



Carbon Neutral ACTION Plan

Prepared for the **Village of
Fruitvale**



**A Starting Point to
Reduce the Corporate Carbon Footprint**

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November 2011

Table of Contents

1.0 Executive Summary.....	2
2.0 Introduction.....	5
2.1 Reducing Greenhouse Gas Emissions in BC	5
2.2 Community and Corporate Emissions	5
2.3 Carbon Neutrality	6
2.4 About the Carbon Neutral Kootenays Project	6
2.5 About the Inventory	7
2.6 Action Plan Process	8
3.0 Corporate Energy and GHG Inventory	8
3.1 Current Kootenay Action	8
3.2 Energy and GHG Tabulation: 2010 Year	9
3.3 Energy and GHG Charts: 2010 Year	10
3.4 Historical Profile	11
4.0 Action Plan.....	12
4.1 Action Sequence	12
4.2 Actions in Place	12
4.3 Action Plan	14

1.0 Executive Summary

The Village of Fruitvale has signed on to the Climate Action Charter, committing the Village to being carbon-neutral in its own operations by 2012. The Dashboard Summary was prepared by the Carbon Neutral Kootenays II Project (CNK2) and outlines the corporate facilities, fleet and energy consumption. All figures in this report are based on 2010 energy consumption and costing data found in the Operations Energy Consumption Greenhouse Gas Emissions Inventory provided by the CNK2 project.

In October 2011 a workshop was held with Village of Fruitvale staff, facilitated by the Carbon Neutral Kootenays Project Team. The workshop group looked at the energy and emissions data for the Corporate Operations and discussed any potential anomalies, and decided on an action plan for the Village of Fruitvale.



Village of Fruitvale Hall

Fruitvale Memorial Centre

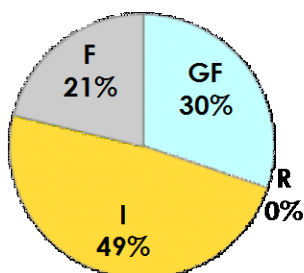




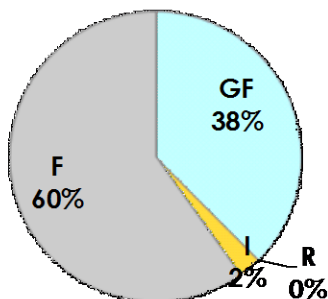
Fruitvale Dashboard Summary: 2010 Year



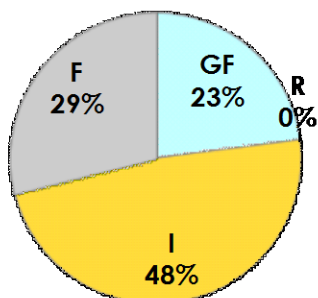
Energy = 47,39 GJ



GHG = 1,19 tonnes CO₂e



Energy Spending (Approx) = \$931,30



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

Operations Profile

General Buildings	5
Community and Recreational Facilities	0
Fire Halls	0
Vehicle Fleet & Equipment	14
Electricity Accounts	16
Natural Gas, Propane Accounts	5, 1

Carbon Costs and Rebates

Estimated cost of offsets in 2012 based on 2010 emissions:	\$3 000
Approximate Carbon Tax Rebate (CARIP Grant) for 2010:	\$2 000
Estimated CARIP Grant in 2012 at current consumption:	\$3 200

Energy and GHG Emissions by Fuel Type

Fuel Type	Energy Consumption	Energy Units	GHG Emissions (tonnes)	Estimated Cost (\$ / year)
Electricity	798 139	kWh	4	\$55 870
Natural Gas	861	GJ	44	\$10 330
Propane (facilities)	0	L	0	\$0
Heating Oil	0	L	0	\$0
Gasoline	9 322	L	22	\$9 320
Diesel	17 607	L	49	\$17 610
Propane (fleet)	0	L	0	\$0
Biodiesel	0	L	0	\$0
Total			119	\$93 130

Top 5 Energy & GHG Contributors (ranked by energy use)

Facility	Total Energy (GJ)	GHG Emissions (tonnes CO ₂ e)
Sewage Treatment Plant	885	1
Memorial Hall	646	22
Water Treatment	628	1
Street Lights	471	0
Village Shop	442	15
Total of These Facilities	3 072	39
Total Inventory	4 739	119

The action plan decided upon by the workshop group is shown as follows:

