

# District of Tumbler Ridge

## Corporate Energy Plan

Draft

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 Date: November 23, 2009



The Peace River Regional Energy and Emissions Project is a collaborative effort between the Peace River Regional District and the municipalities of Chetwynd, Pouce Coupe, Taylor and Tumbler Ridge to develop both corporate and community energy plans for each community and the rural areas in order to meet their voluntary commitments under the Climate Action Charter and the regulatory commitments under the “Green Communities” amendment to the Local Government Act (Bill 27 in 2007). This report represents the District of Tumbler Ridge’s corporate energy plan.

Peace River Regional Energy and Emissions Project Partners:



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

## Plan Summary

The District of Tumbler Ridge, in collaboration with the Peace River Regional District (PRRD), and the municipalities of Chetwynd, Pouce Coupe and Taylor, has undertaken this project to define a baseline inventory of **corporate energy consumption** and **greenhouse gas (GHG) emissions** for 2008 and develop a plan to reduce those emissions and become carbon neutral by 2012. This plan identifies the potential for the District to reduce GHG emissions resulting from corporate operations over the next 5 years by approximately 10%. In addition to acting independently, there are tremendous opportunities to collaborate with other local governments in the Peace River region to find further efficiencies and explore opportunities for alternative energy. This collaboration could result in more substantial reductions in consumption and emissions over the longer-term.

### Corporate Energy and GHG Emissions: 2008

In 2008, the District of Tumbler Ridge consumed a total of **33,345 GJ** of energy and emitted **1,050 tonnes of CO<sub>2</sub>** equivalents in the delivery of its services. Energy consumption in buildings accounts for 72% of these GHG emissions, the fleet accounts for 23% and infrastructure accounts for 5%.

### GHG Emission Reduction Target [Proposed]

The District of Tumbler Ridge will commit to reducing corporate greenhouse gas emissions by 10% by 2015.

### Key Actions for Meeting the Target

The majority of potential savings identified are through building retrofits, including:

- Community / Aquatic Centre: Variable speed drives for pool pumps and fans, mechanical dehumidification, energy efficient lighting
- Sewage Treatment: Variable speed drive for aeration blower, energy efficient lighting
- Municipal Hall: Energy efficient lighting
- Public Works: Energy efficient lighting, programmable thermostats, energy efficient heating, weatherproofing

Further reductions can be made through:

- Fleet right-sizing
- Staff education in energy efficient building operations and vehicle operations
- Infrastructure efficiencies

## Implementation

In order to meet the 5-year target of reducing corporate emissions by 10%, the District of Tumbler Ridge will need to fund building retrofits of approximately \$415,000, some of which may be funded by external programs and agencies. Furthermore, the District will need to continue efforts to educate staff and heighten efficiency in the operations of buildings and fleet.

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# 1 Introduction

## 1.1 Background: Energy, GHG Emissions and Climate Change

There is increasing evidence that global climate change resulting from emissions of carbon dioxide and other greenhouse gases (GHGs) is causing, or will soon cause, significant environmental impact on the ecology of the planet. In addition to impacting ecology, climate change is expected to have serious negative impacts on global economic growth and development. In 2005, the UK government commissioned an independent review called the “Stern Review”, which states that the “costs of stabilizing the climate are significant but manageable; delay would be dangerous and much more costly”. This is a significant conclusion highlighting that deferring action will be more costly than initiating action immediately.

Climate change is a global issue, caused by the daily activities of billions of humans, primarily through the consumption of fossil fuel energy. A solution to the issue will require the activities of billions of humans to **conserve energy** and **reduce GHG emissions**. All persons and entities, including local governments, have a role to play in finding these solutions.

In addition to reducing impacts on climate change, local governments can begin to plan for **energy resilience** in their communities. According to the International Energy Agency, oil accounts for 43% of global energy consumption.<sup>1</sup> Many of the products used on a daily basis are built using oil as a feedstock: plastics, paints, pharmaceuticals, fertilizers, electronic components, tires and many more. As the abundance of cheap oil declines, reducing dependence on it will be a key strategy for ensuring long-term sustainability; reducing vulnerability to price fluctuations and increasing the security of local energy supply.

Local governments can take action on energy consumption and greenhouse gas emissions by:

- Identifying opportunities to reduce consumption and GHG emissions in their operations (corporate energy plan), and
- Implementing broader policies and programs to reduce consumption and GHG emissions in the community as a whole (community energy plan).

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<sup>1</sup> Key World Energy Statistics (2008). International Energy Agency.  
[http://www.iea.org/textbase/nppdf/free/2008/key\\_stats\\_2008.pdf](http://www.iea.org/textbase/nppdf/free/2008/key_stats_2008.pdf)

## 1.2 Climate Action Charter Commitment

The BC **Climate Action Charter** is a provincial initiative introduced in September 2007 to encourage local governments to significantly cut greenhouse gas emissions. Participating local governments have committed to becoming carbon neutral in their municipal operations by 2012. The District of Tumbler Ridge has signed the Charter. Achieving carbon neutrality will involve reducing greenhouse gas emissions, and because it is currently not possible to operate without some emissions, the District will also need to purchase carbon offsets to reach this goal.

