[23] Several local governments and public agencies throughout BC currently employ Energy Managers, including School District #71, City of Richmond, City of North Vancouver, City of Fort St John.

Implementation Activity D: Develop relationships with potential program partners

Developing partnerships provide opportunities to embark on projects that have benefits for multiple users. For example, the Regional District may pursue a partnership with the School District (No. 71) to hire a BC Hydro funded Energy Manager that will jointly manage facility energy and emissions in the Regional District. The District of Mission is currently sharing an Energy Manager with School District No. 75. This partnership will advance energy efficiency and conservation initiatives in their respective buildings, providing benefits to each organization and helping them to meet their respective legislative obligations and voluntary commitments to carbon neutrality. Local governments and provincial institutions that have to fulfill provincial legislative obligations should also be considered likely partners for the Regional District.

Potential partners may include, but not necessarily be limited to:

- Member municipalities - City of Courtenay, Town of Comox, Village of Cumberland
- Utility providers - BC Hydro, Terasen Gas
- School District No. 71 (Comox Valley)
- St. Joseph's General Hospital and the Vancouver Island Health Authority
- Canadian Forces Base Comox
- North Island College
- K'ómoks First Nation
- Non-profit organizations
- Members of the business community

These partnerships may serve to strengthen local support when consideration turns to future community energy projects, such as renewable and district energy systems.

Recommendations:

- The Regional District will actively seek to build partnerships in the community to engage and encourage leadership in energy conservation and climate action.

Implementation Activity E: Report on progress

The tracking of energy consumption data from fuel and utility bills can be accomplished through the Regional District's financial systems, and this data should be provided to facility and fleet managers to enable better energy management.

Tracking energy consumption data is important in identifying components of corporate operations that are not operating as efficiently as expected. Collecting consumption data in conjunction with financial data allows for energy consumption reports to be generated with financial reports. This may require the addition of specific fields to existing financial systems to accommodate the following information from fuel and utility providers:

- kWh or GJ consumption of electricity
- GJ consumption of natural gas
- litre (L) consumption of vehicles fuels (gasoline and diesel)

Staff will provide an annual emissions management report to the Board, including a review of all utility accounts to identify areas of concern, comparisons of current energy use to records from previous years, and documentation of energy reduction initiatives completed each year. Please refer to the proposed annual reporting requirements (section 0) for further detail.

Recommendations:

- Evaluate the capacity of current systems to comprehensively track corporate energy use and GHG emissions.
- Develop additional systems (where necessary) to allow for ongoing monitoring and reporting of energy consumption and GHG emissions.
- Report on the Regional District's energy usage and carbon footprint at least on an annual basis, including a brief discussion of energy management and GHG reduction activities undertaken.

4.2 GHG Emission Reduction Target

It is recommended the Comox Valley Regional District implement the measures identified in this Plan over the next five years in order to attain a reduction of **10% below 2009 levels by the end of 2015.** Table 6 provides a summary of estimated potential reductions by operational sector.

Table 6: Estimated Carbon Reductions by Activity Area

Policy Initiatives & Actions	Estimated GHG Emissions (2009)	Proposed Reduction (%)	Reduction (in tonnes)
General Building	30	10%	3
Recreation & Community Centers	1697	10%	170
Fire Halls	1	10%	0.1
Infrastructure	225	5 %	10
Fleet	489	15%	73
Total	**2,442**	Approx **10%**	**250**

The majority of these GHG emission reductions are achievable through ongoing fleet management activities (Actions 4 and 5) and by taking action on some of the more easily implemented measures (i.e. quick wins) identified through recommissioning of the large recreation facilities (Action 1). A 10% reduction in energy consumption in the Comox Valley Sports Centre and Aquatic Centre could result in reductions of approximately 9% in the overall buildings sector. The initiatives for infrastructure involve offsets and alternative energy generation opportunities, and are not focused on reducing energy or emissions.

4.3 Purchasing Carbon Offsets

In order to achieve carbon neutrality in 2015, the Comox Valley Regional District will need to purchase carbon offsets for any GHG emissions remaining after undertaking reduction activities. Although the current Climate Action Charter guidelines allow the purchase of credits from sources other than the Pacific Carbon Trust (PCT), the quality of the offsets purchased should be equivalent or higher than the standards expected to be set by the Province in the near future. Based on 2009 emission levels and an estimated offset cost of $25 per tonne, the Regional District will need to spend approximately $61,000 to purchase offsets (note: this may change if reduction measures are effective in reducing emissions by the end of 2012).

4.4 Resource Requirements and Funding

In order to carry out the recommended reduction measures identified in this plan, the Regional District will need to establish energy management as part of staff roles (see Action 10). The types of energy management tasks that will need to be carried out include:

- Contracting services to retrofit buildings
- Promoting energy efficiency among staff
- Developing policies (energy efficient building, using alternative energy, purchasing)
- Conducting lifecycle costing for efficient / alternative technologies
- Evaluating appropriate vehicles
- Coordinating staff training for fuel efficient driving
- Communicating with partners in the region (e.g., School District, member municipalities, etc)

The expected effort required to undertake the recommended actions are summarized in Table 7. These are estimates expressed in hours of staff time for one time actions, Person years (PY) of staff time for actions with ongoing effort, and / or estimated program or study costs.

