This Carbon Neutral Plan will guide the District of 100 Mile House decision making process in terms of reducing corporate energy consumption and greenhouse gas emissions and in achieving carbon neutrality.

Corporate Carbon Neutral Plan

February 2013

District of 100 Mile House

Table of Contents

Table of Contents

Introduction

Background

The District of 100 Mile House is a signatory to the Climate Action Charter, and has committed to being carbon neutral in its own operations by 2012. In addition, the current Official Community Plan states that the District will strive to reduce community-wide greenhouse gas (GHG) emissions by 20% by 2020, using 2007 emission levels as the baseline.

What is Carbon Neutral? And Why is it Important?

Becoming 'carbon neutral' means reducing a local government's energy consumption and greenhouse gas emissions as much as possible, then purchasing offsets for any remaining emissions. The result will be a net zero carbon footprint for municipal operations.

Climate change and global warming are the variations in the Earth's global climate, which are experienced regionally and caused by human activities, rather than by historical, evolutionary, and natural processes. Striving to become carbon neutral will reduce the municipality's ecological footprint and slow the contribution to climate change. Shifting to more sustainable energy sources can also reduce reliance on fossil fuels, and thereby insulate the District from escalating energy costs associated with non-renewable energy sources. Energy conservation will also save the municipality money, as direct energy costs will decline.

So, in addition to meeting commitments under the Climate Action Charter, the municipality has other compelling reasons for developing this plan, including: maximizing cost savings, striving for increased sustainability now and into the future, reducing our ecological footprint, and providing a demonstrated leadership role in reducing community wide GHG emissions.

What is this Carbon Neutral Plan?

This Carbon Neutral Plan represents a principled approach to reducing emissions in order to achieve carbon neutrality, which in turn, will result in additional benefits to the municipality and to the wider community. It provides an overview of the actions needed to reduce energy use and GHG emissions, an assessment of the corporate GHG emission footprint, and reduction strategies in relation to set goals. This plan will focus only on strategies and actions aimed at reducing *corporate* GHG emissions. It is one of several steps the municipality anticipates toward reducing its carbon footprint and minimizing the environmental impacts of its operations. The Carbon Neutral Plan will guide the District in making decisions to reduce emissions and establish cost effective trade-offs between reducing emissions and purchasing offsets.

Methodology

The four steps to achieving carbon neutrality are:

1. Measurement / Inventory
2. Reduction Strategies / Plan
3. Balance / Plan for Offsets
4. Report Publicly

For the first step, the District of 100 Mile House established a new process to collect GHG emission data. The process is working effectively, and a relatively complete data set for the years 2009, 2010, and 2011 is available. The corporate energy profile reflects primarily 2010 data, as the drafting of this plan began before full 2011 data was known.

The Carbon Neutral Plan will focus on the second step. It will enable the District of 100 Mile House to assess its corporate GHG emission output, and identify strategies for energy reduction. It will also provide the impetus for a corporate discussion about carbon neutrality.

The preparation of this plan has included an analysis of the District's GHG emissions, and provides the municipality with the data required to monitor emissions and work toward significant carbon reductions. Decisions around how to balance carbon emissions for ongoing operations will be required to fulfill the third step. The fundamental question is whether to purchase carbon offsets or invest in local emission reduction projects or both, to achieve carbon neutrality.

Finally, it is recommended that Council monitor this plan annually, with a complete review every five years. To maintain efficiencies, the monitoring reports should coincide with other reporting already required (ie: CARIP reports), and these monitoring reports will be publicly available.

Corporate Inventory and Energy Profile

Overview

This corporate inventory and energy profile provides a summary of all corporate emissions in the District of 100 Mile House for the years 2008[1], 2009, 2010, and 2011. The provincial government requires that fuel / energy data be gathered on the following traditional municipal services:

- Administration and Governance
- Drinking, Storm and Waste Water
- Solid Waste Collection, Transportation and Diversion
- Roads and Traffic Operations
- Arts, Recreation and Cultural Services
- Fire Protection

The District undertook a corporate inventory during 2011, using a spreadsheet tool developed especially for the municipality. The tool allows for tracking and calculating emissions, with the input of relevant consumption data. First, an inventory of GHG emitting municipal buildings, fleet and services was assembled. These services were compiled into the following categories:

- Administrative and Governance Buildings
- Arts, Recreation and Cultural Buildings
- Water Utilities
- Fleet, Equipment and Machinery
- Emergency Vehicles
- Community Lighting

The energy consumption data was then collected and converted into a measure of greenhouse gas emissions, reported in tonnes of carbon dioxide equivalents [tCO_2e], utilizing the following conversion factors:

Energy-based emission factors		
Energy Source	Emissions Factor	Units
Electricity	0.000022	tonnes/kwh
Natural Gas	0.051	tonnes/gj
Gasoline	0.00241	tonnes/litre
Diesel	0.00276	tonnes/litre
Propane	0.00154	tonnes/litre