## 1.3 What is Carbon Neutrality? What is a Carbon Offset?

Achieving carbon neutrality in local government operations means that the District will:

1. Establish a **baseline** of annual GHG emissions,
2. Reduce those emissions as much as possible through **reduction measures**, and
3. Purchase **carbon offsets** for any remaining emissions.

A carbon offset is a reduction in GHG emissions that is generated through a reduction project (either in the community or elsewhere). These reductions are verified, and then can be purchased by the local government. Note that a project that reduces the local government's current emissions does not qualify as an offset project. Since it is currently impossible to reduce emissions to zero, there will always be some requirement to procure offsets.

## 1.4 Objectives of this Corporate Action Plan

The corporate plan objectives are to:

- Set a baseline of energy consumption and GHG emissions for local government corporate operations.
- Define actions for the local government to implement that will reduce energy consumption and GHG emissions for corporate operations.
- Support the District in meeting its commitment to be carbon neutral in operations by 2012 as part of the Climate Action Charter.



## 1.5 Methodology

The District of Tumbler Ridge's Corporate Action Plan was developed in a series of steps as follows:

- **Corporate inventory:** An inventory of corporate activities that consume energy and produce GHG emissions was compiled to estimate annual energy consumption and GHG emissions for the baseline year of 2008.
- **Background review:** The current corporate policies and initiatives in the District of Tumbler Ridge's operations were identified and assessed with regard to energy and GHG emissions through discussion with staff and review of documents.
- **Action planning workshop:** A workshop was held with staff to review potential types of actions and define activities that would be feasible to implement in order to reduce energy consumption and GHG emissions for corporate operations.
- **Activity research:** Research was conducted on current activities being undertaken in other jurisdictions in BC (particularly other municipalities in the Peace River Regional District (PRRD)) to address corporate operations in a local government context. These activities and examples helped inform the development of actions for this plan.

# 2 Corporate Energy and GHG Inventory

## 2.1 Operations Profile

In order to deliver services to residents, the District operates the facilities, fleet and utility accounts as outlined in Table 1, either directly or through provision of funds to other agencies. This profile is the basis for the 2008 energy and emissions inventory.

Table 1. Operations profile for the District of Tumbler Ridge

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

\* Number of utility accounts accessed to develop the corporate inventory

## 2.2 2008 Energy Consumption and GHG Emissions

The District consumed a total of 33,345 GJ of energy in 2008 and emitted 1,050 tonnes of CO<sub>2</sub> equivalents in the delivery of its services. Table 2 breaks down these totals by fuel type.

Table 2. 2008 Corporate Operations Energy Consumption and GHG Emissions

Fuel Type	Energy Consumption	Energy Units	GHG Emissions (tonnes CO <sub>2</sub> e)	Annual Energy Expenditure (Approx \$)
Electricity	4,305,349	kWh	95	\$ 281,000
Natural Gas	14,440	GJ	713	\$ 172,800
Heating Propane	-	L	-	\$ -
Gasoline	31,649	L	75	\$ 44,000
Diesel	59,661	L	166	\$ 84,000
<b>Total</b>			<b>1,050</b>	<b>\$ 581,800</b>

The total energy consumed and GHG emissions produced are also broken down by operational departments, as shown in Figure 1 and Figure 2, respectively. These charts demonstrate that although electricity accounts for a substantial portion of energy consumption, it contributes fewer greenhouse gas emissions than fossil fuel-based energy sources (e.g. natural gas, gasoline, diesel).

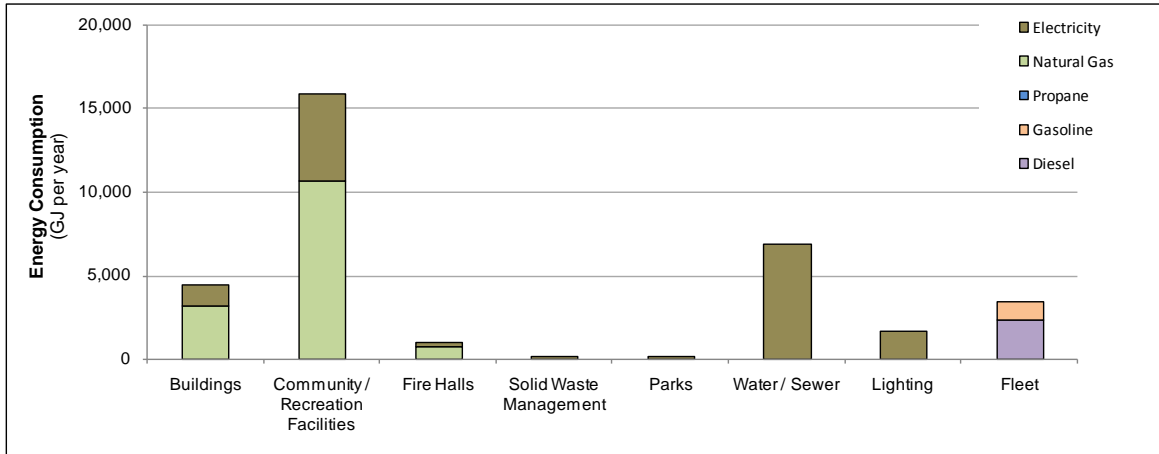


Figure 1. Energy consumption (GJ) in District of Tumbler Ridge’s corporate operations