CORPORATE ACTION PLAN		Year Implemented						
Actions		Already in Place?	2012	2013	2014	2015	2016	2017
1 Building Operations								
	Commit to Building the most Energy Efficient Facilities					X		
	Optimize siting and orientation of new buildings	X						
	Require evaluation of renewable energy sources for new construction & major renovations.	X						
	Conduct energy audits of existing facilities		X					
	Complete energy improvements already identified by previous audits or studies.				X			
	Incorporate energy management into annual building maintenance procedures			X				
	Install programmable thermostats		X					
2 Fleet Operations								
	Develop a vehicle purchasing policy		X					
	Implement an efficient vehicle use initiative	X						
	Develop monitoring program for fleet fuel consumption		O					
	Conduct a fleet routing review		X					
	Encourage efficient use of personal vehicles	X						
	Research bio-diesel options							O
	Implement driver training		X					
	Install vehicle information GPS				X			
3 Infrastructure								
	Conduct energy focused operational review of infrastructure		X					
	Water smart report to reduce water consumption	X						
4 Purchasing & Corporate Leadership								
	Incorporate energy considerations into purchasing policies		X					
	Incorporate Life Cycle Costing into all major purchasing decisions		X					
	Incorporate GHG tracking requirements into service provider agreements				O			
	Encourage and recognize staff who develop new GHG reduction measures					O		
5 Implementation								
	Identify the Owner of the Plan		X					
	Assign the CARIP grant (Carbon Tax rebate) into an energy conservation fund		X					
	Develop an administrative system for tracking corporate emissions		X					
	Develop an emissions reduction reporting process	X						
	GHG Development Permit Area in OCP	X						
	Adopt internal offset purchase carbon fund policy							O
	Adopt Carbon Neutral Action Plan		X					

Action categorized by workshop group as a "yes" x
Action categorized by workshop group as a "maybe" o

2.0 Introduction

2.1 Reducing Greenhouse Gas Emissions in BC

There is increasing evidence that global climate change resulting from emissions of carbon dioxide and other greenhouse gases (GHGs) are causing, or will soon cause, significant environmental impact on the ecology of the planet. Since 2007, the BC Government has embarked upon a number of initiatives to reduce GHG emissions in BC including:

- Setting a target of a 33% reduction in total province-wide emissions by 2020 from 2007 levels.
- Requiring all ministries and other public sector organizations (PSOs) to become carbon neutral beginning in 2010.
- Requiring local governments to incorporate GHG reduction targets, policies and actions to reach these targets into their official community plans (OCPs) and Regional Growth Strategies (RGSs) through the *Local Government (Green Communities) Statutes Amendment Act* (Bill 27 – 2008).
- Encouraging local governments to become proactive in achieving carbon neutrality in their corporate operations by becoming signatories to the **Climate Action Charter**. Signatories commit to achieving carbon neutrality in their local government operations beginning in 2012 through a combination of emission reductions and offsets.

2.2 Community and Corporate Emissions

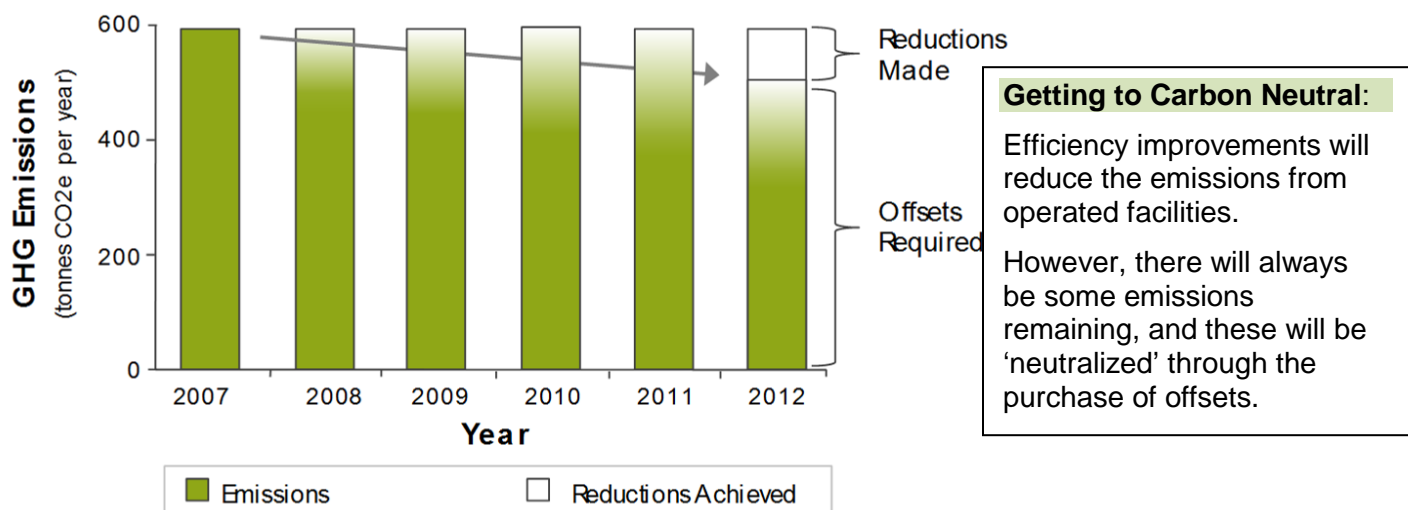
The Operations Energy Consumption Greenhouse Gas Emissions Inventory provided by the CNK2 project addresses the corporate operations consumption and emissions. Actions to reduce energy consumption and greenhouse gas emissions are frequently divided into the realm of:

