Regional District of Fraser-Fort George: Corporate Climate Change Action Plan

Final Report

May 29, 2009

Revised Nov 18, 2009

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Executive Summary

The Regional District of Fraser Fort George (Regional District) has developed a Corporate Climate Action Plan to reduce energy consumption and greenhouse gas (GHG) emissions from its Regional District operations. This energy plan is consistent with the Regional District's commitment to the Climate Action Charter (an agreement between the Province and signatory local governments), and supports the Province's goal of achieving a 33% reduction in emissions by 2020.

The Regional District's Carbon Footprint

The inventory has estimated the carbon footprint of the Regional District to be 1,020 tonnes of CO_2e for 2007. Actions identified in this plan have the potential to reduce emissions by at least 120 tonnes (12% of current emissions).

Targeting Reductions and Carbon Neutrality

To encourage full implementation and the development of new initiatives, it is proposed that the Regional District target to acheive:

Shorter-term:

- *Reduce Corporate GHG emissions by 15% from 2007 levels by 2012, and then explore opportunities to carbon neutrality by offsetting the remaining emissions with carbon offsets.*

Long-term:

- *Reduce Corporate GHG emissions by 50% from 2007 levels by 2020, and then explore opportunities to carbon neutrality by offsetting the remaining emissions with carbon offsets.*

Opportunities and Savings with District Facilities and Fleet Vehicles

From an assessment of Regional District facilities and fleet vehicles, it is estimated that there are significant opportunities for emissions reductions that translate into cost savings. For identified and estimated retrofits to existing facilities there are estimated savings of up to $34,000, and 94 tonnes of GHG emissions. Capital costs are estimated in the range of

$150,000 to $200,000. For fleet vehicles it is estimated that a 10% reduction is swiftly achievable which would equate to a reduction of 3,000 L of gasoline and 4500 L of diesel, thereby reducing emission by 20 tonnes.

Initiatives and Actions

The plan is structured around four major initiatives which are:

1. How we operate our Facilities
2. How we operate our Fleet
3. Our approach to Purchasing
4. Leadership and Staff Engagement

Within the four areas, a total of 18 actions are identified to be implemented, which are summarized below.

Implementation

Implementation will require a sustained effort over several years, and possibly an ongoing commitment of time and resources. Most activities can be implemented by existing staff in terms of skill requirements. It is important to note that implementation is challenging if existing staff attempt to do it within existing resources and it should be acknowledged that specific time, effort and budget needs to be dedicated to implement the action plan.

The entire list of 18 actions will take several years to initiate and implement. Opportunistic implementation should be embraced, meaning that as priorities in the community evolve the Regional District should pursue related actions.

Stable long term funding will be required to execute the actions. One option is that the Regional District could consider funding a community energy coordinator. This could be a partial or full time permanent or term position.

Summary of Actions

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Acronyms & Definitions

BuiltGreen™	A rating system for new detached dwelling construction developed by the BC and Alberta Home Builder Associations to rate and accredit new homes construction for green features.
CAEE	Community Action on Energy and Emissions. An initiative of the BC Ministry of Energy Mines and Petroleum resources.
CEP	Community Energy Plan
CO2	Carbon dioxide, the major greenhouse gas.
CO_2e	Carbon dioxide equivalents - a combined measure of the strength of all the GHGs.
DPA	Development Permit Area
DPG	Development Permit Guidelines
EnerGuide for Houses:	A rating system that evaluates the energy consumption of a home providing a score from 0 (poor performance) to a net zero energy home (score of 100). A score of 80 is considered a very efficient home.
Energy Star	An accreditation system for appliances and equipment identifying those products that meet high energy efficiency standards.
GHG	Greenhouse gas - the products of combustion that result in climate change.
IPCC	Intergovernmental Panel on Climate Change
LEED™	Leadership in Energy and Environmental Design. A rating system which rates and awards certification to buildings based on their green features, established by the US Green Building Council.
OCP	Official Community Plan
Regional District	Regional District of Fraser-Ft George
RGS	Regional Growth Strategy

1 Introduction

1.1 The Issue of Climate Change

There is increasing scientific consensus that the rising concentrations of carbon dioxide and other greenhouse gases (GHGs) in the atmosphere are the result of human activities – primarily from the combustion of fossil fuels – and are contributing to global climate change through the 'greenhouse effect'. These impacts are manifesting themselves in a range of ways including the increased severity and occurrence of precipitation events, sea level rise, changes in wind patterns, increased drought, flooding, heat waves, etc. These changes in climate are in turn affecting biological and physical systems, upon which we depend for our survival.

Recent conclusions of the 2007 Intergovernmental Panel on Climate Change (IPCC) on the climate change trends observed to-date are that the human-caused contribution to climate change is "more likely than not", and the expectation is that the human-caused impact in the future is "virtually certain".

Additionally, the UK government in 2005 commissioned an independent economics review called the "Stern Review", which assessed the potential economic impacts of climate change and the potential costs of stabilizing atmospheric carbon levels [1]. Among the conclusions were that climate change is expected to have serious negative impacts on global economic growth and development. The report does not deny that there are costs to reduce GHG emissions, however it states that the *"*costs of stabilizing the climate are significant but manageable; delay would be dangerous and much more costly*".* This is a significant conclusion highlighting that deferring action will be more costly than initiating action immediately.

Climate change is a global phenomenon, caused by the cumulative effect of the consumption of fossil fuels by the world's population. In response to this challenge, the reduction of GHG emissions will require a concerted global effort to conserve energy and reduce GHG emissions. No one individual or organization can make a difference to global GHG emissions; individuals and organizations must all act in concert, and all individuals and organizations must contribute to mitigate this challenge.

1.2 Provincial Action on Climate Change

The provincial government has been developing legislation and programs to reduce emissions. These actions are providing regional districts and municipalities with tools to reduce energy consumption and GHG emissions. Several of these key items are listed below:

[1] Full content of the Stern review available at www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change

Bill 44 (2007) Greenhouse Gas Reduction Targets Act establishes a province wide reduction of GHG emissions to a target of 33% below 2007 levels by 2020, and a reduction of 80% by 2050. Interim reductions targets were subsequently established as 8% by 2012 and 18% by 2016.

Provincial Climate Change Plan: Developed to support Bill 44, the plan's actions are estimated to achieve 73% of the reductions required to meet the reduction target. Most notable in this plan is the introduction of a carbon tax[2].

Bill 10 (2008) Housing Statutes Amendment Act (greening the building code): which includes more stringent requirements for energy and water efficiency in new buildings[3].

Bill 27 (2008) Local Government (Green Communities) Statutes Amendment Act which establishes that target must be established within Official Community Plans by 2010 and Regional Growth Strategies by May 2011. Among other things, Bill 27 allows local governments to exercise a range of powers not previously available to them including off-street parking flexibility, options to promote energy conservation in Development Permit Areas, and the potential to waive Development Cost Charges for residential units less than 29 square metres.[4] Typically a local government would have to create a bylaw to define how it plans to exercise these powers.

Community Action on Energy and Emissions (CAEE) is a funding program developed to encourage local governments to implement policy and planning changes that will result in lower energy and GHG emitted in communities.

The Community Energy and Emissions Inventory (CEEI) initiative provides communities with inventories of the community-wide emissions for each local government. This data collection, analysis and reporting system will provide local governments with inventory baselines, ongoing monitoring and periodic reports to help inform community decision making and support provincial objectives.

Pacific Carbon Trust: The Pacific Carbon Trust is a provincial Crown corporation set up by the British Columbia government to acquire credible greenhouse gas (GHG) offsets on its behalf and meet the government's target of a carbon-neutral public sector by 2010. Offsets represent emission reductions or removals through projects such as renewable energy generation, energy efficiency initiatives or tree planting.

The Climate Action Charter: (see next section)

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[2] The carbon tax starts at a rate based on $10 per tonne of associated carbon, or carbon-equivalent, emissions and will rise by $5 a year for the next four years — reaching $30 per tonne by 2012.

3 The Housing Statutes Amendment Act also has provisions for improved access to buildings by persons with disabilities, which is not directly relevant to the Corporate Energy Plan.

[4] The Green Communities Statutes Amendment Act also makes provisions for a range of other initiatives including but not limited to: waiving DCC costs for small lots, , money received for parking requirements that can be put in a reserve fund that provides off-street parking or transportation infrastructure that supports walking, bicycling, public transit or other forms of transportation.

1.3 The Climate Action Charter

At the 2007 annual conference of the Union of British Columbia Municipalities the Regional District of Fraser-Fort George committed to addressing climate change issues by signing onto the British Columbia Climate Action Charter. Charter obligations include being carbon neutral by 2012, measuring and reporting on the GHG emissions profile, and creating complete, compact and more energy efficient rural and urban communities. The charter commits the Regional District to develop strategies to reduce its energy consumption and GHG emissions to achieve carbon neutrality, with the remainder being made up by offsets.

What is an offset?
A carbon offset is a financial instrument aimed at a reduction in greenhouse gas emissions. Carbon offsets are measured in metric tons of carbon dioxide-equivalent (CO_2e) and may represent six primary categories of greenhouse gases. One carbon offset credit represents the reduction of one metric ton of carbon dioxide or its equivalent in other greenhouse gases.