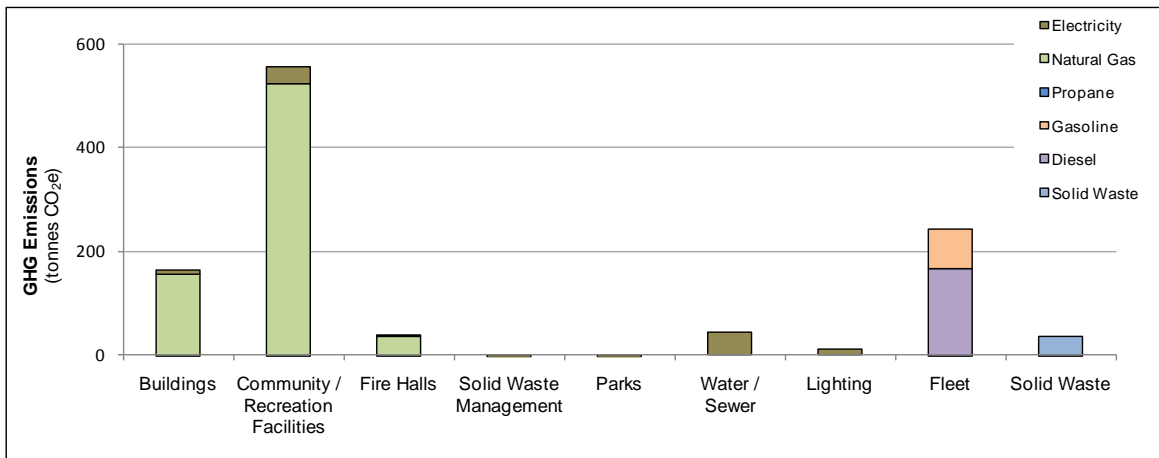


Figure 2. Greenhouse gas emissions (tonnes CO<sub>2</sub>e) from District of Tumbler Ridge’s corporate operations

### 2.3 Carbon Costs and Rebates

Local governments in BC now have costs associated with carbon – first for the “Carbon Tax” associated with all purchases of fossil fuels (e.g. gasoline, diesel, natural gas, propane), and second for the voluntary purchase of carbon offsets to become carbon neutral starting in 2012. By committing to become carbon neutral, local governments are

eligible for a rebate on the carbon taxes paid. The following outlines the expected costs and rebates for 2012, based on 2008 consumption. Offsets are assumed to cost \$25 per tonne and the carbon tax is scheduled to cost \$30 per tonne.

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

## 2.4 Forecast to 2020

Increased energy consumption for municipal operations is driven by growth in the community. The methods for estimating growth are shown in Table 3. Based on these methods, the emissions from corporate operations in 2020 are expected to be approximately 1,060 tonnes CO<sub>2</sub> equivalents, based on 2008 emissions.

Note that actual annual emissions tend to vary due to variations in weather.

Table 3. Corporate Operations Forecasting Assumptions

Area	Consideration	Application
New Facilities	Major facilities (buildings, recreation centers) are built periodically and so the energy consumption and GHG profile shows a step increase when a new facility is created.	No new major facilities are currently planned for the District.
Existing Facilities	Existing facilities may show a slight increase in energy use and emissions as community population growth results in increased operating hours (e.g. an arena). For support facilities (e.g. municipal hall, works yard buildings) there wouldn't be expected any substantial increases over the period of a few years.	No increase assumed.
Infra-structure	Some infrastructure energy use such as street lighting or water pumping would grow as the population grows (but likely at a lower rate. These are frequently electricity powered facilities and so do not result in substantial GHG emissions increases.	Assumed that lighting and infrastructure grow at ½ the rate of population growth to 2020.
Vehicle fleet	Vehicle fleets grow slowly as new activities are created, or new areas need servicing.	Assumed no increase in vehicle fleet.

# 3 Current Initiatives

The District of Tumbler Ridge has already undertaken initiatives to reduce energy consumption and GHG emissions from its operations. These initiatives include:

- Retrofitted town hall and installed a high efficiency HVAC;
- Continuously maintain detailed log books of all vehicles;
- Installed LED street lighting on one street as a pilot project; and
- Built the new Recycle Centre with recyclable materials and installed slab in-floor heating with sensors for bay door to reduce efficiency.

