Corporate Climate Change Action Plan 2024

Regional District of Fraser-Fort George

August 2024

Community Energy Association

Table of Contents

Acknowledgements

The Corporate Climate Change Action Plan was developed by the Regional District of Fraser-Fort George in collaboration with the Community Energy Association.

The RDFFG would like to acknowledge the contributions of the Regional District staff that were involved in the development of this plan., along with the Regional Directors that sit on the Climate Action and Adaptation Standing Committee.

Executive Summary

It has been 15 years since the Regional District of Fraser – Fort George (RDFFG) undertook a review of its energy consumption and greenhouse gas (GHG) emissions. This Corporate Climate Change Action Plan is an update of the RDFFG's 2009 plan and fulfils a commitment made by the RDFFG when it signed the BC Climate Action Charter in 2007 to work towards being carbon-neutral in its own operations.

This update is timely. Following the pine beetle infestation, multiple years of wildfires, and now a drought through much of BC that has reduced river levels in the region to unprecedented levels, climate change is no longer a "future" topic. The Government of BC has responded with a policy context that includes the CleanBC Roadmap to 2030 and a Climate Preparedness and Adaptation Strategy. In 2022, the Province also established the Local Government Climate Action Program (LGCAP), which provides funding to local governments and Modern Treaty Nations in support of local climate action that reduces GHGs and fosters local resiliency. There are also circumstances in Prince George that have changed in recent years and provide unique opportunities for RDFFG actions that could position the RD for climate leadership.

The RDFFG's energy and emissions inventory included in this plan follows LGCAP standards to ensure that the information in this plan is consistent with the annual reports that the RDFFG submits to the Government of BC as a requirement for receiving LGCAP funding support.

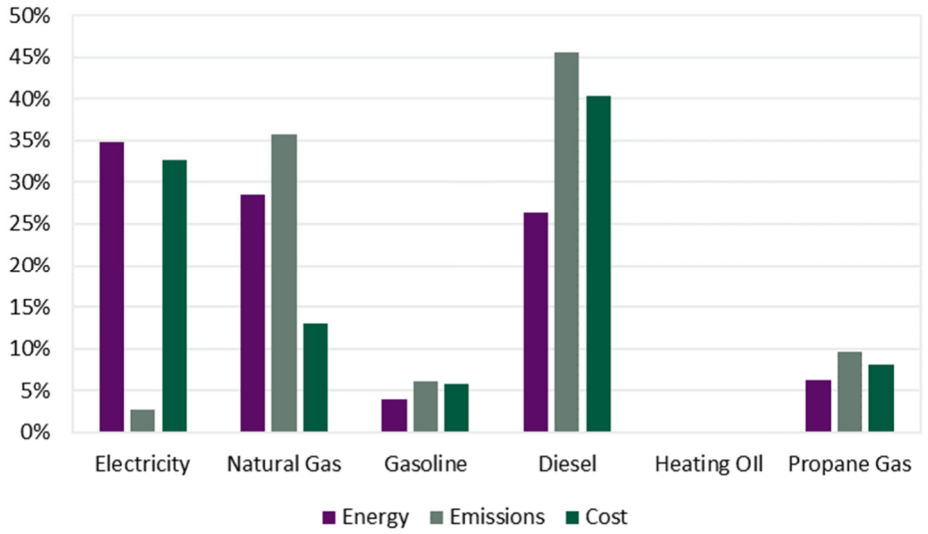
RDFFG's 2022 GHG Emissions	
RDFFG Operations	890 tCO_2e
Contracted Services	441 tCO_2e
Total emissions	1,331 tCO_2e

Current Energy Consumption, Energy-Related Expenditures, and GHG Emissions

In 2022, The RDFFG consumed 33,553 gigajoules (GJ) of energy at a total cost of $1.17 million. Greenhouse gas emissions totalled 1,331 tonnes of carbon dioxide equivalents (tCO2e). Just under 70% of the total emissions were associated with RDFFG's own operations and over 30% were related to the contracted emissions (mostly from transportation of solid waste).

The figure at right indicates the diversity of energy sources that are used by the RDFFG and highlights that the type of energy consumed is not necessarily equivalent to its cost or GHG intensity. For example, while electricity is the largest source of energy in the RD, it is extremely low in terms of GHG emissions. Natural gas, meanwhile, is relatively inexpensive but contributes more than 35% of the RD's GHG emissions. Diesel is notable both for its high cost and high GHG intensity. Reducing diesel consumption, therefore, is a top priority.

The LGCAP classifications also allow for RDFFG energy consumption to be divided between the various RD operations.

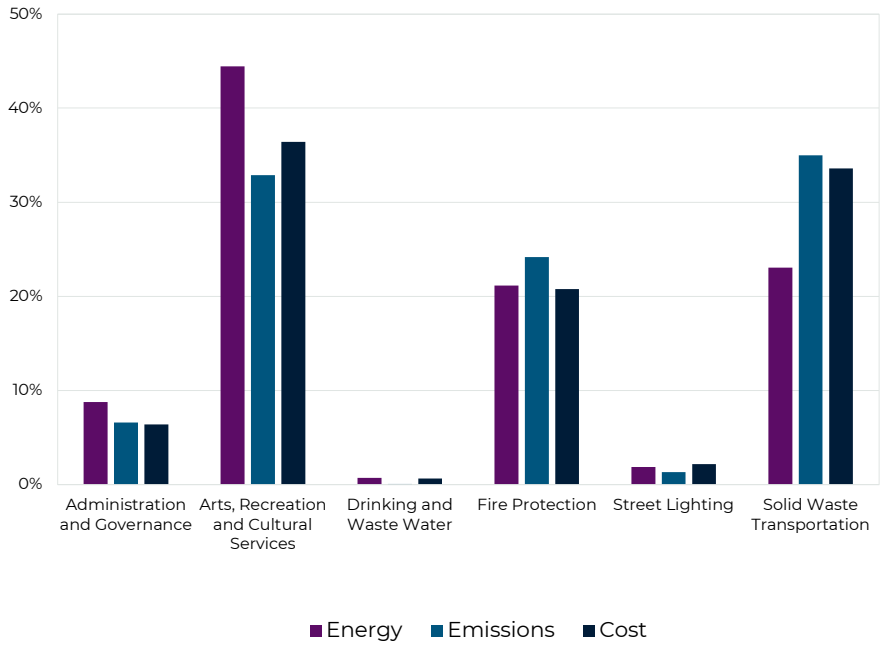


RDFFG Energy sources, emissions, and costs – 2022

Maintaining buildings and operating vehicles are responsible for the majority of the RD's energy consumption, cost, and GHG emissions. Some examples include the high use of diesel fuel for waste disposal trucks and fire trucks, and the use of propane and natural gas to heat community facilities and other buildings, including fire halls and the main RDFFG administration building in Prince George. The facility with the greatest overall energy use and GHG emissions is the Exploration Place, largely because of its use of natural gas for heating, and electricity. The Robson Valley Community Centre is the RDFFG facility that consumes the most electricity.

To date, the RDFFG has implemented a number of initiatives to reduce energy consumption and GHG emissions in its operations. These have included lighting and energy-efficiency upgrades at facilities, installation of electric vehicle chargers, and purchase of a plug-in hybrid vehicle. The RDFFG is also producing renewable natural gas at the Foothills Boulevard Regional Landfill.

However, if the RDFFG implements no additional efficiency or conservation activities, and assuming that future changes are proportional with population increase, the RDFFG's emissions are forecast to increase by 3% by 2030 and 20% by 2050 compared to 2022 levels.



Energy consumption, emissions, and costs across RDFFG operations – 2022

What Can Be Done: Options and Recommended Actions

Based on staff consultation and best practices gleaned over years of producing corporate energy and emissions plans with other local governments around British Columbia, this report recognizes that actions to reduce energy consumption, costs, and GHG emissions will need to come from throughout the organization. These include the following:

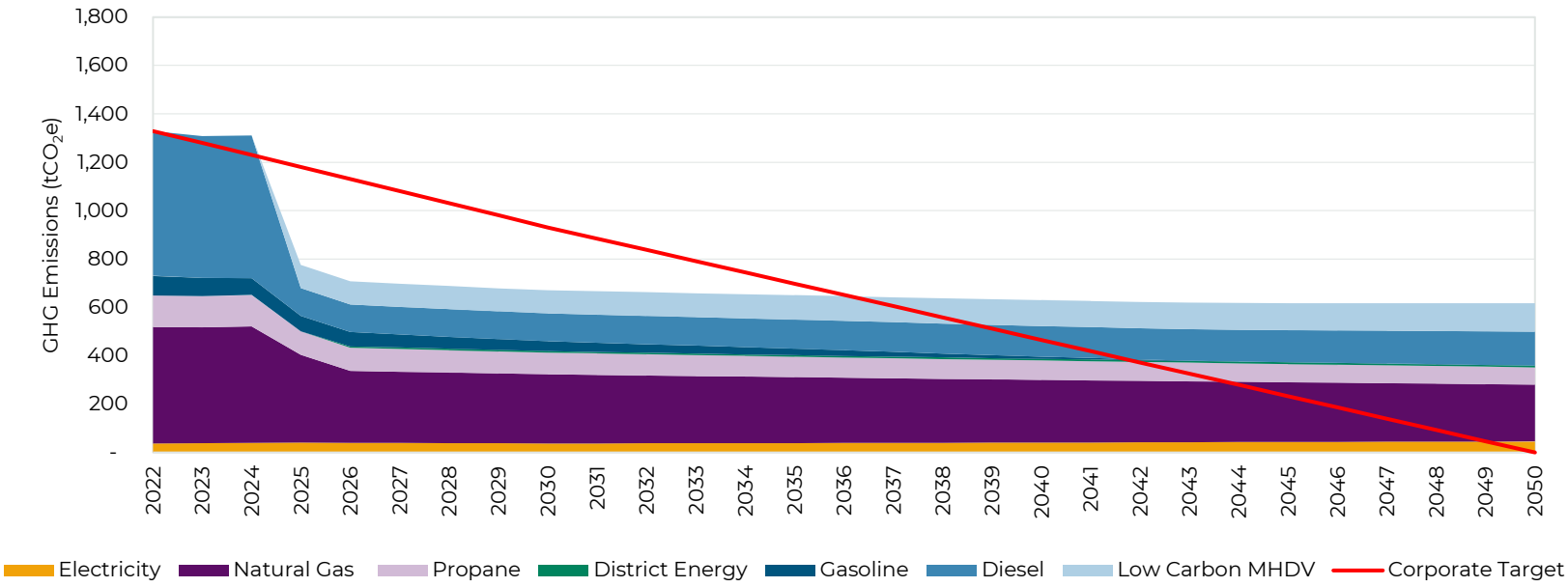
- Corporate leadership to institutionalize this plan and related actions
- Focusing on transportation to improve energy-efficiency of vehicles and switch to low-carbon fuels
- Increasing the use of renewable energy over fossil fuels
- Retrofit existing buildings and infrastructure to improve energy performance and reduce emissions
- Construct new buildings and infrastructure at high standards of energy performance

Within the particular context of the RDFFG, however, this report does recommend specific actions that would significantly and meaningfully reduce GHG emissions. Top three recommended actions are:

1. Reduce the use of conventional, fossil-based diesel for fleet vehicles, including those that are owned by the RDFFG and those that are contracted. Renewable diesel with a GHG intensity 80% lower than fossil-based diesel is now produced and available in Prince George for the first time.
2. Pursue low-carbon retrofits of existing buildings (including the Exploration Place and the fire halls) that would reduce consumption of natural gas and propane. This may include the installation of solar photovoltaics and heat pumps, air sealing, and insulation upgrades.
3. Utilize best management practices focused on sustainable replacement options when considering upgrades of the heating and cooling system for the RDFFG administration building. Connection to the City of Prince George's Downtown Renewable Energy System is an option

Undertaking these initiatives would significantly reduce the greenhouse gas emissions of RDFFG corporate operations, reduce energy consumption overall, and **utilize the low-carbon energy currently being produced in Prince George**.

The graph below identifies the potential GHG emissions that could result from implementing the actions of this report together with an indication of the emissions trajectory that would be necessary for the RDFFG to achieve net zero GHG emissions by 2050.



Potential Impact of Recommended Actions

This reduction in emissions modelled above would allow the RDFFG to reduce emissions by 50% by 2030, achieving the targets set by both the Government of BC and the Intergovernmental Panel on Climate Change.

This would be a significant achievement for the RDFFG. Nevertheless, even under this scenario, significant emissions remain. It is important that this Corporate Climate Change Action Plan be updated again in about 5-7 years to identify new actions to implement to keep the RDFFG on track to achieve net-zero by 2050.

Abbreviations and Definitions

BAU	Business as Usual
CAC	Climate Action Charter
CARIP	Climate Action Revenue Incentive Program (administered through the Province of BC)
CDD	Cooling Degree Day
CEA	Community Energy Association
CEERP	Community Energy and Emissions Reduction Plan
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide equivalent
EV	Electric Vehicle
FCM	Federation of Canadian Municipalities
FCM-ICLEI	Federation of Canadian Municipalities – International Council for Local Environmental Initiatives
GHG	Greenhouse Gas (there are several different anthropogenic GHGs and they have different relative impacts. When tonnes of GHGs are stated in the document the standard practice of stating this in equivalent of tonnes of carbon dioxide is followed)
GJ	Gigajoules (one of the standard measures of energy)
GMF	Green Municipal Fund
HDD	Heating Degree Day
HVAC	Heating Ventilation and Air Conditioning
IPCC	Intergovernmental Panel on Climate Change (an intergovernmental body of the United Nations dedicated to providing the world with an objective science-based view of climate change, its possible impacts, risks, and response options)

KPI	Key Performance Indicator
kWh	kilowatt hours (standard measure of energy, typically used with electricity)
LCR	Low Carbon Resilience (a term to describe integrated climate change mitigation & adaptation, created by Simon Fraser University's Adaptation to Climate Change Team)
LFG	Landfill Gas
LGCAP	Local Government Climate Action Program
LED	Light Emitting Diode
MHDV	Medium and Heavy Duty Vehicles
OCP	Official Community Plan
PCP	FCM-ICLEI's Partners for Climate Protection
PV	Photovoltaics (solar panels that generate electricity)
RCP	Representative Concentration Pathway (four RCPs were adopted by the IPCC as scenarios for the 2014 Fifth Assessment Report, depending on how much GHGs are emitted in future years)
RNG	Renewable Natural Gas
UBCM	Union of British Columbia Municipalities

1. Introduction

1.1 Issue of Climate Change

The climate is changing in British Columbia (BC) as it is around the world. The average global temperature has already increased by 1 degree Celsius (°C) above pre-industrial levels, which is resulting in very severe impacts, and in some cases irreversible changes. The United Nations Intergovernmental Panel on Climate Change (IPCC) is urging a limit of 1.5°C warming, which would require global emissions to be net-zero by 2050. Every degree of warming beyond this threshold will lead to increased impacts of extreme weather, more wildfires and floods, increases in sea-level rise, and severe threats to human health and well-being. It is critical to limit these impacts for a healthy environment, economy and society for us and future generations.

1.2 Provincial Action on Climate Change

In December 2018, the Province of British Columbia released its CleanBC climate plan. The plan reaffirmed the province's previous target to reduce emissions 80 per cent below 2007 levels by the year 2050, and established a new interim target to reduce emissions 40 per cent by 2030. *CleanBC* builds on a history of climate actions and outlines a path to meeting the 2030 targets. These actions include sourcing clean and renewable electricity, incremental increases in building-energy performance in the BC Building Code, tailpipe emissions standards, and measures to reduce emissions from industry. The *CleanBC* climate plan was strengthened by the 2030 Roadmap which is a complementary plan to achieve 100% of B.C.'s GHG emission targets.

1.3 Objectives of the Corporate Climate Change Action Plan Update

Climate action consists of both reducing emissions, or *mitigation*, and preparing for the impacts of a changing climate, or *adaptation*. This plan focuses on mitigation, as a key part of a local government's role in dealing with climate action is to reduce emissions caused by its own assets. Therefore, the main purpose of this plan is to compile an energy and emissions inventory on all corporate assets and contracted services, and to develop a plan that identifies the best opportunities to reduce emissions and costs from corporate operations. The Regional District has signed the Climate Action Charter, committing the RDFFG to work towards being carbon-neutral in its own operations. Updating the Corporate Climate Change Action Plan was set as a priority by the RDFFG Board and this Plan was developed in consultation with the Regional District staff and will provide the Board and staff with the background information to implement key climate actions in the next five to seven years. Reducing corporate GHG emissions has several co-benefits including long-term cost savings, improved climate change resilience, and potential to improve services. This also helps the Regional District to meet its requirements as a signatory of the BC Climate Action Charter (CAC).

The BC Climate Action Charter is a voluntary agreement between the Province of BC, the Union of BC Municipalities (UBCM), and each local government is a signatory. The Charter was launched at the 2007 UBCM Convention. By signing it, local governments acknowledge that they and the Provincial government have an important role in addressing climate change. Local governments make commitments including to measure and report on their corporate emissions, and progress towards becoming carbon neutral in their own operations. RDFFG is a signatory to this Charter, along with every local government in BC.

- Providing a more comfortable working environment for staff and a healthier indoor environment for visitors
- Leading by example with its own assets, helping stimulate further GHG emission reductions in the community
- Improved climate change resilience
- Community economic development by leveraging external funding*

*External funding can be leveraged to improve on the business cases identified in this project

2. Progress So Far

2.1 2009 Climate Change Action Plan

The 2009 Corporate Climate Change Action Plan was developed in response to the Regional District signing on to the Climate Action Charter. The plan included energy consumption and GHG emission sources, as well as an action plan for Regional District facilities, fleet, purchasing and staff engagement.