Figure 1: Types of Greenhouse Gas and Common Sources

Symbol	Name	Common Sources
CO2	Carbon Dioxide	Fossil fuel combustion, forest clearing, cement production, etc.
CH4	Methane	Landfills, production and distribution of natural gas & petroleum, fermentation from the digestive system of livestock, rice cultivation, fossil fuel combustion, etc.
N2O	Nitrous Oxide	Fossil fuel combustion, fertilizers, nylon production, manure, etc.
HFC's	Hydrofluorocarbons	Refrigeration gases, aluminum smelting, semiconductor manufacturing, etc.
PFC's	Perfluorocarbons	Aluminum production, semiconductor industry, etc.
SF6	Sulfur Hexafluoride	Electrical transmissions and distribution systems, circuit breakers, magnesium production, etc.

Source: International Carbon Bank & Exchange

The Climate Action Charter has three commitments for signatories:

- Being carbon neutral in respect of their operations by 2012;
- Measuring and reporting on their community's GHG emissions profile (being accomplished by the Community Energy Emissions Initiative – CEEI of the Ministry of Environment); and
- Creating complete, compact, more energy efficient rural and urban communities.

As signatories to the Climate Action Charter, communities are currently eligible for a rebate of the carbon tax monies they have paid (called the Climate Action Rebate Incentive Program - CARIP). In March, 2009, the Regional District received a rebate $627 through CARIP. For this year, the amount was based on an estimate generated by the Province for reflecting the amount of carbon tax paid by the Regional District for July to December, 2008.

1.4 Objectives of the Regional District Corporate Energy Plan

The goal of the Corporate Climate Action Plan is to define activities for the Regional District to meet its commitments to the Climate Action Charter. Specific objectives include:

- Compiling an inventory of the Regional District's emissions;
- Conducting opportunities assessments of selected facilities; and
- Developing an action and implementation plan.

2 Context

2.1 Regional Districts

The *Community Charter* and *Local Government Act* (LGA) provide the legal framework for local governments to conduct their activities. This includes the provision for the delivery of Regional District services (water, waste, sewerage, police, and fire protection) as well as land use and regulatory activities (zoning, building permits and inspections, bylaw enforcement, etc.).

The Regional District of Fraser Fort George Board is governed by 14 directors consisting of seven directors appointed by four municipalities and seven electoral directors elected by voters in seven electoral areas. The Board is responsible for the activities of the Regional District, approves policy, and enacts relevant bylaw legislation.

Regional Districts were created in the 1960s in BC to fill a 'gap' between incorporated municipalities which provided services and collected taxes from residents, and the provincial government - which was at that time providing services to unincorporated areas through improvement districts, or by contract through regional districts. The purpose of this was to address issues such as uneven planning, urban fringe conflicts and 'free-rider' issues[5].

Regional districts have three basic roles. These are:

- Delivery of typical region-wide services like economic development, water supply, sewerage disposal, and solid waste management. These typically operate either as a wholesale provider (e.g. the CRD, or Metro Vancouver are wholesale providers of water and sewage systems to their member municipalities), or they operate services directly for rural customers in the region.

- A political and administrative framework for inter-regional district or sub-regional service partnerships through the creation of "benefiting areas" - or service areas. Any combination of regional districts and electoral areas can jointly decide to provide services and recover the costs from the beneficiaries. In the Regional District there are a total of 61 service areas primarily for fire protection and recreational facilities. The geographic boundaries of these service areas are different depending on the service.

- Provision of community planning and land use regulation in rural areas as well as building regulation and inspection, nuisance regulation, street lighting; house numbering, and bylaw enforcement.

[5] A summary primer on regional districts is available at www.cd.gov.bc.ca/lgd/gov_structure/library/Primer_on_Regional_Districts_in_BC.pdf

2.2 Services Provided

The Regional District typically provides services requested by its members, acting as a federation which pays collectively or individually for services received. Many services cover the entire Regional District such as 911 and solid waste management, while others are provided to a single community or group of communities, such as an arena or fire hall.

By law, only those areas that subscribe to a service offering are responsible for paying the cost of that service. This may have implications for energy management and conservation activities as rate payers from one portion of the Regional District cannot be required to pay for services (e.g. a building retrofit or upgrade) in another service area.

Core components of the Regional District operations include:

Buildings: The Regional District is currently responsible for 32 buildings in total within its boundaries. This building group is made up of nine community centres (including two arenas), 13 fire services facilities and eight civic buildings.

Fire Services: The Regional District operates 13 fire halls, complete with 14 tankers, 29 pumpers, and 9 other fire services vehicles. These buildings and vehicles are run and maintained by community volunteer firefighters, who report to a Regional District employee.

Solid Waste Management: The Regional District manages solid waste at 3 landfills – one on Foothills Boulevard in Prince George, the Mackenzie landfill and the Legrand landfill in the McBride area – and 19 waste transfer stations. Of these facilities, 2 landfills (Prince George and Mackenzie) and 5 transfer stations are staffed.

Infrastructure: Infrastructure services provided by the Regional District include street lighting, a water storage facility and water systems, and two sewer systems.

Fleet: The Regional District operates a fleet of 70 vehicles, including 18 assigned to specific departments, and 52 fire services vehicles. Each department is responsible for purchasing and maintaining their respective vehicles, and the operational requirements for each department's vehicles can be very different.

Purchasing: Purchasing at the Regional District includes purchasing of products and services that are required to continue the operation or delivery of services to Regional District residents.

2.3 The Regional District's Spheres of Influence

Understanding regional district and regional services helps to define the Regional District's responsibility for the Corporate Energy Plan. This can be viewed as the regional district spheres of influence (Figure 1). At the centre, the Regional District has direct control over its

own operations (buildings, the vehicle fleet, and some purchasing activities). The second sphere is the area of services where the Regional District has some control (e.g. water and sewer services consume energy but more or less in proportion to the amount of water consumed or sewage produced - which depends on the resident's behaviour). The Regional District can work to encourage behavioral change in these areas. Finally, the outer circle represents areas where the Regional District has no role or authority (utility services, energy markets, building codes etc), but there may be opportunities to develop partnerships with other agencies and organizations and show additional leadership.

The key message is that the activities in the inner circle are the core of the Regional District's Corporate Climate Action plan.

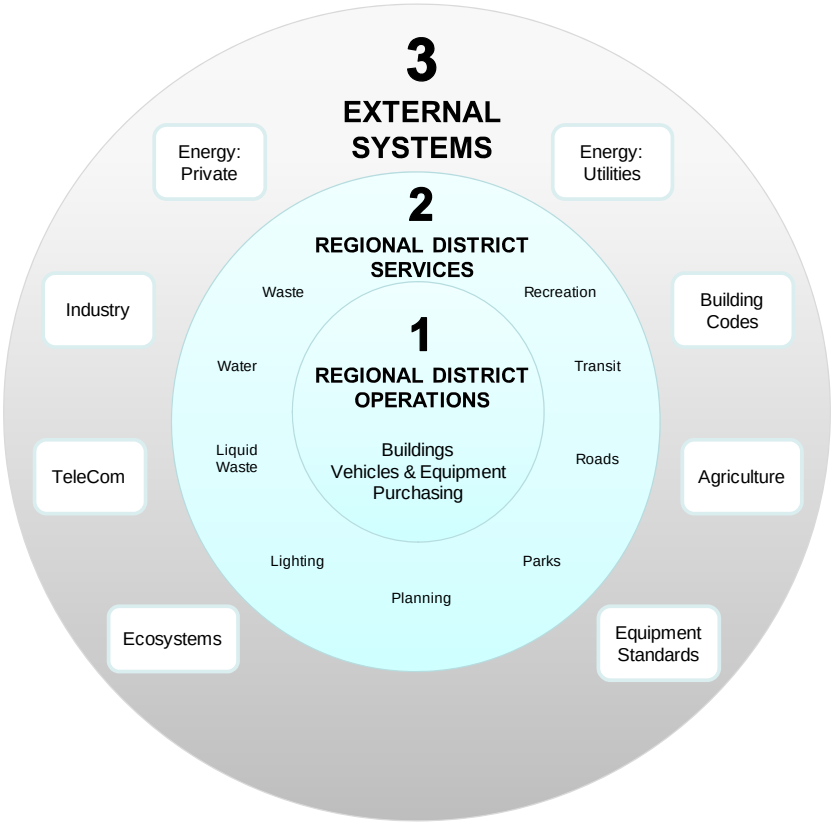

Figure 2: Regional District's Spheres of Influence

2.4 Challenges and Unique Features of the Regional District

The Regional District has a number of features which create unique challenges - and opportunities - for managing energy and GHG emissions. These are not unique to the Regional District but are common to many rural regional districts. These features are highlighted in Table 1.

Table 1: Features of the Regional District and Implications for the Corporate Energy Plan

Item	Implications for Corporate Energy and GHG Reductions
Service area	The Regional District has a large service area, so facilities are dispersed. Vehicles are not located at a centralized location.
Buildings	Age: Due to the age of many buildings, which have a variety of energy sources (e.g. propane, natural gas, electricity) there may be substantial 'low hanging fruit' opportunities to do relatively simple operational improvements of facilities without extensive retrofits.
	Limited staff time: buildings are managed by Regional District staff and volunteers. Therefore, there may be limited time and resources available for administering retrofit and optimizing operational efficiencies.
Fleet	Small number of fleet vehicles, each performing multiple tasks, and in varied locations and weather conditions. No common works yard for fueling and tracking. Large portion of fleet is fire-fighting vehicles. Preference to use smaller vehicles may be limited by performance requirements.
Scope of services	Regional District core facilities are mainly fire halls, local community centers, and include two ice arenas.
Tax base	Residents may have limited resources for high cost activities that must be funded through their service area tax base, according to the governance structure that has been established.

