# 2020 CLIMATE CHANGE MITIGATION PLAN

## Technical Report

May 2020

Prepared for FCM's Partners for Climate Protection Program

CITY OF
PRINCE GEORGE




## Acknowledgements

The Climate Change Mitigation Plan was developed by the City of Prince George in collaboration with the Community Energy Association and Radloff and Associates. Financial support was provided by FCM's Municipalities for Climate Innovation Program.

The City of Prince George would like to acknowledge the contributions of several people and organizations that were involved in the development of this plan.

- Staff from numerous departments at the City of Prince George
- Stakeholders who offered feedback on potential climate actions and opportunities to collaborate with the City including: University of Northern BC, Lakeland Mill, Fortis BC, Chamber of Commerce, Canfor, Northern Health, College of New Caledonia, Home Tech Energy Advisors, PGAir, Northern Real Estate Board, Pelican Consulting, Fraser Basin Council, Pacific Bioenergy, McElhanney Consulting, Regional District of Fraser-Fort George (RDFFG), and Aboriginal Housing Society.
- Community members who attended the public open houses and/or completed the online survey and provided comments on possible climate actions.

# Table of Contents

# List of Figures

# List of Tables

# Executive Summary

## Our Changing Climate

The climate is changing in Prince George and around the world. In fact, while the average global temperature has increased by one (1) degree Celsius above pre-industrial levels (IPCC, 2018), Prince George's annual average temperature has already increased by 1.7°C from 1942 to 2018 (Environment Canada, 2019). The following changes have already been documented and are expected to increase in the coming years:

- increases in annual mean temperature;
- increase in temperature of the hottest day;
- a greater number of days over 30 degrees C; and,
- higher number of frost free days.

More extreme weather events such as floods, landslides, storms and wildfires can also be expected and these changes to our local climate can affect our buildings and infrastructure, physical safety and health, water supply, agricultural resources, and natural environment. Thus, it is important to adapt to climate impacts as well as to take action to lower our greenhouse gas (GHG) emissions. Several measures can even help us achieve both goals. The City of Prince George is pursuing updated Climate Change Adaptation Strategies in parallel with this Climate Change Mitigation Plan and aims to align these two documents into a Climate Action Strategy.

## Governments' Roles in Climate Action

Through Bill 27, the *Local Government (Green Communities) Statutes Amendment Act*, the Province of BC amended the *Local Government Act* and *Community Charter* to require local governments to set GHG reduction targets in addition to actions and policies for achieving those targets in their Official Community Plans and Regional Growth Strategies. Therefore, this Climate Change Mitigation Plan (CCMP) helps the City be compliant with legislation.

While senior levels of government are providing the legislative framework and conducting climate action, municipalities also play key roles through building infrastructure, implementing policies, and conducting educational activities to influence changes in areas such as land use, energy use in buildings, transportation choices, solid waste diversion, and water use. These activities, in turn, help to inform the choices made by local businesses and citizens.

## The Case for Climate Action

An important consideration in the City's approach to climate change mitigation has been the complementary benefits that can be realized from greenhouse gas reduction.

Beyond environmental benefits, reducing GHG emissions offers valuable economic, social and health benefits to communities. Reducing community energy expenditures can help to keep money in people's pockets and/or enable energy expenditures to be retained within the local community, as in the case of the City's Downtown Renewable Energy System,

rather than leave the community. In addition, greater use of wood in energy-efficient buildings – as demonstrated in the UNBC Wood Innovation Research Laboratory – supports local industry and jobs, and stimulates product development for additional markets.

Many strategies to address climate change also improve physical and mental health such as active transportation and access to local, healthy food.

## Prince George: A History of Climate Leadership

Since adopting the 2007 Energy and GHG Management Plan, the City has implemented many climate initiatives in different action categories to try to work towards its community GHG reduction target of 2% below 2002 levels by 2012 and corporate GHG reduction target of 10% below 2002 levels by 2012. Despite its efforts, the community target was missed seeing a 0.8% increase by 2012 and 3.9% increase by 2017 due to growth in vehicle emissions. The corporate target was also missed with an estimated 7% increase by 2012 and 9.5% increase by 2017 due to growth in diesel consumption. Note however that there are significant issues with the 2002 inventories for both community and corporate, and so these results should be treated with caution.

The City has historically had great interest in climate action. The City of Prince George was an early member of FCM-ICLEI's Partners for Climate Protection program, joining in 2002. It was also one of the first communities to reach Milestone 5 for both community and corporate activities in 2011. The City incorporated climate action in to the myPG Sustainability Plan, with goals to *Reduce Carbon Emissions and Adapt to Climate Change*, *Green Energy*, *Green City* and *Green Practices*, and *Reduce Waste*. These goals have been integrated with Council goal setting and the organisational framework since that time, and the Official Community Plan was created around these as well.

The City has also conducted many actions to reduce GHG emissions. In transportation, the City has successfully lobbied for increased public transit, expanded its active transportation infrastructure, has initiated some green fleet purchases for its own fleet, and is putting forth funding for electric vehicle charging stations and is participating in the regional charging network, "Charge North". In buildings, Prince George has a robust downtown renewable energy system that utilizes sawmill residuals from the nearby Lakeland Mill, and provides heat for 11 major buildings in the downtown core. The City has also promoted energy efficiency rebates such as the Energy Incentive Pilot Program, and participated in a FortisBC retrofit program. In renewable energy, in addition to the downtown renewable energy system, the City installed Canada's first electricity-producing micro-turbine at the wastewater treatment centre, utilizing sewage digester gas to provide electricity for the operation of the plant.

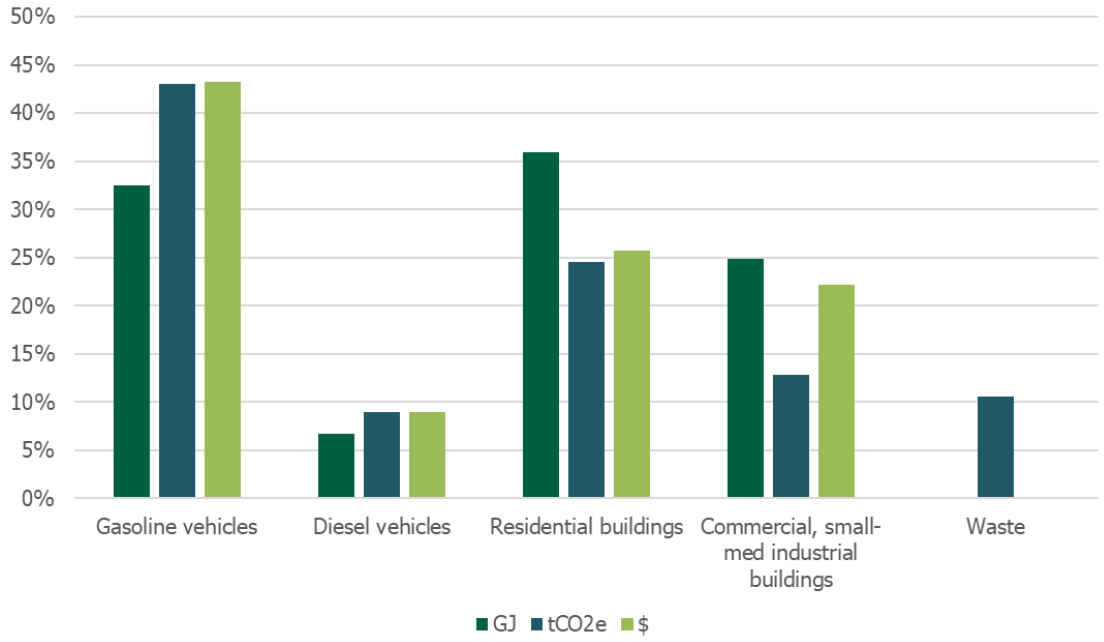
## Prince George's Current Emissions – Corporate and Community

