



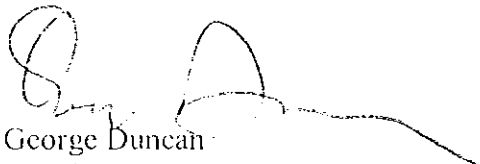
To: Public Works and Transportation
From: George Duncan
Chief Administrative Officer

To Public Works + Transportation:
Date: April 2, 2006
File: 10-6125-01
Apr 18, 2007

Re: Proposed Climate Change Scoping Study for the City of Richmond

Staff Recommendation

That, as per the attached report from the Assistant Manager, Environmental Programs, staff undertake a Climate Change Scoping Study to examine potential impacts of Climate Change for the City of Richmond and report back to Council with major findings and recommended next steps.


George Duncan
Chief Administrative Officer
(4338)

Att. 3

FOR ORIGINATING DEPARTMENT USE ONLY		
REVIEWED BY TAG	YES	NO
	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Staff Report

Origin

At their March 12, 2007 meeting, Richmond Council adopted a sustainability-based approach aimed at facilitating community well-being over the long-term. Action on climate change, both mitigation and adaptation, is essential for community sustainability (i.e., social, economic and environmental well-being). In addition, Community Safety Committee requested that staff review and comment on the City of Calgary's Corporate Climate Change Action Plan.

This report outlines a strategic approach for climate change management for the City of Richmond and recommends that priority action over the near term, be directed towards the area of community adaptation planning. This report also provides the requested information on the City of Calgary plan.

Background

About Climate Change

There is strong consensus among the scientific community that human activity is resulting in increasing atmospheric greenhouse gases and that this in turn, will result in climatic changes. These changes are projected to result in significant management issues for local communities. According to a recent report released by economist Sir Nicholas Stern,¹ "ignoring climate change could result in risks of major disruption to economic and social activity...on a scale similar to the those associated with the great wars and the economic depression". Further background on climate change, including greenhouses gases emission sources and potential impacts is provided in Attachment 1.

City of Richmond Initiatives

The City of Richmond has undertaken several initiatives to reduce its corporate greenhouse gas emissions and being to support greenhouse gas reduction on a community-wide. The City has also initiated preliminary action in other areas of climate change management, such as adaptation planning and sustainable community planning. Major action areas include:

1. Supporting Global Action
2. Sustainable Community Planning
3. Reducing Greenhouse Gas Emissions (Community and Corporate)
4. Planning for Adaptation and Preparedness
5. Research & Innovation.

Highlight initiatives include:

- Urban development policies for reducing car-dependency (e.g., OCP policy for reducing urban sprawl and encouraging compact complete communities, supporting light rail transit and encouraging alternative forms of transportation, bike and greenway planning, etc.)
- Natural areas protection, including dedication of the Richmond Nature Park and Terra Nova Parks, which sequester carbon and reduce greenhouse gas emissions
- Council adopted High Performance Building Policy, Green Fleet Policy and Environmental Purchasing Policy and Guidebook which aim to reduce corporate greenhouse gas emissions

¹ Sir Nicholas Stern is the Head of the Government Economics Service and Adviser to the Government on the Economics of Climate Change and Development for UK and former World Bank chief economist

- Civic Facilities Energy Management Program, resulting in Richmond being recognized as the first Power Smart municipality in BC, reducing corporate energy use and greenhouse gas emissions
- Civic Servicing initiatives (e.g., recycling program, water metering program, etc.) which reduce greenhouse gas emissions on a community-wide scale
- Community Outreach, including Richmond 1-Tonne Community Challenge, Island City by Bike, Clean Air Day, etc. which aim to raise awareness of climate change and greenhouse gas reduction strategies
- Exploring Innovative Practices and Technology (e.g., feasibility of district geothermal utilities; LEED silver accreditation for the Olympic speed-skating facility, etc.) to identify leading-edge opportunities.

An overview summary of Richmond's Climate Change Action Initiatives is in Attachment 2.

Overview of Calgary's Climate Change Action Plan

The City of Calgary's Climate Change Action Program provides a management framework for guiding corporate action for reducing their corporate contributions to climate change. Developed in 2004, Calgary's Plan identifies specific initiatives to enable the City to meet a corporate greenhouse gas emission reduction target within 6 major Action Categories:

- Building Energy Efficiency (city-owned facilities)
- Methane Gas Emission Reduction
- Green Power
- Green Fleet
- Water Conservation
- Innovative Practices & Technology Deployment.