2.2 Emission Reduction Goals and Achievements

The 2009 Corporate Climate Change Action Plan included the short-term target to reduce Corporate GHG emissions by no less than 15% from 2007 levels by 2012. The long-term target was to reduce Corporate GHG emissions by no less than 50% from 2007 levels by 2020. Table 1 summarises the Regional District's corporate emission reduction achievements.

Table 1 – Corporate emissions reduction by 2012 and 2020

Year	2007	2012	2020
Corporate emissions* CO2e (tonnes)	1,020	884	780
Emission reduction %		13%	23%

**Does not include Solid Waste Transportation*

2.3 Actions Undertaken by the Regional District

The Regional District has already implemented a number of climate actions in the last decade or so. The following table summarizes the climate actions undertaken by RDFFG in the past years (Table 2).

Table 2 – Highlighted Corporate Climate Actions

Buildings/lighting	Several energy efficiency measures have been implemented at recreation centres, community halls and volunteer fire departments (VFD). These include but not limited to: chiller replacement at recreation centre, upgrades to LED lighting, installation of radiant heaters, replacement of domestic hot water tank with on demand hot water, replacement of furnaces, insulation upgrades, and replacement of window/doors, EnergyStar appliances
Energy generation	Renewable Natural Gas (RNG) generation project under development with Fortis at the Foothills Boulevard Regional Landfill
Transportation	Installation of 3 EV charging stations to accommodate 6 vehicles throughout the Regional District as part of Charge North; plug-in hybrid vehicle was acquired; each department is doing the assessment for the right-sizing of new or replacement vehicles
Solid Waste	Implementation of the 2015 solid waste management plan; moving to landfill gas (LFG) utilization; study on organic waste diversion possibilities
Water / wastewater	Remote access to Azu water system will reduce need for travel, once connection is established.
Institutionalisation	Corporate Policy RD-03-09 – Procurement of Goods and Services, does reference sustainability principles; hired a sustainability coordinator to work on 50% climate change related corporate projects and 50% asset management; update of the emergency response EOC handbook to deal with increased events due to climate change; 2018 Greenspace/Natural Resource Protection Actions

Corporate Energy & Emissions Plan Development

In 2023, RDFFG, in collaboration with CEA, began the process of creating a Corporate Climate Change Action Plan Update. The planning process consisted of four main steps, as illustrated in Figure 1.

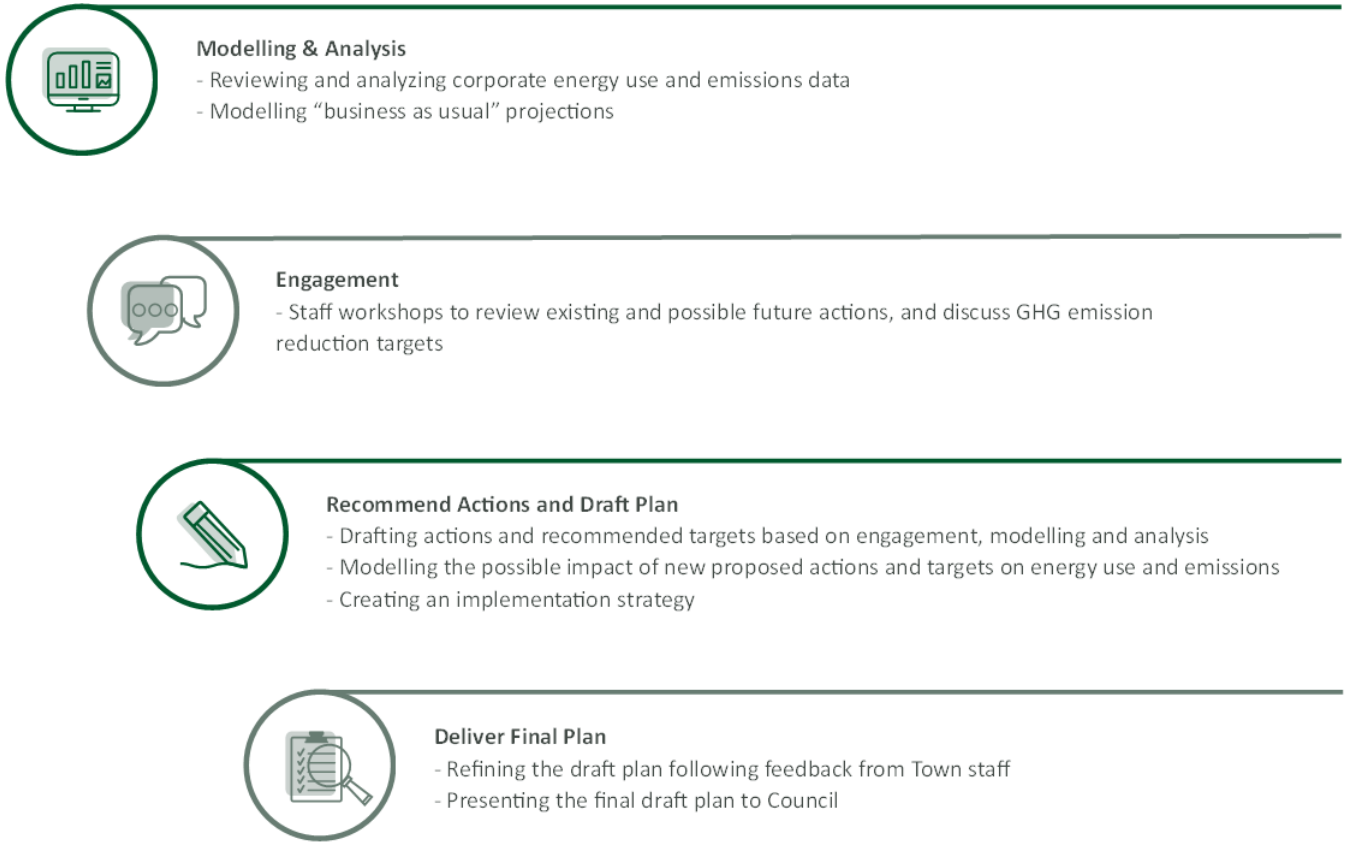


Figure 1 – Development of the Corporate Climate Change Action Plan Update

3. Energy and Emissions Inventory

An inventory is a compiled list of all the energy consumed, the money spent on energy, and the associated greenhouse gas emissions created by the local government in their operations. This may identify the best opportunities for cost and emissions reductions. This inventory describes the GHG emissions, energy consumption, and annual energy expenditures of all corporate assets. See the info box below for a description of common units to express energy usage and GHG emissions, and what they mean practically.

What is a GJ?

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

- *Natural gas for 3-4 days of household use*
- *25-30 litres of diesel or gasoline*
- *Two 20 lb propane tanks*
- *The electricity used by a typical house in 9 days*

What is a tonne (tCO_2e) of GHG?

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

- *385 litres of gasoline (about 10 fill-ups)*
- *A month of natural gas winter heating*
- *Enough electricity for 8.5 average homes for a year (93,700 kWh)*

3.1 Local Government Climate Action Program (LGCAP)

In this report, RDFFG's corporate inventory is defined according to LGCAP (which has the same requirements as the previous Climate Action Revenue Incentive Program - CARIP program).

Local Government Climate Action Program Reporting is the reporting **conducted by local governments in BC each year to receive their LGCAP funding. It requires local governments to report emissions from their traditional services including:**

- **Administration and Governance**
- **Drinking Water and Wastewater**
- **Solid Waste Transportation**
- **Street Lighting**
- **Arts, Recreation and Cultural Services**
- **Fire Protection**

Note that emissions from solid waste (i.e., the landfill) are not included in LGCAP reporting. Fuel from contracted services and from staff-owned vehicles on mileage for corporate work are however included in fuel inventories.

3.2 Current Emissions, Energy Consumption and Costs

3.2.1 Emissions

Figure 2 shows the RDFFG's GHG emissions by LGCAP category and fuel source for the 2022 year. Total corporate emissions by the Regional District in 2022 were 1,331 tCO_2e, with the largest source from Solid Waste Transportation, at 466 tCO_2e, or 35%. The majority of emissions in this category are from diesel consumption in contracted garbage trucks. Arts, Recreation, and Cultural Services follows closely at 437 tCO_2e (33%) mostly owing to the natural gas consumption at the Exploration Place, amounting to 235 tCO_2e. Fire Protection contributes 322 tCO_2e (24%), owing to nearly equivalent contributions from natural gas for building heat and diesel for fire trucks and other vehicles.

Diesel and natural gas were responsible for the largest portions of GHG emissions at 599 tCO_2e (45%) and 480 tCO_2e (36%), respectively. Propane gas followed next at 130 tCO_2e (10%) followed by gasoline with 82 tCO_2e (6%).

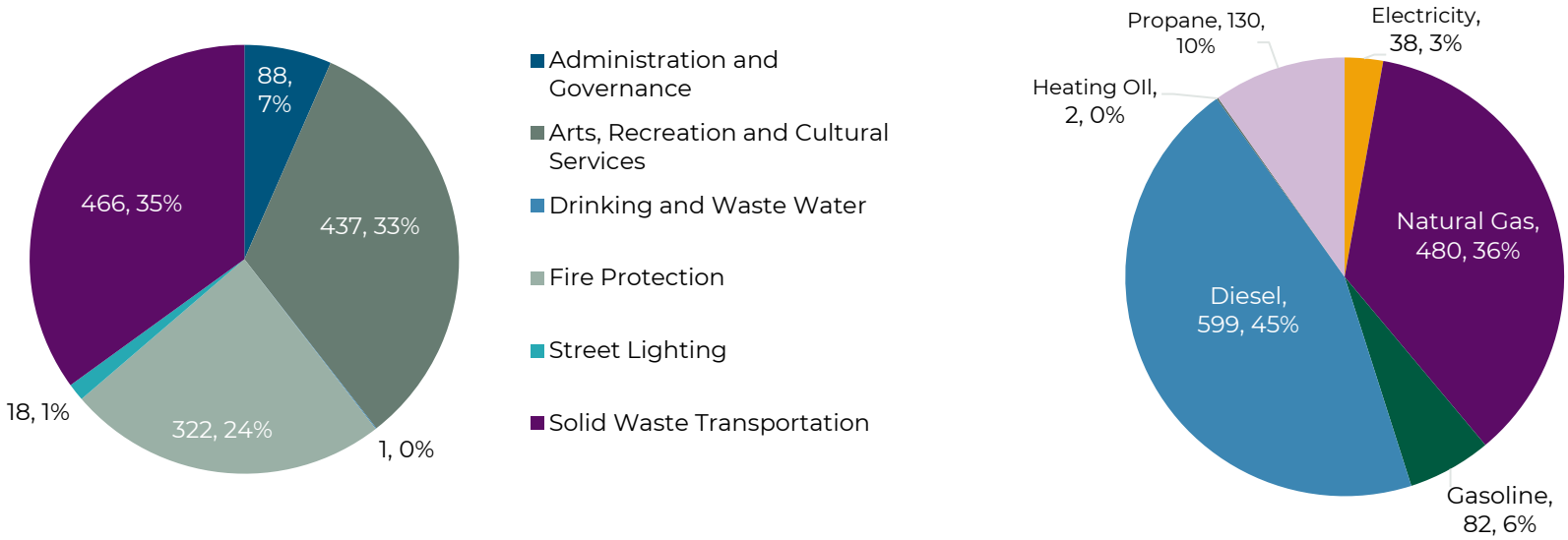


Figure 2 – 2022 Emissions by LGCAP Classification and Fuel Source in tCO_2e

3.2.2 Energy Consumption and Costs

Figure 3 show the RDFFG's energy consumption and expenditures by LGCAP category. Overall, RDFFG's corporate energy consumption was 33,553 GJ, at a total cost of $1.17 million. Arts, Recreation, and Cultural Services represented the highest percentage of energy consumption and costs at 44% and 36%, respectively. Solid Waste Transportation, contributed 23% of energy consumption and 34% of costs, due to the use of diesel fuel which has a high energy cost compared to other fuels.

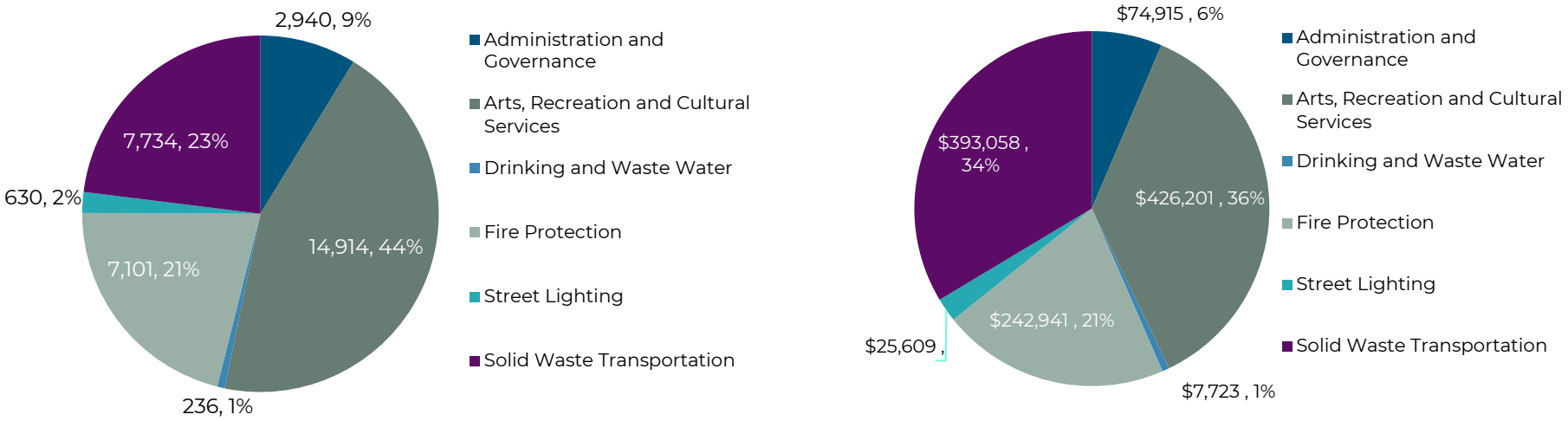


Figure 3 – 2022 Energy Consumption and Costs by LGCAP Classification in GJ and Dollars

Figure 4 shows the energy consumption and expenditure in 2022 by fuel source. Electricity contributed the largest proportion of energy consumption (11,771 GJ, 35%) and second largest of cost ($385,638, 33%). Natural gas was second in consumption (9,633 GJ, 29%), but only accounted for 13% ($154,123) of cost, owing to its relatively low energy cost. Conversely, diesel's high energy cost resulted in the highest percentage of energy cost at 40% ($464,723) despite only contributing 26% of energy consumption (8,682 GJ).

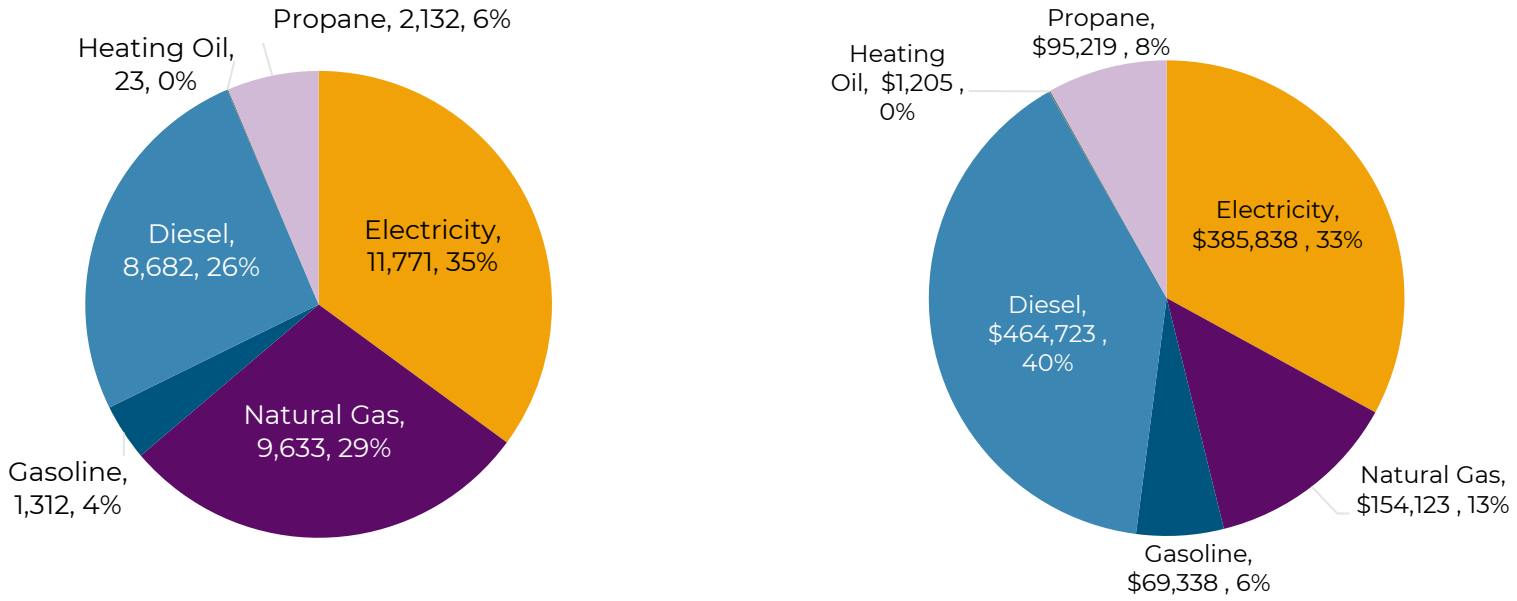
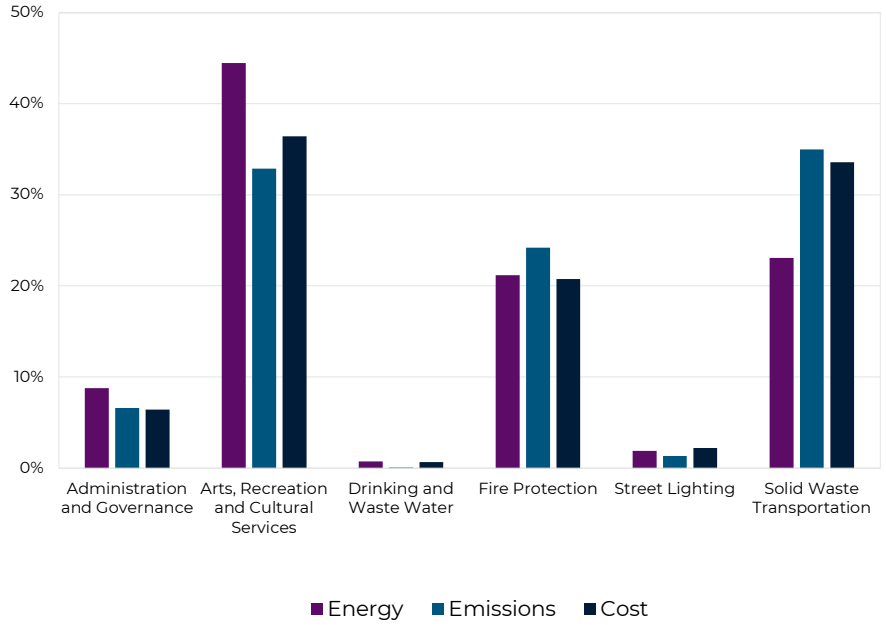


Figure 4 – Energy Consumption and Energy Costs by Fuel Source, 2022

Figure 5 shows the percentage of energy consumption, GHG emissions, and energy expenditure that is attributed to each LGCAP classification and each fuel source. Solid Waste Transportation contributes the largest portion of emissions at 35%, followed closely by Arts, Recreation, and Cultural Services at 33%. The latter however, contributed the largest proportion of energy consumption at 44% and energy costs at 36%, owing to the contribution of electricity which has a high energy cost but low emission factor.