- **Corporate emissions** – those that the local government creates through its activities (and which it has control over) such as local government building operations, recreation centres, vehicle fleets, and utility services; and
- **Community emissions** – those that the residents and businesses in the community create through their activities. The local government cannot directly control these emissions, but may be able to influence them through planning and program activities. These will be addressed in a separate phase of the Carbon Neutral Kootenays project.

2.3 Carbon Neutrality

Carbon neutrality means that the operations of the local government will result in no net greenhouse gas emissions to the atmosphere. Carbon neutrality results from a combination of:

- Reduction measures to reduce the GHG emissions from operations. This is accomplished through retrofits, efficiency initiatives, and behavioural change of staff; and
- Carbon Offsets – which are reductions made by others – elsewhere in the community or province – through registered and reviewed projects that reduce GHG emissions. Owners of these offset projects may sell these registered and reviewed projects that reduce GHG emissions. Owners or these offset projects may sell these ‘reduction credits’ to other parties that are working to neutralize their carbon footprint.



2.4 About the Carbon Neutral Kootenays Project

The Carbon Neutral Kootenays (“CNK”) project is an initiative to assist local governments in the Kootenay region in meeting their commitments under the Climate Action Charter, including becoming carbon neutral in their operations. It is jointly funded by the Regional Districts of **Central Kootenay**, **East Kootenay** and **Kootenay Boundary** and the **Columbia Basin Trust**, with the participation of member municipalities and First Nations.

In CNK Phase 1 (2009-2010), the initiative included compiling inventories of energy and greenhouse gas emissions for local government operations, developing action strategies for reducing emissions from Regional District operations, and conducting outreach and capacity building activities for staff and elected officials in the Kootenay region. In Phase 2, the project includes supporting and maintaining the inventories; implementing carbon neutral actions for the regional districts; helping develop carbon neutral action plans for municipalities and First Nations; coordinating carbon neutral actions on a regional scale; and identifying regional offset investment opportunities.

Phase 2 is being led by the Community Energy Association (an enterprising non-profit) with assistance from Vancouver and Kootenay based consultants.

Project Contact:

For inquiries about any component of this project please contact:

Dale Littlejohn

Carbon Neutral Kootenays Phase 2 Project Manager
Community Energy Association
604-628-7076



The Carbon Neutral Kootenays Project is funded by the Regional Districts to Kootenay Boundary, Central Kootenay, East Kootenay and the Columbia Basin Trust.



2.5 About the Inventory

An inventory is simply a compiled list of all the **energy** use, the **money spent** on energy, and the associated **greenhouse gas emissions** used by the local government in their operations for one year.

Energy use and emissions are also broken down by end use to identify high energy use activities and major emissions sources that may provide the best opportunities for cost and emissions reductions.

The Operations Energy Consumption Greenhouse Gas Emissions Inventory provided by the CNK2 project is completely based within an Excel spreadsheet with several tabs. The tabs store raw data, process and synthesize the information, and then create a report. The spreadsheet contains four types of Tabs – Data Tabs, processing or Synthesis Tabs, Reporting Tabs, and Spreadsheet Activation Tabs.

It is intended for users to be able to update their inventories themselves. Space has been provided for data entry and analysis up to 2012, and an accompanying Inventory Spreadsheet User Guide provides instructions on the use of the spreadsheet.