2.5 Actions Already Undertaken by the Regional District

Energy efficiency actions have been implemented by staff for either environmental or financial reasons or for operational ease. These include:

Fleet vehicles:

- The Regional District has purchased two Ford Escape Hybrids which will be operational shortly. Their intended use is for Building Inspection, replacing two Ford 150 trucks.

Buildings:

- The Regional District is currently investigating further heat capture at the McBride Arena
- The Regional District has asked that several items be included in proposals for the design and construction of the new Beaverly Fire Hall, including:
    - Increased insulation values in the walls and attic space
    - In floor radiant heat
    - A heat recovery ventilator (HRV)
    - Energy efficient windows
    - Energy Star appliances
    - High efficiency furnace
- The Regional District's Main Office was built in 1998, and has many energy efficient features including:
    - new roof-mounted chiller that operates when cooling the building is required
    - Triple-glazed windows
    - General operational mode of five days a week, from 7:00 to 5:30 p.m., after which the building powers down
    - Block heater plug-ins are controlled with a thermostat and do not activate unless the temperature is below -5 C, and will turn on and off at 15 minute intervals.
    - Computer controlled board room based on movement (e.g. when no one is in the board room heating/cooling is reduced)
    - Exterior lights with timers

There is on demand power supply for computers at the Regional District offices, meaning that when they are not in use, the power supply goes into a dormant mode until more power is

required. IT Services has also replaced old tube model (70-150W) monitors with more energy efficient LCD (25-50W) monitors.

Purchasing:

- The Regional District has a Purchasing Policy that supports green procurement that will give preference to environmentally superior products where quality, function and cost are equal or superior.

- The Purchasing Policy also requires that Products and packaging materials will contain post-consumer recycled content and will be minimized and/or substituted with more environmentally appropriate alternatives whenever possible.[6]

- The Regional District generally purchases Energy Star™ (energy efficient) equipment and appliances, although this action is not explicitly a requirement of the Purchasing Policy.

Staff engagement:

When Regional District staff require training they often participate online when the option is available, which minimizes travel emissions as well as cost. The Regional District also tries to bring trainers to the Regional District Office, as opposed to sending staff to a city centre in the Lower Mainland, particularly when more than one person requires training. This action is driven by cost savings but has the additional benefit of reducing emissions from travel.

[6] The Regional District's current purchasing policy supports the concept of 'Green Procurement' which it defines as giving preference to environmentally superior products where quality, function, and cost are equal or superior, and products must contain post-consumer recycled content. A new draft procurement policy has been submitted to Council, and is expected to be ratified by the Regional District Board shortly. The draft can be viewed at: http://agenda.rdffg.bc.ca/May09/rb050933.pdf.

3 Inventory and Buildings Review

3.1 Corporate Energy Consumption and Emissions

Corporate emissions are a result of the energy used and the solid waste generated during the construction, management and delivery of Regional District services and operation of facilities. Policy, planning and budgetary decisions to reduce corporate energy use are within the powers of the Board and staff.

Corporate energy consumption and emissions are those that local government creates through its activities (and which it has control over) such as Regional District building operations, recreation centres, vehicle fleets, and utility services.

Direct energy consumption and GHG emissions in the corporate inventory are derived from:

- Regional District buildings
- Water and sewage infrastructure
- Fleet vehicles and emergency fire vehicles

An energy and greenhouse gas (GHG) emissions inventory was developed for the Regional District as part of this plan. It is important to have a complete baseline in order to accurately determine what reductions must be made to meet the plan's long-term goals. The Regional District's GHG emissions can be broken down into three categories:

Table 2: Components of a Greenhouse Gas Inventory

Emissions Scope	Required for Charter	Description
Scope 1 Direct emissions	Yes	The consumption of natural gas and propane for the heating of civic facilities was the primary focus for direct emissions from Regional District owned and operated buildings. Information was collected from billing data from Regional District records. Fuel consumption for the Regional District's fleets was analyzed using a manifest of vehicles and their respective annual mileages which were determined by odometer readings.
Scope 2 Indirect emissions from purchased electricity	Yes	Electricity consumption for the Regional District was characterized using data obtained from BC Hydro based on a list of facilities and accounts that had been verified with Regional District staff.

Scope 3 Other indirect emissions	No	No Scope 3 emissions were included in the Regional District's inventory. There was insufficient data to quantify the amount of solid waste disposed from Regional District facilities, and thus the resulting emissions could not be determined.

Energy sources included in the inventory are electricity, natural gas and propane (for buildings), as well as gasoline and diesel fuel for the fleet. Consumption of each energy source results in the creation of greenhouse gases (GHGs).

Solid waste collected from Regional District facilities could not be determined as there are currently no systems in place to track the required data. GHG emissions from the disposal of solid waste (which are the result of subsequent decomposition in landfills) are not included in the Climate Action Charter commitments, and were not included in this inventory. What are included are figures for Solid Waste Management, which is the amount of emissions generated by the electricity used to manage these facilities.

Key findings for the 2007 year include:

Total energy consumption by District owned facilities and operations in 2007 was 28,690 GJ, which is comprised of:

- 3.38 million kWh of electricity;
- 7,890 GJ of natural gas;
- 233,700 L of propane;
- 30,000 L of gasoline (estimated); and
- 45,300 L of diesel (estimated).

Total GHG emissions applicable to the carbon neutrality commitment are estimated at **1,020 tonnes CO_2e in 2007**.

The inventory is shown as energy consumption by end-use in Figure 3, and as the associated GHG emissions in Figure 4.

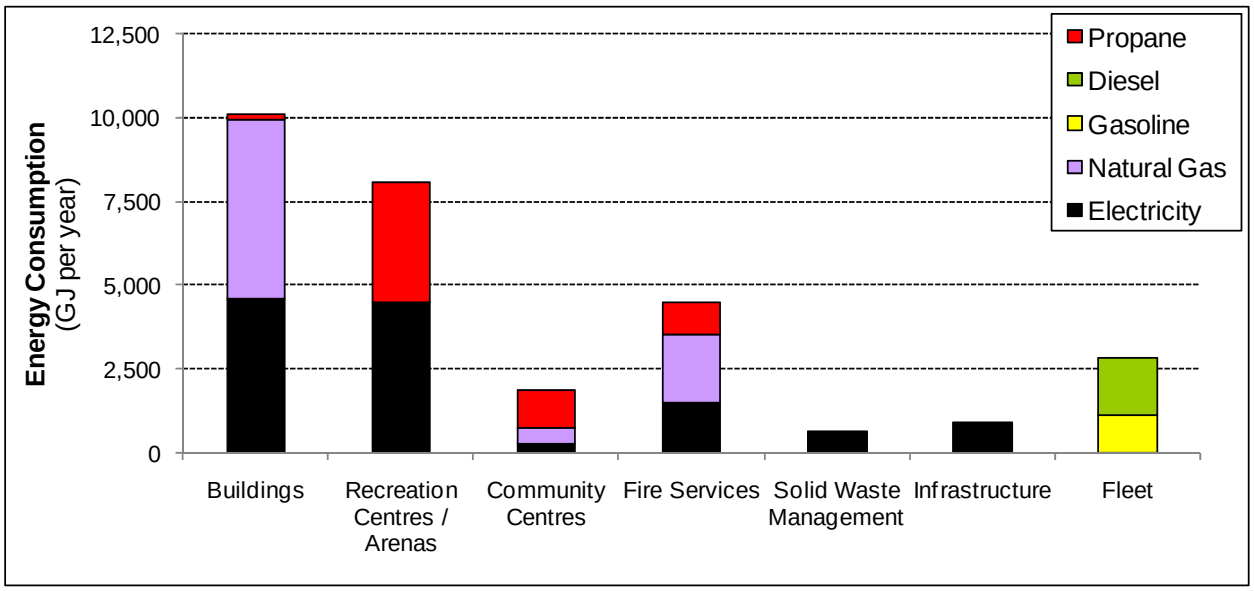

Figure 3: Regional District Operations Energy Consumption Profile (2007)

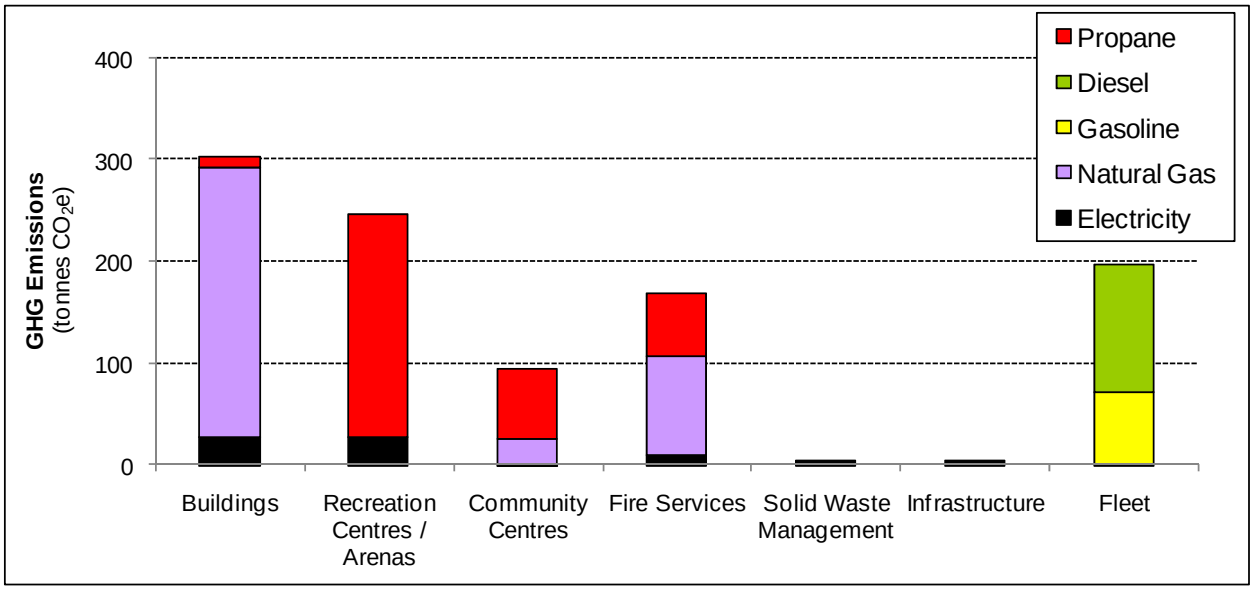

Figure 4: Regional District Operations GHG Emission Profile (2007)

