

District of Tumbler Ridge

2008 Corporate Energy and Emissions Inventory Report

Revised Draft

Prepared for
District of Tumbler Ridge
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Peace River Regional Energy and Emissions Project
A Regional Approach to Climate Action





2008 Operations Energy Consumption & Greenhouse Gas Emissions Inventory
Dashboard Summary

District of Tumbler Ridge



Operations Profile	
General Buildings	9
Community and Recreational Facilities	2
Fire halls	2
Vehicle Fleet	43
Electricity Accounts	35
Natural Gas or Propane Accounts	12

Energy and GHG Emissions by Type of Fuel

Fuel Type	Energy Consumption	Energy Units	GHG Emissions (tonnes CO2e)	Annual Energy Expenditure (Approx \$)
Electricity	4,305,349	kWh	95	\$ 281,000
Natural Gas	14,440	GJ	713	\$ 172,800
Propane	-	L	-	\$ -
Gasoline	31,649	L	75	\$ 44,000
Diesel	59,661	L	166	\$ 84,000
Total			1,050	\$ 581,800

Carbon Costs and Rebates (at current level of consumption):

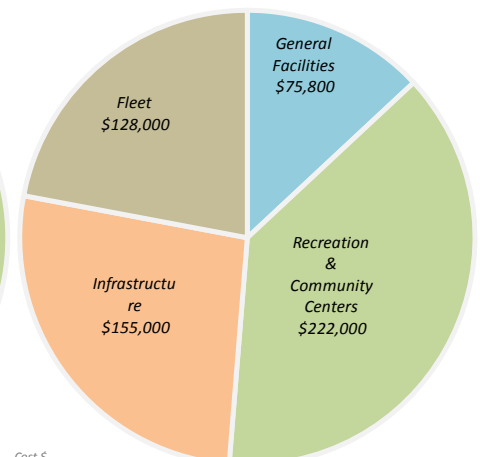
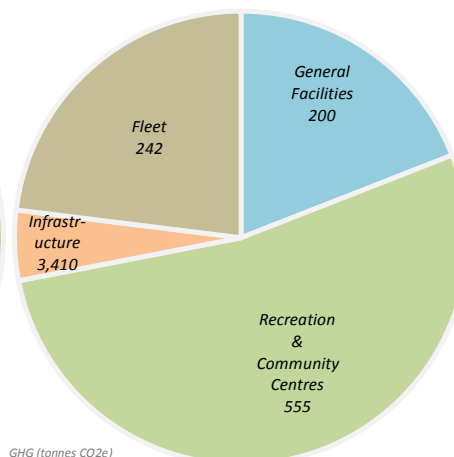
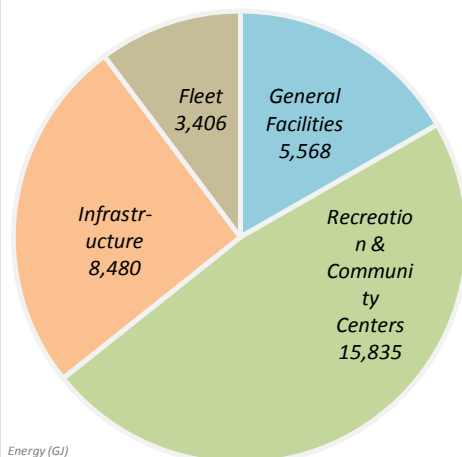
Estimated cost of offsets required to become "Carbon Neutral": **\$ 26,250**
Estimated Carbon Tax Rebate (CARIP rebate) in 2012: **\$ 28,700**

Energy, Greenhouse Gas Emissions, and Costs (2008) by Energy Users

Energy Consumption
33,345 GJ

GHG Emissions
1,050 CO2e

Energy Spending (approx)
\$581,800





1. Introduction

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. In the past 2 years, 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 municipalities to incorporate GHG reduction targets, and strategies to reach them, into their official community plans (OCPs) through the Local Government (Green Communities) Statutes Amendment Act (Bill 27 – 2008).
- Encouraging municipal 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 municipal operations beginning in 2012 through a combination of emission reductions and offsets. The District of Tumbler Ridge is a signatory to the climate action charter.