Diesel contributes the highest proportion of emissions at 45%, along with energy costs at 40%. Natural gas is the second highest contributor of emissions at 36%, though only contributing 13% of costs owing to the relatively low cost of natural gas to other fuels. The highest contributor of energy consumption is electricity at 35%, despite only contributing 3% of emissions. Propane and gasoline contribute only small proportions of emissions at 10% and 6%, respectively.



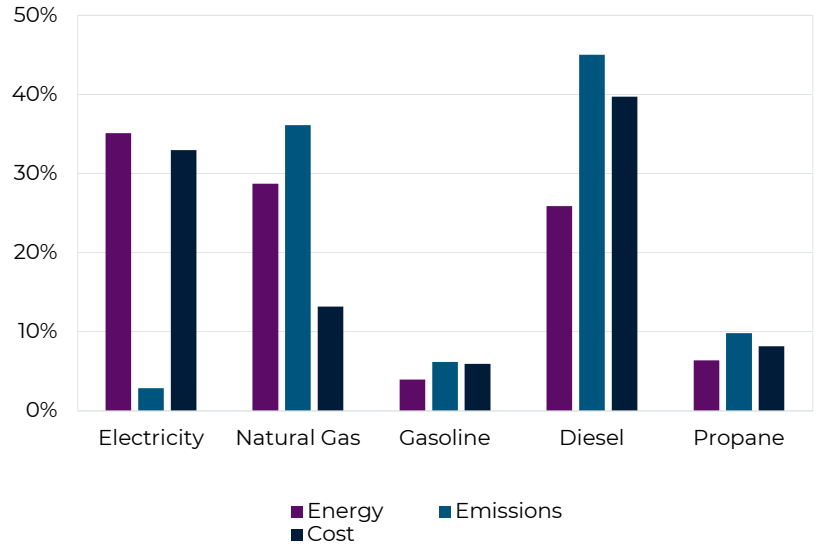
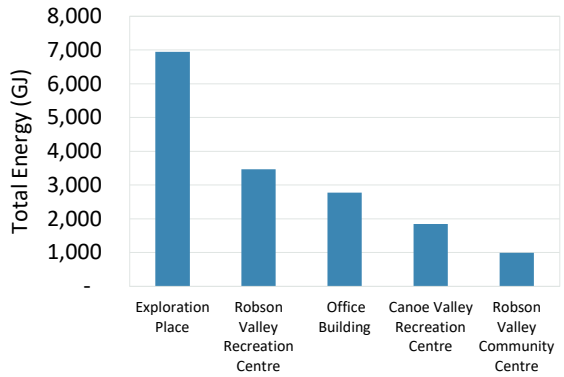


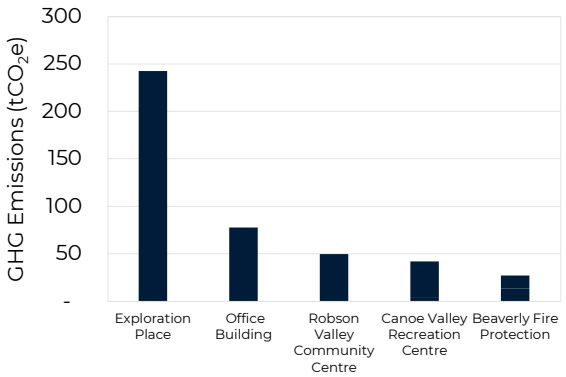
Figure 5 – Energy, Emissions, and Cost by LGCAP Classification & Source in 2022

3.2.3 Top 5 Buildings and Infrastructure for Energy, Emissions and Costs

Exploration Place

Robson Valley Recreation Centre





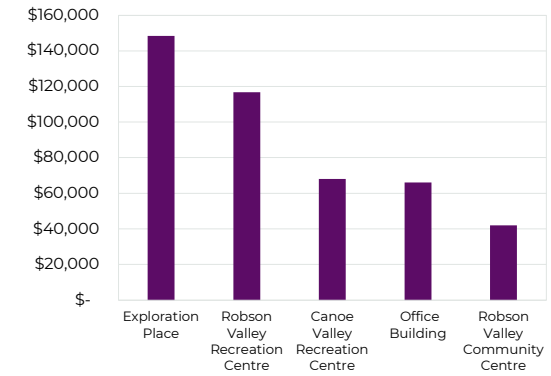


Figure 6 – Top 5 Buildings & Infrastructure for Energy, Emissions and Cost, 2022

These buildings and infrastructure should be the Regional District's priority in order to maximise reductions in GHG emissions and costs.

Figure 6 shows the top five buildings and infrastructure in terms of energy consumption, GHG emissions and energy costs. The Exploration Place contributed the largest proportion of all three categories (6,941 GJ, $148,388, 242 tCO_2e) due to the high use of natural gas heating and electricity. The main Office Building was next in emissions at 78 tCO_2e due to natural gas heating, while the Robson Valley Community Centre was second in both energy consumption and cost, due to its electricity consumption, which was the highest among all buildings.

3.2.4 Business As Usual Projections

Business As Usual (BAU) projections for the RDFFG's inventory are shown in this section.

What does Business as Usual mean?

Business as Usual, or BAU, is a way of describing what is estimated to happen if the regional district does not try to reduce emissions going forward. A number of factors are taken into account, similarly to a Community Energy and Emissions Plan. Population growth and the subsequent growth in corporate assets is a very important consideration. As the number of people increase in a community, more corporate assets are needed to serve them. Other things that are taken into account include:

- **Changing climate patterns, as warmer winters and hotter summers change the way that energy is consumed in corporate buildings.**
- **Impacts of policies already adopted by higher levels of government, such as:**
  - **Renewable and low carbon fuel standards**
  - **Vehicle emissions standards**
  - **That progressive policies on electric vehicles will have an impact on the RDFFG's purchases for gasoline vehicles, in particular the Zero Emissions Vehicles mandate.**
  - **The greening of the BC Building Code (progressive steps towards net zero energy ready buildings by 2032)**

If the RDFFG implements no special efficiency or conservation activities, and assuming that future changes are proportional with population increase, then the RDFFG's emissions are forecast to increase 3% by 2030 and 20% by 2050 compared to 2022 levels as shown in Figure 7. The graph shows that the RDFFG will not meet reduction targets that are in line with the CleanBC or Intergovernmental Panel on Climate Change (IPCC)'s targets for 2030 and 2050.

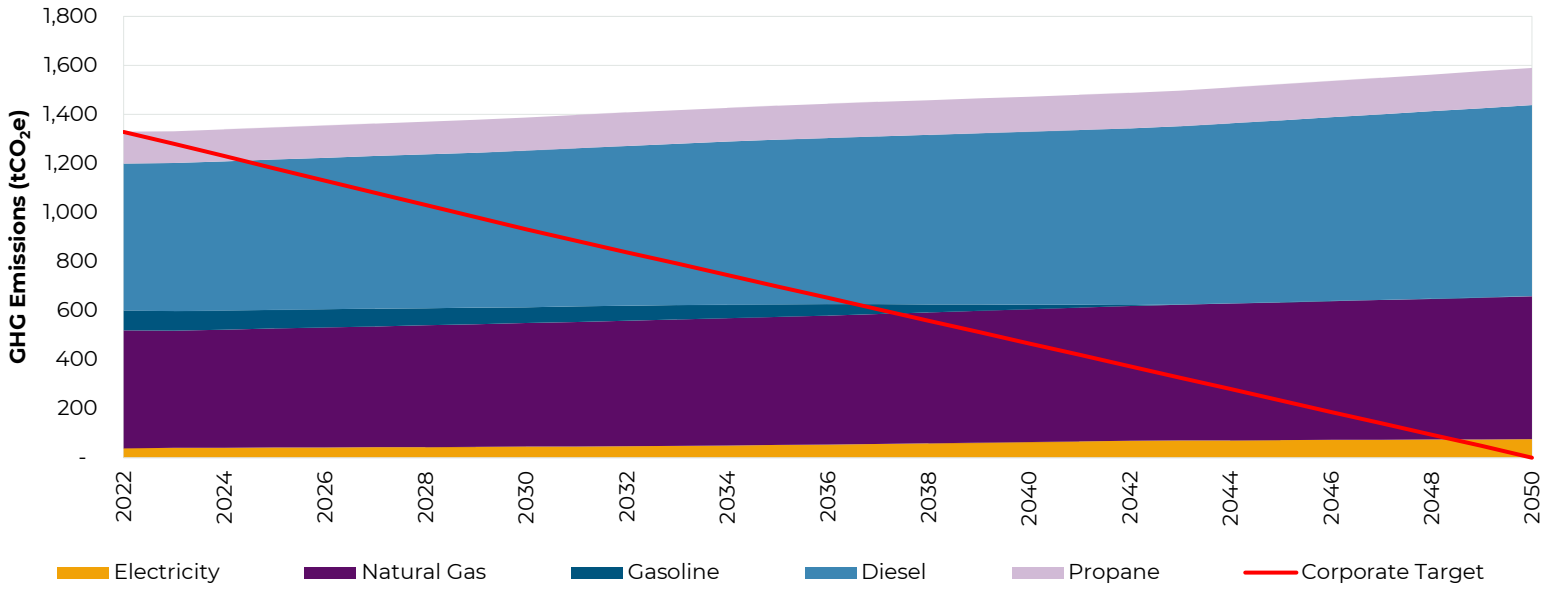


Figure 7 – Business-As-Usual Emissions Forecast to 2050, by Fuel Source

It is difficult to predict these future increases, but it is clear that an increasing population will provide upward pressure, while the policies from higher levels of government will provide downward pressure on GHG emissions. It would therefore be prudent for the RDFFG to also conduct its own measures (i.e. implement the actions detailed in this Plan) to manage its energy consumption, GHG emissions, and energy expenditures.

4. Initiatives and Actions

4.1 Vision for Climate Actions

4.2 Targets

The Regional District's greenhouse gas emissions are forecast to increase by 3% by 2030 and 20% by 2050 compared to 2022 levels, if no new actions are implemented. Based on the emission projections, the actions modelled as part of the plan development, the proposed actions have the potential to reduce the GHG emissions 30% - 50% from 2022 levels by 2030.

Based on these analyses the Corporate Climate Change Action Plan recommends a **corporate GHG emissions reduction target of 30%** of 2022 emissions by 2030 and becoming **Carbon-Neutral** by 2050.

- **Intergovernmental Panel on Climate Change (IPCC) recommended targets are 45% reduction from 2010 levels by 2030 and becoming carbon neutral by 2050.**
- **BC targets are 40% reduction from 2007 levels by 2030 and 80% reduction by 2050.**

4.3 Climate Action Areas Recommended Climate Actions

Based on staff consultation and best practices, actions were identified to be implemented over the next five years. Actions were grouped under the following five categories.

1. ***Enabling Actions and Corporate Leadership***
2. ***Transportation***
3. ***Renewable Energy***
4. ***Existing Buildings and Infrastructure***
5. **New Buildings and Infrastructure**

Tables 3 through 7 show the breakdown of actions by category and the beginning year for each action, each to be continued in following years. Further details on actions, including projected implementation timelines, are detailed in Appendix A.

4.3.1 Enabling Actions and Corporate Leadership

Institutionalise the plan and demonstrate leadership on waste and water management. This may include allocation of funds, having dedicated staff person, monitoring, and reporting on progress on a regular basis.

Table 3 – Climate Actions Summary for Enabling Actions and Corporate Leadership

ACTIONS LIST		Already Done	2024	2025	2026	2027	2028
Enabling Actions and Corporate Leadership							
1.1	Have dedicated staff person or department for plan implementation	X					
1.2	Allocate funds for plan implementation (e.g. LGCAP grant, budget allocation, revolving fund)			X			
1.3	Develop KPIs, monitor and track for progress				X	X	
1.4	Manage waste creation & water consumption				X		
1.5	Join PCP (FCM Partners for Climate Protection)			X			
1.6	Examine local carbon offset projects for remaining emissions (or consider offset purchase)				X		
1.7	Annual reporting on GHGs				X		

4.3.2 Transportation

Improve energy efficiency, reduce fuel consumption, and switch to clean alternatives to reduce GHG emissions in the RDFFG's fleet and fleets operating under contract to RDFFG.

Table 4 – Climate Actions Summary for Transportation

ACTIONS LIST		Already Done	2024	2025	2026	2027	2028
Transportation							
2.1	Develop policies to implement conversion of diesel fleet (including contractor fleets) to other clean MHDV options			X	X		
2.2	Develop a vehicle purchasing policy			X	X		
2.3	Invest in EVs and EV Charging Stations (where available and practical) (consider electric chassis)	X		X			
2.4	Right-size vehicles for assigned tasks	X					
2.5	Fuel efficient driver training & anti-idling policy			X			
2.6	Energy-focused fleet maintenance (e.g. tire pressure, fuel & air system)			X			
2.7	Encourage employee carpooling during work functions where possible			X			
2.8	Include emission targets in contracted services requirements (waste transportation)			X			

4.3.3 Renewable Energy

Increase the use of renewable energy such as solar, biomass, renewable natural gas, renewable diesel, and clean electricity.

Table 5 – Climate Actions Summary for Renewable Energy

ACTIONS LIST		Already Done	2024	2025	2026	2027	2028
Renewable Energy							
3.1	Assess and Implement Solar PV installations on selected buildings/facilities				X		
3.2	Low-carbon heating retrofits for buildings			X			
3.3	Conduct corporate renewable energy study (e.g. solar potential, geothermal, renewable natural gas, district energy system opportunities)			X	X		
3.4	Utilize best management practices focused on sustainable replacement options when considering upgrades to the RDFFG administration office. Connection to the Downtown Renewable Energy System is an option				X		

4.3.4 Existing Buildings and Infrastructure

Improve energy performance and lower GHG emissions in ***existing*** RDFFG buildings and infrastructure.

Table 6 – Climate Actions Summary for Existing Buildings and Infrastructure

ACTIONS LIST		Already Done	*2024*	*2025*	*2026*	*2027*	*2028*
Existing Buildings and Infrastructure							
4.1	Conduct building energy audits			*X*	*X*		
4.2	Implement building energy retrofits recommended by building energy audits				*X*		
4.3	Conduct energy focused operational review of infrastructure			*X*	*X*		
4.4	Implement measures from operational review of infrastructure				*X*		
4.5	Incorporate energy management into annual building maintenance procedures				*X*		

4.3.5 New Buildings and Infrastructure

Build new buildings and infrastructure to higher standards to improve energy performance and lower GHG emissions.

Table 7 – Climate Actions Summary for New Buildings and Infrastructure

ACTIONS LIST		Already Done	2024	2025	2026	2027	2028
New Buildings and Infrastructure							
5.1	Commit to building energy efficient facilities (including Step Code implementation)			X	X		
5.2	Commit to building energy efficient infrastructure			X	X		
5.3	Optimize siting and orientation of new buildings				X	X	

5. What We Can Achieve

Modelling Climate Actions

Implementation of the actions was modelled to estimate the potential GHG emission reductions and energy expenditure savings.

With the availability of low-carbon alternative fuel suppliers in the RDFFG area for medium and heavy-duty vehicles (MHDV), there is significant potential to reduce corporate emissions. This report will primarily analyze a conservative approach of a 20% blend of the alternative fuel with diesel, as shown in Figure 8.

In this scenario, total GHG emissions are expected to decrease relative to 2022 by approximately 30% in 2030 and 26% by 2050. GHG emissions are expected to plateau from 2030 on unless further actions are implemented.

