City of Courtenay

Corporate Climate Action Strategy

February 9, 2009

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Executive Summary

Background

The City of Courtenay signed onto the Climate Action Charter in 2007 together with the Province of BC, UBCM and over 130 BC local governments. The City has made a commitment to use the City's influence to reduce both corporate and community emissions by signing on to the Climate Action Charter. The Charter commits local governments to develop strategies and take action to become carbon neutral in respect to municipal operations by 2012. The completion of this Corporate Climate Action Strategy is a key component to reducing greenhouse gas (GHG) emissions as much as possible before being required to offset corporate emissions in 2012.

The City completed the first step toward achieving this goal by completing a Corporate Energy and GHG Emissions Inventory in October 2008. The Inventory determined that the City's corporate GHG emissions, currently applicable to Climate Action Charter carbon neutrality commitments, are estimated at 869 tonnes.[1] The implementation of this Corporate Climate Action Strategy is a key component to becoming carbon neutral in respect to municipal operations by 2012. The other key component of the Climate Action Charter is the completion of a Community Climate Action Strategy.

Corporate GHG emissions are the emissions generated by the energy consumed during the delivery of municipal operations. Community GHG emissions result from all of the energy consumption activities generated by on-road transportation, buildings, and solid waste from within the entire community. This strategy focuses only on corporate emissions, as the completion of this strategy will give the City an opportunity to "get its own house in order" and lead by example before tackling emission reductions in the broader community. This strategy should be considered a living document and annual reviews are recommended to ensure that new ideas and opportunities are incorporated.

What exactly are carbon neutral operations? The goal of the Charter is for local governments to achieve carbon neutrality by reducing GHG emissions that are associated with operations as much as possible, and by offsetting the remaining emissions. GHG offsets enable individuals and businesses to reduce their GHG emissions they are responsible for by offsetting, reducing or displacing the GHG emissions in another place, typically where it is more economical to do so. GHG offsets usually include investments in renewable energy, energy efficiency and reforestation projects. The Province of BC has set up the Pacific Carbon Trust, a provincial Crown corporation, to identify credible GHG offset projects that are located in BC on the Province's behalf.

From here, the City must adopt and implement the corporate strategy and then embark on the larger community component of the Climate Action Charter.

[1] The City's corporate GHG emissions will have to be adjusted in 2010 to include contracted waste removal services as per Province of BC direction.

Methodology

The completion of the Corporate Climate Action Strategy included a significant amount of research which involved a review of relevant literature, and analysis of the energy reducing practices of several municipal governments throughout North America. A detailed analysis of the City's existing GHG emissions was completed. This provides the City with a 2007 baseline for the GHG emissions related to municipal operations. This information was then presented to the City's Green Team. Potential GHG emission reduction opportunities were identified and considered by the City's Green Team. Using the opportunities identified, the Green Team set targets and identified current and potential GHG emission reduction opportunities through brainstorming sessions. The team then reviewed recommended best practices and considered the effectiveness and ease of implementation of additional initiatives. An implementation plan was then developed to meet the recommended reduction targets.

Goals

By implementing the Corporate Climate Action Strategy, the City of Courtenay will meet the goals of the Climate Action Charter relating to municipal operations. By pursuing the actions outlined in this strategy, the City of Courtenay has the opportunity to lead other organizations within the region and the community as a whole.

By signing onto the BC Climate Action Charter, the City agreed to the following goals:

- To develop strategies and take actions aimed at reducing GHG emissions;
- To become carbon neutral in respect to municipal operations by 2012;
- To remove barriers such as existing policies and procedures that impede taking action on climate change;
- To encourage infrastructure and a built environment that supports economic and social needs while minimizing environmental impacts.

Targets

Establishment of clear targets provides focus for the achievement of the Strategy's objective. Establishing and agreeing to specific, clear targets indicates that the City will provide the support and commitment necessary to achieve the targets. The combination of baseline data and targets provide a framework for measuring and reporting which encourages accountability.

Target 1:
A 33 percent reduction of corporate GHG emissions from 2007 levels by 2020 (in support of the Province of BC province-wide reduction target): In order to achieve this target, the following annual reductions are recommended:

- A 5% reduction from the 2007 corporate GHG emissions annually in 2009 and 2010.

- A 5% reduction of the 2010 adjusted baseline that incorporates contracted waste removal services 2011 and 2012.
- A 2% GHG reduction of the adjusted 2010 baseline GHG emissions annually throughout 2013 to 2019.

The above noted annual targets may have to be adjusted based on annual performance measurement and evaluation in order to meet the primary target of a 33 percent reduction by 2020.

Target 2:
All new City buildings must meet the requirements of LEED™ Silver (or equivalent) and demonstrate energy performance that is 25 percent better than the Model National Energy Code for Buildings.

Target 3:
To decrease the annual energy consumption of the City's large energy consuming facilities by a minimum of 20 percent from 2007 levels by 2012.[2]

Areas for Actions

The Corporate Climate Action Strategy focuses on energy and emissions associated with municipal operations. This Strategy includes a wide range of actions to address the City's GHG emissions. Through review of the Energy and GHG Emissions Inventory, and analysis undertaken throughout the development of this strategy, the following areas have been identified as priorities for action:

1. Fuel-efficiency and green fleet management;
2. Energy efficient retrofits for facilities;
3. Green design for new and replacement City buildings;
4. Behavioural change to reduce energy demands;
5. Energy efficient street and park lighting.

Reducing energy consumption in the City's major facilities and reducing the fuel consumption of our fleet have been identified as the highest priorities. The City's major facilities, including the Lewis Centre recreation facilities, are responsible for 53 percent of GHG emissions. The City's vehicle fleet produces 42 percent of GHG emissions.

[2] Large energy consumer facilities are outlined in Table 1 of the Corporate Energy and GHG Inventory (2008).

Strategy Implementation

During the focus group discussion, four common barriers to implementation were identified. The following efforts are needed to overcome barriers to successful implementation:

1. Communication and clear direction is needed to change “business as usual”;
2. Additional human resources are needed to champion and implement climate action;
3. Existing policies and procedures must be revised (i.e. procurement decisions based on purchase price versus lifecycle costing); and,
4. City budgets, policies and plans must be aligned with Corporate Climate Action Strategy.

The adoption and incorporation of the three draft policies attached to this strategy (Climate Action Purchasing, Green Buildings and Green Fleet) into corporate procedures is vital to providing the tools necessary for staff to implement this Strategy. Ensuring that there are sufficient resources, human and financial, is also a key component to successfully implementing this Strategy.

Successfully implementing the Corporate Climate Action Strategy is an important step toward reducing greenhouse gas emissions in our community and achieving the goals of the Climate Action Charter. Implementing the corporate plan and subsequently developing a Community Climate Action Strategy requires dedicated staff and financial resources. A detailed implementation plan can be found starting on page 39 of this Strategy.

Performance Measurement and Evaluation

An annual review of this strategy is recommended to revisit annual implementation plans and to consider current funding opportunities, recommended best practices, and technological innovations. An evaluation program is necessary to measure the success of the Corporate Climate Action Strategy which should include an annual review that contains the following activities:

- baseline energy and GHG emission data updates;
- progress report on the recommended implementation plan;
- performance measurement reporting;
- case studies describing the cost effectiveness and lessons learned from the implemented actions;
- identification of potential partners and funding opportunities for future projects and programs; and,
- updates to the implementation plans.

Next Steps

The following activities are necessary to implement the Corporate Climate Action Strategy:

1. Council’s adoption of this Strategy by resolution.

2. Council's approval of the draft policies that are attached to this Strategy as appendices: Green Building Policy, Green Fleet Policy, and the incorporation of the Climate Action Purchasing Policy into the City's Purchasing Policy which is currently in the process of being revised.
3. Internally launch the plan by communicating the policies and procedures of the City Corporate Climate Action Strategy to staff.
4. Consider the budget requirements to implement the Corporate Climate Action Strategy in budget deliberations.
5. Provide the human resources necessary to carry out the implementation of the Corporate Climate Action Strategy and embark on the Community Climate Action Strategy.
6. Seek funding to implement specific projects (e.g. BC Hydro's funding for the electricity component of comprehensive building audits).
7. While in the process of implementing and evaluating the Corporate Climate Action Strategy, the City must also embark on the community component of the Climate Action Charter Commitment which includes reporting on the community's GHG emissions profile and preparing a community climate action strategy. An important component of the Community Climate Action Strategy will be determining how to utilize the City's influence and control over land-use, transportation, building design and energy infrastructure to achieve the broader goals of the Climate Action Charter.

Definitions

Biodiesel: A fuel made from plant oils that can be used in a conventional diesel engine. B5 and B20 refer the percentage of biodiesel blended with conventional diesel. B5 includes 5% biodiesel and B20 includes 20% biodiesel.

Biofeul: Fuel made from renewable resources such as cellulose, corn or plant oils. Ethanol, biodiesel and methanol are all biofuels. E10 is a biofeul that includes a blend of regular gasoline and 10% ethanol.

Carbon Neutral: Calculating your total carbon emissions, reducing them where possible, and balancing your remaining emissions with the purchase of carbon offsets.

Community Emissions: Greenhouse-gas emissions from on-road transportation, buildings, solid waste and land use change for a community.

Corporate Emissions: Greenhouse-gas emissions created by the provision of municipal services by a local government. Emissions would be counted from transportation, electricity use, heating and production of solid waste associated with these services. If a local government has a contractual or partnership arrangement to deliver these services, the emissions from these same activities operated by the contractor would also be included for new contracts or after a contract renewal.

E3 Fleet: E3 Fleet provides services and resources to assist government and other fleets that want to: increase fuel efficiency; reduce emissions; reduce costs.

