



THE CORPORATION OF THE VILLAGE OF CUMBERLAND

CORPORATE CLIMATE ACTION PLAN

EXECUTIVE SUMMARY

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EXECUTIVE SUMMARY

Concerns over the impacts of climate change led to the development of the BC Climate Action Charter and the Green Communities Carbon Neutral Framework. As a Charter signatory, the Village of Cumberland has committed to achieving operational carbon neutrality – a goal that requires the Village to measure its GHG emissions, reduce those emissions to the extent possible and purchase carbon offsets to ‘neutralize’ the remaining emissions.

The purpose of the Corporate Climate Action Plan is to explore opportunities to reduce GHG emissions associated with Village operations, make recommendations for action and quantify the likely costs and benefits of the most significant actions.

The 78 recommendations in the full report are the result of a systematic analysis of energy consumption involving the development and analysis of a corporate energy inventory, walk-round and facilities site assessment, staff interviews and ideas development sessions, research on best practices and opportunities, and the involvement of electrical and HVAC suppliers.

This report fits into the context of Cumberland’s Climate Action Roadmap as shown below.

Climate Action Roadmap



MAJOR AREAS FOR ACTION

The Corporate Energy and GHG Emission Inventory data makes it clear that natural gas consumed by buildings and transportation fuel together account for over 85% of emissions and 60% of costs. As such, these two corporate GHG emission sources were targeted for the reduction opportunity investigation. Electricity is a significant cost but, because it is primarily generated by renewable hydroelectric power, it is only a small proportion of carbon emissions.

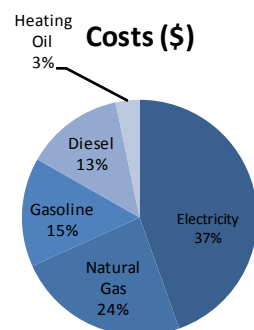
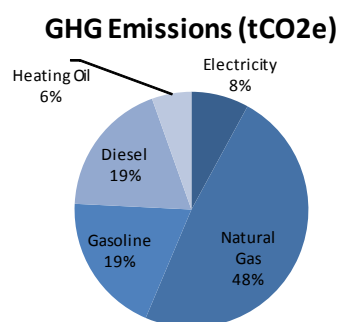
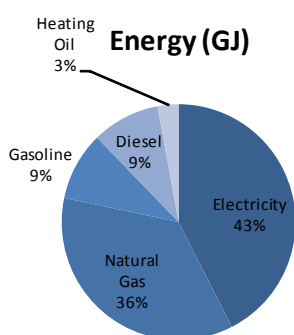
The central goal of this report is to explore opportunities for the Village to reduce carbon emissions; electrical savings are a secondary objective.

Corporate Energy and GHG Emission Inventory - 2011 - Operations Area

| | Energy GJ | Emissions tCO ₂ e | Cost |
|--------------------|--------------|------------------------------|-------------------|
| Buildings | 3,130 | 113 | \$ 61,323 |
| Fleet | 991 | 74 | \$ 35,749 |
| Infrastructure | 1,142 | 8 | \$ 28,554 |
| Grand Total | 5,263 | 195 | \$ 125,626 |

Corporate Energy and GHG Emission Inventory - 2011 - Fuel Type

| | Consumption | Energy GJ | Emissions tCO ₂ e | Cost | Cost / GJ |
|--------------------|-------------|--------------|------------------------------|-------------------|-----------|
| Electricity | kWh | 621,694 | 2,238 | \$ 55,952 | \$ 25.00 |
| Natural Gas | GJ | 1,884 | 1,884 | \$ 29,777 | \$ 15.81 |
| Gasoline | litres | 15,558 | 498 | \$ 18,825 | \$ 37.81 |
| Diesel | litres | 13,539 | 493 | \$ 16,924 | \$ 34.34 |
| Heating Oil | litres | 3,771 | 11 | \$ 4,148 | \$ 27.50 |
| Grand Total | | 5,263 | 195 | \$ 125,626 | |



THE CUMBERLAND RECREATION INSTITUTE (CRI)

The size and age of the CRI means that the building consumes almost half of the energy attributable to buildings in the Corporate Inventory. The majority of this consumption is the use of natural gas to heat the gymnasium. The furnace is antiquated and inefficient, and the space is heated day and night to a constant and relatively high temperature. The envelope of the building is old and poorly insulated, but a few simple improvements can certainly help.

We recommend immediately blocking the attic hatchway and high wall vents to limit the escape of heat. At the same time, install a programmable thermostat and enforce lower daytime set points and low overnight temperatures with limited override. Replacing the furnace should be high on the list of capital improvements.

Elsewhere in the CRI, the gymnasium washrooms are infrequently used yet have constant lighting, heating and ventilation fans drawing the heat out of the building. Occupancy sensors here and elsewhere throughout the CRI are a low cost solution with rapid payback. The squash courts also have high ventilation and heating loads despite the occasional nature of bookings. We recommend a set of solutions to limit energy consumption in this area.

The fitness room is mainly heated by baseboard heating, and we have often seen the windows open for fresh air whilst the heaters try to keep the space warm. In the summer, the space can be unbearably warm and stuffy. Window film, a heat pump system for heating and cooling and a heat recovery ventilator for air circulation would dramatically improve this area for both energy efficiency and comfort.