For this report, we have calculated corporate and community emissions separately. Corporate emissions are those resulting from energy consumption required for all City operations which create direct (fuel) and indirect (for electricity only) greenhouse gas (GHG) emissions. Community emissions are those resulting from energy consumption by everything

within the municipal boundary (all residents, all vehicles etc.) but exempting large industry, which would be a very large contributor over which the City has very limited control.*

In 2017, the latest year for which a full community inventory could be calculated, the community of Prince George emitted 555,000 tonnes of $CO_2e$, and spent about $245 million on energy. The split by sector for emissions, energy consumption, and energy expenditures is shown in Figure 1. Large industrial emitters are excluded for the same reasons as previously outlined.

*Figure 1 – Proportion of community energy consumption, emissions, and energy expenditure by sector in 2017, as a percentage*

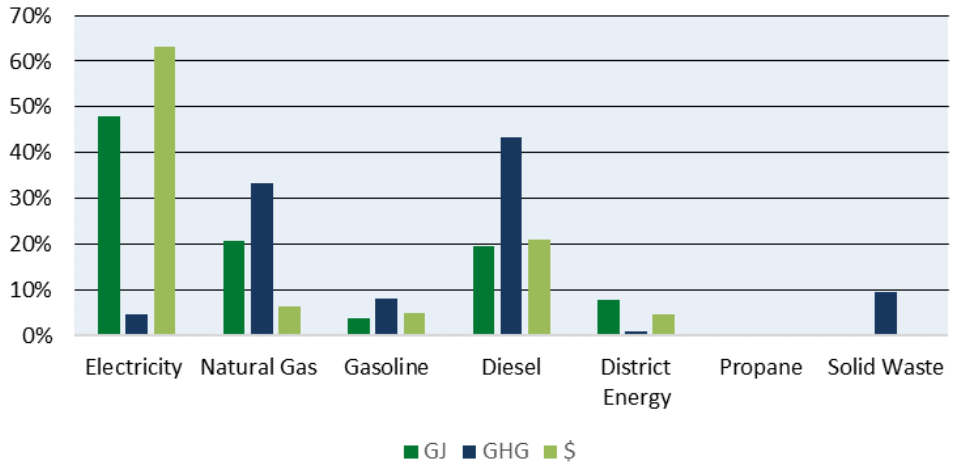



Corporate emissions for the City of Prince George totalled 8,148 tonnes of $CO_2e$† in 2017 with the costs to the City for energy consumption in 2017 estimated at approximately $6.09 million. The split by emissions, energy consumption and expenditures is shown in Figure 2.

* The largest single facility industrial emissions sources in Prince George, emit approximately another 500,000 tonnes of $CO_2e$ per year. Source: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/greenhouse-gas-emissions/large-facilities.html

† Methodology consistent with Federation of Canadian Municipalities' Partners for Climate Protection.

*Figure 2 – Proportion of corporate energy consumption, emissions, and energy expenditure by fuel in 2017, as a percentage*




## Engagement

To ensure that the Climate Change Mitigation Plan was shaped by and had the support of stakeholders and members of the public, the City of Prince George provided a comprehensive set of opportunities for ideas on future climate actions to be shared.

Internal stakeholder workshops were held with Planning and Development, Public Works, Community Services, Infrastructure Services, External Relations, and Finance. Separate internal BC Hydro Community Energy Management Assessment (CEMA) workshops on electric vehicles and buildings were also held.

External stakeholder consultation consisted of two workshops, one main session with representatives from 19 public and private stakeholders, and another focused on mitigation and adaptation which was attended by over 20 people from a range of public and private stakeholders.

Public engagement was conducted through in-person and online events: a public open house and booths at two community events, and an online survey, engaging over 800 community members in the process. This demonstrated broad support for climate action initiatives.

## Recommended Climate Actions

Based on input from municipal staff consultation, stakeholder and public engagement, and best practices, there are thirty-five (35) community actions and 34 corporate actions, to be implemented or investigated within the next five or more (5+) years to assist Prince George lower its GHG emissions.

For community actions, these actions fall within the following categories:

1. *Buildings and Infrastructure*
2. *Renewable Energy*
3. *Land Use and Community Plans*
4. *Transportation*
5. *Waste Management*

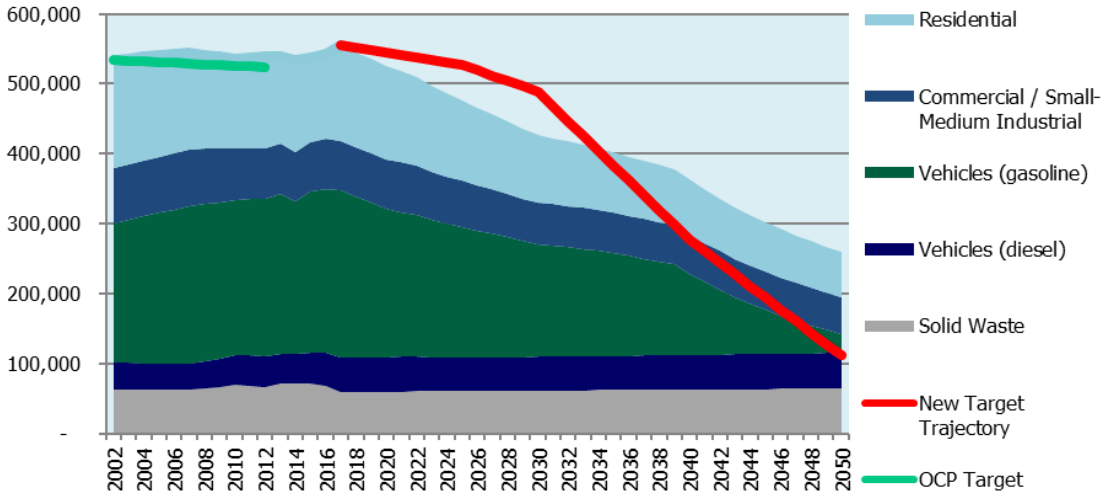
For corporate actions, the categories are as follows:

1. *Buildings and Infrastructure*
2. *Renewable Energy*
3. *Transportation*
4. *Waste Management*
5. *Policy, Decision Making and Reporting*

Summarized lists of community and corporate actions are featured in this plan, with full details in the appendices.

## What Our Actions Can Achieve and Reduction Targets

*Figure 3 – Planned Community GHGs by Sector, tonnes/year*




For community emissions, based on modelling of the full list of climate actions, GHG emissions are expected to decline as shown in Figure 3.