Table 3. List of Regional District Buildings

Facility	Energy Assessment
General Buildings	
Bear Lake Maintenance Shop	-
Dome Creek Library (old school)	-
Dome Creek Library (out building)	-
Exploration Place (museum)	-
Regional District Main Office	Yes
Regional District Parks Building	Yes
Foothills Blvd Communications Site	-
911 Transmission Tower	-
Bear Lake Community Commission	-
Recreation Centres / Arenas	
Canoe Valley Recreation Centre - Valemont Arena	Yes
Robson Valley Recreation Centre - McBride Arena	Yes
Community Hall	
Bear Lake Community Hall	-
Bear Lake Ball Diamond	-
Ness Lake Community Hall	Yes
Ness Lake Ball Diamond	-
Nukko Lake Community Hall	Yes
Reid Lake Community Hall	Yes
Robson Valley Community Hall	Yes
Sinclair Mills Community Hall	-
Tete Jaune Community Hall	Yes
Park - Koeneman Rd	-
Fire Services	
Bear Lake Fire Hall	-
Beaverly Volunteer Fire Hall	-
Buckhorn Volunteer Fire Hall	-
Buckhorn Volunteer Fire Hall - Pump House	-
Ferndale-Tabor Volunteer Fire Hall	Yes
Hixon Volunteer Fire Hall	-
McBride Fire Hall	Yes
Ness Lake Fire Hall	Yes
Pilot Mountain Volunteer Fire Hall	Yes
Pineview Volunteer Fire Hall	-
Redrock Fire Hall / Stone Creek Pumphouse	-
Redrock / Stoner Fire Hall	-
Salmon Valley Volunteer Fire Hall	-
Shell-Glen Volunteer Fire Hall	-
Valemount Fire Hall	Yes
Solid Waste Management	
Foothills Blv - Kiosk	-
Landfill - Foothills Blvd	-
Landfill - Mackenzie	-
Transfer Station - Valemount	-
Transfer Station - Blackwater Rd	-
Transfer Station - Cummings Rd	-
Transfer Station - McBride	-
Transfer Station - Shelley Rd	-
Transfer Station - Otway Rd	-

3.2 Buildings Review

3.2.1 Assessed Buildings

Energy savings assessments - sometimes called "**Opportunities Assessments**" were conducted on a select group of Regional District buildings. An opportunities assessment is a visual inspection by an experienced building evaluator. The inspection includes a general inventory of the equipment and its condition and the operation of the facility. The reviewer identifies upgrades and operational efficiencies that could be implemented and estimates the approximate energy savings and capital cost based on their experience. [7]

Energy assessments were conducted on 14 out of the Regional District's total of 32 buildings. Facilities related to solid waste management (landfills and transfer stations) were not included in this review. The buildings assessed as part of this study are listed in Table 3.

Table 4 summarizes the number of buildings assessed of each type, and the approximate square footage that these buildings represent. As well, also shown are the number and square footage of the buildings that were not assessed.

NOTE: The complete buildings report was compiled as a separate document.

Table 4. Buildings Stock Summary

	Assessed		Un-assessed Total		Total	
Building Type	**Number of Buildings**	**Total Area (ft^2)**	**Number of Buildings**	**Total Area (ft^2)**	**Number of Buildings**	**Total Area (ft^2)**
General Buildings	2	29,500	8	33,800	10	63,200
Recreation Centres / Arenas	2	77,135	-	-	2	77,135
Community Halls	5	11,300	2	8,600	7	19,850
Fire Halls	5	23,100	8	32,385	13	55,500
Total	**14**	**141,000**	**18**	**74,700**	**32**	**215,700**

[7] It is generally expected that the identified energy savings are reasonably quantified, but the capital costs are considered as approximates because there are a range of factors that might affect an actual bid price for a retrofit such as the location and building-specific features. The capital costs identified in an opportunities assessment should be considered as suitable for inclusion in a budget estimate, but any actual spending should be based on receipt of competitive price quotes.

The majority of the identified savings are from potential energy conservation measures in the Regional District's two recreation centres, with an estimated annual savings of $17,000 in energy costs. Measures that could be easily implemented immediately with significant savings were the reduction of domestic hot water (DHW) temperature in the facilities, and the installation of space heat timers.

The Regional District's Fire Halls also represented opportunities for immediate and relatively low cost energy savings through the reduction of DHW temperatures, and the installation of programmable thermostats and door switches for the control of heating equipment.

The findings of the building assessments and identified energy savings are summarized in Table 5. Unit energy savings based on floor areas of the assessed buildings were calculated with the identified energy conservation measures, and then projections of potential total energy savings were made for the remaining unassessed floor areas. The majority of total potential energy savings have been identified in the buildings assessed in this study, but significant savings may still be achieved by comprehensive energy conservation initiatives in the rest of the Regional District's building stock that have not been assessed.

Table 5. Summary of Building Energy Assessments

Building Type	Assessed Area (sq ft)	Identified Annual Savings				Identified Capital Costs	Payback (years)
		Electricity (kWh)	Natural Gas / Propane (GJ)	GHG Emissions (tonnes)	$		
General Buildings	29,464	19,000	170	10	$3,100	$9,900	4
Recreation Centres / Arenas	77,136	176,000	740	45	$16,860	$63,300	4
Community Halls	11,273	700	160	9	$1,740	$6,400	4
Fire Halls	23,142	32,200	88	6	$3,190	$23,900	8
Total / Net	**141,015**	**227,900**	**1,158**	**69**	**$24,890**	**$103,500**	**5**

The savings potentials of suites of identified energy conservation measures are shown in Figure 5. The plot shows an estimate of the simple payback for suites of measures. A point to note is

that while the short payback items produce returns immediately, in the long term capturing a broader range of actions leads to greater savings in the long term.

There are three suites shown, each representing the implementation of all identified measures with the respective payback periods or less. The plot lines are negative at time = 0 representing the net cash outlay for the suite of actions considered. Over time, the energy savings provide a return which results in long term positive cash flow. The point at which the plot lines cross from negative to positive indicate the net payback period for the respective suite of measures.

Significant savings can be achieved immediately and at very little cost with a number of identified measures that have estimated payback periods of less than one year and a net savings of $82,200 over ten years. The net savings over ten years for the buildings assessed can be approximately doubled to approximately $150,000 by implementing almost all of the measures identified, with cash flows indicating a net payback of approximately three years.

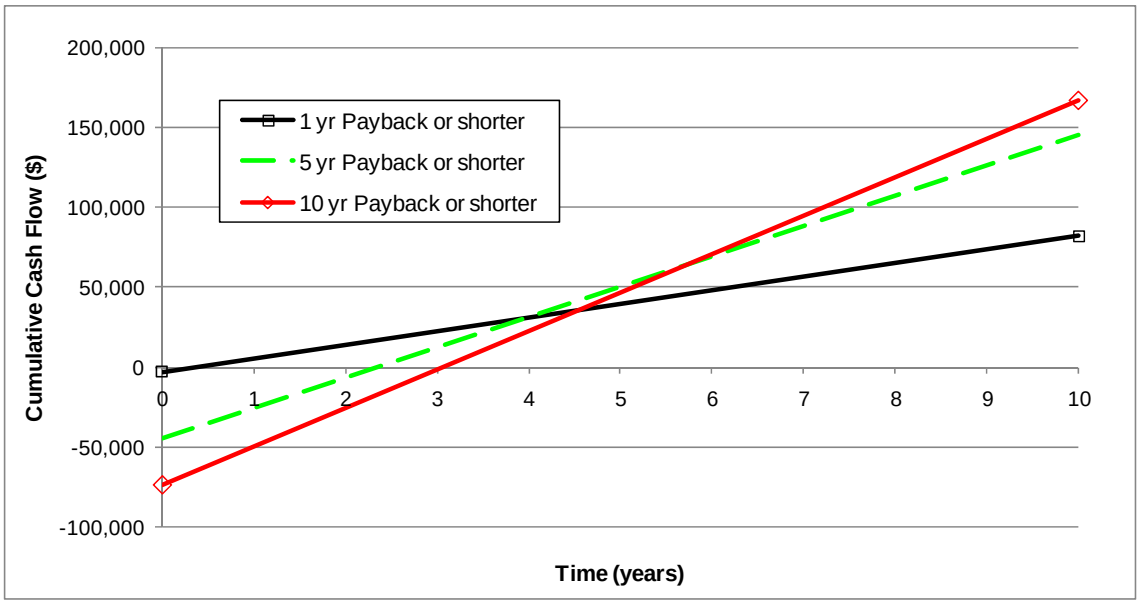

Figure 5. Cumulative Cash Flows from Audited Buildings Measures

3.2.2 Total Buildings

An estimate of the potential savings for all buildings in the Regional District inventory can be made by 'scaling up' the savings from the assessed buildings to all the buildings based on the building floor areas (shown in Table 4). This is an approximate measure but reasonable. The total estimated annual savings that could be achieved for all buildings is estimated in the range of 300,000 kWh of electricity, 1,600 GJ of natural gas or propane, 94 tonnes of GHG emissions, and $32,000 of energy costs, with initial capital costs roughly estimated at $200,000.