[1] incomplete data set

Assumptions and Limitations

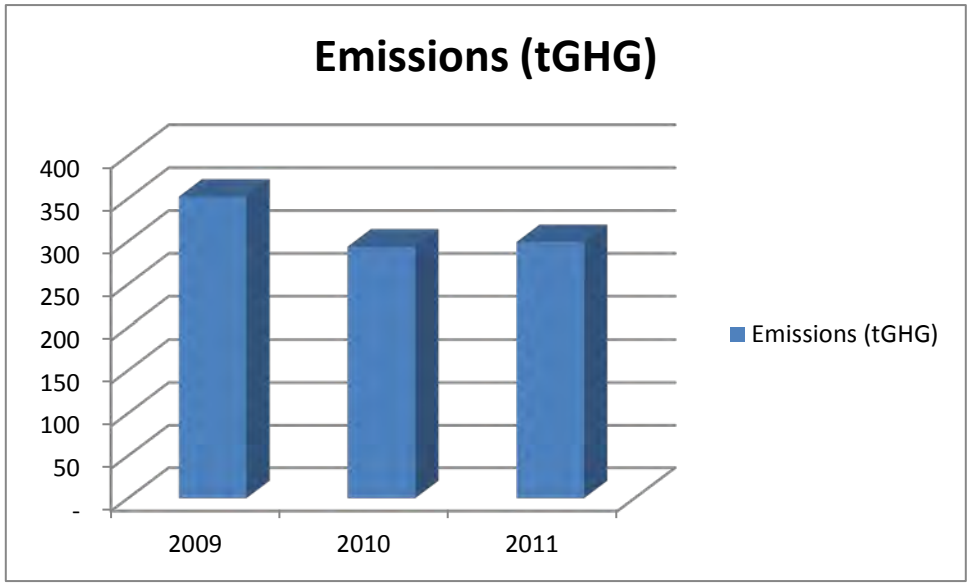
Energy usage data associated with solid waste collection, transportation and diversion has not historically been collected by the municipality, since it is a contracted service. Beginning in mid-2012, it will be tracked and reported. There may be other miscellaneous contracted services which are not captured by the accounting in this plan. As a result, the GHG emission inventory may be slightly underestimated in its present form. The District will work toward collection of data from contracted services over time, incorporating reporting requirements into future contracts as they are renegotiated.

To offset the small underestimation of contracted services, the District's share of GHG emissions is overestimated in the area of fire protection services which extend into the Cariboo Regional District area. It is important that services are not 'double counted.'

Corporate GHG Emissions Summary

The District of 100 Mile House, municipal operations, produced 352 tCO_2e in 2009, 293 tCO_2e in 2010, and 299 tCO_2e in 2011.

2009 – 2011 Total Emissions



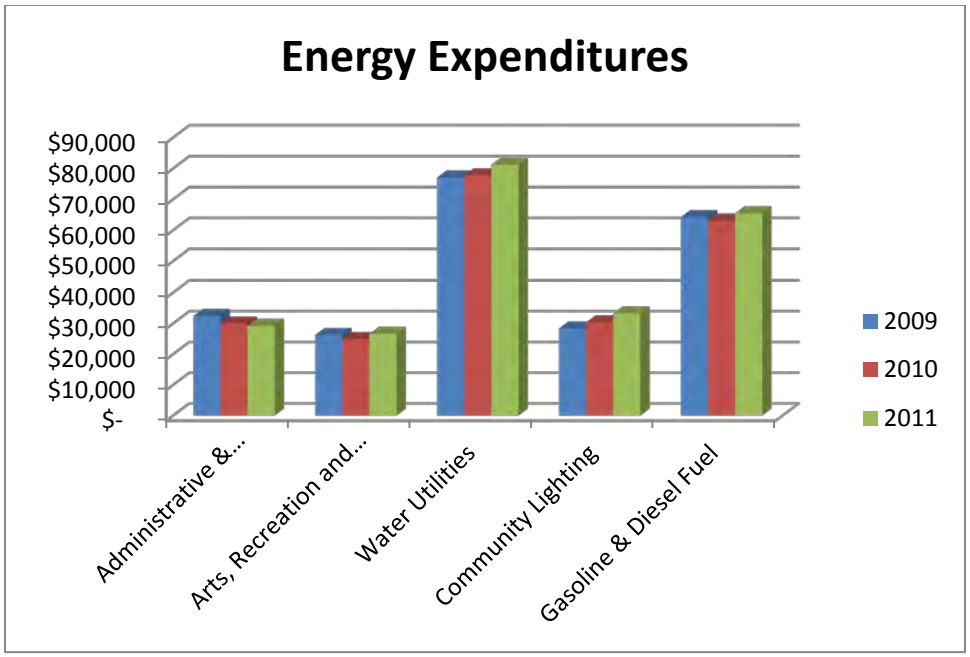
These emissions are the total known emissions produced by the delivery of traditional municipal services.

The District spends approximately $150,000 annually on electricity and natural gas. The total combined cost of gasoline and diesel fuel is approximately $65,000. Gasoline and diesel costs are not broken into separate cost categories. In total, the District spends approximately

$235,000 annually on energy. The highest energy cost was from water utilities, followed by gasoline and diesel fuel.