For specific questions about the content of the inventory, contact:

Julia Roberts

Inventory Administration
250-352-5492

Or your local CNK2 contact:

West Kootenay & Boundary:
East Kootenay:

Adam James 250-368-9768

Megan Lohmann 250-531-0690

2.6 Action Plan Process

In October a workshop was held with staff from the Village of Fruitvale, facilitated by the Carbon Neutral Kootenay Project Team. Prior to the workshop, participants were provided with the Operations Energy Consumption Greenhouse Gas Emissions Inventory for the Year 2010 Inventory developed by the Carbon Neutral Kootenays Project and the Carbon Neutral Action Guide, April 2010 also prepared by the Carbon Neutral Kootenays Project.

At the workshop, after a brief context setting presentation, the group looked at the energy and emissions data for the Operations and discussed any potential anomalies. The workshop group was provided with a collection of action cards, and each action was discussed within the group and placed in one of four categories: “yes”, “no”, “maybe”, and “already done”. Potential additional actions that were not on the cards were also discussed.

The action cards were placed on a chart to create a plan for the next 5 years. Each member of the workshop group was invited to look at the plan and provide input as to the timing and sequencing of the actions. In this way a consensus on an action plan was arrived at by staff of the Village of Fruitvale.

Following this some of the key actions were “unpacked”, meaning that they were discussed in detail, with appropriate steps highlighted, likely impacts, and other considerations.

3.0 Corporate Energy and GHG Inventory

3.1 Current Kootenay Action

Carbon neutral is a clear destination. It is not a new direction in the Kootenays. The 2009 survey of participating local governments found that significant action is already underway across the region in communities of all sizes. Some of the survey highlights include:

- 100% of communities taking actions to save energy and money in their operations;
- 75% of communities already taking action on facilities;
- Nearly ½ taking action on fleet;
- 1/3 taking action on recreation centres, rinks and pools.

3.2 Energy and GHG Tabulation: 2010 Year

The Inventory Summary of the operations energy consumption is shown in Table 1 from the Village of Fruitvale Inventory. The energy consumption and GHG emissions are broken down by the type of fuel and end use.

Table 1: Corporate Energy and Greenhouse Gas Summary 2010

End-Use	Energy	Units of Purchase	Energy (in units purchased)	Energy (as GJ)	GHG Emissions (as CO ₂ e)	Approximate Retail Value (\$)
Buildings	Electricity	kWh	158 065	569	1	\$11 065
	Natural Gas	GJ	861	861	44	\$10 328
	Propane	L	0	0	0	\$0
	Heating Oil	L	0	0	0	\$0
Community / Recreation Centres	Electricity	kWh	0	0	0	\$0
	Natural Gas	GJ	0	0	0	\$0
	Propane	L	0	0	0	\$0
	Heating Oil	L	0	0	0	\$0
Fire Halls	Electricity	kWh	0	0	0	\$0
	Natural Gas	GJ	0	0	0	\$0
	Propane	L	0	0	0	\$0
	Heating Oil	L	0	0	0	\$0
Solid Waste Management	Electricity	kWh	0	0	0	\$0
	Natural Gas	GJ	0	0	0	\$0
	Propane	L	0	0	0	\$0
	Heating Oil	L	0	0	0	\$0
Parks	Electricity	kWh	1 568	6	0	\$110
	Natural Gas	GJ	0	0	0	\$0
	Propane	L	0	0	0	\$0
	Heating Oil	L	0	0	0	\$0
Water / Sewer	Electricity	kWh	492 418	1 773	3	\$34 469
	Natural Gas	GJ	0	0	0	\$0
	Propane	L	0	0	0	\$0
	Heating Oil	L	0	0	0	\$0
Lighting	Electricity	kWh	146 088	526	0	\$10 226
Fleet	Gasoline	L	9 322	336	22	\$9 322
	Diesel	L	17 607	669	49	\$17 607
	Propane	L	0	0	0	\$0
	Biodiesel	L	0	0	0	\$0
Supported Facilities	Electricity	kWh	0	0	0	\$0
	Natural Gas	GJ	0	0	0	\$0
	Propane	L	0	0	0	\$0
	Heating Oil	L	0	0	0	\$0
Unclassified Accounts	Electricity	kWh	0	0	0	\$0
	Natural Gas	GJ	0	0	0	\$0
	Propane	L	0	0	0	\$0
	Heating Oil	L	0	0	0	\$0
Total				4 739	119	\$93 127

NB Values may not sum precisely due to rounding

3.3 Energy and GHG Charts: 2010 Year

What is a GJ?

A gigajoule (one billion joules) is a measure of energy. One GJ is about the same energy as:

- Natural gas for 3-4 days of household use
- 25-30 litres of diesel or gasoline
- Two 20 lb propane tanks
- The electricity used by a typical house in 10 days

What is a tonne of GHG?