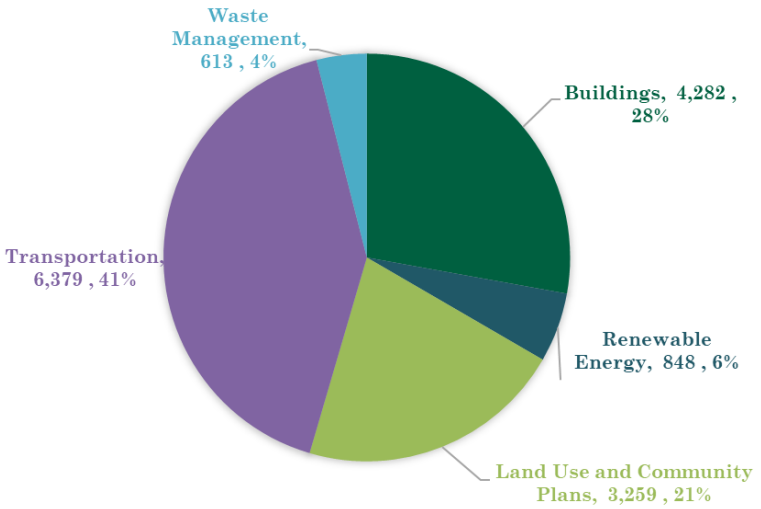
Considering this modelling as well as community and staff engagement, the City of Prince George has set new short-term community targets that are realistic and pragmatic, and will maintain long-term targets that will demonstrate strong municipal leadership. These targets are updates to the 2012 target in the 2007 Energy and GHG Management Plan. From 2017 levels, the City will aim to achieve the following reductions:

- 2025 – 5%
- 2030 – 12%
- 2040 – 50%
- 2050 – 80%

The modelling shows that Prince George may be able to surpass its community targets until 2033, if all the identified actions are implemented as currently anticipated.

The top three community focused actions that will achieve the most GHG reductions by 2025 include: i) investigating financial models for the comprehensive residential energy efficiency retrofit campaign (anticipating that this is implemented); ii) switching transit services to low carbon fuel; and iii) developing an electric vehicle strategy. Transportation, buildings, and other types of action categories are expected to contribute to the 2025 emission reduction target in varying degrees, which are highlighted in Figure 4.

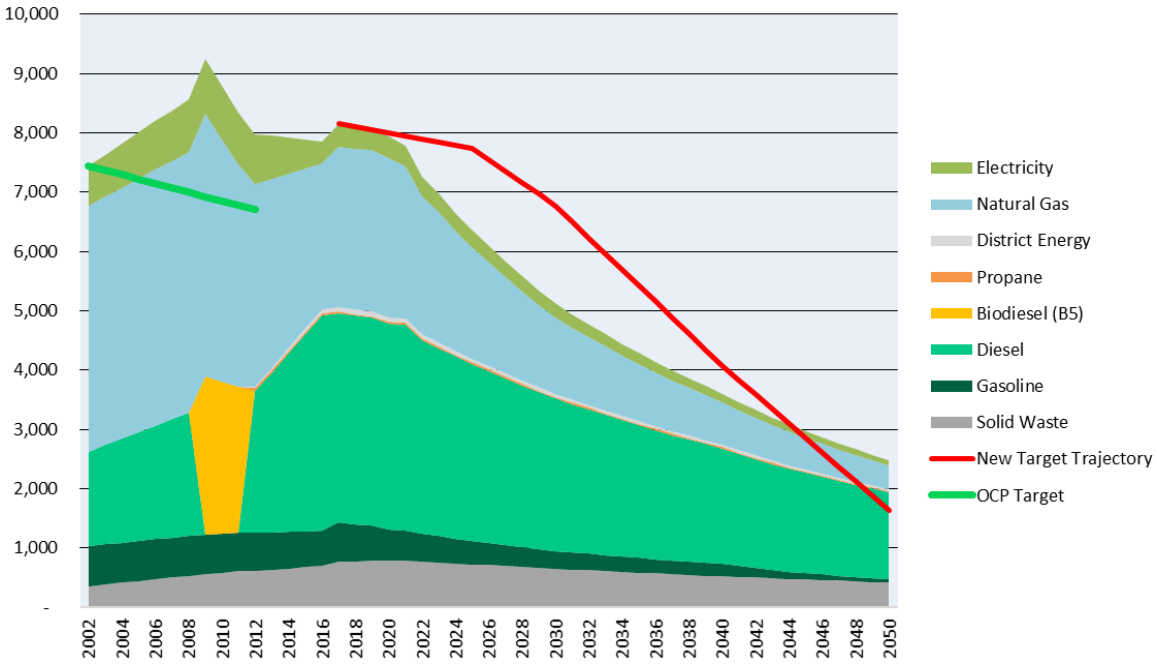
*Figure 4 – Community GHG Emissions Reductions from Each Action Category in 2025*




In contrast, the actions with the greatest public support through the engagement process, were: i) investigating opportunities to expand existing organics program and divert organics from the landfill; ii) continuing to support local food production by providing space for farmer's markets and community gardens; and iii) identifying regulatory measures to protect and grow the urban forest canopy.

For corporate emissions, based on modelling of the full list of climate actions, GHG emissions are expected to decline as shown in Figure 5.

*Figure 5 – Planned Corporate GHGs by Sector, tonnes/year*



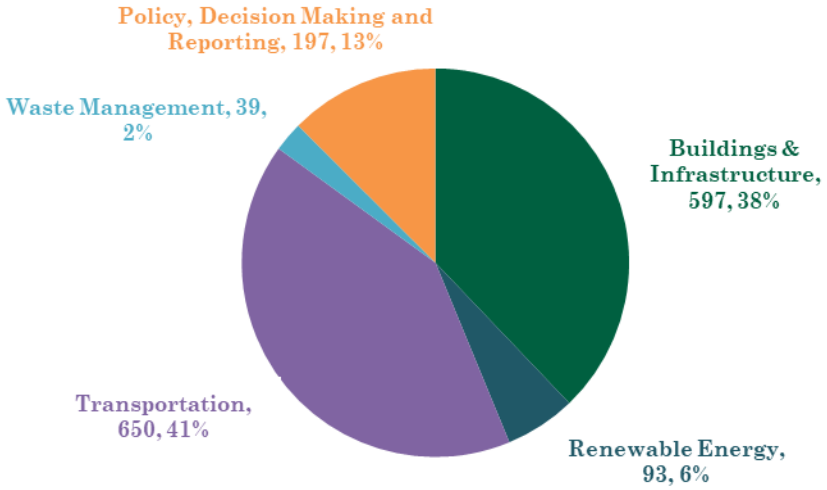

Similar to the community targets, the City has set new corporate GHG targets. These targets are reductions from 2017 levels, and are also updates to the 2007 Energy and GHG Management Plan:

- 2025 – 5%
- 2030 – 17%
- 2040 – 50%
- 2050 – 80%

The modelling shows that Prince George may be able to surpass its corporate targets until 2044, if all the identified actions are implemented as currently anticipated.

The City will need to conduct additional planning work in the future in order to help it achieve its longer-term community and corporate targets.

*Figure 6 – Planned Corporate GHG Reductions by Sector, tonnes/year*




The top three corporate actions that will achieve the most GHG reductions by 2025 are: i) conduct energy audits of existing facilities and infrastructure, and implement actions resulting from audit; ii) conduct and implement a green fleet study; and iii) commit to building Energy Efficient Facilities (including Step Code where applicable). All the action categories are expected to contribute to the 2025 emission reduction target in varying degrees, which are highlighted in Figure 6.

Note that for Figure 4 and Figure 6, renewable energy includes the Downtown Renewable Energy System.