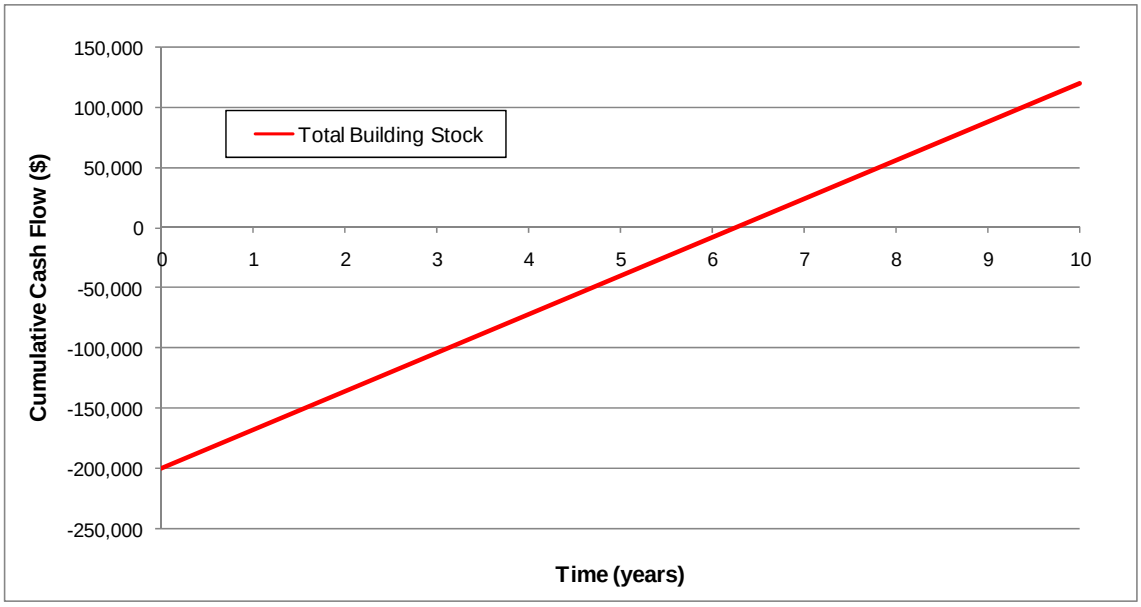

Figure 6. Estimated Cash Flows for All Buildings (with Identified Measures)

3.2.3 Other Identified or Possible Opportunities

In addition to the savings indentified through the opportunities assessments, there are other potential savings that could be captured at the two arenas.

Robson Valley Recreation Centre (McBride Recreation Center / Arena): The McBride arena captures heat from the ice chillers to maintain a warm layer about four feet beneath the cement pad. This was installed at the time of construction due to the soil composition underneath the arena. As such, the heat rejection side of the chillers is already configured to capture heat into a water circulation system. Not all the rejected heat is currently being captured, and expanded heat recovery could capture more of this heat for building heating. A rough estimate indicates that capital costs would be on the order of $125,000 and savings could be 800 to 1000 GJ of electric energy (worth about $10,000 annually, and saving about 6 tonnes of GHGs.). Further evaluation may be required to confirm those savings.

Canoe Valley Recreation Centre (Valemount Recreation Center / Arena): No heat capture is currently in place at the Valemount arena. Capturing the reject heat would require a retrofit of the existing chillers but is potentially a useful activity. This should be evaluated for suitability and the business case.

4 Initiatives and Actions

The actions of this plan were developed by:

- A review of the energy and GHG inventory to identify the component energy users and GHG emissions sources in the inventory;
- A series of “opportunities assessments” or walk through audits of fourteen buildings that identified a number of options for improving energy efficiency; and
- A workshop held with District staff to discuss and review the types of actions and the operational structure to define which activities would be feasible and how they might be implemented.

Four initiative areas were identified that address the following theme areas: Buildings, Fleet, Purchasing, and Leadership and other Sustainability Initiatives. In this section, each initiative is explained as follows:

- Objectives – describes the key areas that the actions are striving to fulfill.
- Background – provides perspective on the issue relevant to the Regional District, identifies why the initiative is important, and gives an overview of the potential barriers to successfully address the initiative.
- Actions - a list of actions that the Regional District can undertake. Some actions are one-time activities and others are longer-term program development activities or planning requirements which require bylaws to be enacted.

Initiative One: How we Operate our Facilities

Objective: To Build and Operate Buildings in an Energy Efficient Manner.

Background: The Regional District is responsible for a building stock of mostly fire halls and community centers, a head office and museum in Prince George, and two recreation centers / arenas. Many of these are intermittently occupied. A walk through analysis confirmed that many of the buildings are intermittently used and dispersed over a wide area, except for the civic offices in Prince George which are used Monday to Friday throughout the year, and the museum which is used five days a week in winter and seven days a week in summer. A review of the buildings commissioned by the Regional District has identified measures and costs showing how retrofits to the existing building stock can be implemented, with the estimated payback time to remunerate those costs.

Estimated Savings / Reductions:

For identified and estimated retrofits to existing facilities, (action -2) there are estimated savings of up to $32,000, and 94 tonnes of GHG Emissions. Capital costs estimated in the range of $150,000 to $200,000.

Savings for other actions have not been quantified.

Strategies:

Policy – create policy that incorporates climate change considerations into the Regional District's strategic direction and detailed policy for implementing energy efficiency (e.g. define green standards for new Regional District buildings).

Direct Action: Find opportunitiesfor energy savings in Regional District buildings

Actions: *The Regional District will….*

Action- 1: Develop a Civic Green Building Policy
The Board will adopt a policy that:

- All new Regional District facilities larger than a minimum size threshold will be built to a desired green standard [8]; and
- All major renovations to existing buildings will explicitly require an energy evaluation prior to the renovation to identify potential synergistic retrofit opportunities.

This policy can also refer to the purchasing policy to prescribe that all buildings should include a consideration of the life cycle energy costs, and should incorporate Energy Star features wherever possible.

Action- 2: Implement Identified Energy Savings Opportunities

The building energy assessments indicate that the identified energy conservation measures have a potential annual savings of up to $25,000 for the buildings that were audited. Given the total estimated capital costs of approximately $100,000 for all identified energy conservation measures, the implementation of all recommended measures would have a payback period of about four years, with potential deep savings over time.

A projection of the identified savings to unassessed buildings estimates an additional $7,000 in annual energy savings with associated capital costs of $50,000. Proper assessments of the Regional District's remaining buildings would be needed, but the potential savings may be worth doing an analysis of the Regional District's complete building stock. For the low cost actions such as thermostats and switches etc, it is reasonable to assume that these could be applied to all buildings.

Action- 3: Evaluate Heat Capture at Robson Valley and Canoe Valley Recreation Centres

Further heat capture at the McBride arena may be immediately economic as a heat capture system is already in place. Capture of heat from the Valemount arena should be evaluated.

[8] Typically a LEED™ rating (registered, silver, or bronze) is cited. 'Green buildings' include a range of other features beyond energy efficiency. Typical statements are for LEED™ Silver (City of Richmond) or LEED™ Gold (City of Vancouver). If energy efficiency alone is desired the requirement could be based on the National Model Energy Code for Buildings (NMECB). Certifying 'green' buildings requires a certain pool of expertise in the architectural, engineering, and construction fields, which might add cost for northern projects.

Action- 4: Evaluate Alternative Energy Sources before Replacing Equipment

At the end of equipment life, there is obviously a requirement for a replacement. At these times it is worth evaluating alternative systems as the incremental cost may be small enough to justify their use. Doing this at the time of a business case for a replacement (e.g. furnace or water heater) may identify cost effective alternatives. Likely examples would include ground source heat pumps for space and water heating and even possibly solar water heating in some instances.

Action- 5: Include Energy Equipment / Utilization in Annual Assessments

The Regional District conducts regular inspection of buildings (Policy F-8- Regional District Facility and Land Inspection Policy) for insurance purposes. These typically focus on the building condition. As a way of gathering information and seeing the effectiveness of some behavioural activities, the Regional District could include some relatively simple energy related operational points into a checklist. This might include whether an added feature (thermostat) is being used, what the setting is, whether lighting and equipment are on or turned off etc. This is intended to be an awareness measure and promote a culture of conservation in the building operators.

Action- 6: When available, work to connect to a future Prince George District Energy System

The City of Prince George is currently developing a District Energy System for the Downtown Core. The Regional District should consider working with the City to explore opportunities to be part of the system. This would apply to the head office which currently consumes about 1500 GJ of electrical energy and 1400 GJ of natural gas annually. The savings from connecting to a district energy system would be reductions in space heating and water heating - most of which is natural gas.

Action- 7: Evaluate Potential Accelerated Reduction Options from Landfill Gas Capture

There may be potential to accelerate implementation of further landfill gas capture in order to generate carbon offset credits. This would result from the destruction of methane gas through flaring or other combustion (e.g. in an engine or a boiler).