A tonne of greenhouse gases (GHG's) is the amount created when we consume:

- 385 litres of gasoline (about 10 fill-ups)
- \$200 of natural gas (a month of winter heating)
- Enough electricity for 3 homes for a year (38,000 kWh)

Figure 1: Energy Consumption (GJ) by Fuel Type

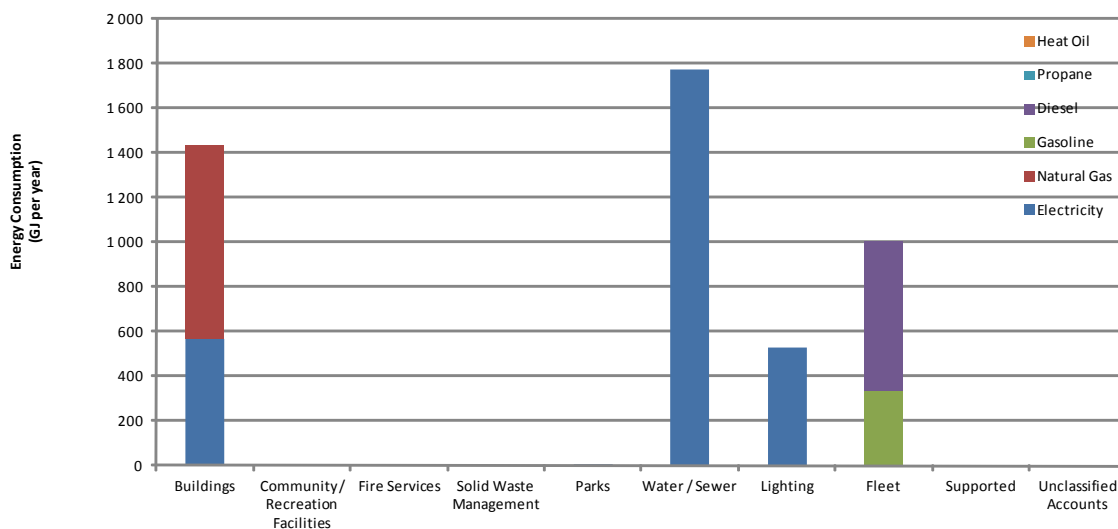
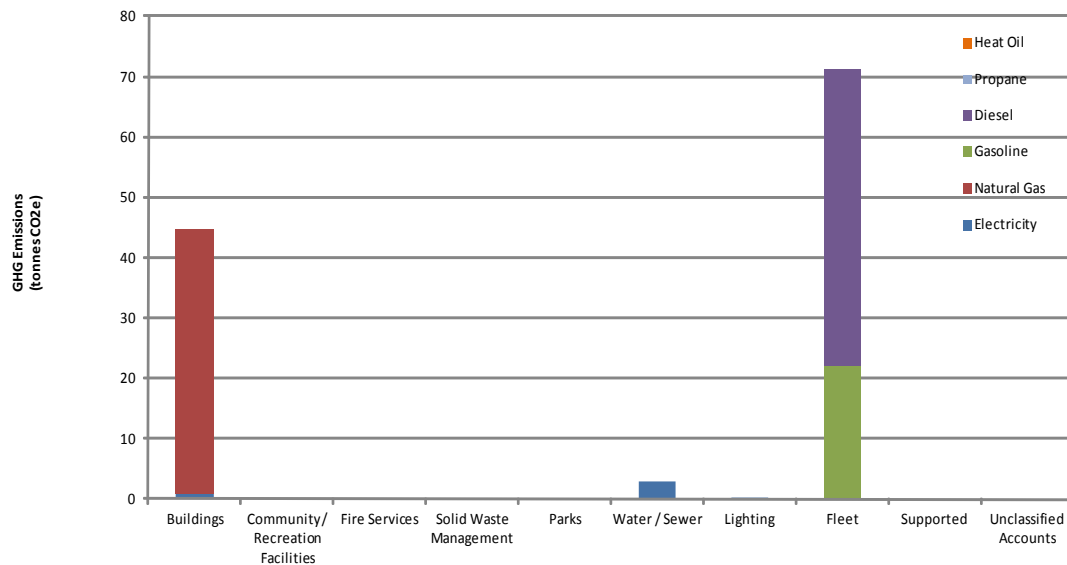


Figure 2: GHG (tonnes CO2e) Emissions by Fuel Type



3.4 Historical Profile

By tracking reductions over several years, the inventory can become a mechanism for tracking changes in energy use and GHG emissions.