## Implementation for Success - Monitoring and Evaluation

In order to successfully implement actions within this Climate Change Mitigation Plan several items would be very beneficial: broad political, staff, and community support; staff and financial capacity; and institutionalization of the plan.

Prince George has some internal support and also some financial resources to implement a number of the proposed actions. It is also a member of FCM-ICLEI's Partners for Climate Protection, which helps to institutionalise climate action by raising the profile and having reporting requirements.

The City of Prince George could benefit from developing further support for climate action, staff capacity, more funding, and more institutionalisation such as incorporating climate action priorities into other planning documents, tracking indicators, and regular reporting to Council. Currently, the City of Prince George would require additional support to implement all of the recommended actions in the timelines that were used in the modelling

Of these, the biggest missing pieces at present are support and staff capacity. For support, emphasising co-benefits such as economic development, social equity, and community health are important. For staff capacity, the Federation of Canadian Municipalities, BC Hydro and FortisBC may be able to assist with funding.

Funding for actions is also critical, and potential internal and external funding sources are identified in this plan, including draft language on how to formalise the City's climate action fund.

In addition, recommendations on how to further embed climate action are noted, such as including climate action implications in reports to Council, budgeting more for climate change initiatives, incorporating climate action into job descriptions of City staff, and monitoring and reporting on indicators to ensure progress is being made.

For monitoring and reporting, thirteen (13) community key performance indicators (KPIs) and eleven (11) corporate KPIs have been noted. When they are monitored regularly, Prince George can determine how to best allocate resources to support implementation and the success of different actions. Annual reporting on progress and accomplishments to Council should be planned.

A review and potential revisions are advisable every five (5) years, depending on the outcomes of monitoring indicators.

# Introduction

## Our Changing Climate

**The climate is changing** in Prince George and around the world. In fact, while the average global temperature has increased by one (1) degree Celsius above pre-industrial levels (IPCC, 2018); Prince George's annual average temperature has already increased by 1.7°C from 1942 to 2018 (Environment Canada, 2018). Prince George will experience more changes to its climate in the coming decades, and should be part of the global movement to try to mitigate these impacts.

Publicly available climatic data summarises changes in different climate variables for Prince George based on different scenarios projected by the IPCC. The following table illustrates the historical mean and some projections, based on a conservative future climate change scenario (changes are likely to exceed this):

*Table 1 – Projected Climate Changes Based on RCP 8.5 scenario*

| Climate Variable | Baseline (1976-2005) | 2021-2050 | 2051-2080 |
|---|---|---|---|
| Mean annual temperature | 3.9°C | 5.8°C | 7.6°C |
| Days over 30°C | 1 | 7 | 18 |
| Days below -30°C | 3.7 | 1.2 | 0.5 |
| Freeze-thaw days | 97 | 76.3 | 62 |
| Mean annual precipitation | 624 mm | 665 mm | 692 mm |

*Source: Climate Change Adaptation Strategies for the Community of Prince George – A Preliminary Stakeholder Informed Guiding Document*

More extreme weather events such as floods, landslides, storms and wildfires can also be expected and these changes to our local climate can affect our buildings and infrastructure, physical safety and health, water supply, agricultural resources, and natural environment. Thus, it is important to adapt to climate impacts as well as to take action to lower our greenhouse gas (GHG) emissions. Several measures can even help us achieve both goals. In conjunction with this CCMP, the City of Prince George has developed an updated Climate Change Adaptation Report, entitled Climate Change Adaptation Strategies for the Community of Prince George – A Preliminary Stakeholder Informed Guiding Document, with ICLEI as part of the Changemakers Project. The City of Prince George is also aiming to develop a Climate Action Strategy, which will involve aligning actions from both mitigation and adaptation updates.

## Our Role in Climate Action

Municipalities across Canada play an important role in lowering GHG emissions. They influence approximately 50% of emissions nationally.* Local governments have varying degrees of influence over community based GHG emissions. They may build infrastructure, implement policies, and conduct education and outreach activities to affect changes in land

* Community Energy Implementation Framework.

use patterns, transportation choices, building energy efficiency, and solid waste diversion. Local governments can have the most impact on corporate emissions as they have direct control over municipal infrastructure, buildings and fleet.

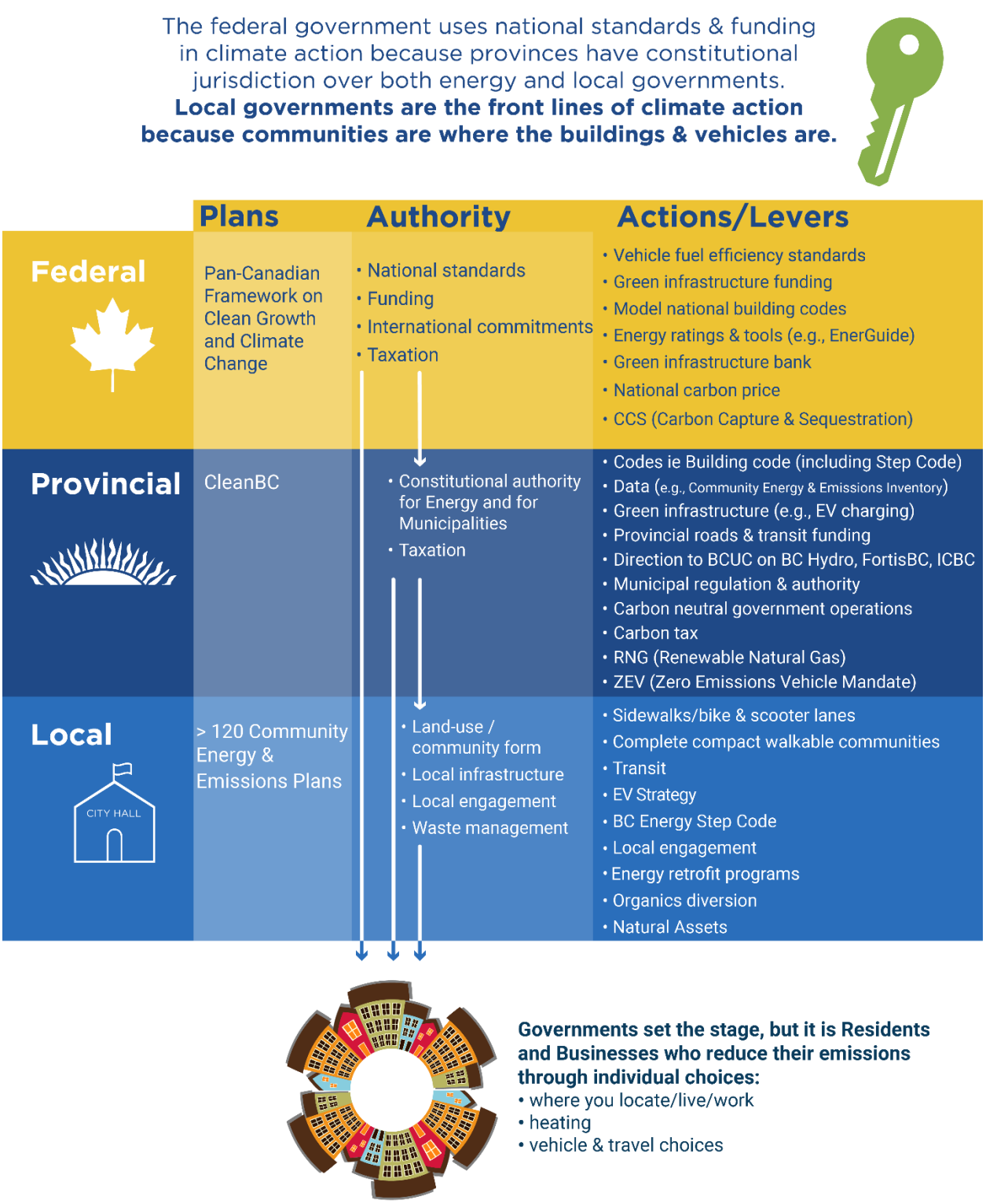
As shown in Figure 7, senior levels of government have recognized the need for strong climate action, and provide support to local governments. In 2016, the Federal Government introduced the Pan Canadian Framework on Clean Growth and Climate Change to help reach its target of reducing national GHG emissions by 30% below 2005 levels by 2030 and net zero emissions by 2050. The framework outlines actions to decrease emissions in electricity, buildings, transportation, industry, forestry, agriculture and waste with the use of funding, regulation, standards, and other policy tools.* In December 2018, the Province of BC released CleanBC. This plan outlines bold actions to lower emissions in buildings, transportation, waste and industry to achieve a 40% emissions reduction target below 2007 levels by 2030, 60% by 2040, and 80% by 2050.† Both levels of government have also devoted considerable funding for local government climate action. The CleanBC Communities Fund in BC‡ and the Low Carbon Economy Fund at the Federal level are two examples.§