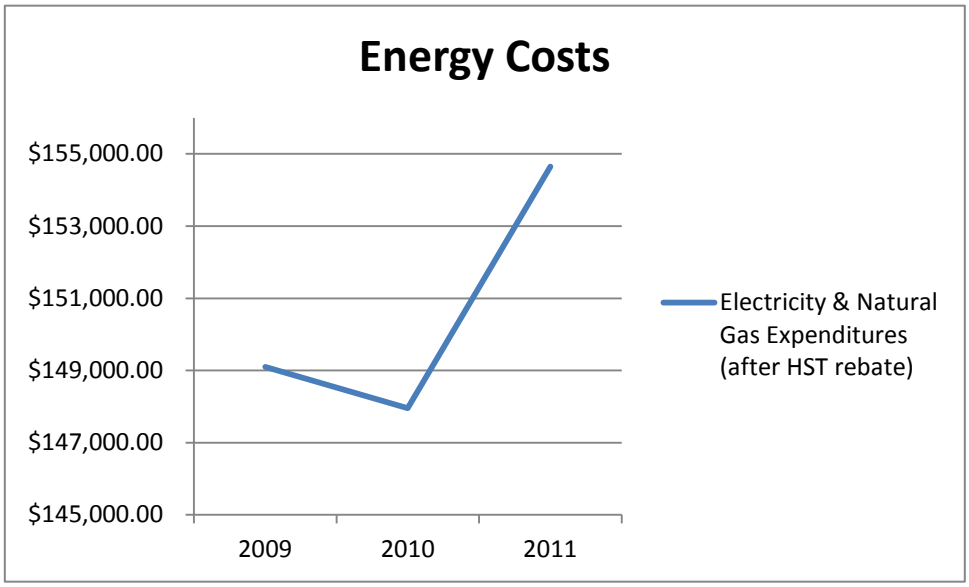
Energy Expenditures	2009	2010	2011
Administrative & Governance Buildings	$ 32,426	$ 29,913	$ 29,250
Arts, Recreation and Cultural Buildings	$ 26,266	$ 24,867	$ 26,579
Water Utilities	$ 77,056	$ 77,756	$ 81,196
Community Lighting	$ 28,359	$ 30,321	$ 33,216
Gasoline & Diesel Fuel	$ 64,223	$ 63,145	$ 65,450
Total Energy Expenditures	$ 228,328	$ 226,001	$ 235,691

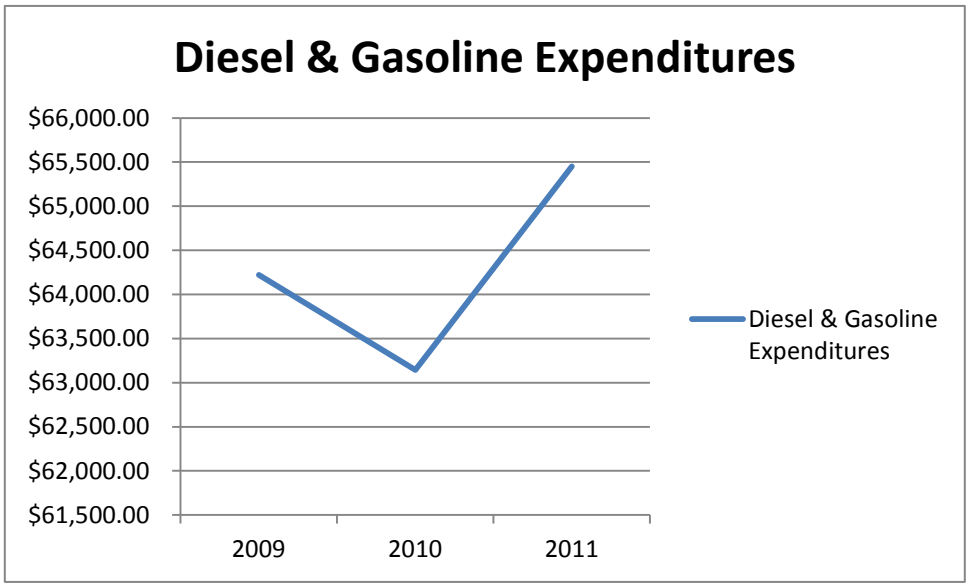
Energy Costs by Municipal Operation



For electricity and natural gas alone, this cost has increased sharply in recent years. Despite a small drop in energy costs for the District between 2009 and 2010, the costs rose more sharply between 2010 and 2011. Electricity and natural gas costs rose by $ 6,701 (4.53%) and gasoline and diesel costs were up by $2,305 (3.65%), totaling just over $9,000 increase in one year.

Energy Costs

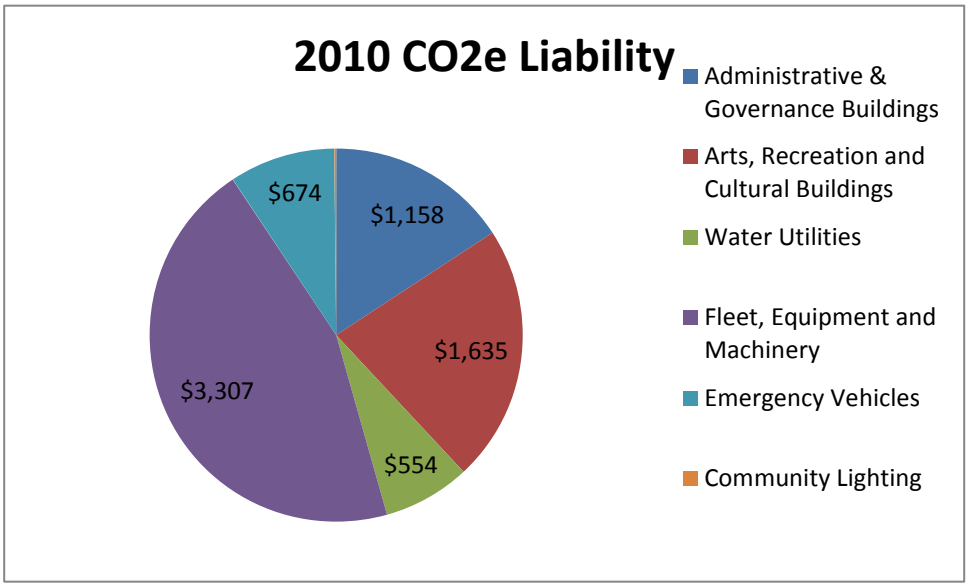




Based on the price for carbon offsets established by the Pacific Carbon Trust ($25 / tonne), the District can expect to pay approximately $7,400 per year from all energy sources. This represents the CO2e liability.