# 4 Opportunities for Reducing Emissions

## 4.1 Summary of Opportunities

In order to become carbon neutral by 2012, the District will need to undertake a combination of emission reduction measures and carbon offset purchases. Opportunities for reducing emissions were identified through analysis of the District's corporate inventory, building assessments of ten facilities, consultation with staff, and a review of activities in similar jurisdictions. The actions are summarized in Table 4. By implementing these reduction measures, it is estimated that the District of Tumbler Ridge could reduce operational GHG emissions by approximately 10%. Additional savings can be found by implementing optional retrofits.

Table 4. Summary of Emission Reduction Opportunities (tonnes CO<sub>2</sub>e)

Actions	2008 GHG Emissions	Estimated Reductions
<b>Existing Buildings:</b> 1. Retrofit buildings for energy efficiency 2. Promote energy efficiency practices among staff 3. Include energy efficiency in building maintenance	755	64
<b>New Buildings:</b> 4. Develop an energy efficiency building policy 5. Develop an alternative energy policy	n/a	30% or more [of future emissions]
<b>Fleet:</b> 6. Select fleet vehicles with "right-sizing" principles 7. Switch fuels or use additives to reduce emissions 8. Reduce idling 9. Train staff on energy efficient driving techniques	242	10% - 15%
<b>Infrastructure:</b> 10. Reduce energy requirements for water and wastewater infrastructure 11. Convert exterior lighting to LED and/or solar power	52	Minimal
<b>Purchasing &amp; Corporate Leadership:</b> 12. Adopt an energy efficient purchasing policy	n/a	[unknown]
<b>Regional Collaboration:</b> 13. Establish a regional energy manager position 14. Participate in regional building energy performance benchmarking 15. Collaborate regionally on purchasing and training	n/a	[unknown]

## 4.2 Actions for Existing Buildings

Proportion of Tumbler Ridge corporate GHG emissions from existing buildings in 2008:	72%
2008 GHG emissions from existing buildings:	755 tonnes
Estimated reduction potential from implementing identified reduction measures:	64 tonnes

### Corporate Action 1: Retrofit buildings for energy efficiency

As part of this project, opportunity assessments were performed in ten District of Tumbler Ridge buildings. These assessments included a review of energy bills, a short walk-through of each building, and discussions with staff involved in operating the buildings. Through this process reductions of approximately 64 tonnes of greenhouse gases were identified<sup>2</sup>. A preliminary financial analysis indicates that undertaking all “recommended” retrofits would cost \$415,000<sup>3</sup> with a simple payback of 12 years. Additional “optional” retrofits are identified that may lead to larger GHG reductions, but require larger capital investments and longer payback periods.

Opportunities identified for each building are summarized in Table 5. For more detailed descriptions, refer to the separate report entitled “Energy Efficiency Opportunity Assessment of Corporate Buildings – Tumbler Ridge”.

Note: opportunities to reduce greenhouse gases from the sewage treatment facility are included here, along with the other building opportunities; however, the current emissions from this facility are included in the “Infrastructure” emissions.

<sup>2</sup> These assessments are not a substitute for comprehensive energy audits or studies, but do allow local governments to make informed decisions about proceeding with more detailed assessments.

<sup>3</sup> Includes 15% allowance for engineering and project management. Incentives may be available from BC Hydro and the federal government. Additional funding may be available through other sources.

Table 5. Summary of Building Retrofit Opportunities from Building Assessments

Recommended Retrofits	Optional Retrofits (not included in GHG or cost estimates)	Estimated Energy Reductions	Estimated Annual Savings
<b>Community/Aquatic Centre</b>			
<ul style="list-style-type: none"> <li>Lighting retrofit</li> <li>Review boiler operation</li> <li>Variable Speed Drives on pool pumps</li> <li>Variable Speed Drives on pool supply fan</li> <li>Utilize mechanical dehumidification</li> </ul>	<ul style="list-style-type: none"> <li>Low-e ceiling</li> <li>Condenser for Dryotron</li> <li>Variable brine pumping</li> <li>Solar hot water heating</li> </ul>	7%	\$14,000
<b>Sewage Treatment</b>			
<ul style="list-style-type: none"> <li>Lighting retrofit</li> <li>Variable Speed Drive aeration blower</li> </ul>		10%	\$5,300
<b>Public Works</b>			
<ul style="list-style-type: none"> <li>Lighting retrofit</li> <li>Reduce overlit areas</li> <li>New high efficiency unit heaters</li> <li>Programmable thermostats</li> <li>Weatherstripping / sealing</li> </ul>		18%	\$2,800
<b>Water pump 7 / 8</b>			
<ul style="list-style-type: none"> <li>Lighting Retrofit</li> <li>Reduce temperature setpoint</li> <li>Trim pump impeller</li> </ul>		5%	\$2,000
<b>Fire Hall</b>			
<ul style="list-style-type: none"> <li>Lighting retrofit</li> <li>Programmable thermostats</li> <li>Revise hot water supply temperatures</li> </ul>	<ul style="list-style-type: none"> <li>Humidity control of hose tower heat</li> </ul>	13%	\$1,200
<b>Bay 5 Fire Dept</b>			
<ul style="list-style-type: none"> <li>Lighting retrofit</li> <li>New high efficiency unit heater</li> <li>Check for gas leak</li> </ul>		47%	\$1,100
<b>Town Hall</b>			
<ul style="list-style-type: none"> <li>Lighting retrofit</li> <li>Reduce light levels in overlit areas</li> <li>Shut off electric heat at night</li> </ul>		9%	\$1,000
<b>Claude Galibois School</b>			
<ul style="list-style-type: none"> <li>Lighting retrofit</li> <li>Programmable thermostats</li> <li>Outside air controls / quantities</li> <li>Insulate boarded up windows</li> </ul>	<ul style="list-style-type: none"> <li>Insulate ductwork of not already done</li> </ul>	9%	\$900
<b>Golf Clubhouse</b>			
<ul style="list-style-type: none"> <li>Lighting retrofit</li> <li>Programmable thermostats</li> </ul>		9%	\$900
<b>Recycling Building</b>			
<ul style="list-style-type: none"> <li>Timeclock for snow melt</li> <li>Night setback of temperatures</li> </ul>		15%	\$500