*Recycling, compost, and rubbish sorting at a Prince George business. Source: CEA*

Residents and small to medium businesses also have a role in climate action. Individual choices on how to travel around our communities, where to live, how to handle household waste, and what types of food to consume affect the amount of GHG emissions that are emitted. Meanwhile, businesses' decisions regarding their current operations and future plans as well as leadership and innovation impact community based emissions. Residential and business decisions can be shaped by other levels of government, including local government.

* Pan Canadian Framework on Clean Growth and Climate Change.
† CleanBC.
‡ CleanBC Communities Fund.
§ Low Carbon Economy Fund.

*Figure 7 – BC Climate Action Planning Through the Three Levels of Government*




*Source: CEA*

## FCM-ICLEI Partners for Climate Protection Program

The City joined the FCM-ICLEI Partners for Climate Protection program in 2002.

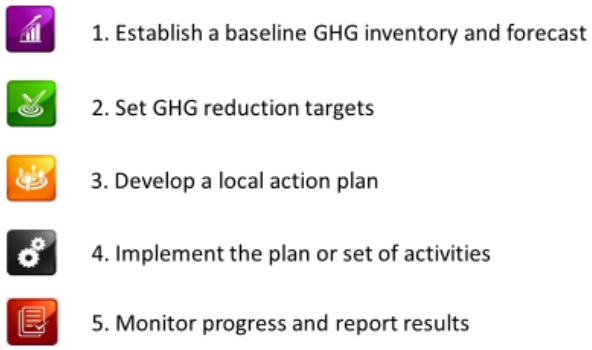
*The Partners for Climate Protection (PCP) program is a network of Canadian municipal governments that have committed to reducing GHG's and to acting on climate change. Since the program's inception in 1994, over 350 municipalities have joined PCP, making a public commitment to reduce GHG emissions. PCP membership covers all provinces and territories and accounts for more than 65 per cent of the Canadian population.*

*The PCP program is managed and delivered by FCM and ICLEI Canada. Together they form the PCP Secretariat which provides administrative and technical support, develops tools and resources, and delivers capacity building activities to support members in reducing local GHG emissions. The Secretariat also provides national recognition for member achievements.*

*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.*

Under PCP, there are five milestones, for both corporate and community categories. The five milestones are set out in Figure 8.

*Figure 8 – Partners for Climate Protection Program milestones*




The City achieved Milestones 1 and 2 in 2005, and Milestone 3 in 2007. The City was one of the first communities in Canada to achieve Milestone 5, initially achieving this in 2011.

Since some time has passed since the City has achieved its milestones, it is fitting that the City look to update these. For Milestones 1-3, this report with its appendices will be sufficient as an update, although to confirm Milestone 2 the report (with targets included) will need to be adopted by Council. To update Milestone 4, the City will need to implement actions in the CCMP, and report on this activity in its annual CARIP reports. Then it will need to submit these reports to FCM-ICLEI. Updating Milestone 5 will require the City to create a

rigorous document with updated inventory information that quantifies the impacts of actions that have been conducted.

## Adapting to a Changing Climate

As highlighted in the preceding section, the climate is changing and will continue to change in the future. It is expected that Prince George will experience a variety of local impacts. The City of Prince George has been proactive on climate change adaptation, being one of the first communities in Canada to develop a Climate Change Adaptation Strategy in 2009.

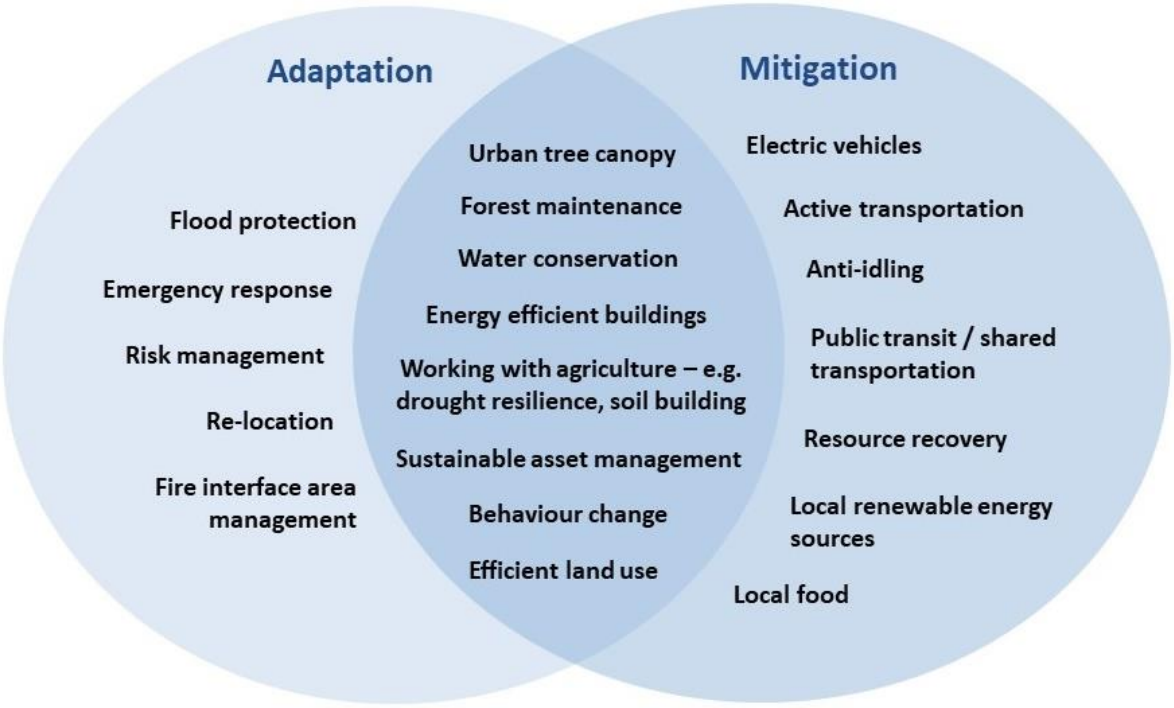
*Flooding in Lheidli T'enneh Memorial Park. Source: City of Prince George*

The City of Prince George recently worked with ICLEI Canada to complete a Stakeholder Informed Guiding Document that identifies updated Climate Change Adaptation Strategies for Prince George. The objectives of this work was to:

1. Strengthen infrastructure resilience and reduce risk to buildings and property.
2. Protect public health and improve social and economic resiliency.
3. Enhance resilience of ecosystems and protect natural areas.
4. Integrate climate change thinking and response.