Corporate Total	2009	2010	2011
Total Electricity Consumption(KWh)	1,464,716.00	1,363,527.00	1,338,938.00
Total Natural Gas Consumption (GJ)	2,541.90	2,045.70	2,592.20
Emissions (tGHG)	351.90	293.56	298.86
CO2e liability ($)	$ 8,797.40	$ 7,338.92	$ 7,471.57
Total Energy Expenditures	$ 164,105.51	$ 162,856.30	$ 170,241.29
Total Energy Expenditures after HST Rebate	$ 149,096.24	$ 147,951.98	$ 154,652.98

2010 CO2e Liability by Municipal Operation

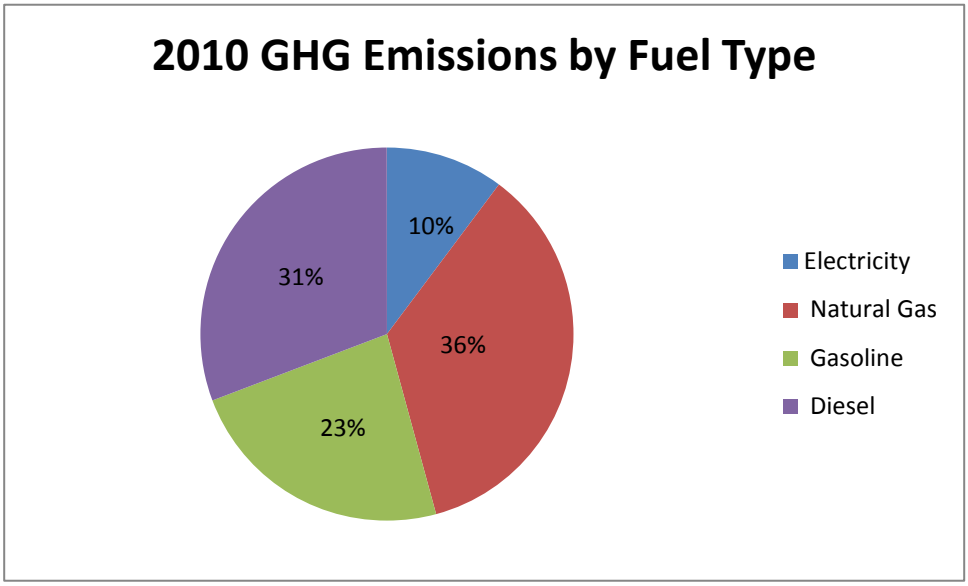


The District's main source of GHG emissions is from consumption of natural gas, which accounts for 36% of all emissions used in District operations, and is used exclusively for space heating. This is followed closely by diesel fuel at 31% and gasoline at 23%, while electricity accounts for only 10% of all emissions.

Although the highest GHG emissions are from natural gas consumption, the highest energy costs are from water utilities, which are actually low in terms of GHG emissions.

Category	2010	CO2e	% of total
Electricity (KWh)	1,363,527.00	30.00	10.22%
Natural Gas (GJ)	2,045.70	104.33	35.54%
Gasoline (L)	28,584.46	68.89	23.47%
Diesel (L)	32,731.86	90.34	30.77%
		293.55	**100%**

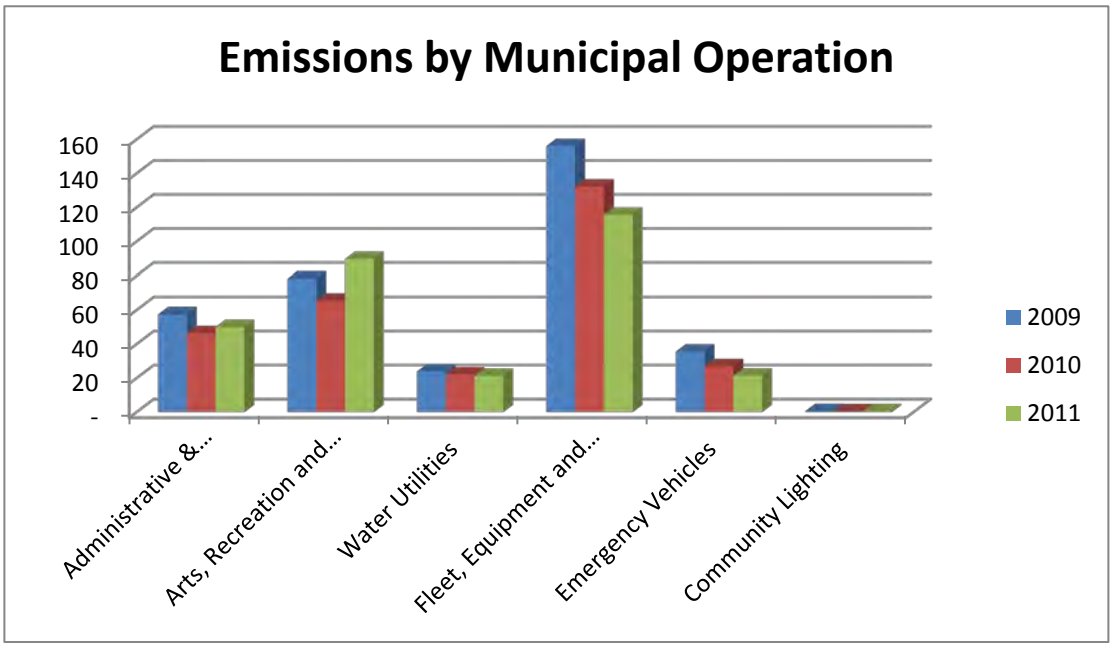
2010 Emissions by Fuel Source



In 2010, the largest overall source of District emissions came from the municipal vehicle fleet, followed by Arts & Recreation buildings, then Administration buildings.