Table 7: Implementation requirements for the Corporate Energy Action Plan

Task	Implementation Requirements	Estimated Resource Requirements
Conduct recommissioning assessments of large recreational facilities	Outreach to BC Hydro and review program requirements. Assign staff responsibilities for maintaining operational optimization.	0.1 Person Years for initial assessment period. Further details for resource requirements will be developed with BC Hydro.
Require an evaluation of energy efficiency for all new facilities and major capital projects	Staff evaluation of energy efficiency opportunities in planning / design of capital projects.	0.1 Person Years. May vary depending on the number and nature of projects.
Require an evaluation of alternative energy sources for new construction and major renovations	Staff evaluation of alternative energy opportunities in planning / design of capital projects.	0.1 Person Years. May vary depending on the number and nature of projects. E3 program fees for current fleet size would be $10,000 – this may change depending on future changes to fleet size.
Initiate fleet management activities	Coordination of initiatives, monitoring of fuel data, staff education / outreach.	0.2 Person Years for current fleet – may increase as fleet expands. This includes time for staff outreach: 30 – 60 minutes per applicable department
Reduce idling	Preparation of supporting materials, staff education / outreach.	20 hours for initial material design / production. Staff outreach: 30 – 60 minutes per applicable department
Investigate opportunities to generate offset credits from landfill	Coordinate evaluation of: • Potential capacity for energy / offsets • Potential development partners • Technical & financial design / analysis	$50,000 for initial pre-feasibility study. Ongoing staff requirements may vary depending on the nature of projects.

Task	Implementation Requirements	Estimated Resource Requirements
Investigate opportunities for alternative energy generation from infrastructure systems	Coordinate evaluation of: • Potential energy capacity • Potential development partners • Technical & financial design / analysis	$50,000 for initial pre-feasibility study. Ongoing staff requirements may vary depending on the nature of projects.
Develop an energy efficiency purchasing policy	Review of current policy and available examples of best practices Staff education / outreach	40 hours for initial policy development and Senior Staff consultation. Staff outreach: 30 – 60 minutes per applicable department
Encourage and recognize energy efficient efforts in the workplace	Regular staff education / outreach	0.1 Person Years. Staff outreach: 30 – 60 minutes per department on a regular basis
Identify Staff Member as the Owner of the Plan	Review staff responsibilities and capacities to identify suitable Plan "owner". Assign responsibilities to support Plan "owner".	0.2 Person Years for Plan "owner". 0.1 Person Years per department for supporting regular Plan activities.
Explore options to support an Energy Manager	Outreach to partner organizations.	0.2 Person Years distributed across staff with responsibilities to support Energy Manager.
Create a fund to support energy efficiency projects	Review of existing funding mechanisms. Periodic consultation with senior staff.	40 hours for initial review / development of funding mechanisms. Periodic review of funding needs and opportunities: 30 – 60 minutes per department on a regular basis
Develop relationships with potential program partners	Outreach to partner organizations	0.1 Person Years
Report on progress	Review existing financial reporting mechanisms to identify opportunities to integrate energy and emissions reporting. Develop additional reporting tools as needed. Regular monitoring and dissemination of energy and emissions data to departmental staff. Compilation of annual energy and emissions report to Council	80 hours for initial review / development of reporting mechanisms. 0.3 Person Years distributed across staff involved with energy and emissions reporting.

Funding to support Plan implementation may come from a variety of sources, some of which are outlined below in Table 8.

Table 8: Sample funding programs to support the Corporate Energy Action Plan[24]

Program	Key Features
Climate Action Revenue Incentive Program (CARIP)	This provincial initiative will reimburse communities that have signed on to the Climate Action Charter. (Note emissions associated with electricity purchases do not pay carbon tax or receive the CARIP rebate, but must still be neutralized through offsets). There is interest amongst Regional District staff in designating CARIP funding for ongoing Plan implementation. Staff discussed opportunities to foster collective thinking and action. One possibility to be investigated further was to create a fund to which departments could apply to support the implementation of energy efficiency measures.
BC Hydro Power Smart	BC Hydro provides funding to support a number of energy efficiency and conservation measures, including some that the Regional District is already taking advantage of (e.g. Energy Manager, Energy Management Assessment, Adaptive Street Lighting). Additional Power Smart programs exist to support: •Energy studies (audits, continuous optimization) •Implementation of energy saving measures identified in audits (given a threshold level of savings can be achieved) •Retrofits (e.g., lighting, arenas, etc) •New construction •Product incentives •Employee awareness / behaviour change workshops
FCM Green Municipal Fund	Grants and loans available to support plans, feasibility studies, field tests and capital projects that reduce energy and GHG emissions. Applications for capital projects undergo a competitive process with RFPs launched annually in various sectors (i.e. brown fields, energy, transportation, waste and water)
Community Works Fund	This funding represents a portion of the transfer of Federal Gas Tax revenue under the New Deal for Cities and Communities. Local governments in British Columbia will receive this benefit through 2010, and projects that are eligible include capacity building projects and environmentally sustainable municipal infrastructure projects.