Calgary updated their plan in 2006, establishing a target to reduce their GHG emissions by 50%, and exploring opportunities for community-based GHG emission reductions. Examples of some of the community-based GHG reduction initiatives being explored include, a 100% residential water meter program, extension of LRT lines, requiring LEED silver accreditation for all new and renovated buildings, and a curbside recycling program.

Analysis

Importance of Climate Change

Due to the magnitude of potential consequences, climate change is an extremely important issue. It is particularly important for consideration at the local level since:

- impacts from climate change are predicted to result in potential significant impacts on community well-being and on many areas of municipal operations and servicing
- municipal communities are major contributors of GHGs and present numerous opportunities for emission reduction measures
- municipalities have a major influence on facilitating sustainable community development, and implementing strategies for enabling adaptation to climate change impacts.

Community conditions, such as our coastal location, large agriculture base and growing investment in residential and businesses, means that climate change management is of particular importance for the City of Richmond. In this respect, effectively managing climate change is essential for the long-term sustainability of Richmond.

Recommended Action for Richmond

The City of Richmond has already undertaken many key initiatives for reducing our corporate greenhouse gas emissions, including many initiatives being pursued by Calgary (Attachment 3). It is important that the City continue acting upon its corporate responsibility to reduce Richmond's GHG emissions and further commit to a practice of continual improvement as part of our on-going operations.

However, the City of Richmond is presently undertaking significant planning initiatives which will direct the future growth and development of the community and long-term civic infrastructure planning. These initiatives significantly affect the climate change footprint of Richmond and our capacity to respond to unavoidable changes.

Accordingly, it is recognized that effective climate change response requires a systematic approach which aims to both mitigate impacts (reduce the problem) and enable communities to effectively adapt to anticipated changes and challenges (respond to the problem). As such, staff recommend that the City adhere to a comprehensive climate change response approach which directs action towards the following three strategic areas:

1. Reduce greenhouse gas emissions to reduce the scope and severity of the change;
2. Devise and implement specific adaptation strategies to mitigate and minimize impacts of concern²; and,
3. Facilitate sustainable community development to build local capacity for future and on-going adaptation to climate impacts.

Given the City's present major planning initiatives, staff recommend that in the near term, the City focus resources towards the higher priority area of adaptation planning (i.e., Strategic Area 2). A proactive approach towards adaptation is expected to best enable the City to retain key strategic opportunities during its current development and thereby, respond to anticipated changes in the most strategic and cost-effective manner. A key area of priority for adaptation planning will be to ensure that investments being made today (e.g., civic infrastructure, community developments, etc.) are conducted in a manner which considers climate change impacts and provide long-term value and security for the community.

² Adaptation strategies reduce community vulnerability by enabling communities to anticipate and proactively respond to potential changes. Adaptation strategies are designed to reduce the magnitude of potential negative impacts and take advantage of potential new opportunities. Examples of potential adaptation measures include

- infrastructure improvements to reduce vulnerability and respond to predicted changes (e.g., infrastructure designed to address sea level rise and more frequent flooding, increase water efficiency measures, etc.)
- community planning initiatives to reduce vulnerability, facilitate activity change and enhance system resiliency (e.g., transition alternative energy sources, prevent development below set elevation, strengthen natural coastal systems, growth management strategies, etc.)
- economic development (e.g., transition to a low-carbon economy, initiatives to strengthen community economic self-reliance, agricultural viability strategies, etc.)

Accordingly, staff recommend that, for the next two years, the City of Richmond:

- continue its current practices of reducing emissions through regular operational improvements and community-based initiatives;
- focus resources on developing a formal strategy for community adaptation and preparedness; and,
- as a first step towards the development of the above strategy, staff undertake an initial Climate Change Scoping Study.

The objectives of the proposed Climate Change Scoping Study would be to:

- consolidate existing knowledge pertaining to climate change and examine potential impacts specifically for Richmond
- disseminate climate change information to support and inform current City initiatives, including but not limited to the City's enhanced sustainability initiative, City Centre Area planning, Official Community Plan update, Flood Management Strategy, Economic Development Strategy, Long-Range Infrastructure Planning and Environmental Initiatives
- identify strategic opportunities to enable Richmond to retain important adaptation opportunities and mitigate impacts on civic infrastructure and community investment
- identify next steps in the development of a formal response strategy, including identifying strategic directions recommended for further more targeted study.