With its resources, the City should both work to reduce corporate and community GHG emissions, and adapt to a changing climate. Fortunately, many actions can do both of these, as shown in Figure 9. These are good actions to conduct, in addition to actions that only adapt or only mitigate.

*Figure 9 – Intersection Between Climate Change Mitigation and Adaptation Actions*




The City of Prince George aims to develop a Climate Action Strategy, which will involve aligning actions from both the Climate Change Mitigation Plan and adaptation strategies updates.

## The Case for Reducing Greenhouse Gas Emissions

Although every town or city contributes only a small part of global emissions, there are many reasons they would want to reduce GHG emissions.

Climate change can be seen as an example of a "tragedy of the commons". This is defined as a situation where individual users, in pursuing self-interest in the exploitation of a shared resource, act in a way that is detrimental to the interests of the whole. Therefore, from a perspective of ethical behaviour and responsibility, it is right for a community to lower emissions. Fortunately, the vast majority of municipalities and countries around the world are working to control their emissions, with varying degrees of effort and success. In BC alone, over 120 cities, towns, have a plan to reduce emissions.

In addition to the moral basis, there are legislative, economic, leveraging, health, social, and local environmental reasons for taking action.

### Legislative

Through Bill 27, the *Local Government (Green Communities) Statutes Amendment Act*, the Province of BC amended the *Local Government Act* and *Community Charter* to require local governments to set GHG reduction targets in addition to actions and policies for achieving those targets in their Official Community Plans (OCP's) and Regional Growth Strategies (RGS's)*.

In 2007, the City of Prince George completed its first Energy and GHG Management Plan to support this legislation. The plan included emission reduction targets for 2012 for both corporate and community emissions and a broad range of climate actions, incorporated with the OCP. Since 2012 has passed, it is important for Prince George to assess its progress to date, determine new potential actions, and set new targets for the future.

The Province of BC also established a voluntary Climate Action Charter. By signing it, local governments acknowledge that they and the provincial government have an important role in addressing climate change. Municipalities make a commitment to create complete, compact, and energy efficient communities; measure and report on their community emissions; and become carbon neutral in their own operations. Prince George is a signatory to this charter, along with almost every local government in BC.†

* Local Government (Green Communities) Statutes Amendment Act.
† Climate Action Charter.

## Economic

Climate change carries a large economic cost to residents, businesses, industries and the Canadian economy. A report by the National Roundtable on the Environment and the Economy (NRTEE) has estimated that climate change could cost the Canadian economy as much as $34 billion per year by 2050.* Arguably the biggest economic advantage of climate change mitigation, therefore, is that it seeks to minimize climate change over time, therefore minimizing the costs needed to adapt to the changing climate.

*Research at the Wood Innovation Design Centre. Source: City of Prince George*

Climate change mitigation also offers other economic advantages, perhaps the greatest of which is the opportunity for businesses and residents to save money by reducing energy bills through increased energy efficiencies, thus reducing the cost of doing business and the cost of living. Reducing corporate and community GHG emissions in Prince George reduces the number of energy dollars exported from the community. For 2017, it was calculated that approximately $3,300 was spent on energy for each person residing in Prince George, with a vast majority of this money leaving the community. This equates to approximately $247 million for the City as a whole. Measures to reduce energy consumption and generate energy locally can result in more money retained locally; a clear benefit for the City, the business community and residents.

Investments in energy efficient building technologies and renewable energy also support local economic development opportunities and can lead to jobs. It also results in more resiliency to fluctuating global energy prices. Green technologies and innovations, such as through wood products for construction and the generation of bio-diesel from wood waste, also can open up employment and business opportunities.

## Leveraging

Another justification for energy planning work, is leveraging. Money spent on climate action by a local government can be used to leverage some of the considerable funding that is available for climate action, and that money can then be brought in to the community.

Good examples of this are the East Kootenay Community Energy Manager, and Charge North and Accelerate Kootenays electric vehicle charging networks.

The East Kootenay Community Energy Manager shows what a dedicated role with a well defined work plan can achieve. Together with partners including BC Hydro, the Regional District of East Kootenay contributes a portion of the $95,000 budget for the position. In

* http://nrt-trn.ca/wp-content/uploads/2011/09/paying-the-price.pdf

2018/19 alone, the CEM brought almost $280,000 into the area. If the Regional District contributed half of the funds, this would be almost a six-fold leverage.

Charge North was initiated with each of the 6 Regional Districts contributing $9,000 (including RDFFG), for a $54,000 investment. To date, this has been leveraged in to almost $1.5 million to realise a pan-northern charging network, over twenty five times the original investment. Similarly, the Accelerate Kootenays electric vehicle charging network turned an initial investment of $90,000 from participating Regional Districts into $1.9 million, over 20 times the original investment.

## Social and Health

The social and health implications of climate change are diverse and far-reaching. The World Health Organization has gone as far as to say that climate change is the greatest threat to world health in the 21st Century. With the recent forest fires and associated smoke and evacuations, we have already experienced some of these effects locally. Reducing climate change therefore has large social and health benefits. Fortunately, many strategies that mitigate climate change also support vibrant and healthy communities. For instance, compact, walkable communities and active transportation supports improved physical and mental health and social connectivity.