Kilowatt-hour (kWh): The standard unit of measure for electric energy. One kilowatt-hour is one kilowatt of electricity supplied for one hour.

Gigajoules (GJ): One billion joules of energy. A joule (J) is a metric unit of measurement for heat energy

Greenhouse gas (GHG): A gas that traps heat from the sun in the Earth's atmosphere and produces greenhouse effects. Carbon dioxide is a major greenhouse gas. Others include nitrous oxide and methane.

GHG Offset: Also referred to as carbon offset, the act of mitigating one's GHG emissions, often purchased through a carbon offset provider that uses the money for carbon-sequestering activities including tree planting, renewable energy, energy conservation and methane capture.

LEED™: The Leadership in Energy and Environmental Design green building rating system, or LEED, is a voluntary, consensus-based national standard for developing high-performance, sustainable buildings.

Life Cycle Costing: Assessment of the costs of a good or service over its entire life cycle. Life-cycle costing should consider: purchase and all associated costs (delivery, installation, commissioning, etc.); operating costs, including energy, spares, and maintenance; end-of-life costs, such as decommissioning and removal.

Model National Energy Code: The Model National Energy Code establishes minimum standards of construction for building components and features that affect a building's energy efficiency. The Model National Energy Code is part of Canada's response to the challenge of climate change- the warming of the earth's atmosphere caused by emissions of greenhouse gases.

Net present value: The present value of a series of future net cash flows that will result from an investment, minus the amount of the original investment.

1.0 INTRODUCTION

1.1 Climate Change

Climate change is a global issue that is caused by the daily activities of billions of humans on the planet. "Climate change is one of the greatest challenges facing British Columbia and the world."[3] Burning fossil fuels and deforestation are the largest contributors to atmospheric climate change. Canada is one of the largest producers of greenhouse gases (GHG) on earth.[4] The solution to the continued advancement of climate change is to conserve energy and reduce GHG emissions by making significant changes – technological, institutional, and behavioural –of an unparalleled scope and scale. Local governments must be prepared to adapt to climate changes and plan to mitigate climate change by reducing emissions that contribute to this problem.

1.2 Climate Action Charter

The City of Courtenay passed a resolution on October 9, 2007 agreeing to sign on to the Climate Action Charter. The Charter recognizes the need for action on climate change and the important role that the Provincial Government and local governments can play in promoting change. By signing the charter, local governments are agreeing to develop strategies and take action to achieve the following three goals:

1. Become carbon neutral in respect to municipal operations by 2012;
2. Measuring and reporting on the community's GHG emissions profile;
3. Creating a complete, compact, and more energy efficient community.

Some of the goals the City agreed to by signing onto the BC Climate Action Charter are:

- to develop strategies and take actions aimed at reducing GHG emissions;
- to become carbon neutral in respect to municipal operations by 2012;
- to remove barriers such as existing policies and procedures that impede taking action on climate change;
- to encourage infrastructure and a built environment that supports economic and social needs of the community while minimizing environmental impacts.

The charter itself does not specify a reduction target for municipal operations; however, the Charter does refer to other commitments that the Province has made which include the target to reduce greenhouse gas (GHG) emissions by 33 percent from 2007 levels by 2020.

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[3] Ministry of Community Services and Community Energy Association. (2008). *Greenhouse Gas Emission Guide for British Columbia Local Governments*. Version 1.

[4] Statistics Canada

1.3 City of Courtenay Green Team

The City of Courtenay has formed a Green Team comprised of 22 staff representatives from all City departments, ranging from frontline staff to senior management, to coordinate green initiatives for the City. The Green Team had its inaugural meeting on January 23, 2008. At the February meeting, the Green Team drafted the following Mission Statement:

> *The City of Courtenay Green Team will champion the City's corporate culture on environmental awareness by promoting green initiatives. This will be achieved by creating action oriented strategic plans that will include a framework for reducing greenhouse gases, water use and energy consumption for the benefit of the community and future generations.*

The first step toward achieving the mission of the Green Team is to lead by example and get the City's "house in order" by developing a Corporate Climate Action Strategy prior to focusing on changing the activities of the broader community. The Green Team has collaborated on the development of the Corporate Climate Action Strategy from its initial conception to final review.

Members of the City of Courtenay Green Team

Left to right: Dennis Nyhof, Susan Murphy, Randy Wiwchar, John Ward, Derek Richmond, Dennis Henderson, Nancy Henderson, John Allen, Anne Guillo, Joy Chan. *Not pictured:* Tim Dojack, Tillie Manthey, Kevin Lagan, Neil Lamb, Donald Bardonnex, Leah Kitching, Dennis Mirabelli, Sandy Todd, Lis Pedersen, Yves Bernard, Jim Griffith, Ross Pagdin.

1.4 Corporate Climate Action Strategy

The Corporate Climate Action Strategy charts a course for the City of Courtenay to reduce greenhouse energy consumption and gas emissions for municipal operations. The Corporate Climate Action Strategy includes a wide range of actions to address the City of Courtenay's GHG emissions resulting from municipal operations. By carrying out the actions and implementation plan in this strategy the City of Courtenay will meet the goals pertaining to GHG emissions related to municipal operations of the Climate Action Charter and the Province of BC's target to reduce GHG emissions by 33 percent from 2007 levels by 2020. The City will strive to achieve the goals and targets established in this plan in a cost effective manner. By pursuing the actions outlined in this strategy, the City of Courtenay will become a role model for other organizations within the region and the community as a whole.

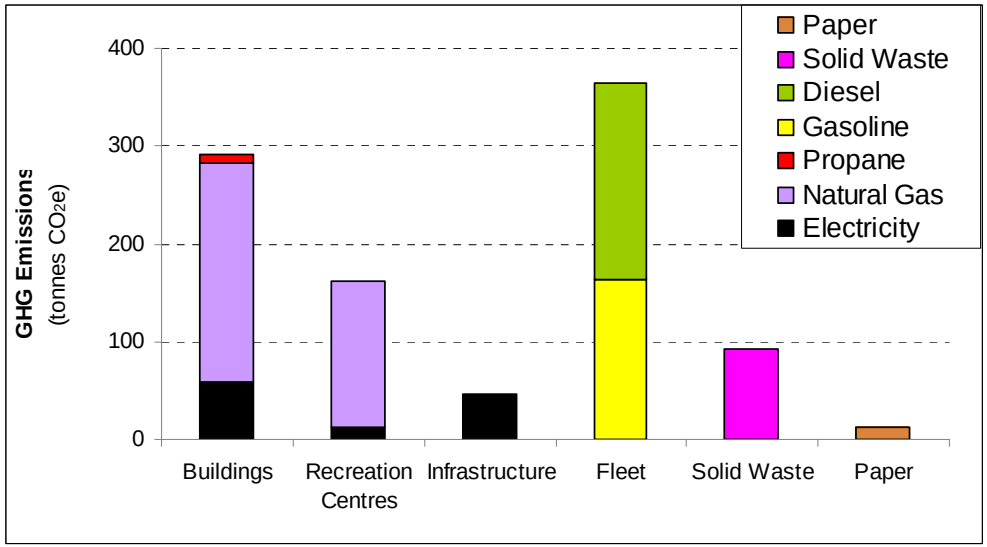
One of the goals the City agreed to by signing onto the BC Climate Action Charter is to become carbon neutral in respect to municipal operations by 2012. What exactly are carbon neutral operations? The goal of the Charter is for local governments to reduce GHG emissions that are associated with operations as much as possible and offset the remaining emissions to achieve carbon neutrality.

As an initial step, the City hired the Sheltair Group to compile a Corporate Energy & GHG Inventory (2008) to establish 2007 baseline data for corporate energy consumption. Energy sources included in the inventory are electricity, natural gas and propane (for carpentry shop) as well as gasoline and diesel fuel for the fleet. The consumption of each energy source results in the creation of GHGs.

Although not included in the Climate Action Charter commitments, GHG emissions are also estimated for the decomposition of the solid waste collected from municipal facilities and for the production of paper consumed by the City. The City feels that by reducing the production of waste and increasing the recycled content in paper will reduce corporate GHG emissions. For this reason, the City has included waste generation and paper use in our Corporate Climate Action Strategy. Ideally, resulting GHG emission reductions would qualify as a carbon offset.

The key findings of the inventory include:

- Total energy consumption by municipal facilities and operations in 2007 was 3.69 million kWh of electricity, 7852 GJ of natural gas, and 155,000 L of vehicle fuels for a total energy consumption of 26,720 GJ.
- Solid waste collected from municipal facilities is estimated at 191 tonnes per year.
- Total GHG emissions applicable to the Climate Action Charter carbon neutrality commitment are estimated at 869 tonnes carbon dioxide emissions in 2007 baseline year.
- GHG emissions related to corporate waste generation and municipal paper consumption are estimated at 93 tonnes and 13 tonnes, respectively. Although these emissions are not included in the Climate Action Charter carbon neutrality commitment the City will endeavour to make GHG emission reductions with respect to waste generation and paper consumption.



City of Courtenay Corporate GHG Emissions by Source

The three major sources of GHG are from municipal buildings, the Lewis Centre recreation facility (buildings, seasonal outdoor pool, and Lewis Park sports field lighting), and the corporate fleet. Municipal buildings consume the greatest amount of energy (gigajoules); however, the relatively low GHG intensity of hydro electricity means that buildings are not the largest GHG emitters. The vehicle fleet consumes 21 percent of the total energy, but produces 42 percent of the Climate Action Charter applicable GHG emissions as petroleum fuels have greater GHG emissions per unit of energy than other fuels.