Emissions (tGHG)	2009	2010	2011
Administrative & Governance Buildings	57.49	46.33	50.09
Arts, Recreation and Cultural Buildings	78.35	65.39	89.73
Water Utilities	23.89	22.15	21.37
Fleet, Equipment and Machinery	156.07	132.29	115.72
Emergency Vehicles	35.56	26.94	21.48
Community Lighting	0.53	0.46	0.46
Corporate Total	351.90	293.56	298.86

2009 – 2011 Emissions by Municipal Operation

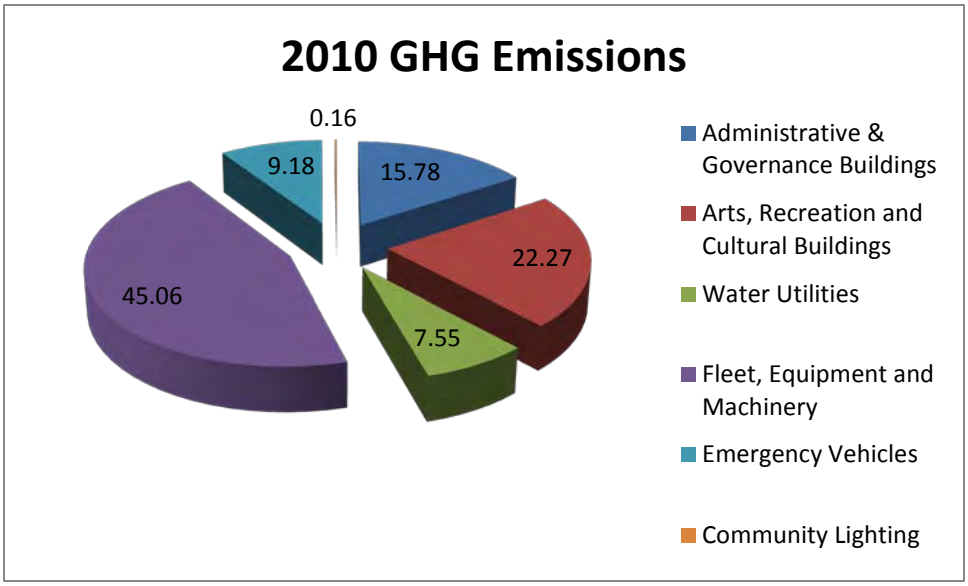


For 2010, the Community Services fleet represents 45% of all emissions from municipal operations, followed by 22% for Arts, Recreation and Cultural Buildings. The lowest emitters by municipal operation are community lighting at less than 1% of total emissions, and water utilities at 7.55%.

2010 Percent of Total Emissions

Municipal Operation	Emissions (tGHG) 2010	% of total GHG Emissions 2010
Administrative & Governance Buildings	46.33	15.78
Arts, Recreation and Cultural Buildings	65.39	22.27
Water Utilities	22.15	7.55
Fleet, Equipment and Machinery	132.29	45.06
Emergency Vehicles	26.94	9.18
Community Lighting	0.46	0.16
Corporate Total	293.56	100

2010 GHG Emissions by Municipal Operation



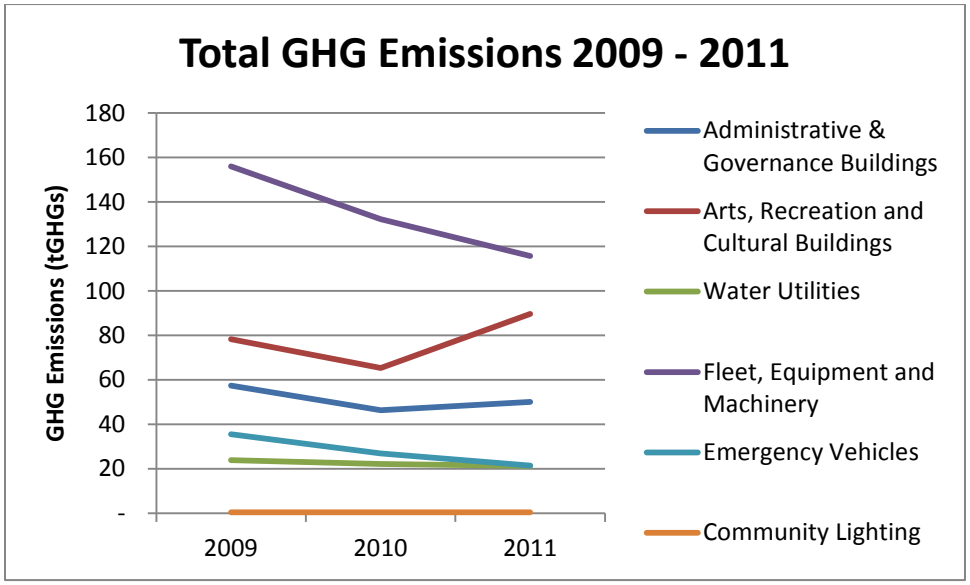
The most significant individual contributors to the total GHG emissions for 2011 are: the Lodge / Martin Exeter Hall (87 tGHGs), the Public Works / Fire Hall building (38 tGHGs), and the 2004 John Deere backhoe (14 tGHGs). These 3 sources represent nearly half of all GHG emissions from municipal operations.