It is intended that the proposed Climate Change Scoping Study be conducted by a consulting team overseen by an interdepartmental staff committee and coordinated through Environmental Programs.

Financial Impact

The proposed Scoping Study can be accommodated within existing Environmental Programs departmental budget.

Conclusion

Climate change is an increasingly pressing global issue predicted to result in significant adverse impacts, both locally and globally. Municipalities can assist in responding to climate challenges by reducing their own corporate greenhouse emissions, and through the development of adaptation and sustainable development strategies that build community capacity to effectively respond to changes and mitigate severe impacts.

The City of Richmond has undertaken many key initiatives for reduce corporate emissions. It is recommended that future efforts be directed at community-wide adaptation planning. To this end, Environmental Programs recommends that the City undertake an initial Climate Change Scoping Study to gain a better understanding of the potential scope and severity of climate change impacts on Richmond. This study will establish a foundation for more strategic action planning, specifically with respect to climate change management and overall community sustainability. By being proactive and exploring early opportunities to incorporate climate change considerations into the fabric of community planning and civic infrastructure development, it is anticipated that Richmond will be in the best position to undertake cost-effective action and act upon any related opportunities.



Margot Daykin, M.R.M

Assistant Manager - Environmental Programs (4130)

Attachment 1 : Climate Change – Sources and Potential Changes and Impacts

About Climate Change

Human-induced climate change is a term used to describe the climatic consequences of increasing atmospheric greenhouse gases arising from human activity, namely the use of fossil fuels and deforestation. Atmospheric greenhouse gases capture the solar radiation being reflected back from the earth's surface. Many greenhouse gases are naturally occurring and are important for moderating temperatures to a level suitable for human living. However, human activities are increasing the concentration of GHGs in the atmosphere at an alarming rate, resulting in the trapping of additional energy within the atmosphere. This "enhanced greenhouse effect" can have serious impacts on the Earth's physical, chemical and biological processes, significantly impacting human communities.

Greenhouse Gases Sources

Naturally occurring GHGs include water vapour, ozone, carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). Additional synthetic (not naturally occurring) greenhouse gases include fluorinated gases (i.e., hydrofluorocarbons, sulphur hexafluoride, perfluorocarbons). The largest source of GHGs is the use of fossil fuels in transportation, manufacturing, heating, cooling, and electricity generation.

Environment Canada acknowledges that Canada is one of the largest producers of GHGs per capita, with CO₂ being the largest contribution. Almost half of Canada's emission are directly or indirectly attributable to activities within municipal communities.

Emissions associated with energy requirements accounts for about 80 % of total Canadian emissions, with key sources including energy industries (28%), transportation (25%), residential and commercial buildings (11%) and energy consumption by manufacturing industries and construction (9%)³. The remainder is generated as a result of industrial processes (7%), agriculture (7%) and waste management activities (4%).

Land use can also significantly affect greenhouse gas emissions, with the potential to either reduce or increase the net total. Forest cover reduces overall emissions while land use conversions that remove forested lands can effectively increase GHG emissions. Since 1990, Canadian annual contributions from land use have fluctuated widely, ranging from a 27% reduction to an 32% annual increase in emissions. Due to the potential for fluctuation, greenhouse gas contributions from land use are typically excluded from national totals.

³ National Inventory Report, 1990-2004 - Greenhouse Gas Sources and Sinks in Canada
http://www.ec.gc.ca/pdb/ghg/inventory_report_2004_report/c2_e.cfm

Potential Changes and Impacts

Global Changes

The most recent scientific assessment from the International Panel for Climate Change⁴ released on February 2, 2006, concludes the following:

- global atmospheric concentrations of greenhouse gases have increased markedly as a result of human activities
- global increases in greenhouse gases are due primarily to fossil fuel use and land-use change and those of methane and nitrous oxide are primarily due to agriculture
- warming of the climate system is unequivocal and changes are being observed now
- there is very high confidence that the global net effect of human activities has been warming.