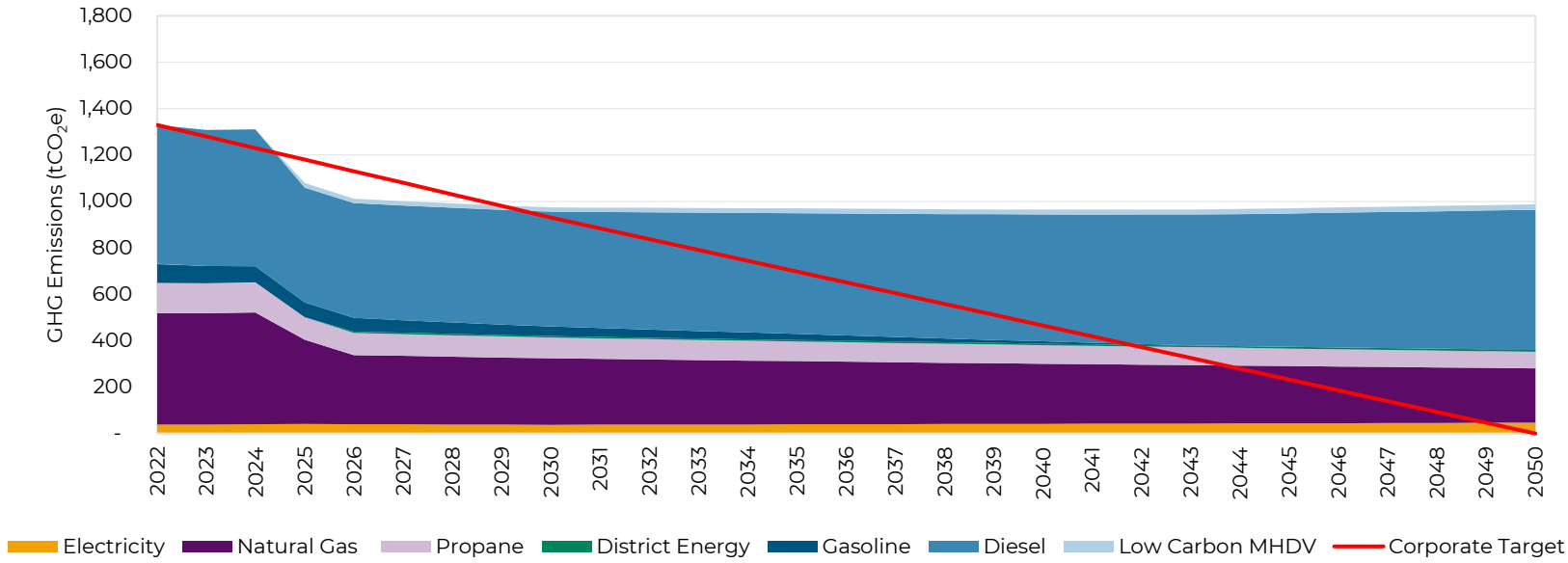


Figure 8 – Modelled Emissions from Proposed Climate Actions

For comparison, Figure 9 shows corporate emissions if all MHDV were converted to alternative fuels. Under this scenario, the total emissions would be reduced by 50% in 2030, meeting the IPCC target of 45%. By 2050, emissions would be reduced by 54%. Even under this scenario, there remains a significant portion of emissions. It is important that this Corporate Climate Change Action Plan be updated again in about 5-7 years to identify new actions to implement to keep the RDFFG on track with its long-term target of net-zero by 2050.

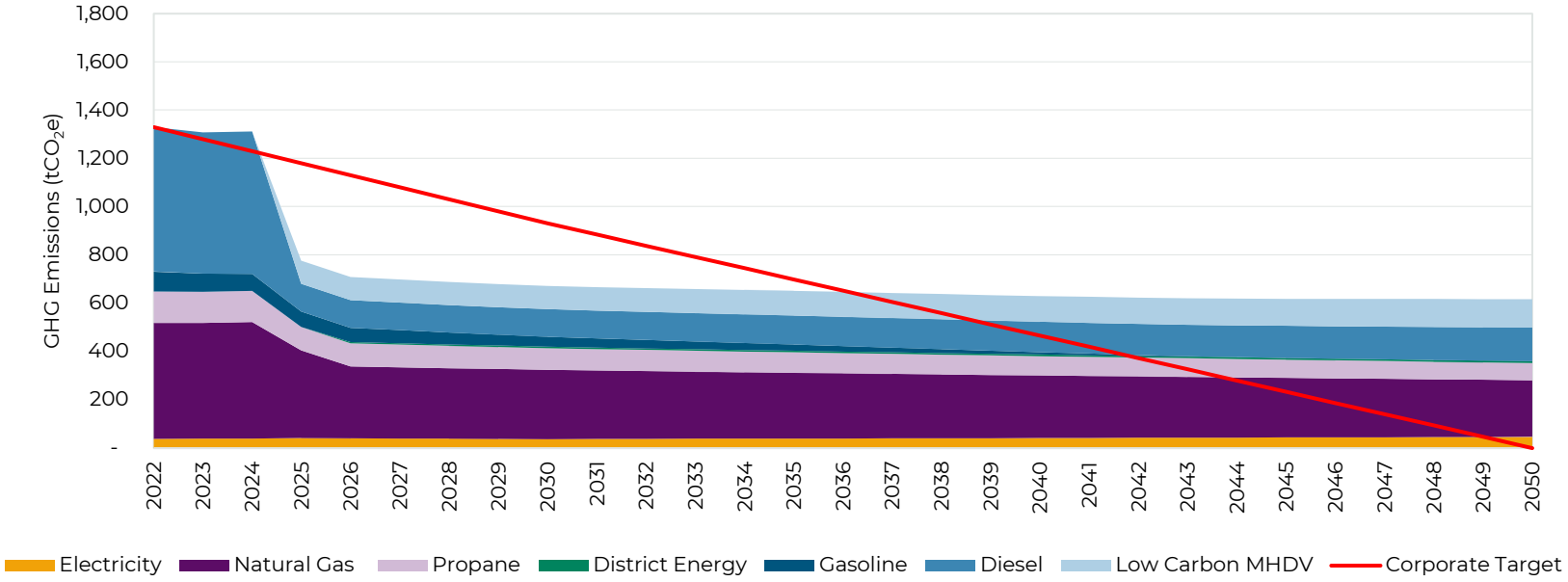


Figure 9 – Modelled Emissions from Proposed Climate Actions with 100% MHDV Alternative Fuel

5.1 Emissions Reduction

As depicted in Figure 10, the top three actions that will achieve the largest reductions in GHG emissions over the next 5 years, in order of largest GHG reductions first, are:

- Convert fleet diesel to other clean Medium or Heavy Duty Vehicle options
- Low carbon heating retrofits for buildings
- Connect Office Building to Downtown Renewable Energy System

Converting the entire diesel fleet (including contractor fleet) vehicles to a 20% alternative fuel blend (or converting all or portion of the diesel fleet to 100% renewable diesel) will reduce the RDFFG's consumption of diesel and therefore result in reduced GHG emissions from fleet vehicles. There will be a nominal increase in emissions from the alternative fuel (assumed to be 20% that of regular diesel, meaning 80% net GHG reduction from diesel displaced by cleaner alternatives).

Implementing building retrofits will consist of fuel switching to low carbon heating systems, such as heat pumps, and measures to improve energy efficiency, such as air sealing and insulation upgrades. The financial case for switching from natural gas to electricity will continue to improve as the carbon tax continuously increases the price of natural gas.

Connecting the main office building to Prince George's Downtown Renewable Energy System (PGDRES) also know as District Energy System will eliminate the building's natural gas emissions, while introducing emissions from the wood waste that fuels the district energy system[1]. Overall, emissions from the building will be reduced by 93% if connected to the PGRDES.

[1] Assumed to be 0.0035 tCO2e/GJ for district energy based on the Carbon Action Secretariat's DES Calculator

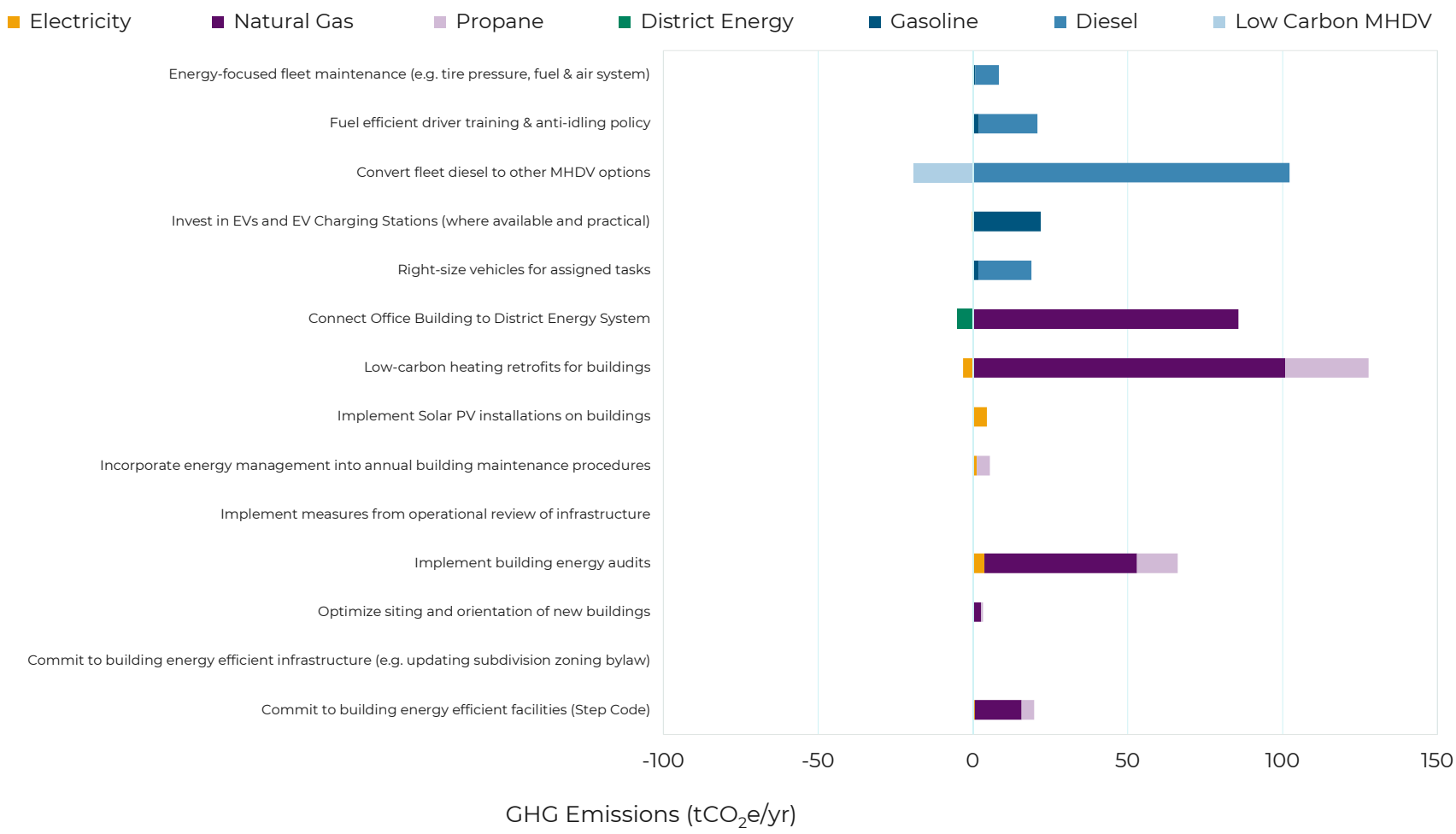


Figure 10 – Emissions Reduction For each Proposed Action, in 2030

Figure 11 highlights the potential GHG savings resulting from full implementation of the plan. Targeting natural gas use provides the largest opportunity for GHG reduction, followed by diesel and gasoline. Note that the added emissions for Low Carbon MHDV and District Energy are included though they are negative values and minor in value (~2% of total emissions), therefore they have been excluded from the graph for ease of readability.

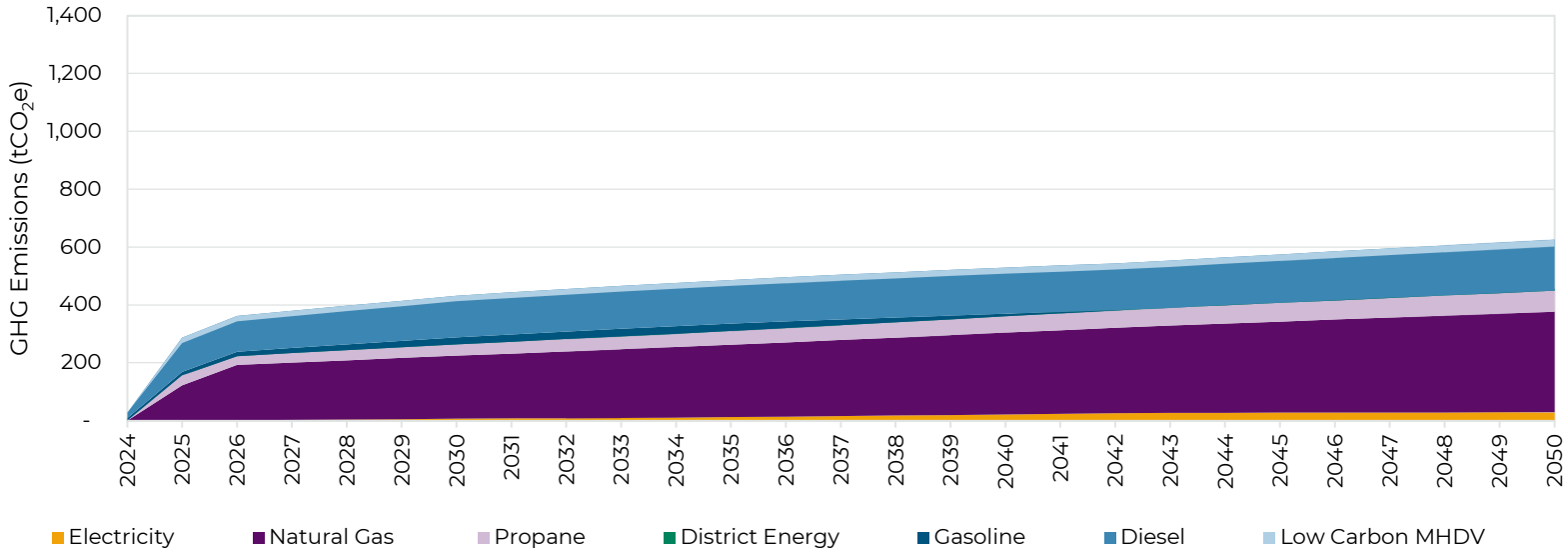


Figure 11 – Plan GHG Savings

5.2 Cost Reduction

Implementing the proposed actions will each have fuel/energy cost savings that will carry into future years. Figure 12 shows the estimated cost savings from each proposed action. Implementing measures from energy audits will result in the highest cost savings, which refers to efficiency upgrades to the RDFFG's buildings. Next is the savings on electricity from the installation of solar PV on corporate building roofs and other assets, and the elimination of natural gas and other fossil fuels from low-carbon heating retrofits, though the savings are tempered by the introduction of electricity consumption to operate associated heat pumps.

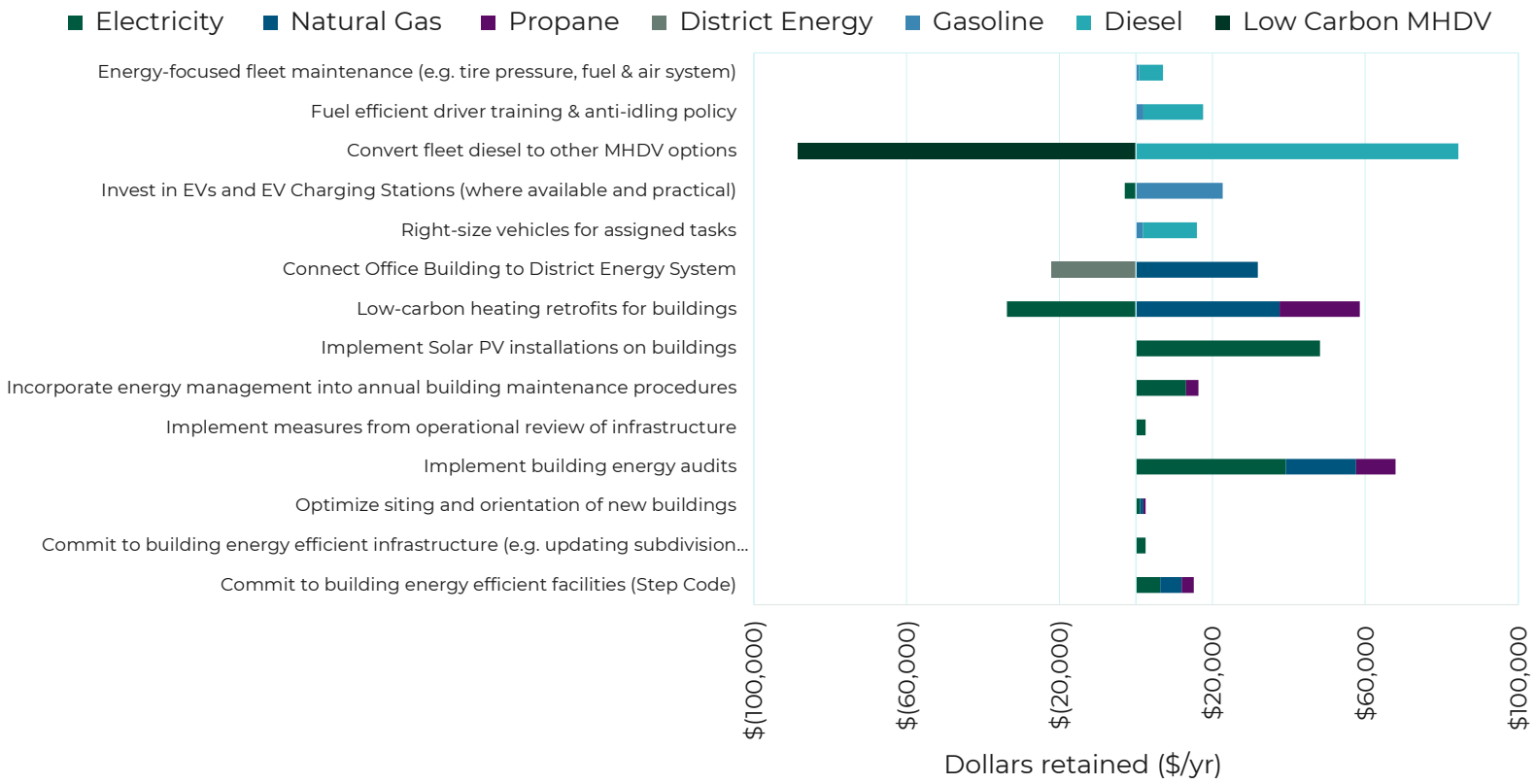


Figure 12 – Cost Reduction For each Proposed Action, in 2030

Substantial energy cost savings could be realised through the implementation of the actions listed, however, this does not reflect the capital cost or payback of each action. More work would be needed to determine this.