## **Corporate Action 2:** Promote energy efficiency practices among staff

Promoting energy efficiency in the workplace is a combination of increasing education and awareness of energy conservation, and engaging staff to actively participate in conservation.

Possible methods for promoting conservation include:

1. Strategically place “smart meters” to track the power consumption of certain equipment.
2. Regularly report building energy usage to staff responsible for operating facilities.
3. Workshops about reducing energy use (e.g. “lunch and learns” with guest speakers). BC Hydro has Power Smart representatives that can engage staff and work with them on specific energy related concerns.
4. Notices about energy efficiency (e.g., quick facts sent via email, posted around the office, or printed on paystubs).
5. Incentives to encourage employees to generate and share ideas for action (e.g., idea of the month gets a prize).

## **Corporate Action 3:** Include energy efficiency in building maintenance

During routine maintenance of buildings there are opportunities to ensure ongoing energy efficiency performance in buildings. Include the following practices into existing maintenance routines:

1. Regularly check programming of thermostats to ensure they have not been altered. Ensure instructions for temporarily changing temperature are clearly posted.
2. Check and replace weather stripping on doors and windows as necessary.
3. Generate reports and monitor annual energy use by building to identify fluctuations. Investigate abnormal energy use to determine cause – operational or structural.

## 4.3 Actions for New Buildings

### **Corporate Action 4:** Develop an energy efficiency building policy

Construction of new buildings provides an opportunity to design for energy efficiency and to integrate technologies and materials that may result in more efficient building operation. Although there are no immediate plans for new facilities at the District, there is an opportunity to develop a policy that guides future construction, which may also be applicable to renovations or other major capital projects.

This policy can be incorporated into a broader green buildings framework such as LEED (Leadership in Energy and Environmental Design)<sup>4</sup>, GreenGlobes<sup>5</sup>, or the upcoming ASHRAE Sustainable Buildings Standard. Considerations include:

- Design: Passive solar, motion sensors for lighting, advanced controls for heating and energy systems, and energy efficient mechanical equipment. Ensure that the designs of buildings are suitable for the intended use with regards to size, layout and intended lifespan.
- Materials: Better insulation, light-coloured exterior materials that reflect heat, and energy efficient windows or window glazings.
- Decision Making Tools: Life cycle costing and triple bottom line methodologies<sup>6</sup>.
- Operation: Regular maintenance, regular audits and re-commissioning, operator training.

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<sup>4</sup> The Province of BC, through the BC Energy Plan, is considering a requirement that all new provincially owned or funded buildings (with over 600m<sup>2</sup> of non-residential floor space) must be LEED Gold certified.

<sup>5</sup> Green Globes website: <http://www.greenglobes.com/about.asp>

<sup>6</sup> Life Cycle Costing considers the total capital and operating costs over the lifetime of the purchase. For example, purchasing a more expensive pump that uses less energy than conventional pumps may save more money over its lifetime, or a shorter period.

*Triple Bottom Line (TBL)* methodologies consider how an initiative meets economic, environmental and social objectives in an integrated evaluation. For example, an energy efficient ventilation system may reduce energy consumption, reducing infrastructure costs and GHG emissions, while also improving indoor air quality and comfort.

## Corporate Action 5: Develop an alternative energy policy

All new construction projects should include a technical and financial evaluation of using alternative energy sources for space and hot water heating that accounts for both the capital and operational costs over an extended period. Alternative energy systems may require higher up-front capital costs, but reduce operating costs (including fuel costs) over the lifetime of the building. Evaluating these costs at the design stage of any major capital project is the most effective time to incorporate alternative energy systems.