The operation of landfill facilities is governed by permit from the Ministry of Environment (MoE). The Landfill Gas Management Regulation was proclaimed in December 2008, defining

requirements of landfill operators for landfill gas capture.[9] The regulation currently identifies that landfills generating more than 1,000 tonnes of methane annually must prepare landfill gas management plans, and implement them within four years of developing the plan. [10]

There ***may*** be an opportunity to implement a landfill gas management system ahead of the regulatory requirement, and by doing so achieve some carbon offset credits for the gas captured from the time of commissioning until the time that the implementation of a gas capture system is mandatory. The MoE is still evaluating the requirements for full implementation of this regulation and is not yet able to provide definitive guidance regarding the applicability of using landfill gas capture as carbon credits. The issue is that activities that solely comply with regulations cannot be used as offsets generally - only those that go above and beyond the requirements could be eligible for use as offsets. Further communication with the MoE will be required later in 2009 to evaluate this potential.[11]

[9] Further information about the new landfill gas regulation can be found at: www.env.gov.bc.ca/epd/codes/landfill_gas/index.htm

[10] A recent study by Golder Associates estimated the methane generation at the Foothills landfill at about 4,500 tonnes per year of methane (see www.env.gov.bc.ca/epd/codes/landfill_gas/pdf/inventory_ggg_landfills.pdf).

[11] Personal communication Natalia Kukleva, Community Waste Reduction Section, Ministry of Environment?

Initiative Two: How we Operate our Fleet

Objectives: To utilize and operate our fleet vehicles in a manner that conserves energy use and reduces greenhouse gas emissions.

Background: The Regional District operates a fleet of 70 vehicles, including 18 assigned to specific departments, and 52 fire services vehicles. Each department is responsible for maintaining their respective vehicles, and as such, the needs required can be very different. For example, a truck used for building inspection has very different requirements from trucks that are used for park maintenance.

Currently, there is no centralized system of tracking mileage, and many of the fire services vehicles are used infrequently and are operated by volunteers. In addition, many of the Regional District vehicles are used in extreme weather conditions during the winter.

Estimated Savings / Reductions:

Reductions will be difficult through changes in equipment. Most reductions will be achieved through behavioral change. Other communities have estimated that awareness and training activities (e.g. NRCan's FleetSmart, of the Fraser Basin Council's E3 program) can reduce consumption by about 10% simply through behavior activities. Estimated that a 10% reduction is swiftly achievable which would equate to 3,000 L of gasoline and 4500 L of diesel and reducing emission by 20 tonnes of GHG emissions.

The Regional District will….

Action- 8: Actively 'Right Size' the Fleet

Through natural vehicle replacement cycles, the Regional District will work to ensure that all vehicles are , considered for 'right-sizing' i.e. selecting a vehicle that is suitable for the tasks assigned and no more, keeping in mind the extreme winter weather conditions and long distances many of these Regional District vehicles are required to travel.

Action- 9: Develop an Idling Promotion Plan

The Regional District has an idling reduction policy which encourages staff to reduce un-needed engine operation. This action commits the Regional District to develop a more vigorous promotion of this policy to staff.

Action- 10: Develop a Monitoring Program for Fleet Fuel Consumption

Establish a monitoring system for vehicle fuel use. Currently there is no cohesive tracking system for fuel consumption - though expenses are captured through various billing and expenses systems. To achieve the objectives of the charter, the Regional District will have to implement some form of monitoring. (see section 7 for discussion of the options).

Initiative Three: Our Approach to Purchasing

Objectives: To purchase products and services that are cost-effective and created, transported and disposed of in an energy efficient manner.

Background: Many local governments have a purchasing policy that articulates the intention to obtain the best possible value and price for goods and services required to run the organization. The current Regional District Purchasing policy supports the concept of Green Procurement and will give preference to environmentally superior products where quality, function and cost are equal or superior.[12]

Comparing costs: the Inkjet printer vs. the Laser printer

UBC Purchasing completed a study comparing the upfront costs of an inkjet printer versus a laser to the life-cycle cost. The upfront cost of an inkjet printer is $69, compared to a laser printer, which is approximately $400. However, over a one year time frame with cartridge costs, amount of pages yielded per cartridge, staff time needed for re-ordering and re-placing cartridge, the difference was clear: the total cost of an inkjet printer over one year was $2051, compared to $622 for the laser printer.

Source: UBC Purchasing Department

Estimated Savings / Reductions:

A Purchasing Policy can achieve several outcomes by:

- Promoting behavior change by getting staff and volunteers engaged
- Demonstrating leadership to the community by finding opportunities to reduce energy use and greenhouse gas emissions in the Regional District's operations

However, reductions are difficult to quantify as the amount and types of business cases is not currently known.

[12] The Regional District's current purchasing policy supports the concept of 'Green Procurement' which it defines as giving preference to environmentally superior products where quality, function, and cost are equal or superior, and products must contain post-consumer recycled content. A new draft procurement policy has been submitted to the Regional District Board and is expected to be ratified shortly. The draft can be viewed at: http://agenda.rdffg.bc.ca/May09/rb050933.pdf.

Actions: *The Regional District will…..*

Action- 11: Highlight the Life Cycle Cost Advantages of Energy Efficiency in Project Business Cases

Include the concept of "Life Cycle Cost" in purchasing. For example, when the Regional District needs to buy a new pump, establish whether the Regional District can afford a more expensive pump at the outset if it uses less energy and saves more money over time.

Initiative Four: Leadership and Staff Engagement

Objectives: To demonstrate leadership within the Regional District organization and serve as a role model for the community.

To develop systems in the Regional District workplace that fosters a supportive environment to implement actions that will contribute to energy conservation and GHG reduction.

Background: As a provider of services to residents in the Regional District of Fraser Fort George, the Regional District will assume a leadership role in developing policies that contribute to the reduction of energy use and GHG emissions for its operation, and also develop education and awareness through community outreach. Opportunities are available to spearhead initiatives that fall within the Scope 3 parameter (

Table 2, i.e. emissions that are indirect and do not fall under the commitments of the Climate Action Charter, but those which organizations may choose to show leadership in, such as in-house recycling programs, double-sided printing, supporting other sustainability initiatives in the community, etc.) These initiatives will be highlighted in documents such as the Regional District's Strategic Plan and Annual Reports and on the Regional District website to let residents know about the Regional District's energy conservation and reduction activities.

Engaging staff in the initiatives and actions designed to conserve energy and reduce emissions is a critical component of this Plan. If there are structures in place that are preventing District employees from easily turning off the lights or their computers for example, it is less likely that these kinds of actions will be undertaken. However, consideration of initiatives and actions within this context will contribute to a higher rate of successfully completed actions.

Actions: *The Regional District will…*

Action- 12: Dedicate Staff Resources to Implementing the Corporate Energy Plan

Explore opportunities for funding to support a staff person to coordinate some of the recommended actions in this Plan. Note: the Regional District is in the process of making a decision to hire a staff person that would devote their time to research and developing funding

proposals. This could be an opportunity to further justify that position by using some of that time for coordination and implementation of energy actions.

Action- 13: Staff Travel Strategy

Develop a District Travel Strategy that will reduce unnecessary travel by employing the following activities:

- Support staff working from home 1-2 days a week
- Continue to support training modules that are online
- Continue to explore options to bring trainers to the Regional District office for staff professional development
- Explore and utilize video conferencing for staff and the Regional District Board for meetings
- Encourage staff to car pool to work and to combine trips when going to meetings

Action- 14: Offset Board Travel

It is not yet clear whether Board member travel will be required to be included in the Regional District's corporate inventory with respect to its Climate Action Charter commitments. At present this is undefined, but to show leadership the Regional District can commit to estimating the carbon footprint of board members' travel and offsetting this through carbon offsets by tracing Board travel to Board meetings, additional meetings that require travel and conferences.

Action- 15: Foster a Culture of Energy Conservation Amongst Staff

Develop a staff education outreach that focuses on energy saving tips in the workplace - particularly computer use, lights, and printing. Promotional materials available from Terasen and BC Hydro could be used, or the Regional District could develop its own outreach materials.

Action- 16: Utilize Information Technologies to Minimize the Need for Travel

IT systems have evolved to enable better help desk and systems upgrades without always requiring a person to visit a distant location. Continue to use technologies to make work flow more efficient, with the added benefit of reducing unneeded travel.

Action- 17: Encourage More Energy Efficient Transport for Staff

Carpooling can be employed for work trips and commuting trips. Understanding that staff time is valuable, the Regional District will find ways to encourage carpooling and combining trips when possible. Additionally, the Regional District can show leadership by exploring commuting opportunities such as carpooling, cycling, and public transit, particularly exploring critical components of these kinds of initiatives, including installing safe bike storage, and reduced fare transit passes.

Action- 18: Report on Progress

Document energy reduction initiatives in an annual report to the Board. This would include a summary of actions taken, the annual corporate inventory, etc.

5 Reductions and Carbon Neutrality

5.1 Carbon Neutrality and Offsets

The objective of carbon neutrality is achieved through a combination of reductions in emissions and offsets, as shown schematically in Figure 7. In the short term - i.e. to 2012, only a few years away - there is a limit to the reductions that can be achieved. Thus for most local governments and regional districts, it is expected that they will meet carbon neutrality through some level of reductions - typically conservation measures and efficiency improvements (NB a 15% reduction is shown in the figure), but the achievement will be accomplished primarily through carbon offsets.