While there is not yet enough data to identify trends in GHG emissions from District of 100 Mile House municipal operations, changes from year to year can be observed. Between 2009 and 2010, total GHG emissions from municipal operations fell by over 16%, contrasted with the 2010 – 2011 period where total GHG emissions rose by nearly 2%. Community lighting and water utilities remained relatively constant between 2010 and 2011, Community Services and emergency vehicles and equipment dropped by 33% in GHG emissions, while GHG emissions from municipal buildings increased by over 45%. The largest increase came from Arts, Recreation and Cultural buildings, which was up by more than 37% over the previous year.

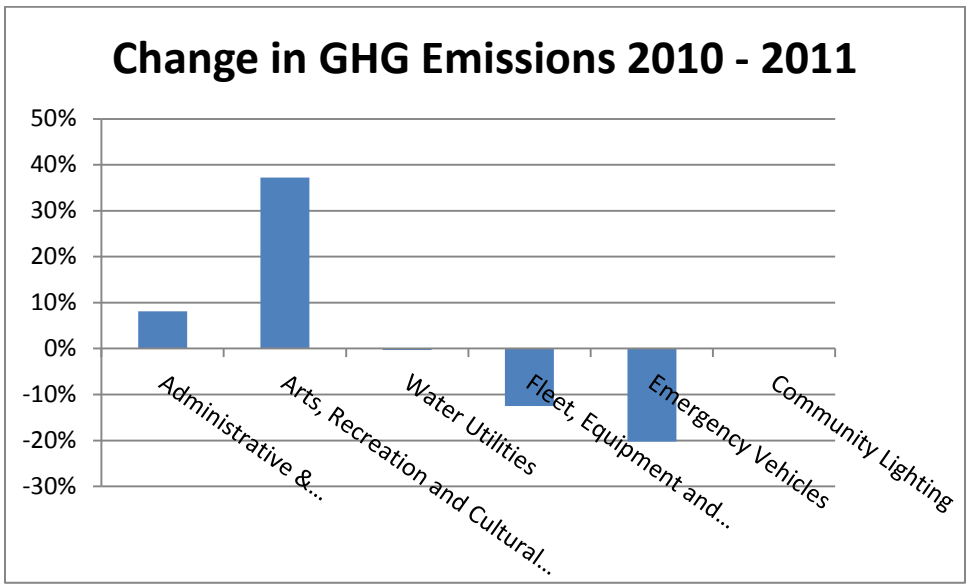
Change in GHG Emissions by Municipal Operation

Emissions (tGHG)	2009	2010	2011	Change 2010-2011
Administrative & Governance Buildings	57.49	46.33	50.09	8%
Arts, Recreation and Cultural Buildings	78.35	65.39	89.73	37%
Water Utilities	23.89	22.15	21.37	0%
Fleet, Equipment and Machinery	156.07	132.29	115.72	-13%
Emergency Vehicles	35.56	26.94	21.48	-20%
Community Lighting	0.53	0.46	0.46	0%

2009 – 2011 Change in GHG Emissions



2010 – 2011 Change in GHG Emissions

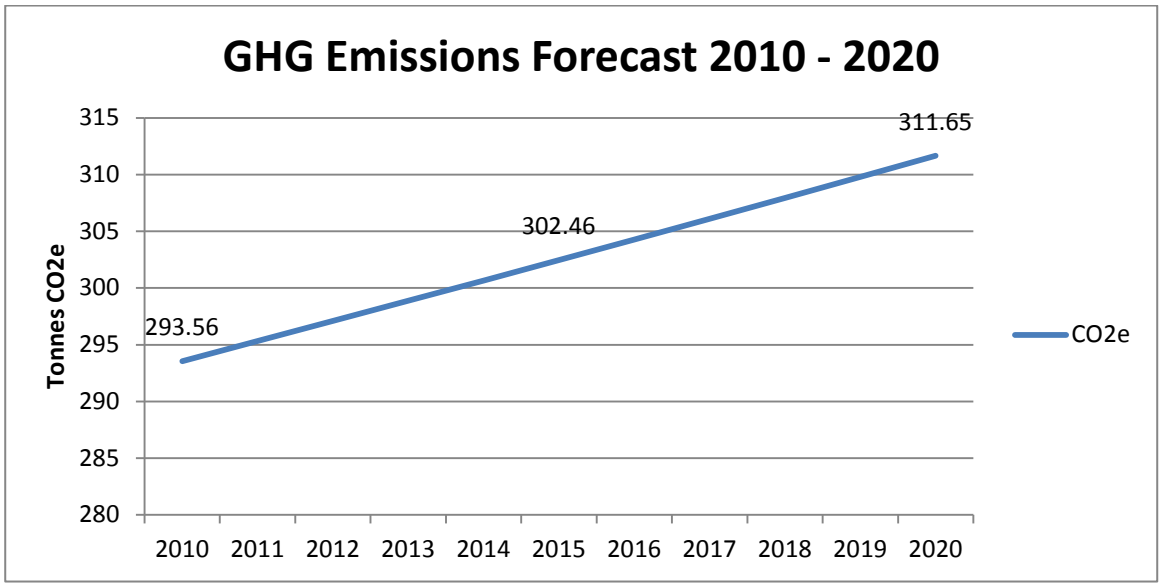


Business as Usual Forecast

Forecasting emissions from municipal operations is a difficult task in a small municipality because the acquisition or disposal of assets like new buildings, facilities, equipment, and fleet vehicles can significantly affect the inventory profile.