Climate Action Toolkit BC states that "If a local government has a contractual or partnership arrangement to deliver these [traditional local government] services, the emissions from these same activities operated by the contractor/partner would also be included for new contracts or after a contract renewal." The City currently contracts out waste collection to a private firm. GHG emissions generated from this private contractor will have to be incorporated into the City's GHG emission calculation upon contract renewal in 2010. This addition is expected to significantly impact corporate GHG emission totals and complicates Climate Action performance measurement.

After reviewing the baseline and throughout the development of the corporate climate action strategy the following areas have been identified as priorities for action:

1. Fuel-efficiency and green fleet management;
2. Energy efficient retrofits for facilities;
3. Green design for new and replacement City buildings;
4. Behavioural change to reduce energy demands;
5. Energy efficient street and park lighting.

The focus of this strategy is on energy and emissions associated with corporate operations. An important next step will be to establish a Community Climate Action Strategy on how to utilize the City's influence and control over land-use, transportation, building design and energy infrastructure to achieve the broader goals of the Climate Action Charter.

1.5 The Challenge of Growth

Over the last 2 decades there have been several goals established to reduce GHG emissions by federal and provincial government as well as many of Canada's largest cities. Despite these goals, in 2007 Canada's GHG emissions have increased 25 percent and provincial emissions are up 30 percent since 1990. Population, the economy, and the built environment have increased providing numerous challenges to reducing GHG emissions; however, the City of Vancouver has demonstrated that despite significant growth pressures and increased demand for services since 1990, corporate GHG emissions have fallen to 5 percent below 1990 levels. The City of Vancouver's population grew by 24 percent between 1990 and 2007 and community emissions have been limited to a 5 percent increase. Vancouver's per capita emissions have decreased by 15 percent since 1990 and are one of the lowest in North America. Vancouver attributes much of their success to comprehensive retrofits of their facilities and the implementation of the Vancouver Landfill Gas Recovery System.

The City of Courtenay has experienced population growth far above the provincial average, with a 90 percent population increase from 1990 to 2006. The City estimates that the population of Courtenay is projected to grow at 3 to 4 percent annually over the next several years. The City's municipal boundary has also increased several times over the last decade. Continued boundary expansion will place a challenge on reducing corporate emissions as service areas increase. An energy and emissions inventory baseline adjustment will likely be required to reflect any future boundary extensions.

There has been a noticeable shift in local and national attitudes toward the realities of climate change in recent years, it is believed that this mainstream interest in combating climate change will aid in the success of this corporate strategy and future community based initiatives despite the continued challenge of growth.

In order to meet the goals and targets established in this plan, the City of Courtenay must revise policies and procedures to ensure that they are aligned with climate action strategies. Future capital plans must be developed with information on GHG reduction impacts in order to coordinate decision making.

1.6 Targets

Targets are established to provide a challenging but achievable goal that provides focus for the achievement of the objective of this strategy. Establishing and agreeing to the targets suggests that the City will provide the support and commitment to achieve the target. The combination of baseline data and targets provide a framework for measuring and reporting which encourages accountability.

Target 1:
A 33 percent reduction of corporate GHG emissions from 2007 levels by 2020 (in support of the Province of BC province-wide reduction target): Based on the 2007 baseline, this target equates to a 322 tonne reduction in GHG emissions by 2020. This 322 tonne target will need to be adjusted to incorporate a 33 percent reduction of GHG emissions generated by contracted waste removal services upon contract renewal in 2010. In order to achieve this target, the following annual reductions are recommended:

- A 50 tonne (approximately 5% of 2007 inventoried corporate emissions) GHG emission reduction annually in 2009 and 2010
- A 5% reduction of the 2010 adjusted baseline that incorporates contracted waste removal services 2011 and 2012.
- A 2% GHG reduction of the adjusted 2010 baseline inventoried corporate and waste removal contract emissions annually throughout 2013 to 2019

The above noted annual targets may have to be adjusted based on annual performance measurement and evaluation in order to meet the primary target of a 33 percent reduction by 2020.

Target 2:
All new City buildings must meet the requirements of LEED Silver (or equivalent) and demonstrate energy performance that is 25 percent better than the Model National Energy Code for Buildings.

Target 3:
To decrease the annual energy consumption of the City's large energy consuming facilities by a minimum of 20 percent by 2012.[5]

[5] Large energy consumer facilities are outlines in Table 1 of the Corporate Energy and GHG Inventory (2008).

1.7 Cost Effectiveness Analysis

"Unlike most capital projects carried out by local governments, energy efficiency projects provide a monetary return through the energy savings they generate. This means they can be viewed as investments rather than simply expenditures."

-Community Energy Association

Local governments undertaking energy efficiency projects tend to look at quick payback measures to justify the higher initial cost of the project. Short-term paybacks may look like the best option at first but when you consider full life cycle costing over the life of the project including deferred maintenance and replacement costs, the long term value of the project is clearer.

Cost effective analysis is incorporated into the recommend climate actions outlined in this strategy. The desired outcomes, GHG emission reductions and energy cost savings, of the recommended action are based on determining the actions with the highest effectiveness relative to cost together with project feasibility and ease of implementation. Cost effectiveness will be measured by determining the following:

- the cost per tonne of reduced carbon emissions;
- payback period of the initial capital cost associated with climate action implementation; and
- positive net present value when fully accounted over the life cycle of the product or project .

2.0 GHG REDUCTION ACTIONS

2.1 Municipal Buildings

The City of Courtenay owns a number of facilities ranging from City Hall, to the Public Works Yard to community and recreation centres. Almost half of the City's corporate greenhouse gas emissions are due to energy use in its facilities. Investing in energy efficient retrofits that will pay for themselves in relatively short order, due to reduced operating costs, while significantly reducing greenhouse gas emissions is a great opportunity for the City.

Action	Description	Measures	Responsibility / Timing
New municipal buildings: adopt a green building policy for new buildings.	Develop a green building policy for all new City buildings that will require all new and replacement City buildings over 500 square metres to: • meet a minimum of LEED™ Silver Certification or equivalent; • exceed energy performance of Model National Energy Code for Buildings by 25% or more; • to consider LEED certification for major renovations of existing buildings under LEED–EB (existing building). • perform a life cycle costing analysis for all projects over 500 square metres; • provide additional funding for designs and capital costs where the life cycle cost analysis shows a return on investment of greater than 10 percent. A draft Municipal Building Policy is attached as *Appendix A.* Challenges: • Administrative costs associated with LEED™. • Ensuring that "equivalent" truly is an equal standard. • Potentially increased capital costs associated with green	Implementation date of Policy Percentage of new buildings developed in accordance with policy New building performance –exceed energy performance of Model National Energy Code for Buildings by 25% or more. Long term monitoring of net present value of green building investment.	Council 2009

[6] City of North Vancouver. (2007) Leadership in Energy and Environmental Design. Retrieved January 6, 2009 from http://www.cnv.org/server.aspx?c=2&i=222

[7] The Sheltair Group. (2008). District of Central Saanich: New Building Policies Review.

Action	Description	Measures	Responsibility / Timing
	buildings ranging from 0 to 13 percent. Generally the greener (i.e. LEED™ Gold or Platinum) the building the more costly it is to construct. • Concern that projected efficiencies of new technologies will not meet expectations. Opportunities: • To display community leadership in the development of green buildings. • LEED™ Silver typically achieves an energy savings of 30 to 40 percent compared to standard construction. An additional capital investment of 2% in construction costs to incorporate LEED™ features will result in overall lifecycle cost savings of approximately 10 times the initial investment through energy savings.[6] • The initial capital outlay is usually paid back in 5 to 8 years due to associated energy efficiency operational cost savings • Ability to utilize existing rating systems and evaluation tools (i.e LEED™). • Energy efficiency upgrades have also shown to improve occupant health and comfort, employee productivity, and reduce maintenance requirements. Costs: The development of the policy will be completed in house at no additional cost to the City. The intent of the policy is to be cost-effective. On average constructing a LEED™ Silver building costs 2 percent more than a conventional building. [7]Additional capital costs may be required at time of construction to exceed the LEED™ Silver standard; however, the provisions of these funds to cover additional costs are recommended where they are proven to be cost effective (10 percent return on investment).		

Actions	Description	Measures	Responsibility / Timing
Retrofit Existing Buildings to Improve Energy Efficiency Buildings with the largest energy consumption should be the priority. Consider pursuing an energy performance contract, where an energy service company undertakes a turnkey retrofit project and in turn receives compensation from the energy savings.	The City will identify and undertake comprehensive retrofit opportunities in its existing municipal buildings. The first step is to conduct an energy audit of the major facilities. An energy audit will identify potential energy efficiency options, anticipated savings and estimated installation costs. Retrofit opportunities may include: • Building automation systems to integrate and control the major mechanical and electrical systems • Building retrofits, including glazing, insulation, and air tightness • Heating, ventilation and air conditioning upgrades • Hot water system upgrades • Retrofits to washroom facilities to conserve the use of domestic hot water Consider the use of an energy performance contract as a possible means of facilitating a comprehensive retrofit of municipal buildings. Energy performance contracting is an innovative funding technique that uses the cost savings from reduced energy consumption to finance the cost of installing the energy conserving measures. Other advantages include the ability to use a single contractor to do necessary energy audits, retrofits as well as guarantee the resulting energy savings. If projected energy savings are not attained the energy service company (ESCO) contractor pays the shortfall in energy savings. Challenges: • Staff time will be required to conduct or contract out the audits, evaluate the results, prepare a business plan, and manage the retrofits.	Percent of recommended retrofits completed. Length of payback period for retrofits. Annual energy cost savings and GHG emission reductions in comparison with baseline data prior to retrofit. Long term monitoring of net present value of green building investment. Survey of building occupants to determine if the retrofits provide comfort and health benefits. Review sick day data to review potential health benefits of retrofits.	Property Management 2009

[8] A major facilities include the large energy producers listed on Table 1 of the Corporate Energy and GHG Emissions Inventory.