[24] In addition to funding to support corporate action, several entities (including BC Hydro and the FCM Green Municipal Fund) support actions to reduce energy and emissions at the community level. For example, BC Hydro and FCM both provide 50% funding for a Community Energy Plans (also known as Community Energy and Emissions Plans, PCP Local Action Plans, Climate Action Plans, GHG Management Plans, etc)

4.5 Monitoring and Reporting

Through the development of this Plan, the Regional District has compiled baseline quantitative data on corporate energy use for facilities, infrastructure, and fleet vehicles. With the baseline corporate inventory now complete, the Regional District has a clearer understanding of inventory data requirements and the processes necessary for ongoing energy and emissions monitoring. These data collection processes should be formalized, with responsibility tasked to appropriate staff persons to ensure ease of reporting on Plan implementation.

Reporting should be streamlined with existing Regional District reporting in order to minimize burden on staff. It is recommended that the corporate inventory be updated annually. In addition to the inventory, staff could provide a brief update on progress with implementation (qualitative information on how implementation is going, including challenges and opportunities and recommended next steps) that may be integrated with existing reporting mechanisms.

Plan activities require monitoring and reporting as shown in Table 9. Key activities are compiling an annual inventory (to enable purchase of offsets) and reporting progress to the Board.

Table 9: Monitoring and Reporting Requirements

Activity	Scope and Timing
Update Inventory	Annually. Utility data is typically available by March for the previous calendar year. Offset purchases will likely be required by June 30. Anticipate updating inventory in April and May.
Report to Board	Report to the Board annually. Content to include: actions executed in previous calendar year, inventory, carbon offset requirements, and actions anticipated for coming year.
Communications to Staff	As need, defined by project activities and promotional events.

Every two to three years, staff should conduct a more comprehensive review of Plan implementation, changing and adding measures as necessary. In this way, the Plan becomes a living document that that is useful for both ongoing energy and GHG management as well as longer-term planning.

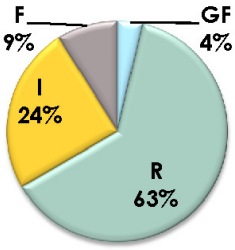
5 Corporate Inventory Dashboard

Corporate Operations Energy and Greenhouse Gas Emissions Inventory

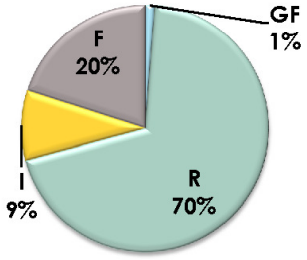
CVRD Dashboard Summary: 2009 Year

Comox Valley REGIONAL DISTRICT

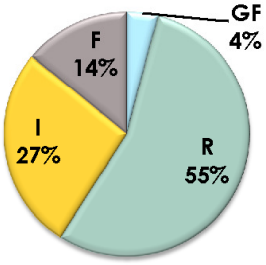
Energy = 76,735 GJ



GHG = 2,442 tonnes CO2e



Energy Spending (Approx) = $1,301,000



F = Fleets, GF = General Facilities,
R = Recreation Centres, I = Infrastructure

Operations Profile	
General Buildings	16
Community and Recreational Facilities	4
Fire Halls	4
Vehicle Fleet & Equipment	54
Electricity Accounts	101
Natural Gas, Propane Accounts	6, 1

Carbon Costs and Rebates	
Estimated cost of offsets in 2012 based on 2009 emissions:	**$61,000**
Approximate Carbon Tax paid for 2009:	**$27,200**
Estimated Carbon Tax paid in 2012 at current consumption:	**$59,800**

Energy and GHG Emissions by Fuel Type

Fuel Type	Energy Consumption	Energy Units	GHG Emissions (tonnes (CO2e)	Estimated Cost ($ / year)
Electricity	10,240,548	kWh	266	$716,840
Natural Gas	32,776	GJ	1,672	$393,320
Propane (facilities)	9,800	L	15	$7,840
Heating Oil	0	L	0	$0
Gasoline	53,000	L	126	$53,000
Diesel	130,000	L	363	$130,000
Propane (fleet)	0	L	0	$0
Biodiesel	0	L	0	$0
Total			**2,442**	**$1,301,000**

Top 5 Energy & GHG Contributing Facilities (ranked by by energy use)

Facility	Total Energy (GJ)	GHG Emissions (tonnes (CO2e)
Comox Valley Aquatic Centre	22921	939
Comox Valley Sports Centre Building 2	17807	484
Sewage Plant Admin & Blower Building	11419	172
Comox Valley Sports Centre Building 1	7475	274
20th St/Comox Rd Sewer Pump Station	1493	11
Total of These Facilities	**61,115**	**1,879**
Total Inventory	**76,735**	**2,442**

Version 1.0 Page 1