Community and Corporate Emissions

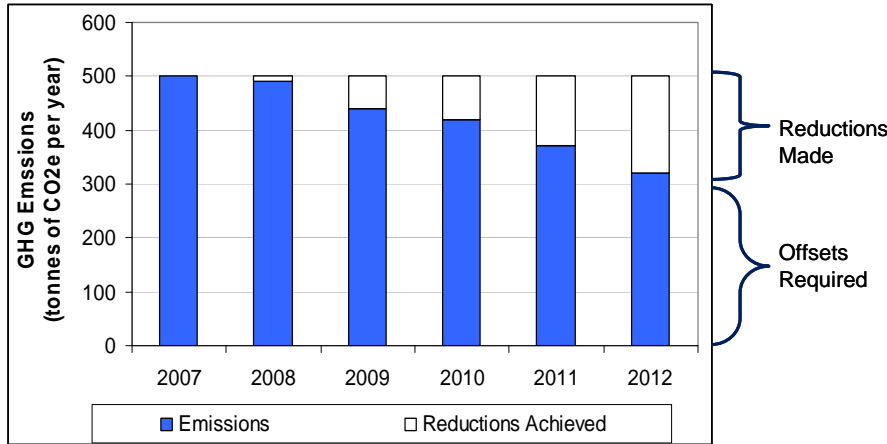
This inventory addresses the corporate operations consumption and emissions. Actions to reduce energy consumption and greenhouse gas emissions are frequently divided into the realm of:

- **Corporate emissions** - those that the municipality creates through its activities (and which it has control over) such as municipal 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 municipality cannot directly control these, but may be able to influence through planning and program activities. These will be addressed in a separate phase of this project.

Carbon Neutrality

Carbon neutrality means that the operation 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 behavioral 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 'reduction credits' to other parties that are working to neutralize their carbon footprint.



Getting to Carbon Neutral:
Efficiency improvements will reduce the emissions from operated facilities. However, there will always be some emissions remaining, and these will be 'neutralized' through the purchase of offsets.

Carbon Neutrality is achieved through a combination of reductions of emissions and offsets

Estimating GHG Emissions from Consumption Data

From an inventory of energy consumption, the greenhouse gas emissions are calculated by multiplying the consumption, by an emissions factor. For the combustion of fossil fuels, the emission factor represents the amount of CO₂ created when burning that fuel (i.e. the "tailpipe" emissions), and depends primarily upon the type of fuel consumed (e.g. natural gas, gasoline, diesel, etc.)¹

For the consumption of electricity, the GHG emission factor represents the amount of CO₂ released to the atmosphere from the generation of the electricity. These emissions do not occur where the electricity is consumed, but rather elsewhere in the grid. There are different emissions factors for different electricity supply areas (i.e. BC Hydro).

¹ The emissions factors do not account for the carbon released to extract, process, and deliver the fuel to the point of use – the "Carbon intensity" of the fuel. There are however efforts under way in BC to reduce these 'upstream' emissions. Under the Greenhouse Gas Reduction (Renewable and Low Carbon Fuel Requirements) Act (Bill 16- 2008), the Province is aiming to reduce the carbon intensity of fuels by 10% by 2020.



2. Components of a Local Government Inventory

Boundaries: What's in, What's out?

Each community offers different services, via a different mechanism to its residents. Counting the carbon footprint can be complicated because of how services are delivered and who's 'carbon balance sheet' they might appear on. The Province, through a joint provincial-UBCM committee is developing guidance for the boundaries of what to include when estimating the emissions included in the Climate Action Charter commitment. To ensure equity between communities, these are being defined around services that are considered to be "**traditional municipal services**".² Traditional services included in the inventories are:

- Administration and governance
- Drinking, storm, and waste water
- Solid waste collection, transport and diversion
- Roads and traffic operations
- Arts, recreation, and cultural services
- Fire protection

In the traditional services approach, the focus is on services funded by the local government – most specifically *what* service is delivered, and not on *who* delivers it.³ The expectation is that energy intensive contracted services will have to be included within community inventories (and thus tracked through contracts) from about 2012 onward. Local governments will be expected to define the emissions that occur from these services and they will form part of the inventory, which will need to be negated through the purchase of carbon offsets.

Approach to Inventory Data Collection

The protocol documents are still under development by the Climate Action Secretariat within the BC Ministry of Environment. The data collection in this project aimed to cast a 'wide net' and capture as much information as possible. As the inventory guidance material is revised, there may be additions or deletions to this information.

² The precise requirements are under development through a joint working group of the Climate Action Secretariat (of the Ministry of Environment), and the Union of BC Municipalities (UBCM). Further information is available at the "Toolkit" website (www.toolkit.bc.ca) and search for "carbon neutral government". The draft protocol document is available at: www.toolkit.bc.ca/sites/default/files/Carbon%20Neutral%20Workbook%20Draft%20Final-1.pdf

³ If the service is not offered at all, then it does not have to be included. Other items not included are capital works and new construction, employee commuting, and the background emissions from producing goods and services.