Figure 13 shows the financial savings that could be realised upon implementation of the plan. Actions will be implemented over time, as per Tables 3-7 and therefore savings will increase over time. There is potential for substantial cost savings on diesel, owing to the consumption for solid waste transport and other corporate vehicles. If implemented, two new fuel expenses will be incurred from the diesel alternative (indicated as Low Carbon MHDV) and district energy, which will offset approximately $110,000 of the savings realized by 2030. Note that in 2026, electricity produces a net savings of $463, which is too small to be denoted by an orange band in the figure.

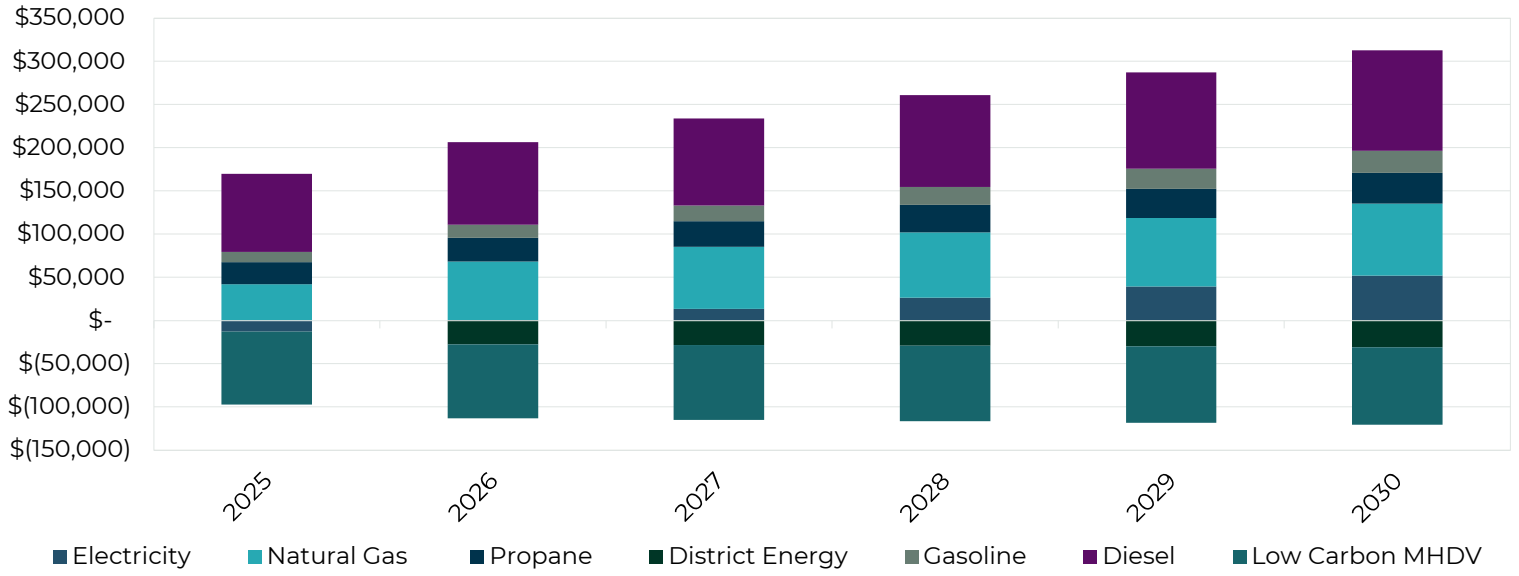


Figure 13 – Plan Cost Savings

Overall, the Plan is expected to save 412 tCO_2e and $192,000 annually by 2030 in corporate GHG emissions and energy costs.

6.Monitoring and Evaluation

Monitoring and evaluating the implementation of the plan is critical for its success. Key Performance Indicators (KPIs) enable the Regional District to measure the outcomes of a plan's implementation. When KPIs are monitored regularly, the Regional District can determine how to best allocate resources to support implementation, and the level of success of different actions.

Suggested indicators are shown in the template in Table 9. Two types of indicators are recommended. Primary indicators measure corporate GHG emissions, energy consumption and energy expenditure, while secondary indicators can quantify the indirect success of various actions.

Unlike a Community Energy and Emissions Plan, the primary indicators of energy consumption, emissions, and energy expenditures can be easily and accurately tracked. Whilst these are the determinants of success, secondary indicators can still play a useful role in monitoring progress on climate action. Annual progress reporting should be planned by the RDFFG.

Table 9 – Primary and Secondary Indicators for Monitoring and Evaluation

INDICATOR	2024	2025	2026	2027	2028
Primary					
Corporate GHG emissions (tonnes CO2e)					
Corporate energy consumption (GJ)					
Corporate energy expenditure ($)					
Secondary - Secondary - Enabling Actions and Corporate Leadership					
Expenditures by Climate Action Revolving Fund (should one be created) ($)					
Total value of incentives received (e.g. grants) for Plan implementation ($)					
Water consumption at specific corporate buildings (litres)					
Volume of waste at specific corporate buildings (cubic yards)					
Current PCP Milestone (1 to 5)					

Secondary - Transportation					
Number of fleet vehicles that are electric, hybrid, or use other alternative fuels					
Number of employees that have completed fuel efficient driver training					
Secondary - Renewable Energy					
Installed capacity of solar PV on corporate buildings (kW) – if applicable					
Secondary – Existing Buildings and Infrastructure					
Number of energy assessments conducted on corporate buildings					
Number of energy efficiency upgrades implemented on corporate buildings					
Secondary – New Buildings and Infrastructure					
Number of new buildings or infrastructure projects conducted to higher energy efficiency standards					

In order to develop the table above, having a comprehensive gathering and tracking methodology for data is important. It will provide consistency and continuity by ensuring that anyone following the methodology will produce the same quality of data. Below are some general steps for gathering the necessary data, and translating it into common metrics:

Gather raw energy consumption and energy cost data for the year of evaluation (e.g. utility bills/accounts, gas and diesel cardlock accounts, current list of fleet vehicles, telematics data on vehicle usage)
Identify data categories required for reporting (e.g. LGCAP, PCP)
For each data category, identify associated energy and emission sources (e.g. electricity, gasoline, natural gas)
For each corporate asset, allocate the appropriate data category(ies) and energy source(s)
Source emission factors and energy density conversion factors to convert raw data into consistent units (i.e. tonnes CO_2e and gigajoules (GJ)). Suggestions for sourcing factors include the **2023 B.C. Best Practices Methodology for Quantifying Greenhouse Gas Emissions** and **National Inventory Report**

See Appendix I for the current list of RDFFG's assets, along with aggregate tables that can be used as templates for developing inventories for future years.

Appendix A. Climate Actions in Detail

How are action impact numbers calculated?

In Table 10 below, action impact numbers are calculated through a number of assumptions and educated estimates based on CEA's experience. The impacts of individual actions on energy consumption are calculated for the year 2030. From this, GHG impacts and economic impacts are calculated using GHG intensity values and energy costs.

Actions may have further reaching impacts than the values stated here. Specifically, they demonstrate leadership and therefore may lead to GHG reductions and energy cost savings in the community.

What do the terms and colour coding mean in the actions tables?

In the table below, the terms refer to the following:

- Effort = staff time
- Costs = municipal costs
- GHG & economic impacts = GHG emission savings & financial savings in the year 2030
- Adaptation / resilience linkages = capacity for increased efficiency and enhanced outcomes through linkages to climate adaptation / resilience. An example of a high resilience linkage is energy independence and an example of a mild linkage is air quality.

And where there are no numbers, there is colour coding to help communicate expected impacts and implications:

- **Green = high adaptation / resilience linkages, low effort, costs estimated to be $0 - $500.**
- **Blue = medium for all attributes. Costs estimated to be in $500-5,000 range.**
- **Red = no adaptation / resilience linkages, high effort, costs estimated to be $5,000 or more.**

Enabling Actions and Corporate Leadership

Action	Timing	GHG Impacts	Economic Impacts	Adaptation/ Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
1.1: Have dedicated staff person or department for plan implementation	**2025**	**n/a**	**n/a**	**High**	**Medium**	**Medium**	**n/a**	**CSS**
A Corporate Climate Action (mitigation) Plan details actions that can be taken to reduce energy and emissions. The plan itself does not result in savings - it is the implementation of the actions listed in the plan that does. Limited staff capacity can be a barrier to successful implementation of the plan. Having a dedicated staff person or department is critical for successful plan implementation. RDFFG has hired a Corporate Sustainability Specialist role that is 50% focused on climate change related corporate projects and 50% asset management.								

Action	Timing	GHG Impacts	Economic Impacts	Adaptation / Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
1.2: Allocate funds for plan implementation	**2025**	**n/a**	**n/a**	**High**	**Low**	**Low**	**n/a**	**Finance, CSS**
There are a variety of mechanisms through which funds could be allocated to corporate climate action. LGCAP funds are one example. A revolving fund can be created whereby cost savings resulting from energy savings from project implementation go back into the climate action fund. Another option is an annual allocation of funds from the budget, or a combination of those.								

Action	Timing	GHG Impacts	Economic Impacts	Adaptation / Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
1.3: Develop KPIs, monitor and track for progress	**2024**	**n/a**	**n/a**	**High**	**Low**	**Low**	**n/a**	**CSS**
It is important to track energy consumption, energy expenditure and GHG emissions year over year to evaluate overall progress. However, some secondary indicators may also be helpful to monitor progress. A full list of primary and secondary performance indicators are provided in the section.								

Action	Timing	GHG Impacts	Economic Impacts	Adaptation / Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
1.4: Demonstrate leadership on corporate waste and water	**2024**	**n/a**	**n/a**	**High**	**Medium**	**Low**	**n/a**	**All**

Actions should be taken to reduce waste creation and water consumption at the corporate level. Demonstrating leadership at the corporate level may help to guide reductions at the community level. Examples include:

- Zero-waste target for corporate operations
- Best practices in water efficient landscaping
- Policies that discourage printing
- Planning purchases to minimize deliveries

Reduction in water consumption and waste creation will have minimal impact on corporate GHGs and energy expenditures.

Action	Timing	GHG Impacts	Economic Impacts	Adaptation / Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
1.5: Join Partners for Climate Protection (PCP)	**2024**	**n/a**	**n/a**	**Low**	**Low**	**Low**	**CEA, FCM**	**CSS**
PCP is a network of Canadian municipal governments that have committed to reducing GHGs and to acting on climate change. The program empowers municipalities to take action against climate change through a five-milestone process that guides members in creating GHG inventories, setting GHG reduction targets, developing local action plans, implementing actions to reduce emissions, and monitoring and reporting on results. It is free to join. The RDFFG should join this and start working through the milestones. This plan will be sufficient for corporate milestones 1-3, although for milestone 2 it will need to be adopted by the Board.								

Action	Timing	GHG Impacts	Economic Impacts	Adaptation / Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
1.6: Examine local carbon offset projects for remaining emissions (or consider offset purchase)	**2025**	**n/a**	**n/a**	**High**	**Medium/High**	**Medium**	**n/a**	**CSS**
To achieve carbon neutrality, local governments must find a way to make up for, or balance, their ongoing corporate emissions. The Green Communities Carbon Neutral Framework provides guidance on how municipalities can become carbon neutral in their corporate operations. Three options exist. 1. Investing in a Green Communities Committee (GCC) supported project allows local governments to invest locally while also ensuring that projects are credible and result in measurable GHG reductions. 2. Investing in alternate GHG reduction projects within the community that are outside the corporate emissions boundary, but do not fall under the definition of option 1. 3. Purchasing offsets from a credible provider is a simple and cost-effective way for local governments to offset their corporate emissions. More information about becoming carbon neutral can be found in this report: https://toolkit.bc.ca/wp-content/uploads/2022/05/BecomingCarbonNeutralGuideV3.pdf								

Action	Timing	GHG Impacts	Economic Impacts	Adaptation / Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
1.7: Annual reporting on GHGs	**Ongoing**	**n/a**	**n/a**	**Low**	**Medium**	**Low**	**n/a**	**CSS**
Track annual emissions from buildings, transportation, waste, and contracted services, as already required for LGCAP.								

Transportation

Action	Timing	GHG Impacts	Economic Impacts	Adaptation / Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
2.1: Right-size vehicles for assigned tasks	**Ongoing**	**18.9 tCO_2e**	**$16k**	**Low**	**Low**	**Low**	**n/a**	**All**
A municipal fleet contains a wide array of vehicle types and sizes. Vehicle fuel economy (litres/100km) varies widely between vehicle types. An appropriately sized vehicle should be used for each task to reduce fuel consumption. The RDFFG will create a vehicle use policy and institutionalise it.								

Action	Timing	GHG Impacts	Economic Impacts	Adaptation / Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
2.2: Develop a vehicle purchasing policy	**2025**	**n/a**	**n/a**	**Low**	**Low**	**Low**	**n/a**	**Corporate, Finance, CSS**

A vehicle purchasing policy should be created and implemented. The policy should ensure that new vehicles are evaluated based on:

- Anticipated usage of vehicles (e.g. engine size, vehicle weight, load capacity, passenger capacity, and routes / operational terrain)
- Life cycle considerations (e.g. life cycle emissions, residual costs / values of vehicle being replaced, capital costs, maintenance costs, fuel costs including fuel being used, resale values)

The objective is to ensure that all vehicles have the lowest GHGs / are the most energy efficient, that still meet minimum service requirements with some contingency. Zero / low carbon vehicles would be considered as part of this.

Action	Timing	GHG Impacts	Economic Impacts	Adaptation / Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
2.3: Invest in EVs and EV Charging Stations	**2025**	**21.6 tCO_2e**	**$19.8k**	**Low**	**Medium**	**High**	**CEA,FCM, FortisBC, Go Electric Fleets**	**Corporate, Finance, CSS**
When light-duty vehicles are due for replacement, the RDFFG will consider purchasing an EV rather than a traditional ICE vehicle. The RDFFG will consider the full life-cycle costs including fuel and maintenance when comparing the two vehicle types for purchase.								

Action	Timing	GHG Impacts	Economic Impacts	Adaptation / Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
2.4: Develop policies to implement conversion of diesel fleet (including contractor fleets) to other clean MHDV options	**2027**	**83.0 tCO_2e**	**(-$4k)**	**Low**	**Medium**	**Medium**	**FCM**	**Env Serv, Public Safety, CSS**
The RDFFG will assess the potential of renewable fuels such as biodiesel, renewable diesel, and hydrogen for its corporate fleet. The RDFFG will request a quote for renewable fuels when tendering for fuel contracts annually. The Regional District will also develop and implement a policy to convert diesel fleet (including contractor fleets) to clean alternatives. This analysis may assume that 20% to 100% of fuelling needs for medium and heavy duty fleet will be converted to alternative fuel (80% diesel), with a 10% premium for the alternative fuel cost not including any costs for conversion to accommodate the new fuel into the vehicle's powertrain. Production of cleaner fuels such as renewable diesel at a local refinery provides an opportunity for the RDFFG and its contractors to explore implementation options (e.g., logistics, fuel availability/sourcing, costing, etc.) with the fuel supplier in the Prince George area. The estimated impacts in the above table are based on 20% fuel conversion. The impacts will be much greater if the conversion to clean/renewable diesel increases to 100% of total fueling needs for diesel fleets.								

Action	Timing	GHG Impacts	Economic Impacts	Adaptation / Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
2.5: Fuel efficient driver training & anti-idling policy	**2025**	**21.6 tCO_2e**	**$18k**	**Low**	**Low**	**Low**	**n/a**	**CSS, Corporate Services**
The most cost-effective way to reduce fleet emissions is through operator behaviour. The costs to implement an efficient vehicle use program will likely be more than offset by the direct savings on fuel purchases. The RDFFG will include this action as part of yearly training, or staff training plans. It will be included as part of new employee training. Training will be tracked in the employee's personal folder. An anti-idling policy will continue to be implemented by the RDFFG.								

Action	Timing	GHG Impacts	Economic Impacts	Adaptation / Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
2.6: Energy-focussed fleet maintenance	**2025**	**8.4 tCO_2e**	**$7.1k**	**Low**	**Low**	**Low**	**n/a**	**All**
Routine checks of vehicle systems (e.g. tire pressures, engine tuning), is a very low cost way to improve on emissions and reduce costs. This could be combined with regular safety inspections of vehicles (e.g. brakes). An example vehicle maintenance checklist is provided in Appendix G.								