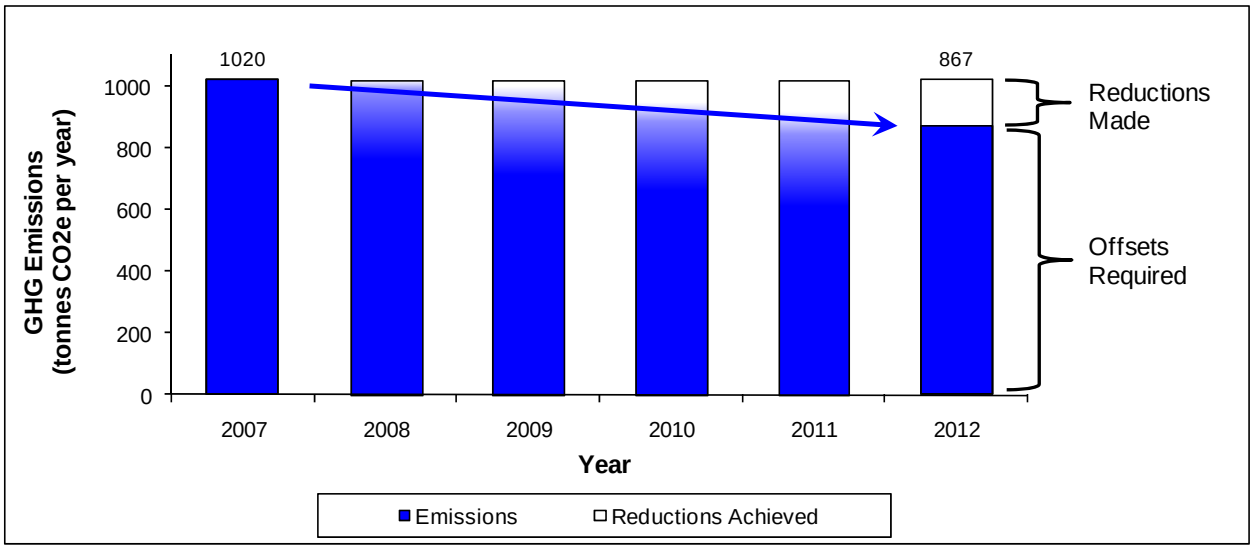

Figure 7: Reductions vs. Offset Required to be Carbon Neutral Compliant to 2012

The Climate Action Charter does not specify where the offsets should be sourced; however, there are protocols under development for defining what it is a legitimate offset. With a requirement for up to 1000 tonnes of offsets, it is unlikely that the Regional District would find any efficiency through developing its own offset system. Rather, it would be most likely that the Regional District will go to the market place to obtain offsets.

Options (at present) will likely include:

- Commercial offset vendors, that source offsets in Canada or abroad.
- The Pacific Carbon Trust - a newly established Crown corporation that is a 'broker' of the offset project for Public Sector Organizations (PSOs) to obtain offsets. These offsets will be located in BC.
- A purchasing call for offsets: By tender or RFP, (or first and expression of interest) the Regional District could request that proponents be asked to provide offsets. This would give the Regional District the opportunity to specify that the offsets should be sourced from within the Regional District. This would likely be more politically acceptable than sending the funds to other areas of the province.
- At present, no action is required as carbon neutrality is not required until 2012. The systems for defining and regulating offsets are expected to progress dramatically in the next two to three years and this will be a rapidly evolving area.

The cost of procuring offsets provides an economic incentive to make reductions rather than to simply purchase offsets. The costs of offsets are presently in the range of $25 per tonne of CO_2e, though this is based on a small market with limited numbers of offset projects. By 2012, there will be a large demand for offsets - likely several hundred thousands of tonnes annually - as local governments seek to obtain offsets, and as all the public sector organizations in BC will be purchasing offsets from 2010 onwards to achieve their own carbon neutrality (as mandated through Bill 44).

The annual cost of offsets required is expected to be in the range of $25,000 depending on the cost of the offsets purchased and the amount of reduction achieved. While the cost of these offsets might not be a large part of the Regional District's total budget, they can add significance to business cases for individual projects.

The cost of avoided offsets should be included as a cost savings in any business case that evaluates a reduction measure - just as the cost of conserved energy should be considered a saving.

Table 6: Estimated Annual Cost for Offsets for the Regional District

	Annual Cost of Offsets (at $25 per tonne)
Cost if Emissions Remain at 2007 Level	$25,500
Achieve 15% reduction	$22,000
Achieve 50% reduction	$12,250

5.2 Emissions Reduction Target

The inventory has estimated the carbon footprint of the Regional District to be 1,020 tonnes of CO_2e for 2007. Actions identified in this plan have the potential to reduce emissions by at least 120 tonnes (12% of current emissions). To encourage full implementation and the development of new initiatives, it is proposed that the Regional District set a target to:

- **Reduce Corporate GHG emissions by 15% from 2007 levels by 2012, and then explore opportunities to carbon neutrality by offsetting the remaining emissions with carbon offsets.** [13]

In the longer term, opportunities will present themselves to rework and review current operations. Rather than simply increase the efficiency of existing buildings, there will be opportunities to replace fossil fuel heating renewable and electric heat sources. There is a greater potential to achieve further reductions over a decade of more. These actions could include joining a City of Prince George district energy system and replacing furnaces with heat pumps, etc.

To encourage these actions, a more aggressive, long term target is recommended for the period to 2020 to:

- **Reduce Corporate GHG emissions by 50% from 2007 levels by 2020, and then explore opportunities to carbon neutrality by offsetting the remaining emissions with carbon offsets.**

5.3 The Business Case for Action

There is a business case for action to reduce energy consumption and Regional District staff have already implemented measures to reduce energy consumption and costs (see section 2.5). This plan aims to support these measures by providing District staff the mandate to intensify these measures.

The commitment of carbon neutrality in the Climate Action Charter supports the business case by adding a cost to carbon emissions through the requirement to purchase offsets. Reducing energy consumption saves money on the purchase cost of the energy, but also saves funds that would otherwise have to be spent on carbon offsets.

The total impact of the plan activities is compared over a ten year period as two scenarios. These are: (i) a “Business-As-Usual” scenario and (ii) an “Action Plan” scenario in which the

[13] The Regional District is exploring with other public sector organizations (PSOs) that must become carbon neutral under Bill 44 (2008), as well as possibly the City of Prince George, if there are opportunities for a locally based offset system.

proposed targets are met through retrofits and other reduction activities. The result is shown Figure 8 and in Table 7. The figure shows the estimated total cost of energy spending, the cost of retrofits, and the cost of purchasing offsets. [14].

From the figure, total costs are higher in the first two years (approx $100,000 spent each year on retrofits or other reduction activities). In the following years the total costs are lower, and continued action results in steadily decreasing costs. By 2020, the Distirct is estimated to be spending $85,000 per year less on energy costs than under a business as usual scenario. The initial investment is paid back in about 5 years.

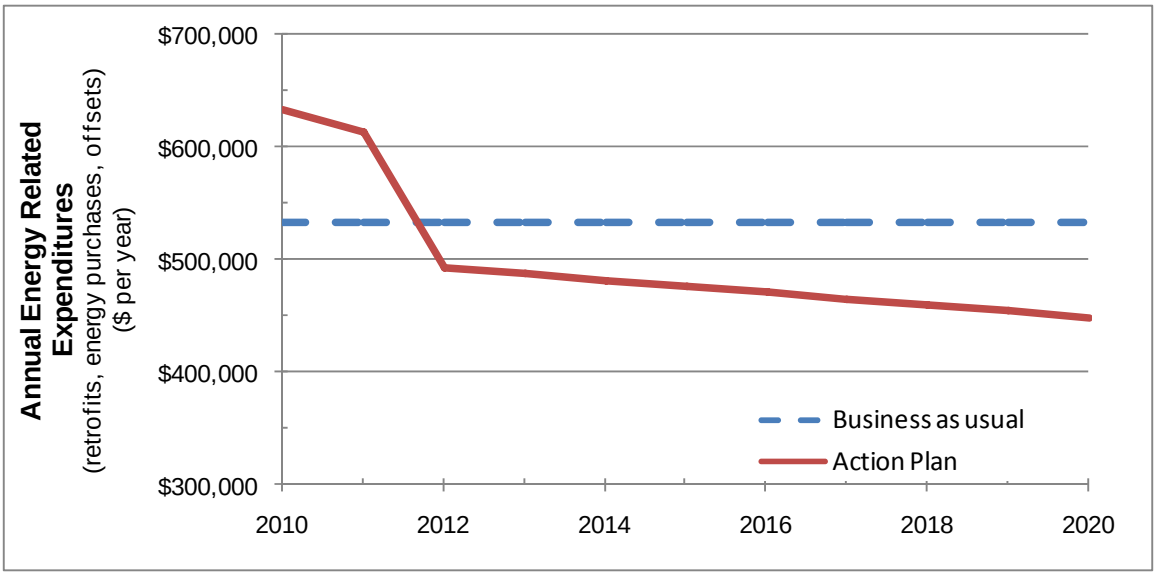

Figure 8: Comparison of the Annual Energy-Related Costs under Business as Usual and Action Plan Scenarios [15]

[14] The District also pays a carbon tax on the fossil fuels it consumes – natural gas, diesel, and gasoline. However, at present the Province provides a carbon tax rebate (called the Climate Action Rebate Incentive Program or CARIP grant) in an amount equal to the carbon tax paid directly by the District. In this sense that carbon tax costs are neutral to the District as they are paid and refunded.

[15] For the business as usual scenario all energy consumption and carbon emissions are assumed to remain constant for the entire period. In the "Action Plan" scenario, the estimated cost of retrofit and fleet reduction actions occurs over two years, with the estimated reduction in energy use and emissions as identified. Following that energy costs are shown to decrease by 1% per year (assumed as part of the effort to achieve the 50% emissions reduction target). This analysis assumes constant prices and does not include the potential for price inflation of energy costs.