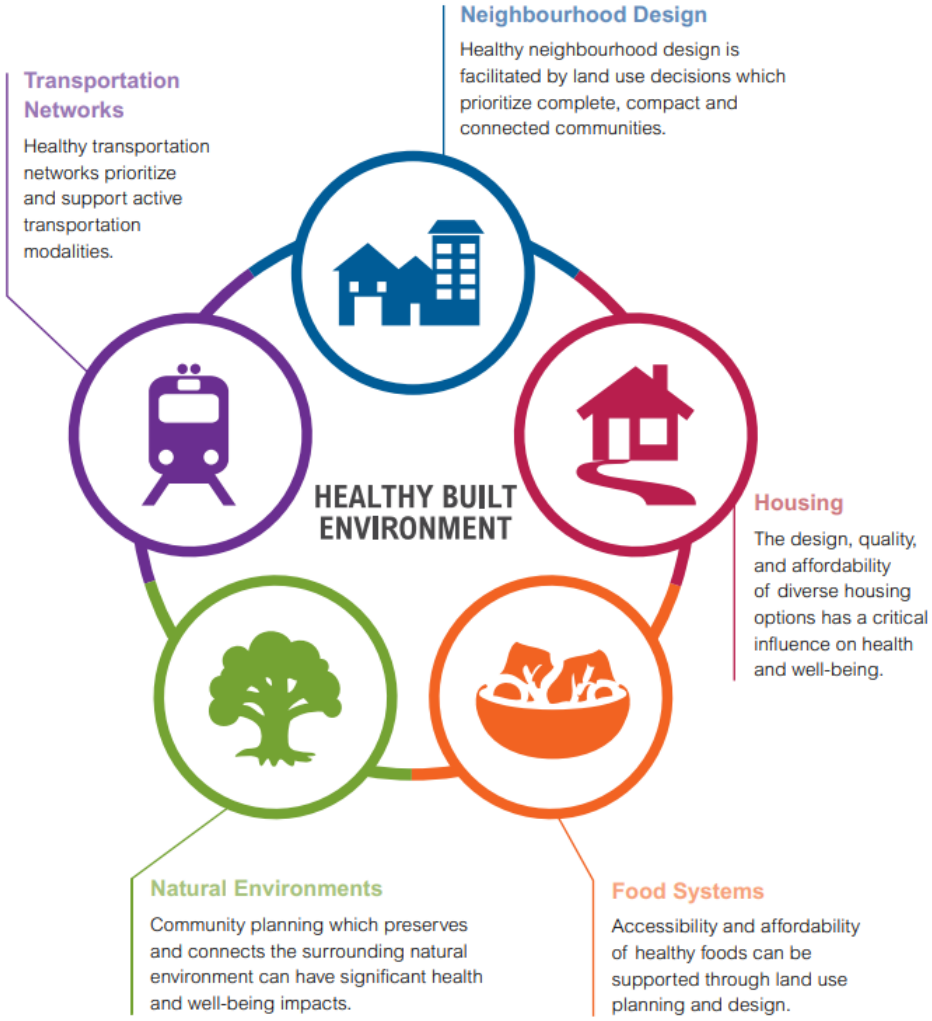
According to research by Canadian economist Kirk Hamilton, the health benefits of lowering GHG emissions could be worth Can $130/tonne of $CO_2$ in countries like Canada, while the cost of abating a tonne of carbon in 2015 was on average Can $47/tonne.

Improving public transportation supports accessibility while energy efficiency can reduce monthly bills and improve affordability. Local agriculture increases access to healthy foods and reduces food insecurities while trees in urban settings provide protection from extreme heat, while adding to the aesthetics of the community. All of these initiatives are identified as climate change mitigations but offer many more co-benefits to the well-being of residents.

The Healthy Built Environment Linkages Toolkit, identifies a framework for a Healthy Built Environment (see Figure 10) which, if followed, will result in positive health-related outcomes, improved social well-being, decreased health care costs and improved physical and mental well-being. All five of the core features are well aligned with a low GHG community.

Infants, children, the elderly, those with existing health conditions and those that are already socially and economically disadvantaged are impacted the most by climate change and will see the greatest social and public health benefits from climate change mitigation.

*Figure 10 – Constituents of a Healthy Built Environment*




*Source: Healthy Built Environment Linkages Toolkit, BC Centre for Disease Control*


*Idle free zone outside of City Hall. Source: CEA*

From a perspective of financial well-being, transportation and housing costs represent the two largest expenditures for most working households. Reducing these costs is key to creating affordability for residents. The creation of compact and complete communities in the City's urban core can increase proximity to work and amenities and reduce the need for vehicle ownership. Improving the energy efficiency of new and existing homes can reduce monthly energy bills. The promotion of BC Hydro and Fortis BC's free conservation programs for income qualifying households can help lower income households save money on their energy bills. These programs will also help to improve the health of residents by providing them with better quality housing that is less subject to climatic extremes.

**Free energy conservation programs from BC Hydro & FortisBC**


*Free Energy Saving Kit for income-qualified households. Source: BC Hydro*

Income-qualified households could be eligible to receive free energy saving help thanks to programs funded by BC Hydro and FortisBC.

The Energy Saving Kit program provides households with a free kit that can include energy efficient lightbulbs, a low flow showerhead, weather stripping, and other products.

The Energy Conservation Assistance Program is similar, except that all the products from the kit are installed in the household by a professional, for free. Some homes also qualify for an ENERGY STAR® refrigerator, insulation in their walls, attic, crawlspace, or a high efficiency furnace – all for free.

These programs should be promoted by the City as part of the implementation of this plan.

## Local Environmental

There can also be many local environmental benefits to climate action, in addition to global environmental benefits. By reducing GHG emissions and air pollutants, air quality improves in communities, which naturally also has positive health benefits. Actions that address climate change can also foster healthier and more resilient ecosystems, such as increasing parklands, urban tree canopy, or helping to protect or re-establish wetlands. Healthy ecosystems, in turn, foster healthy and resilient communities.

## Adaptation

Actions to reduce climate change impacts can also be viewed, in the long-term, as an adaptation strategy – *the best way to start dealing with a hole is to stop digging it*. By Prince George and other communities around the world taking action to reduce GHG emissions, this will reduce the need to adapt to climatic changes in the future.

## Prince George – A History of Climate Action

The City has historically had great interest in and support for climate action. Prince George was one of the first municipalities in BC to join the FCM-ICLEI Partners for Climate Protection program in 2002, and also one of the first to achieve Milestone 5 in 2011.

After joining PCP, the City released its Energy and Greenhouse Gas Emissions Inventory and Reduction Targets report in 2005, completing Milestones 1 and 2.

In 2007, the City of Prince George released its Energy and GHG Management Plan. The Plan noted the following GHG emission reduction targets:

- Corporate
  - 10% below 2002 levels by the year 2012
- Community
  - 2% below 2002 levels by the year 2012

In 2011, the City released its Milestone 4 and 5 report, Corporate and Community Update for Greenhouse Gas Emissions Reduction and Monitoring.

The Plan outlined nine (9) goal areas and twenty (20) actions to reduce community GHG emissions, as well as an implementation and monitoring strategy. The following table provides a snapshot of some corporate and community climate mitigation actions that have been implemented since 2002.

The City has also incorporated climate action in to the myPG Sustainability Plan, with goals to *Reduce Carbon Emissions and Adapt to Climate Change, Green Energy, Green City, Green Practices*, and *Reduce Waste*. These goals have been integrated with Council goal setting and the organisational framework since that time, and the Official Community Plan was created around these as well.