However, the magnitude of the changes and the impact of these changes on economic, environmental and social well-being are less understood, specifically at the individual community level. Potential impacts of concern world-wide include a significant:

- reduction in resource availability (e.g., food, water, forests, fisheries, ecosystems, etc.)
- increase in natural disasters and extreme weather events
- decrease in human health (e.g., increased poverty, increased disease, degraded air quality, etc.)
- impairment to infrastructure (e.g., damage to pipelines, roads, bridges; disruption to electrical and other services, increased costs as a result of need for greater capacity, etc.)
- shrinkage of the global economy.

According to a recent report released by economist Sir Nicholas Stern⁵, climate change could shrink the global economy by 20% (GDP). This report also concludes that stabilization of greenhouse-gas concentration is feasible with continued economic growth and that by taking steps now to transition to a low-carbon economy, the damage to the world economy could be limited to 1 % (GDP) and offer new economic opportunities across a wide range of industry and services.

Local Changes

A recent study conducted by Environment Canada⁶ predicted the following changes for the Greater Vancouver Regional District:

- *Rising Sea Levels* -- expected to rise at a rate of 2-9 mm per year (this would translate to 10-45 cm by 2050 and 20-90 cm by 2100)
- *Increased Spring Flooding and Summer Drought*
- *Groundwater Impacts* -- sea level rise is expected to raise groundwater levels and expand salt water intrusion
- *Coastal Ecosystems* -- intertidal areas and changes in upland estuarine communities are expected to degrade in quality due to immersion and salt water changes in groundwater
- *Air Quality Degradation* -- warmer temperatures are expected to result in degraded air quality

⁴ The IPCC was established in 1988 by the United Nations Environment Programme and World Meteorological Organization. The purpose of the IPCC is to assess on a comprehensive, objective and transparent basis the scientific, technical and socio-economic information pertaining to human-induced climate change, its potential impacts and options for adaptation and mitigation. The IPCC does not conduct research but bases its assessment on peer reviewed and published scientific technical literature.

⁵ Sir Nicholas Stern is the Head of the Government Economics Service and Adviser to the Government on the Economics of Climate Change and Development for UK and former World Bank chief economist.

⁶ Environment Canada, 2000. Climate Change and the Greater Vancouver Regional District. Information to Assist the GVRD in Developing Appropriate Climate Change Adaptation Strategies for Long-Term Utility Planning.

- *Human Health Risks* – increased population of various parasites (e.g., Giardia, fleas, mites, etc.) which thrive in warmer climates

Local Impacts

While local impacts have not been assessed, if left un-managed, potential effects could include:

- diminished provision of global resources and centralized systems (e.g., natural gas pipeline disruption, reduced materials, etc.)
- increased flooding risk due to sea level rise and higher intensity storm events
- higher summer demand for agricultural and domestic water
- increased drought and water shortages
- diminished agricultural viability from diminished water supplies, groundwater salt water intrusion, and increased incidence of pests
- increased demand on municipal servicing (e.g., flood management, emergency management, water, sewerage and stormwater management systems, natural areas protection, etc.)
- diminished local economic development
- diminished human health (e.g., loss of economic well-being, decreased environmental quality, increased incidence of disease, etc.)
- diminished natural resources, including loss of intertidal habitat as result of sea level rise and increasing storm events.

Attachment 2: Overview - City of Richmond's Climate Change Action Initiatives

City of Richmond: Climate Change Action Initiatives		
Action Area		Initiatives
Supporting Global Action	<i>International Government Liaison</i> Support international efforts for reducing GHG emissions globally	Council support for Kyoto Protocol
		Council endorsement of the Toronto Declaration and Communiqué
Sustainable Community Planning	<i>Community Planning</i> Reduce energy consumption and GHG emissions through community planning, transportation-demand management and natural resource protection.	Urban development policies for reducing car-dependency (OCP policy for reducing urban sprawl and encouraging compact complete communities, supporting light rail transit and encouraging alternative forms of transportation, bike and greenway planning, etc.)
		Dedication of Richmond Nature Park
		Tree Protection Bylaw
		ESA Development Permit
		Urban Forest Management Strategy
Richmond Community Greenhouse Gas Emissions Reduction	<i>City Servicing</i> Reduce the amount of GHG emissions produced from the consumption and production of potable water. Reduce the amount of GHG emissions produced from landfills.	Water Metering Program
		Curbside Recycling Program
	<i>Community Engagement</i> Raise awareness and support community action for reducing energy consumption and GHG emissions	Anti-idling School Campaign
		Recycling and Water Conservation Education
		1-Tonne Community Challenge (complete)
	Alternative Transportation Activities (e.g., Island City by Bike, etc.)	