Despite this complexity, a simple business as usual forecast can estimate the impact of doing nothing. Assuming that a growing population will require expansion of municipal services at approximately the same rate, and estimating a population growth rate of 0.6 %, as projected by BC Stats, consumption and emissions can be expected to rise 18.09 tCO2e, to 311.65 tCO2e by 2020. This represents a total increase in GHGs of 6.2%.

Business as Usual Emissions

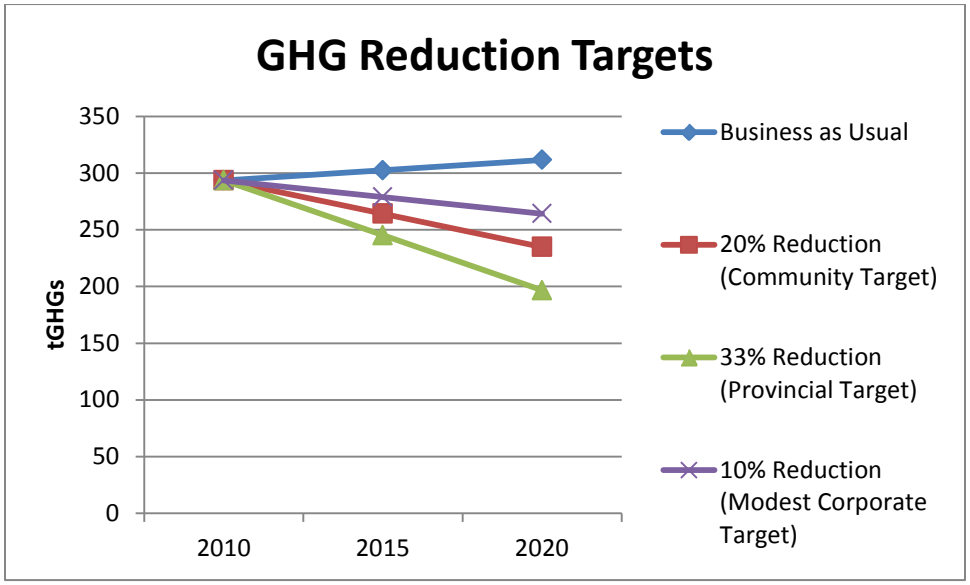


Rising emissions to meet population growth without measurable reductions to emissions, will cost the District money. These costs include increased consumption costs, increased energy costs, and increased carbon tax costs.

Reduction Targets

A good approach for reducing consumption and emissions may be to start with setting reduction targets and timelines for achieving them. A simple comparison of various reduction targets may be helpful in visualizing potential GHG reductions. Those depicted below include the community wide target as determined within the Official Community Plan (20%), the provincial target (33%), and a modest 10% target for comparison.

Options for Reduction Targets



Targets may be pragmatic or visionary, overarching or specific to each municipal operation, short term or longer term, and each target would have an associated cost saving in terms of CO2e liability. Finally, in addition to setting GHG reduction targets, it may also be helpful to establish a consumption reduction target as well, to ensure direct savings in energy costs are also realized.

Corporate Plan

Guiding Principals

Guiding principles have been established for the District to consider, evaluate and rank various reduction opportunities as they arise or are planned. The following principles will guide decision making:

1. *Current levels of service to the public will be maintained.* A reduction in services would be the quickest and easiest way for the District to reduce emissions. However, the municipality will not support reduction efforts that compromise the level or quality of service provided to its citizens.

2. *The District will balance offset purchases and operational emissions reductions.* Purchasing offsets will certainly be required to achieve carbon neutrality. Still, the District will actively pursue the reduction of operational emissions rather than rely solely on purchasing offsets.
3. *The District will support cost effective options.* Options which maximize reduction per dollar spent will be given higher priority. In addition, options having a shorter payback cycle may be preferred.

The District will use these three simple principals to evaluate and make decisions about reduction options that will best meet the municipality's carbon reduction objectives.

Strategies

Strategies for corporate emission reduction are required. The following are the District's initial reduction strategies, developed with the intention of being reviewed and adjusted over time to best reflect the corporate GHG reduction plan:

1. Communicate the District's commitment to carbon neutrality, by providing a clear message to change the status quo approach;
2. Establish a 'green team' to champion carbon neutrality, then encourage and support the team's work;
3. Allocate human resources and funds to implement energy and operational reduction strategies; and
4. Review and monitor the reduction strategies against the goal of carbon neutrality, and further refine them over time and as new strategies become more obvious.

These strategies are envisioned as initial, short term strategies to create an actionable approach for making early progress toward carbon neutrality. The strategies are designed to be flexible enough to be workable, but firm enough to yield direct results. It will be important for

the District to achieve a few initial successes using these strategies in the short term, to help focus the development, in time, of longer term strategies for corporate emission reductions.

Opportunities

There are many emission reduction opportunities possible, ranging widely from making amendments to bylaws, policies and procedures, establishing partnerships with other agencies and organizations, focusing opportunities on sectors, implementing reductions on a range of scales, and many more options. The list that follows serves as a starting point to identify some of the potential reduction opportunities that may be considered.