3. Energy and GHG Emissions

Inventory Summary

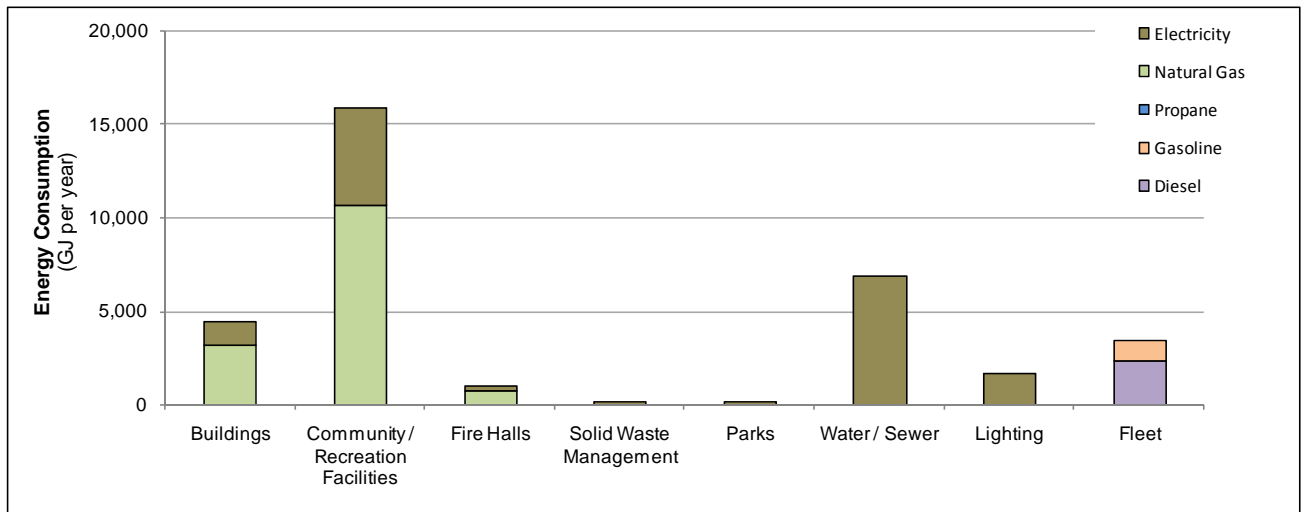
A summary of the operations energy consumption is shown in Table 1. The energy consumption and GHG emissions are broken down by the type of fuel and end use in Figures 1 and 2.

Table 1: Corporate Energy and Greenhouse Gas Summary 2008

End-Use	Energy	Units of Purchase	Energy (in units purchased)	Energy (as GJ)	GHG Emissions (as CO2e)	Approximate Value (\$)
Buildings	Electricity	kWh	353,477	1,273	8	\$23,000
	Natural Gas	GJ	3,122	3,122	154	\$37,000
Community / Recreation Centres	Electricity	kWh	1,457,280	5,246	32	\$95,000
	Natural Gas	GJ	10,589	10,589	523	\$127,000
Fire Halls	Electricity	kWh	72,029	259	2	\$5,000
	Natural Gas	GJ	729	729	36	\$8,800
Solid Waste Management	Electricity	kWh	23,697	85	1	\$2,000
	Natural Gas	GJ	0	0	0	\$0
Parks	Electricity	kWh	27,874	100	1	\$2,000
	Natural Gas	GJ	0	0	0	\$0
Water / Sewer	Electricity	kWh	1,912,458	6,885	42	\$124,000
	Natural Gas	GJ	0	0	0	\$0
Lighting	Electricity	kWh	445,194	1,603	10	\$29,000
Fleet	Gasoline	L	31,649	1,139	75	\$44,000
	Diesel	L	59,661	2,267	166	\$84,000
	Propane	L	0	0	0	\$0
Unclassified Accounts	Electricity	kWh	13,340	48	0	\$1,000
Total				33,345	1,050	\$581,800