Figure 3: Energy Use History

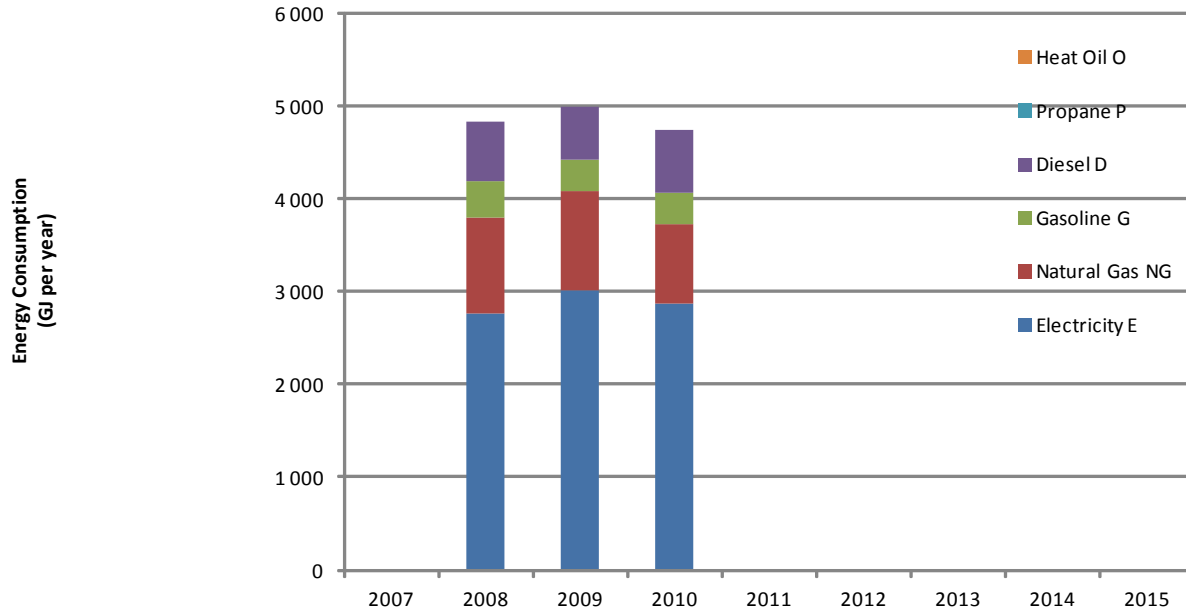
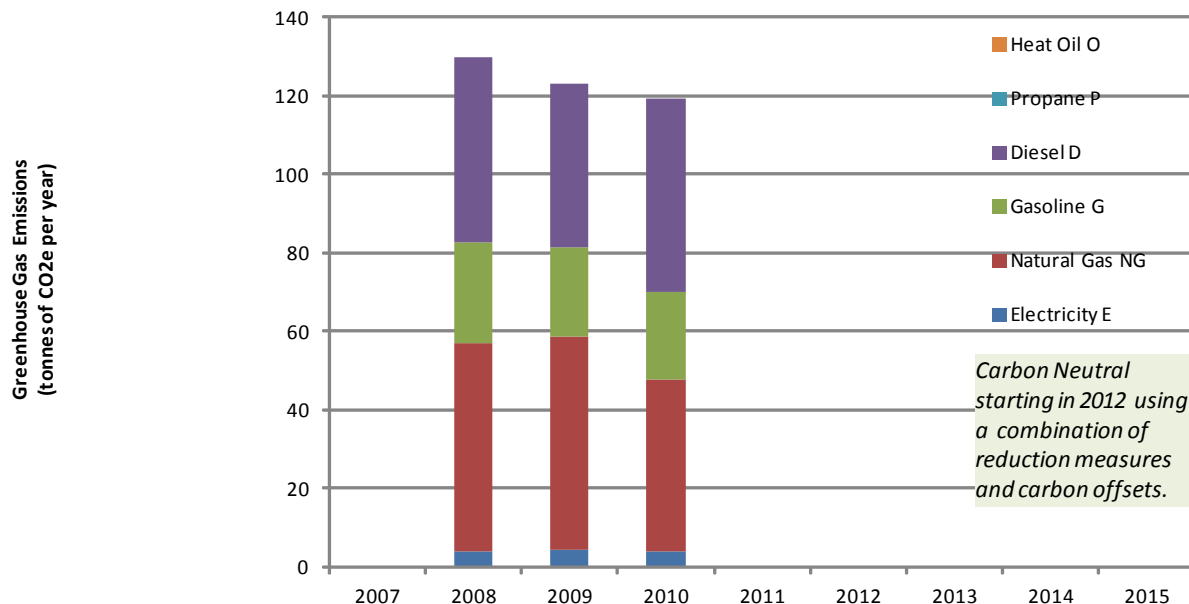