Action	Timing	GHG Impacts	Economic Impacts	Adaptation / Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
2.7: Encourage carpooling where possible	**2025**	**n/a**	**n/a**	**Low**	**Low**	**Low**	**n/a**	**All**
This action encourages staff to carpool for work-related travel. Furthermore, travel needs can be reduced through attending off-site meetings virtually. The RDFFG already suggests that employees carpool when travelling out of RDFFG for conferences and meetings, which is infrequent.								

Action	Timing	GHG Impacts	Economic Impacts	Adaptation/ Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
2.8 Include emission targets in contracted services requirements	**2025**	**n/a**	**n/a**	**Low**	**Low**	**n/a**	**n/a**	**CSS, Env Ser, Finance**
Include emission targets and/or low-carbon fuel requirements for contracted services, such as waste transportation. Example contract language is provided in Appendix H.								

Renewable Energy

Action	Timing	GHG Impacts	Economic Impacts	Adaptation / Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
3.1:Assess and Install solar PV on corporate buildings	**2025**	**4.5 tCO_2e**	**$48k**	**High**	**Medium**	**High**	**FCM**	**Comm Serv, Env Serv, Public Safety**

The RDFFG will consider the potential for solar PV installation on all new corporate buildings and look for potential existing building. Solar PV is often more cost effective when installed on new buildings or when roof replacement is necessary on an existing building, ng. This action has the following benefits:

- Reducing risk by ensuring that the RDFFG owns assets that are "future proofed". I.e. that will have low energy costs, low GHG emissions (and hence low carbon tax payments / low offset requirements), and will be resilient to a changing climate (e.g. hotter and smokier summers).
- Reducing the need for buildings to be retrofit later.
- Ensuring that the RDFFG owns and operates high quality, low maintenance assets.
- Leading by example in the community on building best practices.

At minimum, when a building is re-roofed, it should be made solar-ready. This is low cost but can significantly reduce the cost of a solar installation later.

Action	Timing	GHG Impacts	Economic Impacts	Adaptation / Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
3.2: Low-carbon heating systems for buildings	**2025**	**124.6 tCO_2e**	**$25k**	**High**	**Medium**	**High**	**FortisBC, FCM**	**Building Maintenance, CSS**
Building energy audits as described in action 2.1 may identify opportunities to retrofit low-carbon heating systems. Similarly, low carbon heating systems should be considered for all new corporate buildings. Low-carbon heating systems may include air-source heat pumps and waste heat recovery. This action could lead to substantial GHG savings, but may have negative financial implications in the case of air-source heat pumps, due to the higher cost of electricity than natural gas. This action will tie-in with asset management and building maintenance/inspection programs at the RDFFG.								

Action	Timing	GHG Impacts	Economic Impacts	Adaptation / Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
3.3: Conduct corporate renewable energy study	**2025**	**n/a**	**n/a**	**High**	**Medium**	**Medium**	**FCM**	**CSS**
Renewable energy opportunities include the Prince George district energy system, electricity generation, and waste heat recovery. Solar PV was already discussed in action 3.1.								

Action	Timing	GHG Impacts	Economic Impacts	Adaptation / Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
3.4: Connect Office Building to District Energy System	**2027**	**80.7 tCO_2e**	**$9.7k**	**Medium**	**Medium**	**High**	**City of Prince George, FCM**	**Corporate services, Env Ser**
The main office building for the regional district lies adjacent to the Prince George district energy system. Connecting the building to the system would produce significant GHG savings by curtailing the use of natural gas, while producing minor energy cost savings.								

Existing Buildings & Infrastructure

Action	Timing	GHG Impacts	Economic Impacts	Adaptation/ Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
4.1: Conduct building energy audits	**2024**	**n/a**	**n/a**	**High**	**Medium**	**Low**	**FortisBC, FCM**	**Building Maintenance, Corporate Sustainability Specialist (CSS)**
The RDFFG will conduct energy audits of its buildings, beginning with those that consume the most energy. As the audits are completed, the RDFFG will then prioritize improvements based on audit results. The RDFFG may choose to prioritize projects based on energy cost savings or GHG emissions savings. The former is most likely to come from reduced electricity consumption whereas the latter is most likely to come from reduced natural gas consumption.								

Action	Timing	GHG Impacts	Economic Impacts	Adaptation / Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
4.2: Implement energy retrofits recommended by building energy audits	**2025**	**66.2 tCO_2e**	**$68k**	**High**	**High**	**High**	**FortisBC, FCM**	**Building Maintenance, CSS**
Upon completion of action 2.1, energy retrofits recommended by the energy audit reports should be implemented. A prioritization process will identify which projects to be completed first, based on energy cost savings or GHG emissions savings. Typically, energy retrofits that reduce electricity consumption will result in energy cost savings and energy retrofits that reduce natural gas consumption will result in GHG emissions savings. A project prioritization matrix can be found in Appendix E.								

Action	Timing	GHG Impacts	Economic Impacts	Adaptation / Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
4.3: Conduct energy-focused operational review of infrastructure	**2024**	**n/a**	**n/a**	**High**	**Medium**	**Low**	**FortisBC, FCM/UBCM Asset Management**	**Building Maintenance, Comm Serv, Env Serv, CSS**
The RDFFG will conduct an energy-focussed operational review of its infrastructure, which includes drinking and waste water systems as well as streetlights. It may be possible to identify areas of energy efficiency improvements, which would be planned and implemented after the review.								

Action	Timing	GHG Impacts	Economic Impacts	Adaptation / Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
4.4: Implement measures from operational review of infrastructure	**2025**	**0.0 tCO_2e**	**$2.5k**	**High**	**High**	**Medium**	**FortisBC, FCM**	**Building Maintenance, Env Serv, CSS**
The energy-focussed operational review of infrastructure (specifically water) will have identified areas of potential energy savings in the form of electricity. Due to the relatively high cost of electricity (compared with natural gas), there is the potential for significant energy cost savings.								

Action	Timing	GHG Impacts	Economic Impacts	Adaptation / Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
4.5: Incorporate energy management into annual building maintenance procedures	**2024**	**5.4 CO_2e**	**$16k**	**Medium**	**Low**	**Low**	**n/a**	**Building Maintenance, CSS**

Annual maintenance and safety inspections provide a convenient opportunity to incorporate energy management objectives. Specific actions include:

- Check programming of thermostats and lighting controls
- Check and replace weather stripping on doors and windows as necessary
- Monitor annual energy consumption to identify abnormal energy use
- Assess condition and maintenance dates of HVAC and hot water equipment

Two sample checklists are provided in Appendix F.

New Buildings and Infrastructure

Action	Timing	GHG Impacts	Economic Impacts	Adaptation/ Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
5.1 Build energy efficient buildings	**2025**	**19.8 tCO_2e**	**$15k**	**High**	**Low**	**Medium**	**n/a**	**Comm Serv, Env Serv, Public Safety**

The RDFFG will commit to build new buildings that are energy efficient and have low GHG emissions. Appendix I contains "Guiding Principles for Climate Ready Municipal Buildings" The benefits of doing so are;

- Reducing risk by ensuring that the RDFFG owns assets that are "future proofed", i.e. that will have low energy costs, low GHG emissions (and hence low carbon tax payments / low offset requirements), and will be resilient to a changing climate (e.g. hotter and smokier summers).
- Reducing the need for buildings to be retrofit later.
- Ensuring that the RDFFG owns and operates high quality, low maintenance assets.
- Leading by example in the community on energy efficient building practices, and ensuring that energy efficient best practices are disseminated throughout the community.

Action	Timing	GHG Impacts	Economic Impacts	Adaptation/ Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
5.2 Build energy efficient infrastructure	**2025**	**0.0 tCO_2e**	**$2.5k**	**High**	**Low**	**Medium**	**n/a**	**Env Serv, Public Safety**

The RDFFG will commit to building the most energy efficient and low emission infrastructure that it reasonably can. There are multiple benefits to doing this:

- Reducing risk by ensuring that the RDFFG owns assets that are "future proofed", i.e. that will have low energy costs, low GHG emissions (and hence low carbon tax payments / low offset requirements), and will be resilient to a changing climate (e.g., hotter and smokier summers).
- Reducing the need for infrastructure to be retrofit later.
- Ensuring that the RDFFG owns and operates high quality, low maintenance assets.
- Leading by example in the community by demonstrating best practices.
- Note that no RDFFG infrastructure uses any fossil fuels, hence the negligible GHG impact

Action	Timing	GHG Impacts	Economic Impacts	Adaptation/ Resilience Linkages	Incremental Effort	Incremental Cost	Possible Partner/ Funder	Staff Responsibility
5.3: Optimise siting and orientation of new buildings	**2025**	**3.3 tCO_2e**	**$2.5k**	**High**	**Low**	**Low**	**n/a**	**All, Project Manager, Comm Serv, Env Serv, Public Safety**

The RDFFG will commit to optimizing the siting and orientation of new buildings where possible. This includes optimizing orientation to benefit from passive solar gain and siting a building adjacent to a waste heat source if available. This action has the following benefits:

- Reducing risk by ensuring that the RDFFG owns assets that are "future proofed". I.e. that will have low energy costs, low GHG emissions (and hence low carbon tax payments / low offset requirements), and will be resilient to a changing climate (e.g. hotter and smokier summers).
- Reducing the need for buildings to be retrofit later.
- Ensuring that the RDFFG owns and operates high quality, low maintenance assets.
- Leading by example in the community on building best practices.

Many of these benefits are similar to 1.1 but can in some cases be realised for a lower cost and effort. For example, orientation of a building can ensure passive heat gain at cooler times of the year, while installing passive solar design features that will also reduce the summer heat gain.

Table 10 – Climate Actions in Detail

Appendix B. Inventory and Modelling Assumptions

This appendix contains details on the corporate energy & emissions inventory and projections for the RDFFG.

Inventories

Building and transportation inventories were created using energy and cost data provided by the RDFFG. Based on the data compiled, a full inventory year energy consumption, emissions, and costs for 2022

Emissions factors for inventory years are shown in Table 11 are sourced from the Province of BC[2]. The electricity emissions factors were adjusted in 2022[3] to include net electricity imports.

	GHG/GJ
Electricity	0.003
Natural gas	0.050
Gasoline	0.063
Diesel	0.069
Heating Oil	0.068
Propane	0.061

Table 11 – Emissions Factors

[2] https://www2.gov.bc.ca/assets/gov/environment/climate-change/cng/methodology/2020-pso-methodology.pdf

[3] https://www2.gov.bc.ca/gov/content/environment/climate-change/industry/reporting/quantify/electricity

Projections

CEA's Corporate model was used both to calculate the BAU trajectory, and to estimate the potential GHG reductions that could be achieved. Developed in 2019, the model builds on the RDFFG inventory data using population and assumptions. The model uses formulas both to calculate the BAU trajectory, and to estimate the impacts of each action.

The BAU trajectory was calculated by using available inventory data, and then projecting forwards using a population increase of 1.00% per year (the average annual increase between 2016 and 2021).

From 2023 onwards, all of the data is an estimate as a BAU projection.

For the BAU projection modelling, the assumption is that energy consumption and emissions will increase proportionally with increases to population, although the impact of policies from higher levels of government are also incorporated, and other assumptions. Only policies that have already been adopted and that will have quantifiable impacts are incorporated. Assumptions are:

- The Province's incremental steps to net zero energy ready buildings by 2032.
- Tailpipe emissions standards.
- Renewable & low carbon transportation fuel standards.
- The Government of Canada's Passenger Automobile and Light Truck Greenhouse Gas Emissions Standards requiring 100% of new passenger vehicle sales to be zero emission by 2035.
- How the impacts of a changing climate will affect building energy consumption, as outlined below.
    - Climate change data for the region obtained from ClimateData.ca.
    - Projected global emissions to 2030 currently places the world in the range for the IPCC's Fifth Assessment Report's Representative Concentration Pathway (RCP) 6.0 scenario.
    - RCP 6.0 scenario not available on ClimateData.ca, therefore RCP 4.5 (high impact scenario) used as a conservative proxy.
    - Decreases in commercial / institutional natural gas consumption assumed to be proportional to decreases in HDDs and the proportions of natural gas consumed for space heating for the sector, and that proportion obtained from the Navigant 2017 Conservation Potential Review for FortisBC Gas.
    - Decreases in commercial / institutional electricity consumption assumed to be proportional to decreases in HDDs and the proportions of electricity consumed for space heating for the sector. This proportion obtained from the Navigant 2016 Conservation Potential Review for BC Hydro.

Annual Variability Affecting Projections

Although CEA's model assumes that projections will be linear, there will be annual variability, primarily due to climatic variations (particularly on building energy consumption). These variations mean that it may often be necessary to collect several years of data before one can see the success or lack of it in implementation of an action, in the primary indicators. An exception to this will be streetlights, which have a remarkably similar consumption in each year, and so the impacts of actions taken should be immediately apparent.

Action impacts

To take into account the impact of implementing a climate action plan, the modelling tool estimates the impacts of actions compared to the BAU trajectory. It calculates the individual and combined impact of actions.

The impacts of individual actions depend on the assumptions made. CEA made educated estimates of the impacts that other actions can have.

Details on the impacts of individual actions on GHGs are described in the main body of this report, in Figure 10.

Appendix C. Implementation for Success

Several key factors are important for the successful implementation of energy and emission reduction plans based on research conducted by CEA, QUEST, and Smart Prosperity.[4] Among others, they include establishing broad support for implementation, building staff and financial capacity for implementation, and institutionalizing the plan in order to withstand political and staff turnover.

The RDFFG has political and staff support for climate action. The RDFFG does not, however, have a policy on funding GHG emissions reductions, but have hired a Sustainability Coordinator to work on 50% climate change related corporate projects and 50% asset management.

Funding sources that communities typically use for climate action are shown below. External funding sources should be pursued where available to accelerate action. The internal funding sources that the RDFFG sets aside can be used to leverage external funding to great effect.

Internal Funding Sources	External Funding Sources
• Allocation from operating budget (e.g. 0.1% annually) • Climate action revolving fund • Recycling and solid waste user fees • Bylaw enforcement and permit fees, and other service fees and/or utility user fees	• LGCAP rebate allocated for climate action • UBCM Gas Tax Agreement Funds • Federal government programs such as the Low Carbon Economy Challenge and Clean Energy Innovation Program • Several other grants and incentives as detailed below

[4] Community Energy Implementation Framework, https://questcanada.org/getting-to-implementation-in-canada/

Buildings

Funding	Target	Eligibility	Amount
FortisBC Commercial Energy Assessment Program	Energy assessment walkthrough of commercial buildings to identify energy conservation measures.	A commercial FortisBC natural gas and/or electricity customer The owner or leaseholder of a medium-sized business or small industrial/manufacturing facility.	Free
FCM GHG Reduction Pathway Feasibility	Access the feasibility of energy and GHG reducing projects	Projects can group buildings, but at least one building must be primarily used for providing athletic, recreational, or cultural services Target 50% GHG reductions within 10 years and 80% GHG reductions within the next 20 years.	Single building: Grant up to $65k, up to 80% of eligible costs. Portfolio of buildings: Grant up to $200k, up to 80% of eligible costs.
FCM GHG Reduction Pathway Capital Project	Capital project based on the above feasibility study.	Same as above Must be supported by the above study or an equivalent study	Maximum $5 million. Up to 25% as a grant and the remainder as a loan. Combined loan and grant for up to 80% of eligible project costs.
FCM GHG Impact Retrofit	Capital project to achieve at least 30% GHG reduction.	Either a single community building retrofit, or a portfolio of buildings including: multiple community buildings, one community building and other municipal buildings; or similar community buildings within multiple municipalities A maximum of one third of the total GHG reductions can come from on-site renewable energy generation.	Maximum $5 million. Up to 25% as a grant and the remainder as a loan. Combined loan and grant for up to 80% of eligible project costs.

FortisBC Custom Efficiency Program	**Funding for energy studies paired with implementation incentives and bonuses for energy-reducing measures.**	**Be a FortisBC natural gas customer under any rate class except Rate 1 and/or a FortisBC electricity customer.** **Be an owner or leaseholder of an industrial or commercial building.** **Select from FortisBC's list of approved consultants to perform an energy study.** **The project must have the potential to save a minimum of 1,000 GJ of natural gas or 50,000 kWh of electricity annually.**	**Energy study: Up to $37.5k, 75% of costs** **Implementation incentives: the lesser of $3 per lifetime GJs reduced, $0.02/ per lifetime kWh reduced, 75% project costs, or $500k.** **Implementation bonus: up to $12.5k, 25% of the energy study cost when at least one energy conservation measure is implemented**
FCM Sustainable Affordable Housing	Funding to plan, study, pilot, and either retrofit existing affordable housing units or construct energy efficient new builds.	Study: demonstrate and validate the project's environmental, social and economic benefits Pilots: 25% energy reduction or net-zero ready new builds, 30% units below median rent Retrofit: 25% reduction in energy consumption New builds: net-zero ready	Maximum funding and percentage of costs: Plan: $25k, 80% Study: $175k, 50% Pilot: $500k, 80% Retrofit: $10 million (grant & loan), 80% New build: $10 million (grant & loan), 20%
FCM Retrofit of Municipal Facilities	Funding to improve energy efficiency by at least 30% in municipal facilities.	Retrofits must reduce a building's energy use by at least 30%; a maximum of 10% can come from on-site, renewable energy.	Low-interest loan up to $5 million and a grant up to 15% of the loan; cover up to 80% of eligible costs.
BC Hydro Business energy-saving incentives	Funding for energy-efficient equipment upgrades	Varies	Up to 25% of the upfront costs of energy-efficient equipment (lighting, HVAC, refrigeration, and mechanical technologies)

Fleets

Funding	Target	Eligibility	Amount
FCM Fleet Fossil Fuel Reduction	Study, pilot, and capital projects that reduce or avoid fossil fuel use in municipal vehicles.	Reduce GHG emissions by 20% Municipal fleet or private vehicles that deliver municipal services	Study: up to 175k, 50% of costs Pilot: up to 500k, 50% of costs (up to 80% for municipalities under 20,000) Capital: loan up to $5 million, grant up to 15% of the loan; up to 80% of eligible costs.
BC Hydro Incentives	Funding for EV ready fleet plan and infrastructure. Note: there are minimum fleet number requirements.	Varies	50% of planning costs up to $10,000. Up to 50% of infrastructure costs, not including charging equipment.
Commercial Vehicle Pilot Program	Funding for on and off-road electric vehicles and supporting infrastructure.	On-road weight class 3 and 4 must deploy a minimum of six ZEVs. Weight class 5 and 6 must deploy a minimum of three ZEVs Weight class 7 and 8, and off-road vehicle types, there is no minimum vehicle deployment number.	Up to 100k, 33% of eligible project costs
Specialty Use Vehicle Incentive	Rebates on zero-emission motorcycles, low-speed vehicles, on road Medium- and Heavy-Duty vehicles, airport and port specialty vehicles and utility vehicles.	Eligible vehicles: battery electric, hydrogen, or plug-in hybrid (MHDV and specialty vehicles only) Vehicles must be new	Varies. MHDV: Up to $100,000 or 33% of the purchase price, whichever is lower

Go Electric Fleets Program	**Rebates for fleet assessments and EV infrastructure.**	**Open to B.C. registered companies, non-profit organizations and public entities**	**Free advisory services.** **Fleet assessments: $5,000 (50%)** **Electrical infrastructure: $20k (33%)** **Charging infrastructure: $5k/L2 (75%), $75k/ 50kW DCFC (75%)**

Additional Funding

FCM Municipal Asset Management Program offers up to $50k towards funding, training and resources to help strengthen asset management practices.