Actions	Description	Measures	Responsibility / Timing
	• Initial capital costs. Opportunities: • Financial return on investment as a result of energy savings. • BC Hydro has several funding programs. BC Hydro funds 50 to 100 percent of the portion of the energy audit pertaining to electricity. BC Hydro also funds up to 60% of the retrofit costs that result in a reduction of electricity consumption provided that retrofits are initiated within 1 year of the audit. • Demonstrate leadership in the community. • Building occupant health and comfort improvements. Costs: • Audits range in costs from staff walk through reviews to several thousand dollars for an engineering audit. Costs typically range from $0.10 to $0.20 per square foot. A comprehensive energy audit for all of the City's major facilities is expected to cost in the range of $15,000 to $30,000. • Mechanical and electrical system retrofits cost in the range of $3 to $5 per foot. • Building envelope retrofits are estimated to cost $30 to $50 per foot of wall space. • Energy savings typically pay back in the capital cost of the upgrade in the 5 to 8 year range for larger facilities (the payback period could be reduced should partner funding be secured). • An energy performance contract with an ESCO may enable the City to complete a comprehensive retrofit and finance the capital cost with energy savings. Based on the experience of other municipalities, an average of a 20 percent reduction in energy consumption from retrofitted buildings is cost effective.		

Actions	Description	Measures	Responsibility / Timing
	Greenhouse Gas Reductions[8]: 10 % reduction of major facility electricity consumption equals 5.6 tonnes GHG emissions. 20 % reduction of major facility electricity consumption equals 11.2 tonnes GHG emissions. 30 % reduction of major facility electricity consumption equals 16.7 tonnes GHG emissions. 2.5% reduction of major facility natural gas consumption equals 9.2 tonnes GHG emissions. 5% reduction of major facility natural gas consumption equals 18.35 tonnes GHG emissions. 10 % reduction of major facility natural gas consumption equals 36.7 tonnes GHG emissions. 20 % reduction of major facility natural gas consumption equals 73.4 tonnes GHG emissions. 30 % reduction of major facility natural gas consumption equals 110.1 tonnes GHG emissions.		

Action	Description	Measures	Responsibility / Timing
Consider the feasibility of a district heating system	Explore the feasibility and potential partnerships for a district heating system. Challenges: • The initial cost of a district heating system requires a significant investment. • The capital cost for a building installed with a hot water heating system is higher than one without. • If district heating includes heat provision to private lands, builders of private development can be difficult to convince as the upfront costs fall on the builders and the operational cost savings are redeemed by the future buyers. Opportunities: • Grants and low-interest loans may be available. • Reduce GHG emissions by approximately 21 percent compared to standard heating practices. • The City may wish to consider district heating for redevelopment areas or potentially for new neighbourhoods. • Bill 27 amendments to the *Local Government Act* have provided municipalities with the tools to promote energy conservation and incentives for green developments. Costs: The cost of district heating feasibility studies in other jurisdictions have ranged from $50,000 to $100,000. The capital cost of a district heating system is usually in the range of $10 to $20 million dollars.		Property Management/Green Team 2011

2.2 Parks and Recreation Centres

The Lewis Centre consumes a large amount of energy which presents an excellent opportunity to find efficiencies that will result in GHG reductions. It is not uncommon for recreation centres to be large energy consumers, the City of North Vancouver and the Township of Langley recreation centres produce approximately a third of City emissions.

Action	Description	Measures	Responsibility / Timing
Perform energy audits on Lewis Centre buildings and facilities to identify retrofit opportunities.	This initiative includes energy efficiency audits and retrofits for the Lewis Centre. The Lewis Centre is a large consumer of electricity and natural gas. Opportunities may include: • Building automation systems to integrate and control the major mechanical and electrical systems • Building retrofits, including glazing, insulation, and air tightness • Heating, ventilation and air conditioning upgrades • Hot water system upgrades (ie. solar hot water) • Retrofits to the shower and washroom facilities to conserve the use of domestic hot water • When needed, replace kitchen appliances with Energy Star appliances. Challenges: • Staff time will be required to conduct or contract out the audits, evaluate the results, prepare a business plan, and manage the retrofits. Opportunities: • There are several recreation centre retrofits that have reduced energy consumption in the 20 to 30 percent range, For example, the Hyde recreation Centre in Port Coquitlam was retrofitted with solar hot water heaters in 2004 and has reduced natural gas consumption by 44% and energy consumption by 30%.	Percent of recommended retrofits completed. Length of payback period for retrofits. Annual energy cost savings and GHG emission reductions in comparison with baseline data prior to retrofit. Long term monitoring of net present value of green building investment. Survey of building occupants to determine if the retrofits provide comfort and health benefits. Review sick day data to review potential health benefits of	Community Services/ Property Management 2009

Action	Description	Measures	Responsibility / Timing
	Costs: • Audits range in costs from staff walk through reviews to several thousand dollars for an engineering audit. Costs typically range from $0.10 to $0.20 per square foot. A building audit for the Lewis Centre would cost approximately $5000. • Mechanical and electrical system retrofits cost in the range of $3 to $5 per foot. • Building envelope retrofits are estimated to cost $30 to $50 per foot of wall space. • Energy saving upgrades are typically paid back in the 5 to 8 year range for larger facilities. GHG Reductions: A comprehensive retrofit resulting in a 20 percent reduction of electricity and natural gas consumption would reduce GHG emissions by 27 tonnes	retrofits. Number and frequency of use of space heaters in building.	

Action	Description	Measures	Responsibility / Timing
Memorial Pool –Retrofit or reconstruction and operations review.	Analyze energy performance of pool and change rooms. Retrofit existing faucets and fixtures in the change rooms. Consider the purchase of a thermal pool cover and potentially a solar hot water system for the change rooms. As the facility is seasonal and 60 years old retrofits should be low cost until a decision regarding a larger scale renovation or reconstruction is considered. Potential reconstruction of the Memorial Pool should consider alternative energy sources such as solar or ground source geothermal. Challenges: • Determining the operating life of the aging facility. • Spending money to retrofit a facility with a limited life. • Ensuring recommended operating procedures are implemented by seasonal pool staff. • The pool boiler was replaced in 2008. Opportunities: • Solar BC and ecoEnergy funding opportunities are available for a maximum of $40,000. • Regional funding may be available for either reconstruction or retrofits. • The pool has a very high natural gas consumption for a facility with a 3 month operating season. In 2007, the natural gas consumption at the pool was responsible for 61 tonnes of GHG emissions (7% of City's Charter commitment GHG emissions). Costs: Vary from low-cost options to reconstruction costs.	Percent of recommended retrofits completed. Length of payback period for retrofits. Annual energy cost savings and GHG emission reductions in comparison with baseline data prior to retrofit. Long term monitoring of net present value of green building investment.	Community Services/ Property Management 2009

Action	Description	Measures	Responsibility / Timing
Solar irrigation and park lighting	The City of Courtenay currently has one of the largest computerized irrigation systems in the Pacific Northwest. Approximately 95% of the City's irrigation system is computer controlled by weather station data. Due to proposed changes in BC Hydro water meter requirements and billing for irrigation systems a solar panel system is recommended for all new irrigation systems as a pilot project. The success of the "pilot" should be monitored closely to determine maintenance requirements and program success. Challenges: • The upfront cost of installing a hydro connection is less expensive but comes with ongoing costs. Opportunities: • Ability to provide irrigation and possibly park lighting with no electricity costs. • Visible solar panels will provide positive examples of alternative forms of energy in high profile public places. Costs: Solar panel cost $5000. The payback period is approximately 7-12 years. Water meter $1500 and $280 annual hydro costs GHG reduction: Emissions associated with irrigation are small.	Actual costs compared to estimated costs. Compare maintenance requirements between hydro and solar systems. Number of park lights and irrigation powered by solar panels.	Parks 2009

Action	Description	Measures	Responsibility / Timing
Urban Afforestation and Street Tree Planting	Planting trees can help reduce the amount of carbon in the atmosphere. Trees naturally sequester carbon and store it as wood. Growing trees can store carbon until they reach maturity at 80 to 100 years old. After a tree reaches maturity, little carbon is sequestered. The City proposes to take an active role in urban afforestation projects on private and public land. The City has applied for Trees for Tomorrow funding to develop a BC 150 Grove at Malahat Park. Contingent on funding approval, the grove is expected to consist of approximately 4000 trees and shrubs. The Residential Tree Program is proposed to be launched in March 2009. The program would allow Courtenay residents to purchase up to 3 trees per property at a discounted rate at River Meadow Farms Nursery. The discount is to be borne by the nursery and the advertising and coupon system is administered by the City. Challenges: • For tree planting to be considered a carbon offset the tree planting would have to be something that would not have happened otherwise. • Trees that are installed after lands have been cleared to build infrastructure should not be incorporated into an offset unless the lands were cleared prior to 2009 with no plans for afforestation. Opportunities: • To increase the number of trees on City owned lands. • To encourage the afforestation of schools, and private property. • School districts, colleges and other provincial agencies are required to be carbon neutral by 2010 and should be encouraged to partner on afforestation projects.	Number of trees planted on City lands. Number of trees purchased by residents under the Residential Tree Planting Program.	Community Services/ Engineering BC 150 Grove: 2009 (contingent on Provincial funding) Residential Tree Program: 2009 Consider annual programs and partnerships.