City of Richmond: Climate Change Action Initiatives

Action Area		Initiatives
Corporate Greenhouse Gas Emissions Reduction	<i>Procurement</i> Reduce energy consumption and GHG emissions from City supplies	Environmental Purchasing Policy/Guidebook
	<i>Building & Lighting Energy</i> Reduce energy consumption and GHG emissions from City buildings and facilities	High Performance Building Policy ¹
		Energy Management Program
		Use of LED Street Lighting
	<i>Green Fleet</i> Reduce City vehicle fleet's GHG emissions	Green Fleet Policy
		Resolution to Purchase Hybrids/Smart Cars
		Works Yard Idle-Free Campaign
		City Car-Pool program
Adaptation and Preparedness	<i>Flood Management</i>	Flood Management Strategy
		Flood Construction Levels
		Dyke Management Program
Research & Innovation	<i>GHG Emissions Reduction</i>	Biodiesel Demonstration Project
		District Geothermal Utility System Exploration
		Eco-Industrial Networking Study

¹ Target established to meet or exceed LEED gold for new facilities > 2000 m² and meet performance standards of LEED Silver certification as a minimum requirement for major renovations to existing facilities and new City Buildings smaller than 2000 m². A variety of varying initiatives are undertaken to meet LEED standards and may include measures such as use of alternative energy sources (solar, geothermal), energy efficiency techniques (daylighting, energy efficient lighting, etc.), stormwater management (detention ponds, green roofs, etc.), water conservation techniques (e.g., low-water use toilets/fixtures; use of grey water, etc.) and use of environmentally-preferred products (locally produced, low toxicity, etc.).

Attachment 3: City of Calgary's Climate Change Action Initiatives with Comparison to City of Richmond Action

City of Calgary			City of Richmond Comparison
Action Category/ Goal	Initiatives	Status	
Building Energy Reduce energy consumption and GHG emissions from City buildings and facilities	Energy Retrofits/Upgrades to Corporate Facilities	Ongoing	Ongoing
	Adopt a Sustainable Building Policy (meet or exceed LEED silver for all new facilities > 500m ²)	Initiated	Completed
	Green Procurement for Office Equipment	Being Developed	Completed (for all corporate procurement)
	Building User Education program	Proposed	Ongoing
	Canada Fire Department Energy Challenge	Ongoing	Not being done
Methane Gas Emission Reduction Reduce methane emissions from City operations to as low a level as is technologically and economically feasible.	Capture of Wastewater Treatment Methane Gas for Power Generation	Ongoing	Ongoing (through the GVRD)
	Organic Waste Diversion Program –The East Calgary Compost Facility accepts commercial sources of vegetative materials and residential organics (primarily leaves from the leaf and pumpkin collection program).	Ongoing	Ongoing (City/GVRD)
	Organic Waste Diversion on a City-wide Scale (residential curb-side collection pilot project for yard and kitchen waste)	Being Developed	Ongoing for yard & garden/ Conceptual for kitchen (City/GVRD)
	Bio-reactor Pilot Project at Shepard Landfill	Initiated	Not applicable ⁷
	BIOcap Pilot Project at East Calgary Landfill (use of biological oxidation where capture is not feasible)	Proposed	Not applicable (as above)
	Expansion of Methane Capture and Green Electricity production at landfills	Proposed	Ongoing (GVRD)
	Methane Optimization Policy that commits the City to capture as much methane as feasible and utilize it to produce Green Power	Conceptual	Conceptual (GVRD)
	Ride the Wind Program – Light Rail Transit (LRT) powered 100% by Green Power (wind)	Ongoing	Not being done
	Green Power Purchase Contract (3.7 million kWh/year)	Ongoing	Conceptual

⁷ GVRD advise that superior methane collections systems are in place.