UBCM Asset Management Planning Program offers up to $25k for up to 50% of project costs for asset management training, planning, and development.

Infrastructure Planning Grant Program offers up to $10k to help local governments develop or improve plans such as asset management, integrated stormwater management, liquid waste management, and water master plans.

FCM Green Municipal Fund – Wastewater, stormwater offers funding for studies, pilots, and capital projects related to stormwater quality improvement, water conservation, and wastewater and septic systems.

The RDFFG already has incorporated climate action into some documents such as the 2015 Regional Solid Waste Management Plan. In addition to these actions, the RDFFG should consider:

- Discussing climate action implications in all reports to the Board.
- Dedicating funds to climate action annually as part of the operating budget and maintaining a reserve fund for larger climate action projects.
- Incorporating climate action into job descriptions of other RDFFG staff. Climate action is the responsibility of all departments, and there is greater chance of success if responsibility is formally shared.
- Investing in education and professional development for all RDFFG staff on climate change, climate mitigation, and climate adaptation.
- Embed climate action into the budgeting process.
- Monitoring indicators that are easy to track to help ensure that progress is being made.
- Host regular meetings to discuss implementation with internal and/or external stakeholders.
- Reporting on indicators as part of an annual report to Board.
- Joining PCP and progressing through the milestones.
- Renewing this plan in five years.

What is a Climate Action Revolving Fund?

Climate action revolving funds invest in energy efficiency projects to reduce energy consumption and hence energy expenditures. Energy cost savings are then reinvested in future projects. They are called "revolving funds" because all or a portion of the savings from previous projects are used to fund new projects, and fund "revolves" in this way. Two local governments in BC have implemented such a fund, Summerland and Vernon. BC Crown Corporations have also implemented these, e.g. Health Authorities. Although conceptually intuitive, they can be difficult to implement in practice.

Appendix D. Sample Project Scoring Matrix

Project #	Date Reviewed

Reviewed By: _____

I. Project Overview	
Project Title	**Analysed By:**
	Name:
	Dept:
Project Lead:	**Supporting Staff (if applicable):**
Name:	**Name(s):**
Dept:	**Dept(s):**

II. Project Metrics		
	Annual Average	**Life of Project**
Emissions Avoided (tCO_2e)		
Financial Savings ($)		

Simple Payback (yrs) after external funds:	Annual ROI (%) after external funds:	Cost per tCO_2e avoided ($):
Project References / Success Examples:		

Category	Point Value	Poor 0.0	Fair 0.25	Acceptable 0.5	Good 0.75	Excellent 1.0	Total
Potential to Reduce GHG Emissions (50)							
Total GHG Reductions per $ (Community funds only, after external funds)	20						
Annual GHG Reductions	10						
Lifespan of Project	10						
Replicability of Project within community	10						
Ease of Implementation / Business Case (30)							
Ease of implementation (staff time)	10						
Business case (simple payback or ROI)	10						
External funding sources likelihood	10						
Other Considerations (20)							
Impacts to Health and Safety	5						
Project Visibility/Innovation	5						

Benefits to Community	5						
Other Resources Conserved	5						
Total Points Available	**100**	**Total Points This Application**					

Other Key Criteria:

- Staff capacity
    - Project leads and project supports should each determine their capacity to take on projects.
    - Limit projects they take on to their capacity.
    - Select most effective projects first, to maximise effectiveness of staff capacity.

- RDFFG funds – budgeting
    - Departments should each determine the ability of their funds to pay for projects.
    - Limit projects based on available funds.
    - Select most effective projects first, to maximise effectiveness of departmental funds.

Appendix E. Sample Building Maintenance Checklists

Sample 1

Building System Optimization – Simple Energy Efficiency Retrofit Measures

Space Heating and Cooling

☐ Building envelope sealing – caulk and draught proof around windows and doors, and other gaps on exterior walls.

Lighting, Appliances and Equipment

☐ Replace any remaining incandescent bulbs with LEDs.

☐ Improve safety and energy efficiency by converting Exit signs to LED. For Exit signs use LED products that maintain their brightness.

☐ Put vending machines on a vending miser – a device with a motion sensor so that it only switches on when people are present.

☐ Plug certain appliances into intelligent power bars with master/slave functions or motion sensors. These can be used for TVs, bench tools, compressors, task lighting, auxiliary heating, printers, coffee makers, microwaves, beverage coolers, or similar devices. (Appliances that need a controlled shutdown sequence, e.g. computers or many ink-jet printers, should not be plugged into such a power bar.)

☐ Unplug or remove unused or rarely used equipment (equipment that is not “on” may still use electricity).

Water – hot and cold

☐ Install aerators on taps in bathrooms and kitchens.

☐ Install low flow shower heads.

☐ Install timers, motion detectors, or flushes to save water with urinals.

☐ Install insulation on hot water pipes where accessible.

☐ Insulate domestic hot water tanks installed before 2005 (if they are not due for replacement).

☐ Turn down domestic hot water tank to lowest acceptable setting, e.g. 55°C (131 F).

Occupant engagement

☐ Dedicate a staff member on energy efficiency for each building, tasked with ensuring lights and equipment are off at the end of each day, and thermostats are correctly set.

Put up signs to:

☐ Remind people to switch off lights.

☐ Remind people to switch off equipment when not in use, including computers, monitors, printers, and photocopiers.

☐ Where there are programmable thermostats, explain how to use these without permanently overriding the settings (install lockable boxes around them if necessary).

☐ Encourage people to close window blinds when leaving a room.

☐ Encourage employees to participate in residential energy efficiency programs. If energy efficiency practices are adopted at home, they are more likely to be adopted in the work place.

Sample 2

MONITORING	
Each billing period	Ensure the energy consumption for bills of each facility is monitored by the local government as each bill arrives (recording of energy consumption needs to be conducted for the Climate Action Revenue Incentive Program public reporting anyway). Monitor the consumption for any obvious changes, comparing it especially with billing periods with similar weather, e.g. the same billing period in previous years. Large changes in consumption should be investigated as well as the appearance of any special charges, e.g. demand charges or power factor charges.
SPACE HEATING / COOLING	
Monthly	Check settings of Building Automation Systems / thermostats.
Monthly	Inspect, clean, and change HVAC air filters once a month (or according to equipment specifications).
Twice a year	Ensure building temperatures are adequate for building occupants.
Annually	Check weather stripping and caulking around doors and windows. Fix any problems.
Annually	Check HVAC equipment for any obvious signs of problems, e.g. vents/blowers not operating correctly.
Annually	Clean evaporator and condenser air conditioning coils – dirty coils can increase energy costs and reduce equipment life
Annually	Check air conditioner refrigerant levels – too much or too little refrigerant can increase energy costs and reduce equipment life.
LIGHTING, APPLIANCES, EQUIPMENT	
Twice a year	Ensure lights are still working. Ensure no incandescent lightbulbs are installed.
Twice a year	Ensure light sensors are working correctly, e.g. motion sensors for interior lights, and photosensors for exterior lights.
Twice a year	Ensure intelligent power bars and vending misers, where they are being used, are working correctly.
WATER – HOT & COLD	
Annually	Ensure low flow devices working correctly, e.g. timers for urinals.
Annually	Check hot water temperature. If water is too hot or cold, adjust the tank's settings.

OCCUPANT ENGAGEMENT	
Monthly	Check-in with dedicated staff member on energy efficiency for that building.
Twice a year	Ensure signs to encourage energy efficient behaviour (like switching off lights) are still in place.
Twice a year	Ensure posters and leaflets encouraging occupant participation in residential energy efficiency programs are still in the facility, and current. (If energy efficient practices are adopted at home, they are more likely to be adopted by occupants in the work place.)
VEHICLES	
Each winter	Ensure engine block heaters are on a suitable schedule. Experiment to find the optimum schedule for employee comfort and energy efficiency. E.g. on/off for 20 minutes, every 20 minutes, during the coldest months of the year.
SKILLS	
Annually, or every 2 years	Consider going on an energy efficiency course or sending a member of staff on one. Training and workshops may be available through FortisBC, or through professional associations.
SERVICE CONTRACTS	
At contract renewal	Ensure service contracts (where applicable) support energy efficient operations. Energy efficiency can be written in to contract terms during renewal.

Appendix F. Sample Vehicle Inspection Report

OAKVILLE

Vehicle Inspection Reports

Truck / Trailer Make		Truck Unit #	Date: mm/dd/year
Truck License Plate #	Trailer License Plate #	Trailer Unit #	Odometer Finish
☐ Pre -trip	Inspection Location: Oakville, Ontario	Time: AM PM	Odometer Start
☐ Post -trip	Inspection Location: Oakville, Ontario	Time: AM PM	Total Km's Driven

Driver(D) use X if item is not satisfactory — **Mechanic (M) use √ + your initials when defect corrected**

Truck	D	M	Truck	D	M	Truck	D	M	Trailer / Towed Vehicle	D	M
Air Brake Adjustments + Connections			Wheels, Rims + Fasteners			Defroster / Heaters, Fans & Controls			Air Brake Adjustment / Brake Components		
Air Compressor			Condition of Tires + Proper Inflation			Steering Wheel			Parking Brake		
Air Lines - Supply + Service			Fire Extinguisher			Air / Electric Horn			Electric / Hydraulic Brakes		
Air Brake Pressure			First Aid kit			Doors, Locks, Handles			Ownership / Valid Insurance		
Parking Brake			Reflective Triangles			Body Damage			Annual Inspection Sticker / Certificate		
Low Air Warning Signals			Stop/Brake & Tail Lights			Cleanliness of Cab			Valid License Plate		
Brake Pedal			Clearance Lights / Reflectors			Mirrors			Lights + Reflectors		
Air Tanks			Turn / Hazard Signals			Load Security			Ramps / Tailgates		
Hydraulic Brakes			Auxiliary Lighting			Mud Flaps			Wheel, Rims, Fasteners		
Electric Brake / Controls			Exhaust Systems			Plow Assemblies			Condition of Tires + Proper Inflation		
Chassis, Frames and Cross Members			Radiator & Fluid Level			Body Damage			Suspension, Springs, Air bags + Controlling Attachments.		
Clutch + Adjustment			Fuel Systems			Valid License Plate			Jack / Landing Gear		
Transmission			Engine			Ownership / CVOR			King Pin / Plate		
Rear End / Axles			Battery(ies)			Valid Insurance			Pintle Hook / Ball Hitch		
Suspension, Springs, Air Bags and Controlling attachments			Oil Pressure & Level			Annual Inspection Sticker / Certificate			Load Security		
Drive Line			Windshield + Windows			Seat Belt			Body Damage		
5th Wheel / Pintle / Ball			Windshield Wipers + Washers			Other Attachments			Other		

Driver's Comments:

Mechanic's Comments:

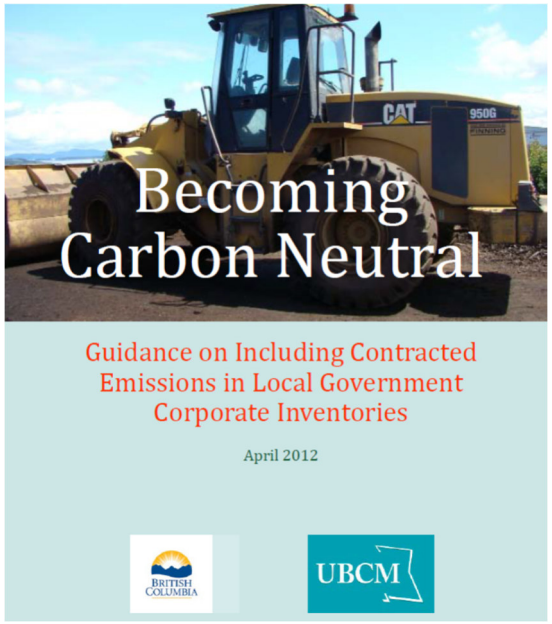
☐ Conditions of above vehicle satisfactory. ☐ Above defects corrected.

☐ Above defects need not be corrected for safe operation of vehicle. Repair Order #:

Driver's Name: (Print and sign)	Time:	AM PM	Date: mm/dd/year
Mechanic's Name: (Print and sign)	Time:	AM PM	Date: mm/dd/year

Appendix G. Service Contract Language

Source: *Becoming Carbon Neutral: Guidance on Including Contracted Emissions in Local Government Corporate Inventories, April 2012* found at **www.toolkit.bc.ca**
A sample contracted Emissions Template is available online at **http://www.toolkit.bc.ca/carbon-neutral-government**
Sample Contract Language:



Vehicle and Fuel Data

Requirement for Fuel Consumption Data Provision

Commencing on [start date] the [name of local government] will require [name of contractor] to communicate the quantity of fuel used to operate vehicles, equipment and machinery as part of the delivery of the services described in this contract on a [frequency of reporting] basis. Fuel consumption associated with the provision of these services must be provided to the [name of local government] within thirty (30) days of the following dates: [dates on which fuel consumption data will be required by the local government].

Data provided should include the following information:

- Number of vehicles, by vehicle class, used to deliver the contracted service (heavy duty, light duty, off road);
- Type of fuel consumed by each vehicle class (e.g. diesel/gasoline/natural gas/ethanol blend/biodiesel blend); and
- Litres of fossil fuels consumed in relation to the service delivered under the contract in each vehicle class, up to the dates specified above.

Fuel Consumption Data

Requirement for Fuel Consumption Data Provision

Commencing on [start date] the [name of local government] will require [name of contractor] to communicate the quantity of fuel used to operate vehicles, equipment and machinery as part of the delivery of the services described in this contract on a [frequency of reporting] basis. Fuel consumption associated with the provision of these services must be provided to the [name of local government] within thirty (30) days of the following dates: [dates on which fuel consumption data will be required by the local government]

Appendix H. Sample Policies

Green Fleet Policy Template

Adopted {insert date}

POLICY NUMBER:

CHAPTER:

SECTION: CORPORATE SERVICES / GREENHOUSE GAS EMISSIONS REDUCTION

SUBJECT: LOCAL GOVERNMENT GREEN FLEET POLICY

RESOLUTION:

EFFECTIVE DATE: **REVISION DATE:**

1. RESOLUTION

THAT the Green Fleet Policy for the replacement and maintenance vehicles utilized by the Local Government be adopted.

2. OBJECTIVE

To formalize and clarify fleet replacement policies and practices and to support climate action policies to reduce GHG emissions and related pollutants by acquiring the most appropriate vehicle and equipment, minimizing fuel consumption, improving driver satisfaction and equipment life and reducing operating costs.

3. INTRODUCTION

- The Local Government shall utilize a green vehicle purchasing strategy in the replacement of vehicles.

- The Local Government utilizes a fleet of vehicles to support both general operations and service delivery.

- The Local Government will ensure that vehicles under its control are acquired, assigned, utilized, replaced and maintained in the most efficient and effective manner possible.

4. DEFINITIONS

Local Government vehicle - means any licensed motor vehicle owned, rented, borrowed, or leased by the Local Government and used primarily to transport people or property over roads, highways or Local Government property. Rental vehicles are considered Local Government vehicles when rented by a duly authorized employee and while used for official Local Government business.

Operator - means any authorized Local Government employee, or other individual approved by the Chief Administrative Officer (CAO), who is in control of a Local Government vehicle and who possesses a valid driver's license for the type of vehicle operated.

Fleet manager - means the individual designated by the CAO to manage the Local Government vehicles.

Specialty use vehicle - means Local Government fleet vehicles especially equipped for specific function or purpose.

5. RESPONSIBILITY FOR IMPLEMENTATION

There will be one fleet manager, appointed by the CAO, who will be responsible for overall fleet management. He/she will work with department managers to meet their department's fleet vehicle needs within approved financial plans.