Action	Description	Measures	Responsibility / Timing
	Costs: Costs range from less than a dollar for seedlings to several hundred dollars for a more mature tree. City owned parks and boulevards generally would require the installation of fairly mature (expensive) trees. The BC 150 Grove is estimated to cost $100,000 with 50% funding from the Province and 50% funding from existing budgets. The residential tree planting program has an advertising cost of approximately $1000. Residents will pay for the trees at a discounted rate provided by the nursery. GHG Offset: The 150 grove located at Malahat & Lerwick would result in an annual carbon sequestration of 10 tonnes annually for approximately 80 years. The 2009 residential tree program, based on 400 trees planted, would equate to a 1 tonne annual offset or an 80 tonne offset over the life of those trees.		

2.3 Fleet

The City of Courtenay fleet consists of approximately 145 cars, trucks and heavy equipment units. Approximately 40 percent of City's corporate greenhouse gas emissions are a result of the operation of the City fleet. The City has taken several actions to improve fuel efficiency and reduce emissions such as the conversion to biodiesel. There are several actions that the City would like to take that are expected to provide opportunities to reduce emissions and improve fuel efficiency. The adoption of green fleet policy and procedures will guide the City in achieving this goal.

Action	Description	Measures	Responsibility / Timing
Adopt green fleet policies and procedures	In order to ensure that the City is purchasing the most fuel efficient and appropriately sized vehicles for our fleet, green fleet policy and procedures must be established to guide this process. Draft Green Fleet Policy and Procedures are attached as Appendix B. Challenges: • The new policy and purchasing procedures will have to be communicated effectively to staff. Senior staff must be informed about the revised procedures and business case expectations for fleet purchases. • More staff time will be required to complete business case and incorporate life cycle cost analysis. Opportunities: • Approximately 40 percent of the City's GHG emissions can be attributed to the fleet. • Replacing the fleet with fuel efficient and alternative fuel vehicles can have significant impacts on corporate GHG emissions. • The City of Toronto estimates that green fleet purchasing will reduce GHG emissions between 2008 and 2011 by 11 percent compared to business as usual. Toronto's green fleet plan 2008-2011 is expected to result in an operating cost savings that is twice the capital cost of the green fleet. Costs: The draft Green Fleet Purchasing Policy has been completed in house. Implementation is expected to be carried out by staff at no	Adoption of Green Fleet Policy	Council 2009

	additional cost to the City.		

Action	Description	Measures	Responsibility / Timing
Right-size the fleet	When replacing vehicles, ensure that all new vehicles are the most-fuel efficient nature for the defined staff/task. It is recommended that this program be initially implemented at time of vehicle replacement for 2009. The City typically replaces 5 to 10 vehicles annually. Right-sizing vehicles prior to replacement date should prove to be cost effective. It is recommended that consideration of early replacement be considered in the E3 Fleet Review provided that the early replacement is cost effective. Analyze vehicle utilization to reduce the number of vehicles required and kilometers traveled, use vehicles more efficiently and delete underused vehicles from the fleet. Evaluate the use of electric low-speed vehicles for specific City operations and pilot testing these vehicles if the evaluation indicates that they will be beneficial. Give consideration to the potential of task specific trailers to reduce fleet requirements. Fleet purchasing policy and procedures must be revised to support implementation of right-sizing initiative. Incorporating life-cycle costing in purchasing procedures is an important component to realizing operating cost savings associated with fuel efficiency. Challenges: • Need to revise policy and procedures to support implementation • Cost premiums of hybrids and zero emission vehicles. • Slow turn over of City vehicles • Staff acceptance (early signs are positive) • Reduced safety standards of low speed zero emission electric vehicles	Fuel consumption and emissions. Energy efficiency and GHG emission comparison between previous and replacement vehicle.	Multi-Department Fleet Committee 2009 – ongoing

Action	Description	Measures	Responsibility / Timing
	• A bylaw must be enacted that would allow Zero Emission Electric Vehicles on City roads marked up to 50 km/hr. Opportunities: • Greening the City's fleet will raise our corporate profile and demonstrate leadership. • Some members of City staff have identified opportunities to down size vehicles. • PST savings on hybrid vehicles • Potential for low speed zero emission electric vehicles on City roads with 50 km/h speed limits or less (Bylaw approval required) • Consider the development of initiating a community car share program with under utilized vehicles • Vehicle operation costs savings • Excel based tools are available to compare vehicle purchase choices to make optimal decisions. Costs: Initial capital cost may be higher but fuel saving should result in a cost savings over the life cycle of the vehicle. In many cases a smaller vehicle will be less expensive. Lifecycle costing needs to be incorporated into decision making.		

Actions	Description	Measures	Responsibility / Timing
Continue alternative fuel use. Utilize a B20 blend for 12 month a year. Consider E10 blend gasoline when locally available.	Continue to use a B20 biodiesel blend. Utilize B20 blend rather than a B5 blend during winter months. Stay current on the availability of alternative fuels. E10 a 10% blend of ethanol in gasoline that is anticipated to be available from the City's fuel supplier in 2010. Challenges: • Social cost of using food crops as fuel • Winter vehicle and equipment operation in winter months utilizing B20 blend as it tends to clog filters more than a B5 blend. Opportunities: • Assuming that biodiesel is considered to be carbon neutral with respect to tail pipe GHG emissions, reductions in GHG emissions correspond to the percentage of biofuel content in the blend used (i.e. a B20 biodiesel blend has only 80% of the tailpipe GHG emissions as a regular diesel). Costs: There is approximately a two to three cent per litre surcharge for B20 blend biodiesel; however, this surcharge is negated by tax savings associated with the biodiesel portion of the fuel. Currently, there is a one to two cent net savings for utilizing a B20 blend. GHG Reductions: The anticipated GHG emission reductions of utilizing a B20 blend for 12 month a year is 15 tonnes (based on 2007 fuel consumption). The anticipated GHG reduction of utilizing an E10 blend in 2010 (based on 2007 fuel consumption) is 18 tonnes.	Annual use of B20 and B5 biodiesel blend	Multi-Department Fleet Committee Annual B20 use: 2009 Incorporation of E10 gasoline blend in 2010.

Action	Description	Measures	Responsibility / Timing
Driver training and fuel efficient policy and procedures	How a vehicle is driven can have a significant impact on fuel consumption. Driver training in fuel efficient driving techniques can significantly improve fuel efficiency. Develop formal operational procedures and driver training programs that ensure fuel efficiency measures such as: • Driving techniques • Speed policy • Idle-reduction • Vehicle weighing • Route planning Conduct half day sessions that combine safety & fuel saving on-road training with classroom theory session for 30 employees with the most utilization of the City fleet. All other full-time employees are to participate in a 1 hour fuel efficient driving workshop. Include fuel efficient driving tips in seasonal employee orientation program. Challenges: • Staff has self-initiated many of these fuel efficiency measures; anticipated fuel efficiency may not be as high as other jurisdictions. • Some of the larger vehicles are required to warm up by idling the vehicle in winter conditions. • Some vehicles require that the engine run while operating secondary equipment. Opportunities: • Fuel savings can be as high as 30% and on average 10% fuel savings are obtained through the in vehicle driver training. • The City of Edmonton reports a 5% decrease in fuel consumption due to driver training.	Percentage of employees with fuel efficient driver training. Development of fuel efficiency policy and procedures. Fuel efficiency monitoring of fleet.	Multi-Department Fleet Committee 2009

Action	Description	Measures	Responsibility / Timing
	Costs: Half day driver training costs approximately $75 per employee and 1 hour workshops for 30 employees cost $300 dollars. The cost of this program is approximately $4000. Ongoing updating should be considered on an annual basis. Greenhouse Gas Reduction: The projected greenhouse gas emissions reduction, based on a 3% reduction of 2007 fuel consumption, is 11 tonnes.		

Actions	Description	Measures	Responsibility / Timing
Initiate a pilot project to install auxiliary heaters in 13 fleet vehicles.	Auxiliary cab heaters allow heat to be generated inside the cab of a vehicle without the engine having to run. In the wet and cold winter months vehicle often have to idle for several minutes in order to defrost and defog. This pilot project will provide the City the ability to review the impact and success attributed to the installation of auxiliary cab heaters in 13 of the heavily utilized Parks and Public Works fleet. This pilot is recommended based on the success of other pilot projects in other jurisdictions with similar winter climates. Challenges: • Getting staff in the habit of plugging their vehicle in at night. Opportunities: • Auxiliary heaters will be on timers, vehicles will be ready when employees report to work allowing staff to be more efficient. • The electrical plug-ins provide for opportunities to utilize auxiliary batteries for other uses and will make the Works Yard electric vehicle ready. • Staff will not be using de-icing chemicals on vehicles that are utilizing the heaters. • Based on the City of Vancouver's GHG emission reduction estimation this is a very cost effective way to reduce emissions. Cost: Auxiliary heaters cost approximately $200 each installed. The cost of the pilot is $2600. The plug-ins could also be utilized when the City has electric vehicles that will also require plug-ins for recharging. GHG reduction: The City of Vancouver estimates that 1 auxiliary	Fuel consumption and efficiency monitoring of pilot project. Survey staff regarding effectiveness of pilot in reducing idling and improvements to employee comfort.	Fleet Management Committee Pilot Project Implementation: 2009

Actions	Description	Measures	Responsibility / Timing
	cab heater in a well utilized vehicle can reduce GHG by 0.88 of a tonne. Based on this estimation, 13 vehicles could reduce GHG emissions by 11.4 tonnes. Based on a conservative estimate of idling time to de-frost/de-fog and the utilization of the heaters for a four month period the pilot would reduce GHG emission by 4.5 tonnes and save approximately 4000 litres of fuel. Paying for the program and providing fuel savings in less than 3 months.		