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City of Calgary			City of Richmond Comparison
Action Category/ Goal	Initiatives	Status	
Green Power Increase the Green Power component of the City's total electricity consumption	Green Power Production from Methane and Wastewater Treatment Plan	Ongoing	Ongoing
	Green Power Production from Methane at Landfills	Initiated	Ongoing
	Green Power Corporate Target	Initiated	Not being done
	Partner promoting Green Power to Community	Conceptual	Conceptual
Green Fleet Reduce City vehicle fleet's ghg emission: Short term: stabilize the City fleet's fuel consumption at the year 2000 level Long term: stabilize fleet ghg emissions at the user 2000 level by 2012	Vehicle Use Optimization - Route Planning Efficiencies	Complete	Ongoing
	Utilize Latest Technologies to Reduce Vehicle Emissions (e.g., installation of "halo" spark plugs, automatic engine shut-offs, external diesel fire heater, etc.)	Ongoing	Ongoing
	Establish a Corporate "Best in Class" Vehicle Acquisition policy that includes a "Right Sizing" Vehicle Needs Assessment Element.	Ongoing	Complete (Comprehensive Green Fleet policy established)
	Improve Driver Education with Regard to More Fuel Efficient Use of Vehicles	Ongoing	Ongoing
	Green Fleet Program to Guide Corporate-Wide Effort to Reduce Fleet GHG Emissions	Initiated	Ongoing
	Add Bicycles to City Vehicle Pool	Initiated	Not being done
	Vehicle Idling Reduction Policy	Initiated	Complete
	Conduct Employee Commuter Options Survey	Initiated	Not applicable (City Carpool Program)
	Develop an External Networking Group Comprised of Several Municipalities to Test Green Fleet Initiatives	Initiated	Ongoing
	Establish New Vehicle Maintenance Protocol to Maximize Fuel Efficiency	Conceptual	Initiated
	Establish Hybrid/Alternative Fuel Targets	Conceptual	Initiated
	Staff Transportation Mode Change – Transit Ticket Sign Out for Work Travel	Conceptual	Not being done
Employee Travel Plan	Conceptual	Not applicable (City Carpool Program)	

City of Calgary			City of Richmond Comparison
Action Category/ Goal	Initiatives	Status	
Water Conservation Reduce the amount of GHG emissions produced from the consumption and production of potable water.	Universal Metering Program	Ongoing	Initiated
	Water Main Replacement/ System Leak Detection Program	Ongoing	Ongoing
	Treatment Process Efficiency Improvements	Ongoing	Ongoing
	Audit Pilots (for commercial, industrial & institutional consumers)	Ongoing	Not being done
	Residential Water Conservation Program (Water Saver Kits, Toilet Rebate, Rain Barrels)	Ongoing	Ongoing
	Bus Wash Recycling	Ongoing	Not applicable
	Education Program	Ongoing	Ongoing
	Water Managed Sites Certification Program – By implementing water efficiency measures, residential, commercial, industrial and institutional properties with an in-ground sprinkler system can get certified by The City of Calgary for water efficiency.	Ongoing	Not being done
	Parks Water Management Strategic Plan - Manage water consumption while continuing to meet the horticultural needs of plants growing in parks and open spaces by implementing water conservation best practices, and increasing use of non potable water for irrigation.	Ongoing	Some specific initiatives being done but no overall plan in place ⁸
Water Utility Bylaw – Approved in 2005, the bylaw stipulates that all residential customers will be on a water meter by the year 2014, and all new water accounts are required to be set up on a water meter.	Completed	Completed ⁹	
Industrial/Commercial/Institutional Water Efficiency Program – Includes education, audits, and a free dishwashing spray valve replacement program for Calgary restaurants.	Ongoing	Not being done	
Innovative Practice & Technology Demonstration/ Deployment	Solar Walls	Completed	Ongoing
	Replacement of Traffic Light Signals with LED Lighting Technology	Ongoing	Completed
	Retrofit of Street Lighting with Lower Wattage Bulbs	Ongoing	Completed
	Biodiesel Demonstration Project	Initiated	Ongoing
	Urban Transit Hydrogen Fuel Cell Study	Initiated	Not applicable

⁸ Parks staff advise that City of Richmond has significantly lower park water demands. Volunteer WMP for existing residential. Mandatory for new and existing homes where main upgrades occur.

⁹ Volunteer WMP for existing residential. Mandatory for new and existing homes where main upgrades occur.

City of Calgary

Action Category/ Goal	Initiatives	Status	City of Richmond Comparison
The City take a local leadership role in demonstrating and adopting new GHG reduction technologies and practices.	District Heating System	Proposed	Conceptual
	Co-Generation Microturbines	Proposed	Not being done