Alternative energy sources with promise for the District of Tumbler Ridge include:

- Solar hot water: practical for facilities with high hot water demand (e.g. pool).
- Heat recovery from ice plants: may be practical for the ice rink.
- Geo-exchange: likely not practical for retrofits, but should be evaluated for any new buildings. Open loop groundwater is the least expensive, if available, but care is needed with re-injection.
- Micro Hydro on water supply: substantial elevation drop between the reservoir and the town (71 metres). There are three PRV stations used to reduce pressure caused by the elevation and flows are between 1,500 and 3,000m<sup>3</sup> per day. Although a small system, there may be potential for some electricity generation. Feasibility would depend on costs of small scale equipment and access to the power grid, and a pilot project may be a good first step. Electricity generation has been done on larger water systems (e.g. West Vancouver and Lake Country).
- District energy opportunities: may be potential in the long-term if future development is concentrated in the downtown where several existing facilities are already located (e.g. recreation centre, municipal hall, police, fire hall, hospital, high school, three hotels and a supermarket). Because the buildings already exist, it is likely most feasible to connect them with a high temperature system (either biomass or natural gas).
- Heat recovery from sewage treatment: may be an option if future municipal buildings are constructed near the treatment facility

#### 4.4 Actions for Fleet

Proportion of District of Tumbler Ridge corporate GHG emissions from fleet in 2008:	23%
2008 GHG emissions from fleet:	242 tonnes
Estimated reduction potential from implementing identified reduction measures:	10% - 15%

#### **Corporate Action 6:** Select fleet vehicles with “right-sizing” principles

Fleet energy efficiency can be improved by purchasing vehicles that are appropriate for the job being performed. Throughout the region, alternatives to standard vehicles are being evaluated. For example, “mini trucks” with 3-cylinder engines have been used successfully throughout the year and hybrid vehicles are being tested. Evaluate:

1. Anticipated usage of vehicles when purchasing them (e.g. engine size, vehicle weight, average load capacity, average passenger capacity, average operational terrain).
2. Life cycle considerations (e.g. residual costs / values of vehicle being replaced, capital costs, maintenance costs, fuel costs, resale values).

These considerations may be included in a formal policy regarding the purchase of vehicles, or be made a part of a general purchasing policy.

#### **Corporate Action 7:** Switch fuels or use additives to reduce emissions

Fleet GHG emissions may be lowered by switching to electric or low emission fuels, or improving fuel efficiencies.

1. Electric vehicles: electric or hybrid vehicles are tested by vehicle manufacturers for cold-weather climate and typically guarantee engines will start down to 30 degrees Celsius below zero. Hybrid vehicles are currently being used by some municipalities in the region.
2. Fuel additives and after-market equipment: these may improve fuel efficiency or reduce emissions. The testing and evaluation of items such as vortex exhaust and hydrogen generation systems has recently started in the region. Sharing experiences with these technologies between local governments can facilitate more informed decisions regarding their adoption.

## Corporate Action 8: Reduce idling

Idling is generally unnecessary for newer vehicles, and excessive idling can lead to increased wear and maintenance. Idling reduction may be promoted through outreach and signage; however, this approach is unlikely to result in significant uptake (or reduced emissions) unless formal anti-idling policies are adopted and enforced. Such a policy may read as follows:

All fleet vehicle operators will not idle for more than 30 seconds after starting the vehicle once the windows are clear, and should be encouraged to turn off the vehicle if stopped for more than 10 seconds unless the vehicle is:

- In traffic,
- In the course of performing a specific duty that requires the vehicle to be left running, or
- If doing so would compromise human safety or the mechanical integrity of the vehicle.

Installing LED traffic control and construction beacons on applicable vehicles also reduces the need to run engines in order to power the beacons. While LED lighting equipment may cost more initially, they generally last significantly longer and reduce fuel consumption.

## Corporate Action 9: Train staff on energy efficient driving techniques

Driver behaviour and fleet maintenance can have significant impacts on the amount of fuel used by a vehicle fleet. Staff education programs for driving techniques that maximize fuel efficiency can be arranged through institutions such as Northern Lights College. Simple measures such as checking tire pressure before trips and ensuring that vehicles are regularly maintained can save fuel and prolong the lifespan of fleet vehicles.

## 4.5 Actions for Infrastructure

Proportion of District of Tumbler Ridge corporate GHG emissions from infrastructure in 2008:	5%
2008 GHG emissions from infrastructure:	52 tonnes
Estimated reduction potential from implementing identified reduction measures:	Minimal

### **Corporate Action 10:** Reduce energy requirements for water and wastewater infrastructure

Approximately 21% of the District of Tumbler Ridge's energy consumption and 4% of GHG emissions result from water and wastewater infrastructure. The District can work to reduce this consumption by considering lifecycle energy costs during the purchase of new equipment. Equipment that may result in a reduction in energy consumption includes:

- Variable speed drives on pumps and fans – allows them to run at lower speeds when demand is low
- Soft starts and capacitors for motors – reduces power factor charges (note: may not have much impact on overall energy requirements, but reduces peak grid loads)
- Sewage lagoon aerator options – wind or solar-powered; surface aerators to reduce / replace sub-surface blower energy use

### **Corporate Action 11:** Convert exterior lighting to LED and/or solar power

Lighting constitutes 5% of the District of Tumbler Ridge's energy consumption and 1% of GHGs. Continue evaluating LED street lights and consider expanding initiatives to other lighting applications such as solar and LED options for lighting equipment for crosswalks and decorative lighting. Solar and LED lighting is potentially cost effective given the reduced replacement requirements and costs of otherwise installing power distribution wiring. Liaise with BC Hydro to ensure that any switches to lower power exterior lighting equipment is reflected accordingly in the billing.