Actions	Description	Measures	Responsibility / Timing
Develop a heavy equipment idle time baseline. Program heavy equipment to turn off when idling longer than 3-5 minutes. Initiate the use of idle limiting devices.	One of the key objectives of a green fleet is to reduce fuel consumption and exhaust emissions. Some vehicles equipped with power take-offs need to idle to operate units, heaters, boom cranes and other truck-mounted equipment. Unnecessary or excessive idling, however, is expensive and causes environmental damage. Since idling gives you zero kilometers per litre and typically reduces the operating life of engine oil and engine life, it really does get you nowhere. Some of the City's newer heavy equipment is equipped with an engine computer that tracks idle time and has the ability to be programmed to turn off the engine after idling for a set time such as 3 to 5 minutes. It is recommended that a baseline be established by downloading the current idling information and that the computer to control idle times on this equipment is programmed. A pilot project to install idle limiting devices in 2 of the City's fleet that idle unnecessarily most often. The device will turn the engine off after 4 minutes of idling. The operator would have to lift the hood and press a restart button on the device. This process is expected to break idling habits. Challenges: • Staff may be resistant to the potential inconvenience of idling control devices. Opportunities: • Reduced idle times will save on fuel and maintenance cost as well as reduce emissions. • By using idle-limiting devices, Neptune Food Services reduced idling time from 20 percent to 7 percent. Cost: Two idle-limiting pilot devices installed costs $1020. Heavy equipment baseline and idle control programming can be completed in-house at a staff cost of approximately $200.	Fuel consumption and efficiency monitoring of pilot project. Number of times the idle limiting device turned off each vehicle. Survey staff regarding effectiveness of pilot project in reducing idling.	Fleet Management Committee Determine Heavy Equipment idling baseline: 2009 Program heavy equipment for idle control: 2009 Installation of 2 idle reduction devices: 2009 Consider installation of additional idle reduction devices: 2010

Action	Description	Measures	Responsibility / Timing
Retrofit older fire engines with LED lights	Two of the older fire engines require that the engine be idling for the emergency lights to be on. Retrofitting these vehicles with LED emergency lights allows the lights to be on without the engine having to run. Opportunities: • Reduce idling times of fire department vehicles while at emergencies. Challenges: • The cost of LED replacement is ineffective unless a grant opportunity is available. • The vehicles in question do not have computers to track idling time or engine running hours, making determination of idling time or resulting emission reductions difficult. Cost: LED light retrofits cost approximately $7500 per vehicle. GHG reduction: Based on current vehicle use, GHG reductions are minimal.	Retrofitted fire truck fuel consumption and efficiency.	Fire Department Implementation dependant on funding opportunities and further cost effective analysis.

Action	Description	Measures	Responsibility / Timing
Complete a Fleet Review – track fuel consumption and vehicle performance data.	E3 Fleet has developed a comprehensive software supported, expert review for reviewing the energy, emissions and financial performance of fleets, and identifying priority areas to increase fuel efficiency, reduce operating costs, and reduce emissions. The first step is to determine GHG emissions and fuel performance for each vehicle. The utilization of each vehicle is also determined. The City installed a Computrol Card Lock System which has been tracking fleet fuel data since the Spring of 2008. The system will track odometer readings and fuel consumption for each vehicle in the fleet. Once an annual baseline is established, it will be much easier to complete a fuel performance monitoring and reporting program. Challenges: • In order to analyze a complete year of data, the City will have to wait for the data to be collected. • Staff time or consultant costs to analyze fuel and emissions data. Opportunities: • Managing fuel data will provide a better understanding of fleet operations costs. Costs: Staff time or consultant fees to analyze data. Approximately initial cost of $5000 in addition to annual updating costs.	Completion of Fleet Review Fuel consumption monitoring Fleet GHG emissions	Multi-Department Fleet Committee 2010 – ongoing

2.4 Street, Traffic, and Ornamental Lighting

The City of Courtenay participated in BC Hydro's LED traffic light and crosswalk change-out program in 2002 and has replaced all incandescent traffic signal bulbs with high efficiency LED lights.

The City has also converted its holiday lights from the older, inefficient incandescent bulbs to LED bulbs. In 2008, the City purchased over 6,500 new LED bulbs and will be replacing the lights on all its seasonal displays, as well as the fairy lights which are up year-round. The new lights are about 88% more efficient than the old bulbs, resulting in significant energy savings. The City estimates that the entire cost of the new bulbs will be offset by the energy savings in less than two holiday seasons.

The City of Courtenay is in the process of initiating a detailed energy assessment of the implementation of an adaptive street lighting program. An adaptive street lighting (ASL) program includes the installation of hardware in each street light owned by the City to allow the lights to operate at a reduced output during times in the night when there is very little traffic on the streets. BC Hydro will reimburse the City for the full cost of the assessment ($45,886.05) once completed. The ASL assessment is expected to be completed by February 2009.

Action	Description	Measures	Responsibility / Timing
Street light retrofits	Implement an adaptive street light (ASL) program and/or replace street light standard with energy efficient models. The City of Courtenay has approximately 1000 street lights. Challenges: • The current low cost of electricity and the associated change out costs make grant money necessary for this program to be cost effective. Opportunities: • BC Hydro will pay 60% of costs associated with the installation of adaptive street lighting hardware and controls. • An ASL program is expected to reduce street light energy consumption by 17% or over 150,000 kWh annually. Based on current rates, electricity saving would be approximately $10,000 annually. • Obtrusive light reduction.	Percent of street lights included in ASL Program. Monitor the amount of electricity utilized by street lights. Energy efficiency and GHG emission comparison between existing street lighting and ASL.	Engineering Division Implementation: 2009

Action	Description	Measures	Responsibility / Timing
	Costs: • The City's costs associated with implementing an ASL program for all 1000 street lights is approximately $60,000 (based on 60 percent of cost being paid by BC Hydro). • The estimated payback is 6 years or less. • GHG emissions reduction: approximately 5 tonnes annually		

2.5 Procurement and Information Technology

Green procurement practices are an effective tool for achieving energy and GHG reductions. This section outlines several actions to ensure the purchase of energy efficient equipment as well as recommending draft purchasing policies for energy efficiency equipment and a green fleet (as outlined in the Fleet section of this strategy).

The Climate Action Toolkit BC states that "If a local government has a contractual or partnership arrangement to deliver these [traditional local government] services, the emissions from these same activities operated by the contractor/partner would also be included for new contracts or after a contract renewal. The rationale for including contracted out services was to establish a level playing field amongst all local governments. The rationale for phasing them in was to provide local governments with an opportunity to influence emissions during the next contract, and difficulty in data collection in some present circumstances."

BC Hydro has determined that energy efficient office equipment offers one of the most cost effective ways to reduce office energy consumption. Generally energy efficient office equipment has no incremental capital cost and could save an average of 25 percent in the operating cost of office equipment.

Action	Description	Measures	Responsibility / Timing
Energy efficient purchasing	Adopt a Climate Action Purchasing principles (draft attached as Appendix C) to select only Energy Star rated equipment, supplies, and appliances, for products with an established rating. Challenges: • It may not be possible to source Energy Star rated products for all purchases. Opportunities: • Energy Star office equipment reduces energy consumption by 25 percent compared to standard equipment. Costs: There may be minimal surcharges for Energy Star appliances.	Number of Energy Star products purchased. Number of Energy Star products replacing non-rated less efficient products.	Purchasing Agent/All Departments 2009

Action	Description	Measures	Responsibility / Timing
Develop Climate Action contract specifications	Develop contract specifications that meet the City's Climate Action Charter commitments in requests for proposals and tendering documents. The purpose of these specifications would be to ensure that Climate Action energy reducing measures and GHG emission data is collected by contractors of traditional municipal services. Purchasing contracts must also ensure the increased use of products and services that are environmentally sensitive in the way that they are manufactured, used and disposed of. Challenges: • The City's contract with IPI is up for renewal on March 31, 2010. Corporate GHG emission data will require adjustment at that time. • GHG emissions will have to be incorporated into the City's carbon neutrality commitment upon renewal. • Being familiar with the most energy efficient specifications in a continuously evolving industry. • Energy and GHG emissions baseline and annual data collection from private contractors. • Influencing practices such as idle-reduction, route planning and fleet purchasing of a private waste collection contractor. • Climate Action contract specifications will likely increase the cost of contracted services to the City. Opportunities: • To raise awareness of green procurement and practices in the private sector. • There are other governments that have developed green specifications that can be referenced by the City. Costs: Staff time to draft contract specifications and collect data from contractors. GHG Reductions: Contracted services must be added to the City's emissions upon renewal and ideally reduced over time.	Number of new and renewed contracts entered into annually. Annual GHG reductions achieved based on contract specifications. Number of Energy Star products purchased. Number of Energy Star products replacing non-rated less efficient products.	Purchasing Agent/All Departments 2009

Action	Description	Measures	Responsibility / Timing
Initiate a Low Carbon Information Technology (IT) Program	Purchasing Energy Star computer equipment and programming energy saving measures such as automatic sleep and standby modes on all computers and monitors will provide significant energy reductions. Installing power bars to ensure that there are no "phantom consumers" of energy. According to the US Department of Energy, "In the average home, 75% of the electricity used to power home electronics is consumed while the products are turned off." This phantom power consumption can be avoided by using a power bar and using the switch on the power bar to cut all power to the electronic equipment. Challenges: • Restarting computers can be considered inconvenient and has a time component associated with it. • Ensuring that the power bars switches are used. Opportunities: • Purchasing Energy Star computer equipment and programming energy savings measures is expected to reduce annual energy consumption by 87,304 kWh. • Microsoft Outlook reminders could be utilized to remind staff to use the power bars switches. Costs: The costs associated with purchasing power bars is $2000 dollars; however, the estimated annual electricity savings is $6000. GHG Reductions: The energy savings associated with a Low Carbon IT Program is approximately 1 tonne.	Electricity Consumption Survey staff to determine the frequency of utilization of the power bar switches. Number of Energy Star IT products purchased. Number of Energy Star IT products replacing non-rated less-efficient products.	IT 2009

Action	Description	Measures	Responsibility / Timing
Increase recycled content of paper	Until November 2008 the City purchased 100% virgin fiber paper. Purchasing paper with a 40% recycled content will reduce emissions that occur upstream in the supply chain and not within the City. This initiative would be considered to be an offset to corporate GHG emissions and not a reduction of our corporate emissions as per the BC Climate Action Charter. It is recommended that the quality of 50 to 100% recycled paper products be monitored annually to determine if technological improvements provide the desired printing quality. Challenges: • Maintaining the quality of printed material with higher recycled contents. Opportunities: • Switching from 40% to 100% would be an additional reduction of 3.6 tonnes of GHG emissions. Costs: The annual cost based on 2007 paper consumption data is $200. GHG Offset: Based on 2007 paper consumption data, the change to 40% recycled content will offset our Corporate GHG emissions by 2 tonnes. Corporate waste generation is not a Climate Action Charter commitment. Resulting GHG reductions should be considered an offset for 2009.	Recycled content of paper.	Financing/ Purchasing Monitor new paper products annually for higher recycled content.