Figure 4: GHG Emissions History



4.0 Action Plan

4.1 Action Sequence

It may not be immediately obvious as to where to begin with energy and emissions actions. The following sequence is generally recommended to optimize value:

- 1 **Reduce “Behaviour” Losses:** Consider if energy is currently being wasted through certain behaviours such as idling vehicles or heating / cooling / lighting buildings when they are unoccupied. These measures can save energy and emissions for low or no cost.
- 2 **Consider Energy in Operations and Maintenance:** Operating buildings, vehicles, and infrastructure optimally can save significant energy and emissions. Well-maintained vehicles use less fuel than poorly maintained ones. Building equipment should be serviced and cleaned regularly to optimize energy use and occupant comfort.
- 3 **Efficient Equipment:** Considering the most efficient equipment to meet the need. This can include heating, ventilating, and air conditioning equipment for buildings and vehicle size for fleet.
- 4 **Renewable Energy:** The final step is considering the energy source used to meet the energy needs now that waste has been reduced, equipment is optimized, and the most efficient equipment is being considered. Renewable energy can include bio-fuels for vehicles or hybrid / electric vehicles. For buildings it can include heat pumps (air, water and ground source), solar hot water, or other renewable energy technologies.

4.2 Actions in Place

The Village of Fruitvale reports the following established community and corporate actions.

Table 2: Corporate Actions in Place

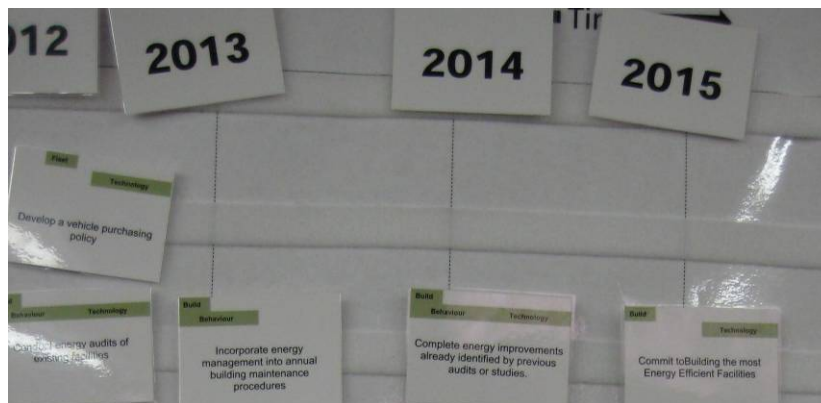
Corporate Actions			
Action Type	Supportive Action Area	Action Category	Action
Supportive	Employee Awareness Building	Broad Planning	Three educational workshops were held for both staff and elected officials
Direct		Transportation	Replaced retired 1991 dump truck
Direct		Water/Sewer	Completion of electrical repair/upgrade to the Highway Sewer Lift Station
Direct		Water/Sewer	Reconditioning of wells for efficient pumping (Beaver Valley Water System)
Direct		Building & Lighting	Kitchen equipment at Community Hall replaced with high efficiency models
Direct		Building & Lighting	Partial retrofit of LED lighting for the FMC
Direct		Building & Lighting	Replacement of PW furnace with HEmodel
Supportive		Planning	GHG Development Permit Area in OCP
Direct		Building & Lighting	Included insulated roof package at Hall
Direct		Transportation	Electric golf cart is fleet vehicle

Table 3: Community Actions in Place

Community Actions			
Action Type	Supportive Action Area	Action Category	Action
Supportive Action	Education and Engagement	Broad Planning	Workshop on climate change for community
Supportive Action	Education and Engagement	Energy Generation	Woodstove / clean energy community workshops
Supportive Action	Education and Engagement	Water/Sewer	2010 water conservation calendar distribution (Beaver Valley Water District)

Much discussion ensued at the October 2011 workshop. Some points that were noted:

- There is a need for a community workshop and learning sessions to provide details on initiatives and reasons for becoming Carbon Neutral.
- Financial pay back is important and it will help to change behaviour.
- Public works now has electric golf cart in fleet. Fruitvale vehicles are 10-12 years old. Are hybrid vehicles useful? Buying new vehicles would reduce emissions by 20%.
- Lots of potential with upgrading buildings.



Developing the Action Plan



4.3 Action Plan

Actions considered to be inapplicable are not included in the plan and some actions may have already been implemented. The actions in the plan were categorized according to what year it is believed that they could be implemented.