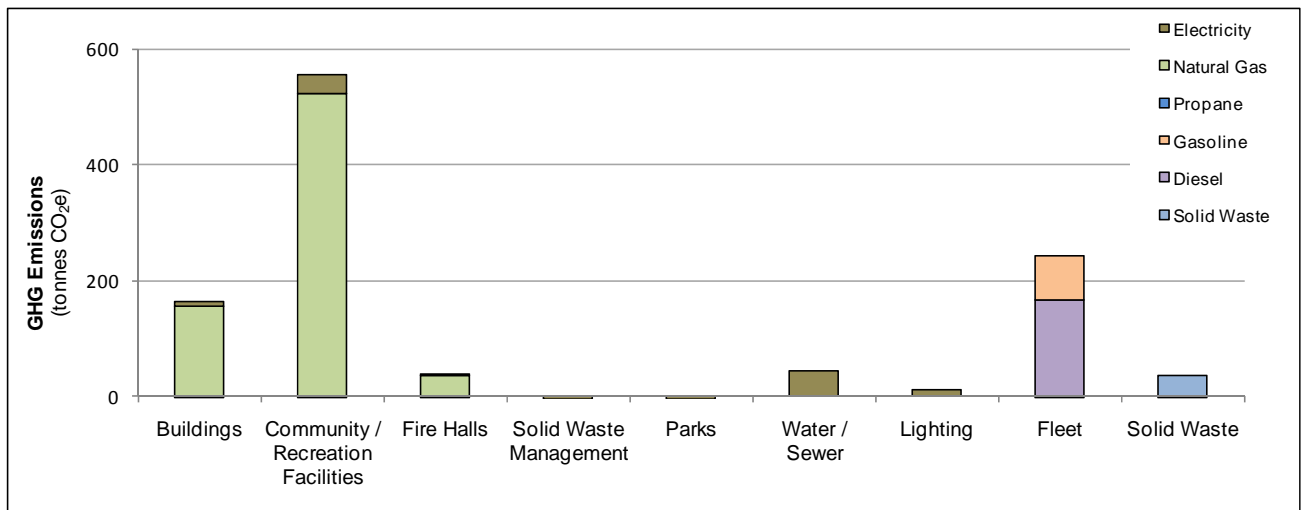
Figure 1: Energy Consumption by Fuel Type



What's a GJ?
A gigajoule (GJ - 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 ten days

Figure 2: GHG Emissions by Fuel Type



What's a tonne of GHG?
A tonne of greenhouse gases 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).



4. Data Tables

This section contains compiled data, and emissions factors used in the compilation of the inventory.

Table T- 1: Facilities List

Facility	Location
Buildings	
Founder St - Town Hall	305 Founders St
Public Works Building	103 BECKER RD
MacKenzie Way PL28606 Dog Pound	MACKENZIE WAY PL28606 L1
Airport Building	AIRPORT
New Tower Site (Cell tower)	HERITAGE HWY
Generator	315 Founders St
Recycle Building	103 RIDGE RD
Community Centres	
Community Centre	340 FRONT ST
Aquatic Centre	280 Front St
Fire Services	
Fire Hall	325 FOUNDERS ST
Bay 5 - (Fire Dept)	115 COMMERCIAL PRK 5
Fire Department Training Trailer	124 Commercial Park
Solid Waste Management	
Landfill Gate	RIDGE RD
Transfer Station (Incinerator)	GARBAGE DUMP
Parks	
Flatbed Park	FLATBED PRK
Dump Station-RV Park (103 Ridge Road)	103 RIDGE RD
Monkman Way - Pole for Grizfest	MONKMAN WAY COMMUNITY CENTRE PRO
Water / Sewer	
Water Treatment Plant	PIONEER LOOP AND MACKENZIE WAY
Heritage Highway-Pumphouse #3	HERITAGE HWY
Heritage Highway-Pumphouse #1	HERITAGE HWY
Municipal Water-Reservoir Site	MUNICIPAL WATER RESERVOIR SITE
MacKenzie Way-Old Quadra (water pump)	103 MONKMAN WAY
Sewage Treatment Plant	103 RIDGE RD
Temporary Sub LA	TEMPORARY SUB LA
Heritage Highway - Reservoir	HERITAGE HWY
BCDC Well	BCDC WELL
BCDC Pumphouse	BCDC PUMPHOUSE
Water Pump 7-Chetwynd Highway	WATER PUMP 7 CHETWYND HWY
Lighting	
Overhead Street Lighting	OVERHEAD STREET LTG
Ornamental Street Lighting	ORNAMENTAL STREET LTG
McKenzie at Various	MURRAY AND MACKENZIE
MacKenzie/Pioneer	MONKMAN/BERGERON
MacKenzie/Monkman	MONKMAN AND WILLOW



Facility	Location
MacKenzie/Willow Dr	MACKENZIE/WILLOW DR
100 C Monkman Way (Shanco Camp) on pole	100 C MONKMAN WAY
Leased	
Claude Galibois School	255 MURRAY DR
Caboose (when rented they pay-vacant now)	250 SOUTHGATE RD
Tumbler Ridge Golf Course	103 Golf Course Rd
Unclassified Accounts	
250 SOUTHGATE RD	250 SOUTHGATE RD

Fleets and Equipment

Fleet information includes the type and nature of the fleet vehicles, as well as the consumption data.