## 4.6 Actions Demonstrating Leadership

### **Corporate Action 12:** Adopt an energy efficient purchasing policy

Adopting a green purchasing policy enables an organization to consistently consider environmental criteria in addition to financial and quality criteria when making a purchase. Organizations may define various types of criteria which may include: recycled content, energy ratings, product lifespan, presence of toxic materials, packaging, etc. There is now a BuySmart Network that has been developed by the Fraser Basin Council to provide support for organizations pursuing these efforts.

The purchasing policy may include:

- Guidelines for selecting appropriate fleet vehicles (“right-sizing”),
- Listing labelling programs to look for (e.g. Energy Star, Environmental Choice),
- Requiring recycled content in paper purchases,
- Setting vehicle standards for contractors,
- Requiring reporting of energy consumption and greenhouse gases for contracted services included in the Climate Action Charter (e.g. waste collection and disposal), and
- Including energy conservation targets in facility management contracts and possibly providing incentives or requirements for conservation.

## 4.7 Actions Requiring Regional Collaboration

### **Corporate Action 13:** Establish a regional energy manager

Consider establishing a staff position that works to identify, coordinate, and/or implement opportunities for energy conservation and emission reduction for all municipalities in the PRRD.

This role may be responsible for:

- Assisting with development of business cases for alternative energy projects,
- Distributing up-to-date case studies and information about energy efficient technologies to Public Works / Engineering / Operations staff throughout the region,
- Identifying funding opportunities for alternative energy projects,
- Organizing semi-annual meetings with select local government staff from each municipality and the Regional District to share experiences (successes and problems) with regard to energy efficiency programs and alternative energy projects in their communities, etc.

BC Hydro has recently announced up to 50% funding for energy coordinator positions through the Power Smart program. Although the District of Tumbler Ridge alone does not have large enough consumption to qualify, together at a regional level the PRRD municipalities may be eligible (total consumption needs to be 200,000 kWh per year).

### **Corporate Action 14:** Participate in regional building energy performance benchmarking

Regional building energy performance benchmarking provides building operators with a comparison of energy performance with other local government buildings of similar use. As a preliminary example, Figure 3 shows the energy consumption per square foot of building area for a selection of local government buildings in the Peace River region. This task could be undertaken by the regional energy manager, if such a position is established, who could work with local government operators to identify buildings that are not performing to expected levels.



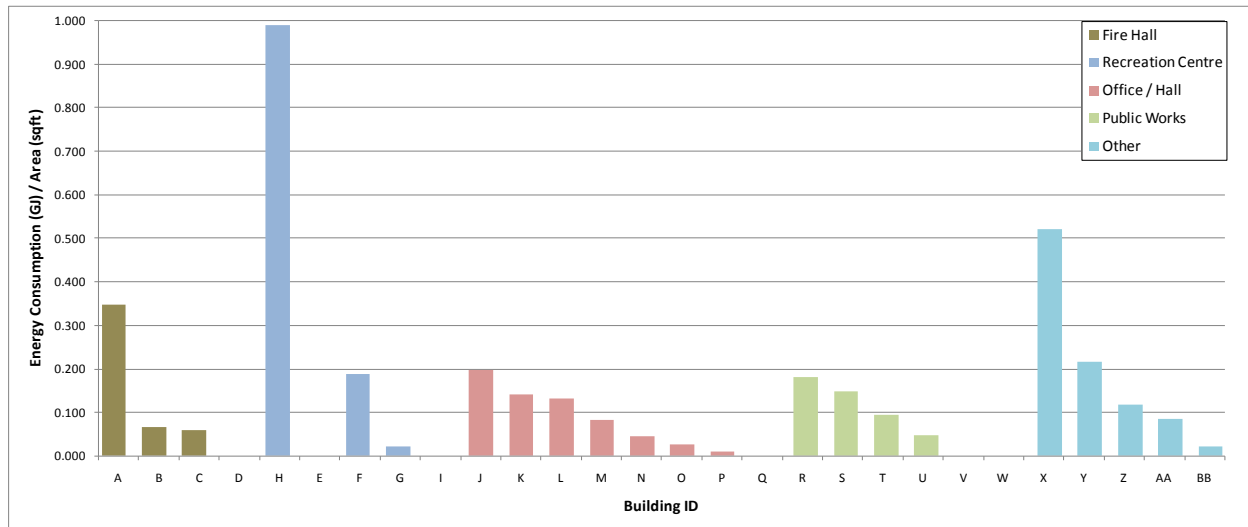


Figure 3. Example of a regional building energy performance benchmarking exercise

### Corporate Action 15: Collaborate regionally on purchasing and training

Building on the collaborative approach to energy planning undertaken with this project, municipalities in the PRRD can partner with the Regional District to make bulk purchases of energy efficient technologies that may be more expensive if purchased individually. This may apply to:

- Hybrid, electric, or more compact / efficient vehicles.
- Programmable thermostats, efficient lighting, LED lighting, etc.