Action categorized by workshop group as a "yes" x
Action categorized by workshop group as a "maybe" o

CORPORATE ACTION PLAN		Year Implemented							
ACTIONS	In Place?	2012	2013	2014	2015	2016	2017	IMPLEMENTATION	
1 Building Operations									
Commit to Building the most Energy Efficient Facilities					x			<input type="checkbox"/> Nothing on radar	
Optimize siting and orientation of new buildings	x								
Require an evaluation of renewable energy sources for new construction and major renovations	x								
Conduct energy audits of existing facilities		x						<input type="checkbox"/> Connect with contractors <input type="checkbox"/> Provide information <input type="checkbox"/> Build in review in plan	
Complete energy improvements already identified by previous audits or studies.				x				<input type="checkbox"/> Walk through facilities <input type="checkbox"/> Implement Fortis plan later <input type="checkbox"/> Bundle things together	
Incorporate energy management into annual building maintenance procedures			x					<input type="checkbox"/> Build in review of plan <input type="checkbox"/> Evaluate and review	
Install programmable thermostats		x						<input type="checkbox"/> Village Hall , Community Hall	



CORPORATE ACTION PLAN		Year Implemented							
ACTIONS		In Place?	2012	2013	2014	2015	2016	2017	IMPLEMENTATION
2 Fleet Operations									
Develop a vehicle purchasing policy			x					<input type="checkbox"/> Review, customize and adopt CNK2 policy <input type="checkbox"/> Ford Ranger to be replaced soon <input type="checkbox"/> Review potential of hybrid vehicle	
Implement an efficient vehicle use initiative		x							
Develop monitoring program for fleet fuel consumption			x					<input type="checkbox"/> Track when filling up vehicles	
Conduct a fleet routing review			x					<input type="checkbox"/> Discuss with crews / employee support <input type="checkbox"/> Operations review formalized <input type="checkbox"/> Snow clearing, garbage routes <input type="checkbox"/> Parks route is set	
Encourage efficient use of personal vehicles		x							
Research bio-diesel options								<input type="checkbox"/> Research local suppliers	
Implement driver training			x					<input type="checkbox"/> Do annually <input type="checkbox"/> Safety first <input type="checkbox"/> Identify trainer and what review to be	
Install vehicle information GPS			x					<input type="checkbox"/> Budget <input type="checkbox"/> Select vendor <input type="checkbox"/> Employee training and explain purpose/usage <input type="checkbox"/> Install in vehicles	



CORPORATE ACTION PLAN		Year Implemented						
ACTIONS	In Place?	2012	2013	2014	2015	2016	2017	IMPLEMENTATION
3 Infrastructure								
Conduct energy focused operational review of infrastructure	x							
Water smart report to reduce water consumption	x							
4 Purchasing & Corporate Leadership								
Incorporate energy considerations into purchasing policies		x						<input type="checkbox"/> Review, customize and adopt CNK2 policy
Incorporate Life Cycle Costing into all major purchasing decisions		x						<input type="checkbox"/> Review, customize and adopt CNK2 policy
Incorporate GHG tracking requirements into service provider agreements				o				<input type="checkbox"/> Review agreements
Encourage and recognize staff who develop new GHG reduction measures					o			<input type="checkbox"/> Consider developing staff recognition program



CORPORATE ACTION PLAN		Year Implemented							IMPLEMENTATION
ACTIONS	In Place?	2012	2013	2014	2015	2016	2017		
5 Implementation									
Identify the Owner of the Plan		x						<input type="checkbox"/> Include in job description	
Assign the CARIP grant (Carbon Tax rebate) into an energy conservation fund		x						<input type="checkbox"/> Review, customize and adopt CNK2 policy <input type="checkbox"/> Add to budget	
Develop an administrative system for tracking corporate emissions	x								
Develop an emissions reduction reporting process	x								
GHG Development Permit Area in OCP	x								
Adopt internal offset purchase carbon fund policy							o	<input type="checkbox"/> Employee buy-in <input type="checkbox"/> Political approval <input type="checkbox"/> Develop policy (based on Dawson Creek example) <input type="checkbox"/> \$1200 per year to fund Climate Action projects <input type="checkbox"/> Add to strategic plan for financial plan	
Adopt Carbon Neutral Action Plan		x						<input type="checkbox"/> Staff to develop Action Plan with CNK2 team <input type="checkbox"/> Action Plan to be part of budget discussions <input type="checkbox"/> Adopt as part of strategic plan	

Action categorized by workshop group as a "yes" x
Action categorized by workshop group as a "maybe" o