OTHER BUILDINGS

Most buildings would benefit significantly from simple changes, mainly the use of programmable thermostats with low overnight settings and occupancy sensors for well-lit but infrequently used spaces. In addition, the use of window film to limit heat loss and solar gain, and simple weather-stripping or upgrades of poorly fitting doors would be valuable steps to improving energy efficiency and comfort.

Any incandescent lights used for more than a few hours a day should be changed to LED bulbs where paybacks are less than two years and lamp lifetime is proven to be up to a decade.

The Village park requires action to stem consumption at the washrooms, where the oil-fired boiler system produces over 5% of the Village's GHG emissions and cost nearly \$2,000 in 2011 (and preliminary data shows \$3,000 in 2012). In addition, the Horseshoe Clubhouse used \$1,900 of electricity in 2011, almost as much as the Firehall.

VEHICLE FLEET

Compared to some vehicle fleets, it is more of a challenge to find 'big win' fuel reduction projects in Cumberland. But this challenge is not uncommon when it comes to fuel-efficient fleet management, where behaviour change is central and the focus is on many small changes adding up over the years.

Driver behaviour can make a very large difference in fuel consumption. On first impressions, this should be easy to change through education, but behaviour change is notoriously difficult to achieve in practice. The two main areas for action concern idling, where the implementation of a policy to reduce idling could save considerable fuel and maintenance costs, and driving style, where policy and education can have dramatic effects by changing the speed drivers choose and the acceleration they use to get to that speed. Comparable fleets have seen improvements of up to 25% through similar policies; in Cumberland, where staff are already attuned to energy issues, we see 10% as easily achievable.

Technology could help, mainly by enabling idle time shut down features already present on most modern commercial duty vehicles, and by providing trip computers with real-time feedback on fuel efficiency. However, the main savings are achieved by using a vehicle differently rather than adding gadgets.

Vehicle selection for fleet replacements should be increasingly driven by energy efficiency and the selection of the smallest vehicle suitable for the tasks required. Fuel costs have risen steadily and significantly over the past few years and there is little reason to expect prices to fall much in the future. In ten years' time, purchasing decisions could leave the Village with an efficient, effective fleet or a collection of fuel hungry vehicles that are too expensive to run.

ACHIEVABLE BENEFITS

We have estimated energy cost and carbon savings for the major reduction and capital investment opportunities, and we also included estimates where they were straightforward and based upon reliable assumptions. The other recommendations will also create savings, some of them substantial, although it is beyond the scope of this report to investigate these savings in detail; some are impossible to quantify in advance.

For the recommendations where we have quantified the costs and benefits, we have identified approximately 64 tCO₂ reduction, which is almost a third of the total emissions inventory. This also equates to over \$21,000 of annual energy savings.

The cost estimates to achieve these are in the order of \$85,000 capital investment, although this is unevenly distributed and some recommendations give spectacular returns on investment. In particular, fitting and using programmable thermostats to reduce night-time temperatures will pay back in weeks. Occupancy sensors to control lighting and washroom fans are also a rapid payback, especially in infrequent use areas like the CRI gym washrooms and kitchen.

Whilst we do not make estimates for all recommendations, it would not be unreasonable to expect that if everything was done, and done well, carbon emissions would be reduced by at least half with commensurate energy savings of well over \$30,000 a year, or 25% of annual energy costs.

CARBON NEUTRALITY AND THE CLIMATE ACTION CHARTER

In the full report, we detail the benefits of being a signatory to the Climate Action Charter and the consequences of withdrawing from that commitment. We outline the options and process involved in achieving Carbon Neutrality and consider the approaches taken by other local governments. We suggest the Village has three options with regard to fulfilling its commitments under the Climate Action Charter:

1. Decide not to become carbon neutral and thus not invest in carbon offsets. Pull out of the Charter and forgo CARIP grant.
2. Decide to fulfill Charter commitments and invest in local carbon reduction projects that meet defined Provincial criteria, and/or
3. Buy quality market-based carbon offsets and achieve carbon neutral status.

Since the CARIP grant almost equates the carbon offset liability amount, we strongly advise against option 1. From a public policy perspective, backing out of the Charter would garner significant negative press and send the wrong message to the community about the importance of taking action on the environment and climate change.

Further, participation in the Charter offers a number of benefits as it ultimately provides a framework and incentive to reduce operational energy costs and leverages action across the province. Ultimately, the Charter can be credited with the development of this Plan which has revealed significant operational cost saving opportunities. Continued participation in the Charter will have the added benefit of increasing the Village's competitive edge when it comes to grant applications, particularly the federal-UBCM Gas Tax grants and provincial infrastructure grants.

Given rapid developments in the carbon offset market and the local government Carbon Neutral Framework, we suggest that the Village proceed with its commitment to become carbon neutral, and budget approximately \$4,000 to procure offsets in early 2014 to offset expected 2013 emissions.

Most communities would like to see their carbon offset investments stay in their local area and many are developing Provincially supported or alternate validated offset projects. We recommend that the Village pursue a combination of local projects and quality market-based carbon offsets. A preliminary assessment of opportunities for Cumberland include obtaining carbon credits for household organic waste composting, aggregated community energy efficient building retrofits and an emerging forest protection protocol. These could substantially reduce or eliminate the need to purchase offsets.

While a number of BC communities will be achieving their carbon neutral goals for 2012, the majority are targeting 2013 as their first operational carbon neutral year. With the completion of this report, the Village is well on its way to achieving its carbon neutral goals for 2013 – an accomplishment the Village should be proud of.