This initiative may also be extended to coordinate training among local government staff to bring trainers to the region and reduce the need for staff to travel outside the region.

# 5 Implementation

It is recommended the District of Tumbler Ridge undertake a 5-year implementation plan to carry out the key reduction measures identified in this plan and attain a reduction of 10% from 2008 GHG emissions.

## 5.1 GHG Emission Reduction Target [PROPOSED]

*The District of Tumbler Ridge will reduce corporate greenhouse gas emissions by 10% by 2015.*

The majority of these GHG emission reductions are achievable through a comprehensive building retrofit program, as identified in the opportunities section. Some additional savings are achievable through right-sizing fleet vehicles, and using more efficient fuels (or electric vehicles) where possible.

## 5.2 Purchasing Carbon Offsets

In order to achieve carbon neutrality in 2012, the District will need to purchase carbon offsets for any greenhouse gas emissions remaining after undertaking reduction activities. Based on 2008 emission levels and an estimated offset cost of \$25 per tonne, the District will need to spend approximately \$26,250 (note: this may be reduced if reduction measures are effective in reducing emissions by the end of 2012).

The District and other local governments in the Peace River region would like to direct the purchase of these carbon offsets towards projects within area. Note that the District cannot apply carbon offset funds towards projects that result in the reduction of its own corporate emissions (for example, the funds cannot be used to retrofit municipal facilities with solar panels).

However, there are currently no qualifying carbon offset projects underway in the Peace River region. To facilitate the development of such projects, the District may wish to work together with all the local governments in the Peace River Regional District to pool resources and fund projects within the region.

### 5.3 Personnel Requirements

In order to carry out the recommended reduction measures identified in this plan, the District will need to establish energy management as part of staff roles – either by integrating into existing roles, or establishing a portion of a new role. The types of energy management tasks that will need to be carried out include:

- Contracting services to retrofit buildings
- Promoting energy efficiency among staff
- Developing policies (energy efficient building, using alternative energy, purchasing)
- Conducting lifecycle costing for efficient / alternative technologies
- Evaluating appropriate vehicles
- Coordinating staff training for efficient driving
- Communicating with regional partners

Several of these tasks could be undertaken by a regional energy manager, if such a position is established.

### 5.4 Funding

In order to carry out the recommended building retrofits in the ten assessed buildings, the District will need approximately \$415,000. Some funding may be available through programs, as outlined in Table 6.

Table 6: Sample funding programs to support the GHG Emission Reduction Plan

Program	Key Features
Climate Action Rebate Incentive Program (CARIP)	<p>This provincial initiative will reimburse communities that have signed on to the Climate Action Charter. Of the 1050 tonnes of Charter emissions, about 955 of these tonnes are eligible for the carbon tax rebate (NB emissions associated with electricity purchases do not pay carbon tax or receive the rebate, but must still be neutralized through offsets).</p> <p>As of July 1, the tax is \$15 per tonne (implying a potential rebate of \$14,500. By 2012, the tax will be \$30 per tonne and the rebate about \$29,000). As an example, Whistler has designated that its rebate will not go to general revenue, but will be put in a dedicated fund.</p>
BC Hydro Energy Coordinator Funding	BC Hydro has provided partial funding to some municipalities to fund an energy coordinator for the municipal operations.
BC Hydro Power Smart	Rebates and incentives to encourage energy efficiency in new construction and the installation of energy efficient products and appliances in existing facilities.
FCM Green Municipal Fund	Grants and loans available to support capital projects that reduce energy and GHG emissions. Competitive process with RFPs launched annually to fund projects related to brownfield redevelopment, energy, planning, transportation, waste and water.
Community Works Fund	This funding represents a portion of the transfer of Federal Gas Tax revenue under the New Deal for Cities and Communities. Local governments in British Columbia will receive this benefit through 2010, and projects that are eligible include capacity building projects and environmentally sustainable municipal infrastructure projects.

# 6 Conclusion

Through the implementation of the recommended actions outlined in this plan, the District of Tumbler Ridge is well position to reduce both the energy consumption and GHG emissions resulting from corporate operations over the next 5 years by approximately 10%. In addition to acting independently, there are tremendous opportunities to collaborate with other local governments in the Peace River region to find further efficiencies and explore opportunities for alternative energy. This collaboration could result in more substantial reductions in consumption and emissions over the longer-term.