3.0 Leadership and Communication

The implementation of the Corporate Climate Action Strategy will demonstrate commitment within the organization and position the City as a role model for Climate Action in the community. Communicating to staff and encouraging behavioural change through promotions, presentations, and newsletters is vital to the successful implementation of this corporate Strategy and will be imperative to taking the next step of the Climate Action initiative which will be to develop a Community Climate Action Strategy.

This section provides several other recommended actions that will illustrate leadership but may not be directly related to corporate emissions.

Action	Description	Responsibility
Communicate Success	• Share success stories via media releases and the City website • Develop posters and interpretive signage to communicate and inform the community about Corporate Climate Actions.	Community Services/Green Team
Promotion	• Promote energy saving initiatives at community events such as Earth Day.	Community Services/Green Team
Capacity Building	• Educating staff about energy conservation activities. • Develop informative newsletters and energy saving tips and reminders for staff. • Coordinate Climate Action learning opportunities for staff.	Community Services / Green Team
Corporate Demand Side Management	• Develop programs regarding staff energy use and commuting. • Develop strategies to support employees to find ways to avoid traditional single occupant commuting. • Examine the efficiency, cost-savings and environmental benefits of a compressed work week and alternative work arrangements.	CAO /HR/ Green Team
Consider GHG emission reduction in decision making and business case reviews	• In order for the implementation of the Climate Action initiative to be successful it will be important to include energy and emission impacts in Council reports and business cases to ensure that energy management is considered in all decision making.	Council/ All Departments

Action	Description	Responsibility
Zero Emission Electric Vehicles Bylaw	Adopt a bylaw that would allow Zero Emission Electric Vehicles on City roads marked up to 50 km/hr.	Council/ Engineering/ Corporate Services
Become a member of the Community Energy Association and become a participating municipality with Community Action on Energy and Emissions (CAEE)	• Increase membership with research, funding and outreach organizations specializing in providing support to local governments.	Planning
Corporate Waste Reduction	• Increased recycling opportunities in City buildings. • Provide dishwashing facilities and table and glassware at meeting facilities to reduce disposable products.	Green Team/ Community Services/ Property Management
Adapting to Climate Change	• Consider climate change impacts and adaptation when undertaking capital projects and making land use decisions.	All Departments

4.0 Resources and Requirements

Senior management's support and commitment is critical to ensure the plan has the resources, direction, and accountability that is necessary to ensure success at the implementation stage. The CAO and Directors of the City have demonstrated strong support of this initiative from concept to the completion of this strategy.

Over the last several years the City has undertaken several initiatives that have reduced energy consumption and GHG emissions. Many of the past initiatives have been in response to funding opportunities and are not necessarily based on consideration of a comparable cost effective analysis. Although there is a staff desire to take actions to reduce GHGs and energy consumption, staff has often found that there are often obstacles to implementation. During the focus group discussion, four common barriers to implementation were identified. The following efforts are needed to overcome the identified barriers to successful implementation:

5. Communication and clear direction is needed to change business as usual;
6. Additional human resources are needed to champion and implement energy and GHG emission reducing actions;
7. Existing policies and procedures must be revised (i.e. procurement decisions must be based on purchase price versus lifecycle costing); and,
8. City budgets, policies and plans need to be aligned with Corporate Climate Action Strategy.

5.0 Implementation

Implementing the Corporate Climate Action Strategy is an important step toward reducing greenhouse gas emissions in our community. Implementing the Corporate Climate Action Strategy and developing a Community Climate Action Strategy requires dedicated staff and financial resources.

The following outlines a recommended implementation plan for 2009 through to 2011. It is imperative that this implementation plan is reviewed and revised annually to explore available funding opportunities and data that has become available over the course of the year.

2009 – 2011 Recommended Implementation Plan

Annual municipal review and reporting on energy consumption and GHG emissions must be incorporated into the annual review and revision of this implementation plan.

2009 Climate Actions

Project	Estimated GHG Emissions Reduction	Projected Costs	Cost per GHG tonne reduced or operational savings
Adopt Municipal Green Building Policy		nil	n/a
Comprehensive building audit[9]		$15,000[10]	n/a
Retrofit existing buildings – Phase 1	Estimate 13 tonnes but will be based on audit (partial year may translate to 5 to100 tonnes annually).	Based on audit	Based on audit. Energy savings are projected to finance capital costs with a 5-10 year payback resulting in a net long term operational savings.
Residential Tree Program	80 tonne lifetime offset.[11]	$1000	$12.50 per tonne
BC 150 Grove (Grant funding dependent)	10 tonne annual offset/ 800 tonnes over lifetime.[12]	$50,000 (City portion from existing budgets)	$62.50 per tonne
Adopt Green Fleet Policy and Procedures		nil	n/a
Green fleet and driver training – 3 percent reduced fuel consumption	11 tonnes	$4000	$4648 projected annual fuel savings is greater than the cost of the program.
Replace B5 biodiesel with B20 biodiesel during winter months	15 tonnes	$500 - $1000 savings	Small fuel cost savings

[9] Lewis Centre and Memorial Pool audits are included in this project.

[10] Based on BC Hydro funding for 50% of the audit. BC Hydro may refund the City's cost of the audit if a electricity savings retrofit takes place within 6 months of audit completion.

[11] Determined by Tree Canada's recommended carbon offset formula.

[12] Determined by Tree Canada's recommended carbon offset formula.

Project	Estimated GHG Emissions Reduction	Projected Costs	Cost per GHG tonne reduced or operational savings
Auxiliary Cab Heater Pilot Project	4-11 tonnes	$2600	The project is expected to reduce fuel use by 4000 litres over 4 winter months resulting in a cost savings greater than the heater cost within the first 3 months of use. The project also provides staff time efficiency.
Idle limiting device pilot and heavy equipment baseline and idle control	2 tonnes (estimate, as no baseline exists, based on reducing idling in each vehicle by 30 minutes per work day)	$1220	This pilot is expected to reduce fuel consumption by 960 litres annually. Payback 1.5 years.
Alternative Street Lighting Program based on June 09 installation and 6 months of electricity savings. 50% of GHG reduction accounted for in 2010.	2.5 tonnes for first 6 months	$60,000 (Proposed in the 2009 Engineering Division budget)	The resulting $10,000 of annual energy savings results in a projected 6 year payback and net long term operational savings.
Adopt Climate Action energy efficient purchasing principles		nil	n/a
Develop climate action contract specifications			n/a
Low carbon IT program	1 tonne	$2000	The annual operational savings is $6000 resulting in a net savings.
Leadership and communication projects		Staff time	
Behavioural change – Phase 1	5.5 tonnes	Staff time	Operational savings
Energy and GHG Inventory baseline update	n/a	$2000	n/a
Planned Minimum Greenhouse Gas Reductions	**51 tonnes**		
Projected Offsets	**90**[13]		

[13] Based on a one time 80 tonne lifetime offset for the residential tree program and a year 1 -10 tonne annual offset for the Malahat Grove

2010 Climate Actions

Project	GHG Emissions Reduction	Projected Costs	Cost per GHG tonne reduced
Building Retrofits and behavioural change – Phase 2	(estimated 20 to 100 tonnes)	Based on audit	Based on audit
Residential Tree Program Phase 2	40 tonnes *offset*	$500	$12.50
Fleet Review – data analysis		$5000	
Green fleet – 3 percent reduced fuel consumption • Driver training - Phase 2 • Vehicle right-sizing	10 tonnes	$2000	$3000 net savings from reduced fuel costs.
Replace gasoline with an E10 blend	18 tonnes		Small fuel cost savings.
Consider additional idle limiting devices or policy			
Consider additional auxiliary cab heaters			
Alternative Street Lighting Program based on June 09 installation and 6 months of electricity savings	2.5 tonnes		
Waste Removal contract renewal – Energy and GHG Inventory baseline adjustments			
Energy and GHG Inventory baseline update and waste removal contract adjustment	n/a	$5000	n/a
Planned Minimum Greenhouse Gas Reductions	**50 tonnes**		

2011 Climate Actions

Project	**GHG Emissions Reduction**	**Projected Costs**	**Cost per GHG tonne reduced**
Green fleet initiatives – reduced fuel consumption • Actions to be based on 2010 fleet review analysis • Vehicle right-sizing	15 tonnes		
Building Retrofits and behavioural change – Phase 3	35 tonnes		
District Heating Feasibility Study	n/a	$50,000 - $100,000	n/a
Energy and GHG Inventory baseline update	n/a	$2000	n/a
Planned Minimum Greenhouse Gas Reductions	**50 tonnes plus 5% waste removal contract GHG emissions**		

Appendix “A”

Municipal Green Building Policy

PURPOSE

The Municipal Green Building Policy supports other initiatives with respect to conservation and the environmental stewardship. The intent of this policy is to help the City meet its corporate climate action and sustainability goals. The City also recognizes that green buildings have health, environmental, financial, and occupant comfort benefits in addition to energy efficient operations.