Table T- 2: Vehicle and Equipment Overview

Vehicle	Number
General Fleet	
Passenger Vehicles	-
Light Truck/SUV	18
Other	18
Fire Services	
Light Truck	2
Heavy Truck	1
Tanker / Tender	1
Pumper	
Engine / Firetruck	1
Waste Management	
Garbage Truck	2

Table T- 3: Vehicle Fuel Consumption 2008

Fuel Type	L	GJ
Gasoline	31,649	1,139
Diesel	59,661	2,267

Contracted Services

Some of the “traditional municipal services” that are subject to the Climate Action Charter reporting and must be included in the local government inventory are executed by an agent other than the local government. As a guideline, if the local government is providing funding to a traditional municipal service, then it is likely to be included in the emissions inventory.

This section compiles the known services that are funded by the local government that are delivered by another organization.



Table T- 4: Contracted Services

Service	Company	Contact Information
None Identified		

Note: Additions and corrections to this information are welcomed.

Leased Facilities

There are also occasions where buildings are owned by the local government and leased out to other agencies (e.g. heritage society, seniors center, etc) wherein the leasee operates the facility independently, or where the local government does not own or operate the building but provides funds for annual operations.

Facilities owned by the municipality, but independently operated by others are shown in Table 7.

Table T- 5: Owned Facilities, leased to Others

Facility	Operator	Who Pays Utilities?
Claude Galibois School	Tumbler Ridge Museum	Tumbler Ridge Museum
Caboose (when rented they pay-vacant now)		
Tumbler Ridge Golf Course	Tumbler Ridge Golf Course	Tumbler Ridge Golf Course

Note: Additions and corrections to this information are welcomed.

Solid Waste

The decomposition of organic material in landfills, results in methane gas emissions. Methane is a potent greenhouse gas and so is included in many inventory protocols.

The Climate Action Charter does not include the emissions from waste decomposition. However, this information is included in other protocols. For example the FCM Partners for Climate Protection program includes waste emissions.

For information only, this section presents the estimated solid waste generated at local government facilities only (i.e. does not include community waste).



Table T- 6: Solid Waste Generation

Location	Number	Bin		Estimated tonnes per year of waste
		Volume (yd ³)	Pick-Up Frequency (weekly)	
Town Hall	1	4	1	24
Community Centre	2	4	1	48
Public Works Building	3	0.15	1	4
Total				75

Emissions Factors

Table T- 7: Emissions Factors for Converting Energy Consumption to GHG Emissions

Energy Source	GHG Emission Factor	Units	Source
BC Hydro	22	tonnes CO ₂ e / GWh	Used for the BC Provincial SmartTool. BC Hydro 3 year average intensity of BC Produced electricity.
Natural Gas	0.049	tonnes CO ₂ e / GJ	Pacific Northern Gas
Propane	0.061	tonne CO ₂ e / GJ	Jaques, A. (1992). Canada's Greenhouse Gas Emissions: Estimates for 1990. Environmental Protection, Conservation and Protection, Environment Canada. EPS 5/AP/4, December.
	0.025	GJ / L	
Gasoline	0.00238	tonne CO ₂ e / L	
	0.036	GJ / L	
Diesel	0.00279	tonne CO ₂ e / L	
	0.038	GJ / L	



About this report

The Peace River Regional District is working with the municipalities of Chetwynd, Pouce Coupe, Taylor and Tumbler Ridge to develop climate action plans in order to meet their commitments under the Climate Action Charter. This includes becoming carbon neutral in their corporate operations. As part of this process, energy inventories have been compiled to develop actions to reduce their respective 'carbon footprints'.

Notes about these Inventories

[1] These inventories are in draft form and subsequent review may define further information.

[2] The protocols for defining the boundaries for the inventories are still under development and review by the Climate Action Secretariat of the Ministry of Environment. The required information may evolve as these protocols are further developed.

[3] Energy costs cited in this report are estimates and are not based on actual utility invoices.

[4] Costs for offsets are estimated assuming \$25 per tonne of offsets. Estimated CARIP rebates are based on the total applicable inventory and \$30 per tonne carbon tax (as expected to become effective on July 1, 2012).

About the Peace River Regional Energy and Emissions Project

The Peace River Regional Energy and Emissions Project is jointly funded by:

- Peace River Regional District,
- District of Chetwynd,
- District of Taylor,
- District of Tumbler Ridge, and
- Village of Pouce Coupe.

2009 Project Activities delivered by:



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