- Revisit existing District studies, like the Community Energy & Emissions Study prepared in 2008, which contains recommendations for both community wide and corporate energy emission reductions;
- Utilize existing resources, like utility bill inserts, to communicate Council's commitment to lowering corporate emissions;
- Develop Council policies that establish the District's commitment to reducing corporate carbon emissions; policies might include a 'green' corporate purchasing policy, low emissions travel policy;
- Consider life cycle energy implications in facility development and vehicle purchasing decisions;
- Adopt an anti-idling bylaw or policy , and apply it to the District's fleet;
- Undertake a staff awareness initiative;
- Pursue training opportunities to better inform staff of energy efficient practices;
- Actively search for procedural efficiencies;
- Reduce business travel;
- Fleet management strategies and improvement of municipal fleet;
- Encourage and acknowledge staff initiatives where employee efforts show leadership and help reduce municipal GHG emissions;
- Engage experts to assist the District in making the best investments for our local situation;
- Conduct an energy audit for all municipal buildings;
- Lead by example;
- Engage in pilot projects and monitor results (ie: solar hot water system);
- Carry out building retrofits;
- Explore partnership opportunities:
    - Partner with other area municipalities or CRD to hire an Energy Manager, who could work with the District to help find further reductions and/or local projects for offset investment;

    - Partner with key stakeholders, like BC Hydro or Fortis BC, to identify further energy use reductions;
    - Partner with Fraser Basin Council or other organization to implement an Integrated Community Sustainability Plan;
    - Engage consulting firms to assist the District with identifying, accrediting and monitoring larger scale projects;
- Explore larger scale project ideas, while making small changes a matter of course and an expectation;
- Set short term and long term targets to better drive change, maintain momentum, and measure progress; and
- Celebrate achievements from early projects, however small or large.

Challenges

While there are ample opportunities available to the District to implement this plan, some challenges have also been identified.

As a small municipality, with a relatively small level of corporate operations, we will be challenged to make changes that will have an impact on GHG emissions without compromising levels of service. Likewise, it will be difficult to garner the fiscal resources needed to achieve reductions on a scale that will enable us to achieve carbon neutrality.

Another cost related challenge includes balancing cost savings with emission reductions. For instance, the data shows that emissions from electricity consumption are already low, and it would be difficult to reduce them further by switching to an alternative energy source. Yet, reducing electricity consumption could yield potentially high cost savings to the municipality.

Mitigation of carbon emissions will require significant staff and planning resources. Successful implementation of the carbon neutral plan will also be dependent on a unified and comprehensive approach, across all departments and operational spheres.

Perhaps most importantly, the municipality's success in reducing GHG emissions will require a strong sense of commitment to the plan, particularly from Council and senior staff.

Recommendations

An assessment of the opportunities to reduce GHG emissions was conducted, and the following early opportunities were identified to affect quick, short term success:

- Set energy consumption and GHG emission reduction targets;
- Establish municipal Green Team to launch in-house sustainability initiative;
- Conduct a policy review – idling policy, sustainable purchasing policy;

- Undertake a staff awareness initiative, including staff engagement program, education, and suggestions;
- Implement departmental / operational reporting structure to track successes;
- Begin with demonstration scale projects – solar hot water in municipal hall washrooms or Visitor Centre;
- Pursue a full municipal building energy audit;
- Consider building retrofits;
- Pursue funding opportunities that align with the plan;
- Prioritize the development of an Integrated Community Sustainability Plan (ICSP); and
- Identify short, medium and long term reduction targets.

These recommendations largely consist of 'low hanging fruit.' A significant question will be whether these changes will be sufficient to affect real change in consumption and emissions. Further review of corporate energy consumption and enhancing the strategies for emission reduction will be required. In addition, developing annual implementation plans will provide guidance to work toward further reductions, and provide a framework for monitoring success.

Financial Impacts

There will be energy cost savings associated with reducing emissions. However, commitment to reducing carbon emissions will have financial impacts. There is even a cost to doing nothing, $7,500 in carbon offset purchases.

Without question, budget allocations will be required to move this plan forward. Some municipalities are setting aside reserve funds to assist them in balancing emissions. These reserve funds may then be applied to projects in any way the municipality choses. For example, reserves could be applied to: capital expenditures to increase energy efficiency, reduce emissions, or improve sustainability; principal and interest costs related to capital expenditures; plans and programs that promote, study, or implement reduction strategies for the municipality; or others.

Purchasing Offsets vs Investing in Projects

After reducing emissions as much as possible, the District of 100 Mile House will need to consider options to balance or offset remaining emissions. Understanding the ways that the District can invest in offset projects to meet its carbon neutral commitment is key to making the right choice early on. Further exploration and understanding of offsets is required.

Conclusion

As a small municipality, reductions should be pursued across all operational areas. The District will also need to closely monitor the corporate emissions inventory and work diligently towards energy conservation and carbon neutrality. Implementing strategies to reduce the corporate carbon footprint will include making provisions for carbon offset purchases or investments.

As a signatory to the BC Climate Action Charter, the District of 100 Mile House made a commitment to become carbon neutral in respect to municipal operations by 2012. This Carbon Neutral Plan will assist in focusing action to achieve carbon neutrality. But, most importantly, municipal leadership is key to demonstrating Council's commitment to achieve carbon neutrality, and to engaging the wider community to do the same.