SCOPE

This policy applies to all City departments.

POLICY STATEMENTS

1. The City will incorporate green and energy efficient building practices, where practical, into municipal facilities of all sizes that are developed, owned or managed by the City;

2. The City will consider transportation energy intensity (anticipated energy and GHG emissions generated traveling to and from the municipal building)in the site selection process for municipal buildings;

3. New and replacement City buildings over 500 square metres are required to meet a minimum of LEED™ Silver Certification or equivalent.

4. New and replacement City buildings over 500 square metres will achieve 25% or greater energy efficiency than the Model National Energy Code for Buildings, where possible.

5. The City will perform a life-cycle cost analysis comparing LEED™ Silver, Gold and Platinum standards prior to tendering for all construction and retrofit projects larger than 500 square metres undertaken by the municipality

6. Additional funding will be provided for designs and capital costs where the life cycle cost analysis shows a return on investment of greater than 10 percent, over the expected life of the asset.

7. The City will undertake operational retrofits of existing facilities to improve energy and water efficiency, where the retrofits prove to be cost effective based on a life cycle cost analysis.

8. The City will consider certification for major renovations of existing buildings under LEED™–EB (existing building) or a comparable green building program.

9. The City of Courtenay will show leadership in green building design by working cooperatively with other jurisdictions to promote green building design and practices in a consistent way in the region.

Appendix “B”

Green Fleet Policy and Procedures

PURPOSE

The purpose of this policy is to outline the process for purchasing and managing the City fleet, which includes both vehicles and heavy equipment, in a manner that minimizes greenhouse gas emissions and considers life-cycle costing.

The City recognizes that fleet assets account for approximately 40 percent of the City’s overall greenhouse gas emissions, and that these emissions can be reduced, along with fuel consumption and maintenance costs, through the purchase of green vehicles and heavy equipment.

SCOPE

This policy applies to all City Departments.

POLICY

The City adopts the following policy:

1. The City shall make every effort to purchase and use the lowest emission vehicle or equipment item possible, while taking into account the vehicle’s life-cycle costs and the ability to support City operations and services.

2. Through implementation of this policy, the City shall seek to decrease total vehicle emissions in accordance with the City’s Corporate Climate Action Strategy.

3. Current and future emissions targets will be developed and evaluated within the context of the City’s overall Climate Action strategies.

The objectives of this policy are to:

A. Optimize the fleet size – eliminate or redeploy unused or under-utilized vehicles while promoting sharing across departmental lines.

B. Purchase non-emergency fleet vehicles that provide the best available net reduction in vehicle fleet emissions, including, but not limited to, the purchase of alternative fueled, electric, and hybrid vehicles.

C. Consider purchasing lower emission emergency fleet vehicles with comparable performance, safety, and fuel availability during emergencies as compared to conventionally powered emergency fleet vehicles.

GREEN FLEET PRCOCEDURES

Establishment of Multi-Department Green Fleet Team

1. Establish a Green Fleet Team to monitor, review, and implement the Green Fleet Policy.

2. The Green Fleet Team will include, but not limited to, representation from Public Works, Parks, Fire and Finance, and the City Mechanic as well as involvement of the staff person responsible for coordinating Climate Action.

3. The function of this Team shall be to develop and monitor policies and procedures related to the purchase of City vehicles and vehicle maintenance products and services to achieve the goals and objectives of the program. The Team will report findings and progress annually starting in 2009.

Funding

1. The Green Fleet Team will be responsible for making recommendations on acceptable initial incremental costs for improved environmental performance compared with vehicle fuel savings and emissions reductions achieved over the service life of that vehicle. This life-cycle cost analysis, which will include fuel, maintenance, and operation costs over the projected life of the vehicle will be performed prior to purchasing fleet replacements or additions and will be reflected in the corresponding bid process as appropriate.

2. Funding from outside sources shall also be pursued to assist in the offset of the incremental costs of “green” vehicles, if available.

Fleet Inventory

1. The City will complete a Fleet Review in 2010 and will maintain a complete inventory of the vehicles in its fleet. This inventory will include not only the type and number of fleet vehicles, but also the amount and types of fuel used, annual kilometers driven, the costs associated with their use, and the corresponding emissions.

2. This inventory is critical if goals are to be set and success measured for the fleet. All City vehicles and metered equipment that operate on gasoline, biodiesel, electricity, or other energy sources are included in this policy.

Green Fleet Strategies

Right Fleet Size

1. The vehicles considered for removal from the fleet or reassignment shall include the following:

    a) Light duty vehicles (passenger cars, light duty pick up trucks and vans) that are driven less than 7,700 km annually.

    b) Metered equipment that is used less than 240 hours annually.

2. The determination of which vehicles are to be reassigned shall be at the discretion of the Green Fleet Team working in cooperation with user departments.

3. Encourage the selection of vehicles of a smaller class size whenever possible to achieve increased kilometre per litre and lower emissions. Requests for new vehicle purchases must be supplemented with written justification addressing the need for a class or type.

4. Fleet Management shall work with the applicable operating departments to determine whether a proposed vehicle could be downsized and still fulfill its required function within the department.

Decrease Vehicle Emissions

1. The City shall make every effort to obtain the *"cleanest"* vehicles possible as measured by available emissions certification standards and those published by the manufacturers.

2. Each replacement vehicle will achieve the greatest level of emission reductions possible, while still meeting the operational needs of the City. Alternate-fuel replacement vehicles should be procured only when there is fueling infrastructure in place at City operated or local commercial fueling stations to support the operation of these vehicles.

3. Emission reduction targets shall be reviewed annually by the Green Fleet Team and modified based on vehicles available for that model year.

4. Vehicle purchase requests shall be reviewed and minimum emission reduction targets will be employed when possible. The Green Fleet Team will work with all City Departments to identify the most fuel-efficient vehicle with maximum emission reduction available that can meet the operational needs of the department, while taking into account the vehicle's life-cycle costs and fuel availability.

5. Purchase accessory equipment that reduces fuel consumption, pollutant emissions and idling by the City's vehicles, such as, LED lights, batteries, inverters, auxiliary cab heaters or other equipment that reduces the need to idle the vehicle.

6. Request for exemptions to the Green Fleet Policy shall be outlined in the vehicle purchase business case. Exemptions may be awarded if there is sufficient justification (see Exemptions section of this policy).

Exemptions

1. The Green Fleet Team may grant an exemption from the requirements of this Policy to an applicable department requesting an exemption under any one of the following circumstances:

    a) Where there is no model of motor vehicle or motorized equipment available that will comply with the requirements of this Policy and still meet the specifications for its intended purpose.

    b) Where the analysis demonstrates to the satisfaction of Green Fleet Team each of the following:

        i) That any amortized additional incremental cost of purchasing a lower emission vehicle that complies with the requirements of this Policy cannot be recovered over the operating life of the vehicle or metered equipment through a reduction in fuel, maintenance, and other costs incurred during the operating life of such vehicle or equipment; and

        ii) That Green Fleet Team, or another City department, has unsuccessfully applied for, or attempted to identify grant funding for the purchase or lease of the vehicle or motorized equipment that complies with the requirements of this Policy from outside sources.

        iii) Where the requesting department demonstrates to the satisfaction of Green Fleet Team that the use of a vehicle or metered equipment that complies with the requirements of this Policy would significantly disrupt operations or reduce service levels.

2. In the case that Green Fleet Team grants an exemption, the Green Fleet Team shall purchase or lease the model of motor vehicle or metered equipment that will meet the specifications of the applicable departments and has the highest fuel efficiency and lowest available emissions ratings available for the type of vehicle or metered equipment specified provided the cost is within a reasonable range of the cost of a vehicle meeting the specifications but having higher emissions ratings.

Appendix “C”

Climate Action Purchasing Principles

PURPOSE

The energy efficiency purchasing policy supports other initiatives with respect to conservation and the environmental stewardship. The intent of this policy is to help the City meet its corporate climate action and sustainability goals.

SCOPE

This policy applies to all City departments.

POLICY STATEMENTS

1. Purchasing decisions will take into account the following financial and economic factors:
   - price comparison for equivalent quality of materials or services;
   - total life cycle financial cost of the goods or services to be purchased;
   - where appropriate, any extraordinary impacts on the local economy;
   - where appropriate, any extraordinary impacts on other economies.

2. The City will purchase energy efficient equipment, supplies, and appliances wherever possible. This requires that product specifications be compliant with:

   - Energy Star® guidelines and recommendations
   - National Research Council and Natural Resources Canada (NRCan) guidelines and recommendations.

3. This policy applies to a wide spectrum of products including, but not limited to:

   - Appliances
   - HVAC equipment
   - Electric motors
   - Office equipment
   - Lighting and Signage

- Transformers
- Consumer electronics

4. While pricing and cost comparisons remain important factors, purchasing decisions will also include environmental sustainability; considering life cycle costs, available choices and environmental risks.

5. Reduce consumption, where possible, only purchase necessary items in appropriate volumes.

6. These criteria must be included in all materials specifications involving the purchase of supplies or equipment by the City of Courtenay.