6. GREEN FLEET VEHICLE POLICY

a) As per the Local Government's goal to achieve carbon neutrality in part by reducing corporate greenhouse gas emissions from fleet vehicles, the Local Government is committed to:

- Reducing GHG emissions;
- Reducing emissions of other pollutants;
- Reducing vehicle idling;
- Reducing single occupancy trips;
- Purchasing more efficient vehicles and fuels;
- Right-sizing vehicles;
- Considering life cycle costs of fleet vehicle operations when purchasing vehicles;
- Maximizing vehicle efficiency.

b) Vehicle Attributes: Local Government vehicles shall have the following minimum attributes:

- Be right-sized for its intended purpose(s).
- The ability to securely haul materials and equipment required for intended purpose.
- Air conditioning and all wheel drive/four wheel drive features, are optional and only where appropriate.
- Colour = _____
- Acceptable fuel mileage for the anticipated use. The use of electric vehicles, plug-in hybrids, hybrids, vehicles that use other zero / low GHG fuels, and fuel efficient vehicles, with the intent of reducing the Local Government's carbon footprint, are required wherever operational requirements allow.
- Acceptable crash/safety ratings.

c) Right-Sizing Purchasing: Local Government vehicles should be purchased according to the average or usual anticipated use of the vehicle. Occasional vehicle needs that exceed the capacity of the vehicle purchased should be met through vehicle sharing or renting. The following use requirements should be considered when purchasing a vehicle:

- Engine size;
- Vehicle weight;
- Average carrying capacity;
- Average passenger capacity;
- Average terrain.

d) Life Cycle Cost: Life cycle costs should be considered for all vehicle purchases. Life cycle costs should include: capital costs, maintenance costs, fuel costs and resale costs.

e) Fuel Choice: The lowest GHG emission fuel possible should be purchased for all vehicles in the fleet. Consideration of fuels should include:

- Purchasing vehicles that run on zero / low GHG fuels, e.g. electricity, hydrogen, biodiesel, bioethanol, natural gas. The focus should be on electric, plug-in hybrid, and hydrogen vehicles.
- Purchasing low emission fuel for fleet vehicles that cannot be electric or plug-in electric (i.e. renewable natural gas, gasoline with a high percentage of bioethanol and diesel with a high percentage of biodiesel);
- Purchasing vehicles with an acceptable fuel consumption mileage for the anticipated use. The use of electric vehicles, hybrids and fuel efficient vehicles, with the intent of reducing the Local Government's carbon footprint, is required wherever operational requirements allow.

f) Operating: Fleet vehicles shall be operated with the following considerations:

- Idling shall be reduced among all fleet vehicles and the following guidelines shall be followed by all fleet vehicle operators:
    a. Reduce warm-up idling (no more than 30 seconds as long as windows are clear);
    b. Vehicles are to be turned off when stopped for more than 10 seconds except in the following circumstances: in traffic; in the course of performing a specific duty that requires the vehicle be left running; if the outside temperature is below -10°C; or if doing so would compromise human safety or the mechanical integrity of the vehicle.
- Vehicle sharing shall be encouraged. Single occupancy vehicle trips will be minimized. Vehicles should be shared between departments to ensure maximum efficiency for vehicle use.
- Driver education and driving procedures to increase the efficiency of vehicle operations, including anti-idling, should be included in driver training programs for Local Government staff.

g) Vehicle Maintenance and Monitoring: Fleet vehicles shall be operated with the following considerations:

- All Local Government vehicles shall be kept in good mechanical condition and shall be inspected at required intervals.
- Maintenance on fleet vehicles should continue to ensure that preventative maintenance continues to maximize the efficiency of all vehicle operations.
- All vehicles shall be monitored to track fuel consumption, fuel costs, mileage and maintenance costs.

h) Vehicle Replacement and Acquisition:

- In general Local Government vehicles will be considered for replacement when they have at least 5 years of service and 150,000 kilometres. Vehicles may be retained beyond this point if they are in good working order and are meeting the needs of the Local Government. Alternatively, vehicles that have excessive maintenance, carbon emissions, other air pollutant emissions, or operating costs may be replaced sooner.
- All vehicle replacements are to be identified in the approved Financial Plan.
- All Local Government vehicles shall be purchased in accordance with the Local Government purchasing policy.
- All vehicles shall be acquired in a manner consistent with budgetary intent.

i) Consider joining programs to assist with reducing fleet GHG emissions

Green Purchasing Policy Template

Adopted {insert date}

POLICY NUMBER:

CHAPTER: FINANCE

SECTION: EXPENDITURES

SUBJECT: GREEN PURCHASING POLICY

RESOLUTION:

EFFECTIVE DATE: **REVISION DATE:**

1. RESOLUTION

THAT the Green Purchasing Policy to require energy considerations of product selection, life cycle costing in operational decision making and encourage green procurement be adopted.

2. OBJECTIVE

To support Local Government corporate initiatives with respect to sustainability and environmental stewardship, including the Local Government's corporate GHG reduction targets.

3. INTRODUCTION

The Green Purchasing Policy requires that energy considerations and life cycle costing inform product selection and purchasing decisions and encourages green procurement. Products are chosen based on best overall value, not just the lowest price.

4. POLICY

a) The Local Government will buy in the open market and will seek the best value and service for its purchasing dollars. The placement of orders and awarding of contracts will be based on best value to the Local Government.

b) Purchasing decisions are to be based on the life cycle cost of the acquisition rather than just the initial purchase price. Life cycle costs include operation, repair, staff, and disposition costs as well as the invoice price.

c) In order to minimize the Local Government's environmental impact and carbon footprint, staff will review their requirements to ensure that specifications are amended to provide for use of goods and services with lower environmental impact and specifically to follow the steps to sustainable purchasing, life cycle costing and energy efficient equipment purchasing.

5. STEPS TO SUSTAINABLE PURCHASING

In considering future purchases, the Local Government will follow the steps to sustainable purchasing in product selection and decision-making:

a) Rethink purchase – is it necessary?

b) Rent, lease or buy it second hand.

c) Choose a durable or longer-life product and compare cost to disposable product.

d) Choose products or services designed to address specific environmental or social concerns.

e) Choose suppliers committed to sustainability.

f) Calculate the total cost (i.e., storage, maintenance, need to buy additional equipment, energy use, waste disposal, administration).

g) Reduce the transportation impacts.

6. LIFE CYCLE COSTING PURCHASING

In considering future purchases, the Local Government will undertake life-cycle costing in determining the full cost of a product or service. Steps in life cycle costing include:

a) Compare the costs of different products and different purchasing choices.

b) List and compare the accessory activities and costs associated with owning a particular product, such as: storage, maintenance, accessory equipment, operating costs, energy and water use, environmental hazards, waste disposal, training and administration.

c) Purchase based on total costs. Total cost = acquisition + use + disposal and post-disposal costs.

7. ENERGY EFFICIENT EQUIPMENT PURCHASING

The Local Government shall purchase energy efficient equipment, supplies and appliances whenever possible. This requires that product specifications be compliant with ENERGY STAR® guidelines and recommendations and/or Natural Resources Canada guidelines and recommendations.

Energy efficient equipment includes but is not limited to: appliances, HVAC equipment, electric motors, office equipment, lighting and signage, transformers, consumer electronics, vending machines, etc.

The Local Government purchase of energy efficient equipment has the following potential benefits:

- Reduced energy costs and electricity demand;
- Reduced impact on the environment;
- Reduced life cycle cost;
- Extended life and reduced operation and maintenance costs; and
- Manufacturer, government or utility company purchase incentives.

Green Event Policy Template

Adopted {insert date}

POLICY NUMBER:

CHAPTER:

SECTION:

SUBJECT: LOCAL GOVERNMENT GREEN EVENT POLICY

RESOLUTION:

EFFECTIVE DATE: **REVISION DATE:**

1. RESOLUTION

THAT the Green Event Policy to reduce the environmental impact of events hosted by the Local Government be adopted.

2. OBJECTIVE

To support climate action policies to reduce GHG emissions, waste, and other environmental impacts by reducing the impacts of Local Government hosted events.

3. INTRODUCTION

The Green Event Policy requires that GHG and environmental considerations inform how events are conducted, not just the lowest price.

4. POLICY

a) The following are discouraged and encouraged:

Discouraged	Encouraged
Disposable items, including plates, cutlery, cups, single-use water bottles	Reusable dinnerware, and water jugs of local tap water with glasses
Disposable give-away items / prizes	Service-based prizes
Bleached paper napkins	Paper napkins with recycled content
Single-use condiment packets	Reusable containers/squeeze bottles
Garbage-only receptacles	Labeled garbage, recycling, compost receptacles
Food and drink with non-recyclable packaging	Minimal packaging or recyclable packaging
Disposable shipping boxes	Reusable shipping containers
Cellophane wrap and polystyrene	Reusable serving trays/platters
Disposed extra food	Composted or donated
Imported produce	Seasonal, regional produce (where available)
Non-edible garnishes	No garnishes or edible garnishes

Guidelines are meant as guidelines only and all applicable food, health and safety regulations must be met.

Guiding Principles for Climate Ready Municipal Buildings

Adopted {insert date}

POLICY NUMBER:

CHAPTER:

SECTION: GREENHOUSE GAS EMISSIONS REDUCTION / CLIMATE CHANGE ADAPTATION

SUBJECT: GUIDING PRINCIPLES FOR CLIMATE READY MUNICIPAL BUILDINGS

RESOLUTION:

EFFECTIVE DATE: **REVISION DATE:**

1. RESOLUTION

THAT the Policy on Guiding Principles for Climate Ready Municipal Buildings, to evaluate GHG emission reduction and climate adaptation potential in Municipal buildings, be adopted.

2. OBJECTIVE

To ensure that all new Local Government buildings are built to have as low GHG emissions as possible, and are built to be resilient to forthcoming climatic changes. Also to ensure that all existing Local Government buildings have their GHG emissions reduced on an ongoing basis, and are able to be resilient to forthcoming climatic changes.

3. INTRODUCTION

The Local Government is committed to corporate and community energy and GHG reductions, and to being resilient to climatic changes. Therefore it will establish a procedure to build and operate all Local Government buildings with the lowest GHGs possible, and ensure that they will be able to continue to operate effectively when considering predictions of coming climatic changes that will likely take place over their lifespan.

4. POLICY

New Civic Buildings:

a) Aim to construct carbon neutral corporate buildings, e.g. by following Canada Green Building Council's Zero Carbon Building Standard.

b) Incorporate high performance attributes into new civic buildings so that they meet the highest level of the BC Energy Step Code and strongest requirements of the Zero Carbon Step Code for its building type. If the building type is not included in the Energy Step Code, choose the appropriate alternative energy standard:
    - Meeting or exceeding ASHRAE 90.1-2022 (for all other building types)
    - National Energy Code for Buildings (NECB) 2020
    - LEEDv4 or v4.1 Energy Performance requirements

c) Aim to build with materials with low embodied carbon emissions, e.g. favouring sustainably sourced wood, or low GHG concrete over conventional concrete.

d) Consider forthcoming climatic changes that are likely to occur over the lifespan of the asset in its design and construction.

Existing Civic Buildings:

e) Follow sustainable operation and maintenance best practices guidelines for new and existing buildings, which emphasize conservation, optimized building performance, and continued improvement in energy use, water efficiency, and indoor environmental quality.

f) Maximize energy and operational efficiency through the selective re-commissioning of civic facilities on an on-going basis. Re-commissioning is a form of quality assurance testing that is carried out to ensure that building physical plant systems operate as effectively as possible given occupancy patterns and building function.

g) Strive for GHG emission reductions at all existing civic facilities on an ongoing basis through conducting energy assessments and implementing the recommended measures.

h) Strive for continual decreases in corporate building greenhouse gas emissions through the above measures to help meet municipal GHG reduction targets.

i) Strive to ensure that buildings are equipped to be resilient and effective over the course of forthcoming climatic changes that are likely to occur over their remaining lifespan.

Climate Ready Infrastructure

Adopted {insert date}

POLICY NUMBER:

CHAPTER:

SECTION: GREENHOUSE GAS EMISSIONS REDUCTION / CLIMATE CHANGE ADAPTATION

SUBJECT: ENERGY RECOVERY OPPORTUNITIES POLICY

RESOLUTION:

EFFECTIVE DATE: **REVISION DATE:**

1. RESOLUTION

THAT the Climate Ready Infrastructure Policy to evaluate GHG emission reduction and climate adaptation potential in the planning of Local Government infrastructure assets be adopted.

2. OBJECTIVE

To operate and manage Local Government infrastructure assets, including natural ones, in a manner that conserves energy, reduces greenhouse gas emissions, and is resilient to climatic changes.

3. INTRODUCTION

The Local Government is committed to corporate and community energy and GHG reductions, and to being resilient to climatic changes. Therefore it will establish a procedure to build and operate all Local Government infrastructure assets with the lowest GHGs possible, consider natural assets, and ensure that infrastructure will be able to continue to operate effectively when considering predictions of coming climatic changes that will likely take place over the lifespan of those assets.

4. POLICY

On an ongoing basis, the Local Government shall evaluate opportunities to ensure that infrastructure assets have the lowest GHGs possible, and are resilient to climatic changes. The Local Government will also evaluate natural assets as part of its infrastructure assets, with the benefits these bring.

5. PROCEDURE

a) The Local Government shall conduct energy studies for its existing grey infrastructure assets, and implement recommendations to reduce GHG emissions by as much as possible;

b) Develop a natural asset inventory and expand the evaluation of nature-based solutions for infrastructure projects, including consideration of co-benefits such as carbon sequestration and wildlife;

c) Build new grey infrastructure assets so that they have zero (or as low as possible) GHG emissions, and have as low operational energy costs as possible;

d) Incorporate life-cycle costing into both the infrastructure capital and operational decision-making process;

e) Consider embodied / life-cycle carbon emissions as part of all new infrastructure decisions.

Appendix I. Data Gathering Template

Asset-based data table – Update annually

ID	Name	Address	LGCAP Classification	Energy (GJ)								
				Electricity	Natural Gas	Heating Oil	Propane	Gas	Diesel	Total	Fleet Total	Building Total
1101	Bear Lake Community Commission	320 Hart Lake Rd, Bear Lake	Arts, Recreation and Cultural Services									
1202	Community Services		Arts, Recreation and Cultural Services									
1412	Office Building	155 George Street	Administration and Governance									
1424	Network		Administration and Governance									
2201	Untidy and Unsightly Premises		Street Lighting									
2401	Bear Lake Fire Protection	320 Hart Lake Rd, Bear Lake	Fire Protection									
2402	Buckhorn Fire Protection	5645 Buckhorn Lake Rd	Fire Protection									
2403	Pineview Fire Protection	8535 Pooley Rd	Fire Protection									
2404	Valemount & District Fire Protection	1380 5th Ave, Valemount	Fire Protection									
2405	Beaverly Fire Protection		Fire Protection									
2406	McBride District Fire Protection	875 SW Frontage Rd, McBride	Fire Protection									
2407	Ferndale / Tabor Fire Protection	16315 Giscome Rd	Fire Protection									
2408	Hixon Fire Protection	367 Von Lienen Rd	Fire Protection									
2409	Salmon Valley Fire Protection	5155 Salmon Valley Rd	Fire Protection									
2410	Ness Lake Fire Protection	9770 Lakeside Dr	Fire Protection									
2411	Red Rock / Stoner Fire Protection	4030 E Red Rock Rd,	Fire Protection									
2412	Shell-Glen Fire Protection	3985 Shelley Rd	Fire Protection									
2413	Pilot Mountain Fire Protection	9070 Syms Rd	Fire Protection									
2501	Chilako/Nechako Rescue Service		Not Traditional Service									
2502	Area D Rescue Service		Not Traditional Service									
2503	911 Emergency Response Service	2259 S Quinn Street	Fire Protection									

2506	Valemount & District Rescue Service		Fire Protection										
2901	Inspection Services		Administration and Governance										
3001	Bear Lake Street Lighting		Street Lighting										
3002	Hixon Street Lighting		Street Lighting										
3003	Pineview Street Lighting		Street Lighting										
3004	Red Rock Street Lighting		Street Lighting										
3005	Buckhorn Street Lighting		Street Lighting										
3006	Willow River Street Lighting		Street Lighting										
3007	Shelley Street Lighting		Street Lighting										
3008	McLeod Lake Street Lighting		Street Lighting										
3009	Chief Lake Street Lighting		Street Lighting										
3305	Solid Waste Management		Solid Waste Transportation										
3901	Foothills Boulevard Regional Landfill		Solid Waste Transportation										
3902	Mackenzie Transfer Station		Solid Waste Transportation										
4001	Regional Land Use Planning		Arts, Recreation and Cultural Services										
5001	Regional Parks		Arts, Recreation and Cultural Services										
5003	Robson Valley Recreation Centre		Arts, Recreation and Cultural Services										
5004	Nukko Lake Community Hall		Arts, Recreation and Cultural Services										
5006	Sinclair Mills Community Hall		Arts, Recreation and Cultural Services										
5007	Bear Lake Recreation Facilities		Arts, Recreation and Cultural Services										
5008	Canoe Valley Recreation Centre		Arts, Recreation and Cultural Services										
5009	Reid Lake Community Hall		Arts, Recreation and Cultural Services										
5010	Tete Jaune Community Hall		Arts, Recreation and Cultural Services										
5011	Dome Creek Recreation Facility		Arts, Recreation and Cultural Services										
5014	Robson Valley Community Centre		Arts, Recreation and Cultural Services										
8001	Bear Lake Water		Drinking and Waste Water										
8005	Azu Water		Drinking and Waste Water										
9001	Tabor Lake Sewer		Drinking and Waste Water										
9003	Bendixon Sewer		Drinking and Waste Water										
9004	West Lake Sewer		Drinking and Waste Water										
9004-E	Exploration Place		Arts, Recreation and Cultural Services										

9004-O	Off Site Storage		Administration and Governance									

Aggregate totals for energy, emissions, and cost:

LGCAP Classification	Energy	Emissions	Costs
Administration and Governance			
Arts, Recreation and Cultural Services			
Drinking and Waste Water			
Fire Protection			
Street Lighting			
Solid Waste Transportation			
Total			
Energy Source	Energy	Emissions	Costs
Electricity			
Natural Gas			
Gasoline			
Diesel			
Heating Oil			
Propane			
Total			