Table 7: Estimated Annual Energy-Related Costs form a Business as Usual and Action Plan Scenario

Business As Usual	2010	2011	2012	2013	2014	2015
Capital Cost	$0	$0	$0	$0	$0	$0
Annual Energy Expenditure	$508,000	$508,000	$508,000	$508,000	$508,000	$508,000
Carbon Tax	$16,600	$21,300	$26,000	$28,400	$28,400	$28,400
Offset Cost (total)			$25,500	$25,500	$25,500	$25,500
CARIP REBATE	-$16,600	-$21,300	-$26,000	-$28,400	-$28,400	-$28,400
Total Annual Cost	**$508,000**	**$508,000**	**$533,500**	**$533,500**	**$533,500**	**$533,500**
Action Plan	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Capital Cost	$100,000	$100,000	$0	$0	$0	$0
Annual Energy Expenditure	$508,000	$489,500	$471,000	$466,300	$461,600	$457,000
Carbon Tax	$16,600	$19,700	$22,100	$22,900	$21,600	$20,400
Offset Cost (total)			$21,700	$20,600	$19,400	$18,300
CARIP REBATE	-$16,600	-$19,700	-$22,100	-$22,900	-$21,600	-$20,400
Total Annual Cost	**$608,000**	**$589,500**	**$492,700**	**$486,900**	**$481,000**	**$475,300**

Business As Usual	2016	2017	2018	2019	2020
Capital Cost	$0	$0	$0	$0	$0
Annual Energy Expenditure	$508,000	$508,000	$508,000	$508,000	$508,000
Carbon Tax	$28,400	$28,400	$28,400	$28,400	$28,400
Offset Cost (total)	$25,500	$25,500	$25,500	$25,500	$25,500
CARIP REBATE	-$28,400	-$28,400	-$28,400	-$28,400	-$28,400
Total Annual Cost	**$533,500**	**$533,500**	**$533,500**	**$533,500**	**$533,500**
Action Plan	**2016**	**2017**	**2018**	**2019**	**2020**
Capital Cost	$0	$0	$0	$0	$0
Annual Energy Expenditure	$452,400	$447,900	$443,400	$439,000	$434,600
Carbon Tax	$19,200	$17,900	$16,700	$15,400	$14,200
Offset Cost (total)	$17,200	$16,100	$15,000	$13,900	$12,800
CARIP REBATE	-$19,200	-$17,900	-$16,700	-$15,400	-$14,200
Total Annual Cost	**$469,600**	**$464,000**	**$458,400**	**$452,900**	**$447,400**

6 Implementation

6.1 Program Description

Name

Regional District of Fraser-Fort George Corporate Greenhouse Gas Action Plan

Objective

To enable the Regional District of Fraser-Fort George to achieve reductions in energy consumption and greenhouse gas emissions within Regional District operations.

Targets

Proposed Regional District Operations Targets:

- Reduce Corporate GHG emissions by no less than 15% from 2007 levels by 2012, and then achieve carbon neutrality through offsets for the remainder.

Program Overview

The plan's major features include:

- Definition of four initiative areas and actions for each initiative;
- Inclusion of energy considerations within the Regional District's planning processes;
- Identification of funding opportunities to ensure actions will be supported with resources; and
- Regional District action within the Regional District's facilities to demonstrate leadership in the community.

Program planning and execution will be coordinated by the Regional District. Partnerships will be established with other levels of government, as well as utilities and private sector sponsors.

Specific components of the plan will be executed by a number of departments within the Regional District. These are defined within the action areas of the plan.

6.2 Responsible Party

A staff member may be designated as the "Energy Program Coordinator" for energy and GHG management. This person is responsible for working with staff from each department to initiate activities and ensure that the annual work plan is progressing.

Note: As one of the recommended actions, the Plan identifies funding opportunities to support half of a FTE for the program coordinator. A sample break-down of responsibilities for the program coordinator and other staff are listed in Table 8.

Table 8: Examples of typical Energy Program Coordinator and Staff Responsibilities in Plan Implementation

Typical Responsibilities of Program Coordinator	Typical Responsibilities of Other Department Staff
Establish annual work plan (in consultation with Environment Commission)	Conduct building audits on municipal facilities
Develop internal awareness programs	Budget and implement identified improvements
Publicize activities to staff through internal communications	Monitor and report on activities
Define data collection requirements and frequency; Collect, store and report on data	Implement fleet reduction activities
Make contact with other partners to promote the plan and find areas for municipal involvement	Implement transit, cycling, and other consistent plans
Apply for funding through various provincial and federal programs to meet the plan objectives	
Promote energy efficiency and awareness in the community	
Act as a resource to the community on energy efficiency	

Over time, carbon tax rebates paid to the Regional District could be dedicated to support a portion of a staff person's salary. By 2012, carbon tax rebate to the Regional District may be approximately $26,000 (see Table 9).

Table 9: Projected Carbon Tax Rebate from the Climate Action Revenue Incentive 2007-2013

2007 Taxable Tonnes CO_2e **	Year					
	2008	2009 *	2010 *	2011 *	2012 *	2013+ *
Tax Rate as of July 01 ($/tonne CO_2e)	$10	$15	$20	$25	$30	$30
Average Annual Tax Rate ($/tonne CO_2e)	$5.00	$12.50	$17.50	$22.50	$27.50	$30.00
946	$4,700	$11,800	$16,500	$21,300	$26,000	$28,400

* - Forecast tax responsibilities are based on 2007 taxable emissions.

** - The BC carbon tax does not apply to electricity purchases.

6.3 Funding

It is important to pursue long-term funding sources in order to implement this plan. Permanent funding will ensure sufficient staff resources and training is recommended. Funding may be available through individual Regional District service areas to implement energy efficiencies within those particular service areas. If the energy initiative affects the Regional District as a whole, then a business case for funding through general revenue should be pursued.

The Regional District can also seek funding from other sources such as BC Hydro, and the Federation of Canadian Municipalities. Table 10 provides a selection of funding opportunities currently available that may be used for implementing climate change and energy-related actions.

Table 10: Sample Funding Programs to Support the Corporate Energy Plan

Program	Key Features
Climate Action Rebate Incentive Program (CARIP)	This provincial initiative will reimburse communities that have signed on to the Climate Action Charter. The carbon tax starts at a rate based on $10 per tonne of associated carbon, or carbon-equivalent, emissions and will rise by $5 a year for the next four years — reaching $30 per tonne by 2012.
BC Hydro: Energy Coordinator Funding	BC Hydro has provided partial funding to some municipalities to fund an energy coordinator for the municipal operations. Recently, in a pilot project, BC Hydro has funded an energy coordinator position directed towards community activities in Prince George.
BC Hydro Power Smart	Rebates and incentives to encourage energy efficiency in new construction and the installation of energy efficient products and appliances in existing facilities.
FCM Green Municipal Fund	Grants and loans available to support capital projects that reduce energy and GHG emissions. Competitive process with RFPs launched annually to fund projects related to brownfield redevelopment, energy, planning, 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.

Program	Key Features
Innovative Clean Energy Fund	The ICE Fund supports pre-commercial demonstrations of innovative clean energy technologies in rural areas of BC. The Regional District falls within the Northern Development Initiative Trust Region of the program, and any technologies that have not been deployed in BC before, or that are being applied in a novel way, are eligible. The second call for applications closed in 2008, and there are plans to announce a Third Call for Applications in the late summer/ early autumn period.

6.4 Monitoring & Reporting

A monitoring program will enable the Regional District to assess progress towards the defined targets. Indicators, also called performance measures, help 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 recommended for monitoring the progress of this Corporate Energy Plan. These are based on the baseline inventory of energy and GHG emissions:

- Total corporate energy consumption (GJ/year)
- Total corporate GHG emissions (tCO_2e/year)

Additional indicators can be developed to define the progress towards meeting the plan activities. These are typically more representative of the means to the end and can be informative of the progress made. Possible indicators could include:

- Amount of fuel used per fleet vehicle

The Regional District will need to implement a tracking system for fuel use to qualify for the portions of the Carbon Tax Rebate. Currently the Regional District tracks costs accrued for mileage paid for use of a personal vehicle on Regional District business. It also tracks for vehicle expenses for Regional District owned vehicles which includes fuel, repairs and insurance costs for vehicles as a single line item. Table 11 below shows a comparison of different tracking options.

Table 11. Comparison of Fleet Consumption Tracking Options

System	Description	Pros	Cons
Regular (e.g. quarterly) recording of vehicle odometer readings.	Combined with make, model, and year, and Federal fuel efficiency data would provide a reasonable estimate of the fuel consumption.	Simple	May not be suitable for obtaining the Carbon Tax rebate (for 2008, no rebates were given for estimated consumption, only for proven purchased consumption). Doesn't capture personal vehicle use
In vehicle log books	A log book in the vehicle is filled in by operators when they fuel the vehicle.	Written record of actual litres purchased - rather than an indirect measure from distance travelled.	Manual - may have spotty compliance.
Ledger expenses	Expensed kilometers are recoded with code 261	Easily captures personal vehicle kilometers	Code 262 captures total fleet vehicles expenses and this includes fuel maintenance etc so cannot separate fuel consumption.

Annual Reporting

It is proposed that brief annual progress reports be prepared by staff to monitor progress of implementation. The annual report will describe activities implemented in the previous year and define an annual action plan.

Annual reports can also be used to identify areas of change and provide an opportunity to update the plan by adding new actions or modifying existing actions.

Five Year Reporting

It is proposed that the corporate-wide inventory be updated every five years starting in year 2014. This will include:

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