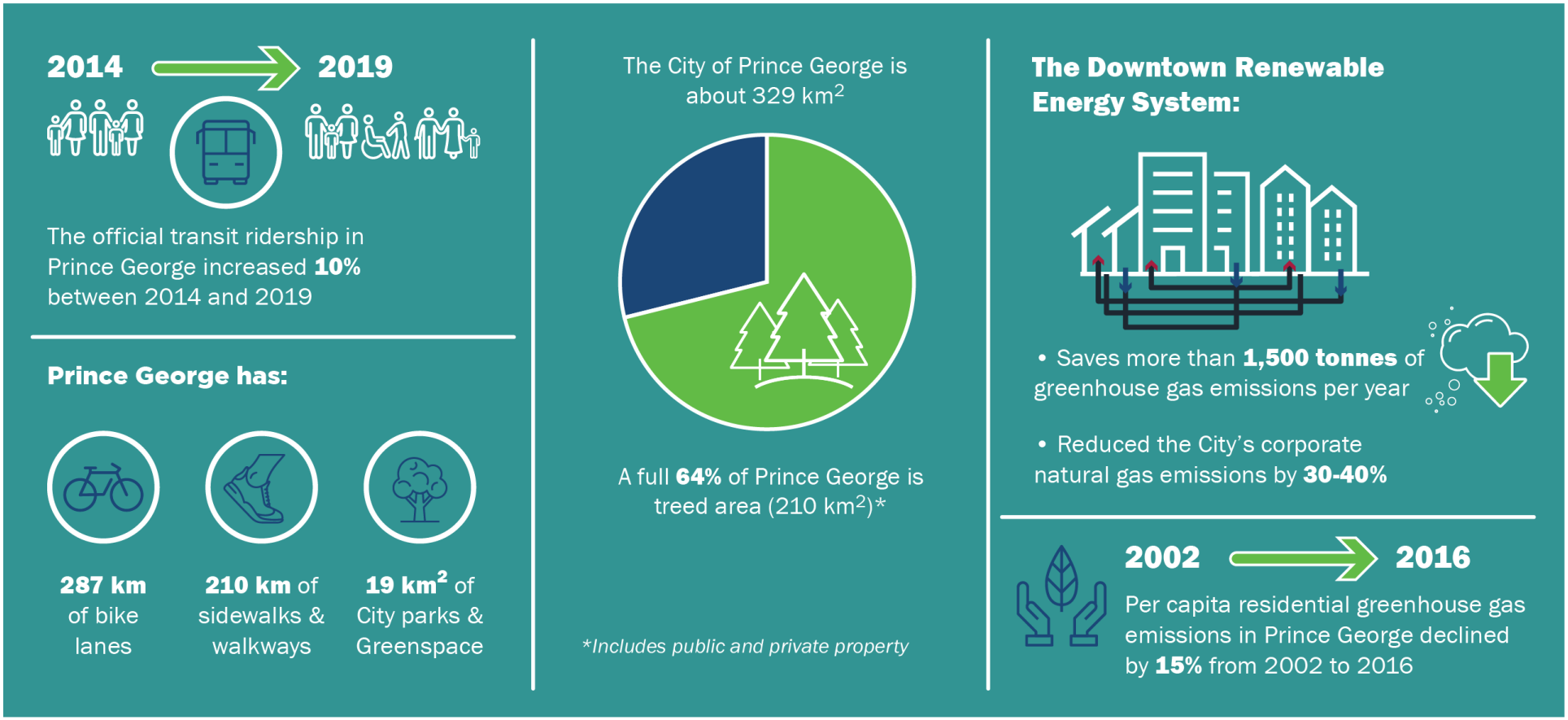
*Table 2 – Snapshot of Some Existing Climate Mitigation Actions*

| | |
|---|---|
| New Buildings | • Capacity building on energy efficiency with home builders sector. Multiple training events on energy efficient construction have been held in the community, including by CHBA North, CEA, and BC Housing.<br>• Information Session and Consultation with local building contractors regarding BC Energy Step Code in March 2020.<br>• New RCMP building is LEED® Silver certified |
| Existing Buildings | • Completed energy audit program for municipal buildings.<br>• Developed energy tracking and management systems to allow for effective analysis and reporting of energy consumption by the municipality.<br>• Implemented the street light dimming program where applicable.<br>• CN Centre lighting upgrade to LED.<br>• Aquatic Centre condensing boiler upgrade. |

| | |
|---|---|
| | • Energy labelling for real estate transactions – Develop an Energy "Labelling" initiative to include energy evaluations (or ratings) as part of Real Estate transactions.<br>• Energy mapping of the community: The City collaborated with CanmetENERGY, Natural Resources Canada's energy research division to pilot the Spatial Community Energy, Cost and Carbon Characterization Model (SCEC3).<br>• Energy Charrette: A one-day workshop with community stakeholders to identify options for energy conservation and alternative energy in the Crescents neighbourhood in Prince George. Funding was provided by BC Hydro and by Natural Resources Canada. |
| Renewable Energy | • Completed the implementation of the energy recovery project at the Wastewater Treatment Centre to use digester gas to generate electricity with micro-turbines.<br>• Built in 2012, the Downtown Renewable Energy System delivers heat to 11 buildings, including both municipal and non-municipal buildings.<br>• Installation of a solar wall at RCMP building. |
| Land Use | • In 2009, the City had a multi-day Downtown Smart Growth on the Ground charrette.<br>• SCEC3 Land Use policy modelling dashboard for new neighbourhoods and retrofits to determine most effective policy measures based on neighbourhoods whether existing housing stock and potential new build energy systems methods.<br>• In 2016, the City received the Canadian Institute of Planners (CIP) Award for Planning Excellence and the Planning Institute of BC (PIBC) Gold Award for Research and New Directions in for the Community Lifecycle Infrastructure Costing (CLIC) Tool. |
| Anti-Idling | • In 2004, an Anti-Idling Campaign for the City's fleet was created to help the City meet its environmental objectives in the areas of greenhouse gas emission reduction, improved air quality, energy use conservation, noise reduction, and efficient resource use.<br>• The City of Prince George has been a long-standing member of the Prince George Air Improvement Roundtable which focuses public education around reducing vehicle idling and use.<br>• In addition, a community-wide Vehicle Idle-Free Program was developed with the Provincial government to educate businesses, local government, educational institutions, and residents on the benefits.<br>• In 2010, The City Fleet Idling Policy was approved by Council. |

| | |
|---|---|
| Adopting Zero Emission Transportation | • The City shares a 100 per cent electric vehicle (Nissan Leaf), with the Fraser Fort-George Regional District, Northern Health, and the University of Northern British Columbia.<br>• December 2016; the City joined the Fleet Champions Program and pledged to "Evaluate Zero Emissions Vehicles" as part of all fleet purchases and leases.<br>• 2017; Completed EV assessment for the City's fleet.<br>• June 2018; City acquired its own battery electric vehicle (Chevy Bolt) for municipal use.<br>• Annual City and community participation in Bike to Work Week event. In 2011, 606 cyclists participated, riding 17,600 km during the week.<br>• Deployed U-Pass program for UNBC students – Encouraged and advocated for the successful implementation of a U-Pass program with UNBC students.<br>• Active Transportation Plan (2011) – Developed a non-motorized transportation plan to increase walking and cycling paths and corridors.<br>• Pedestrian Network Study was undertaken in 2004 which developed a plan for improving pedestrian networks and safety.<br>• The City adopted a Green Fleet Action Plan and Green Fleet Action Committee in 2010 to maximize fuel efficiency, reduce emissions and fuel costs, and improve local air quality.<br>• In conjunction with the Green Fleet Action Plan, the City obtained a National Silver Award as part of the Fraser Basin Council's E3 Fleet Program. |

*Figure 11 – Snapshot Infographic of Some of Prince George's Climate Action Achievements*




*Source: CEA*

## *The Downtown Renewable Energy System*

The biomass-based Downtown Renewable Energy System (DRES) provides environmental benefits to the City of Prince George. The system takes what was previously considered waste heat from the Lakeland sawmill and transfers it through insulated piping. In 2017, the DRES reduced more than 1,500 tonnes of greenhouse gases (mostly the City's corporate emissions) and currently heats 11 key buildings in downtown Prince George, with more being connected regularly.


*Prince George Downtown Renewable Energy System with current connections in green and future expansion indicated in red (Source: City of Prince George website).*

Apart from reducing GHG emissions, the DRES also represents a local energy utility. Purchases of this energy remain within this local utility, rather than leaving the community, and puts it back in to the local forestry sector by buying energy from them. The DRES also improves local air quality, reducing total net particulate matter by 100.7 tonnes per year.*

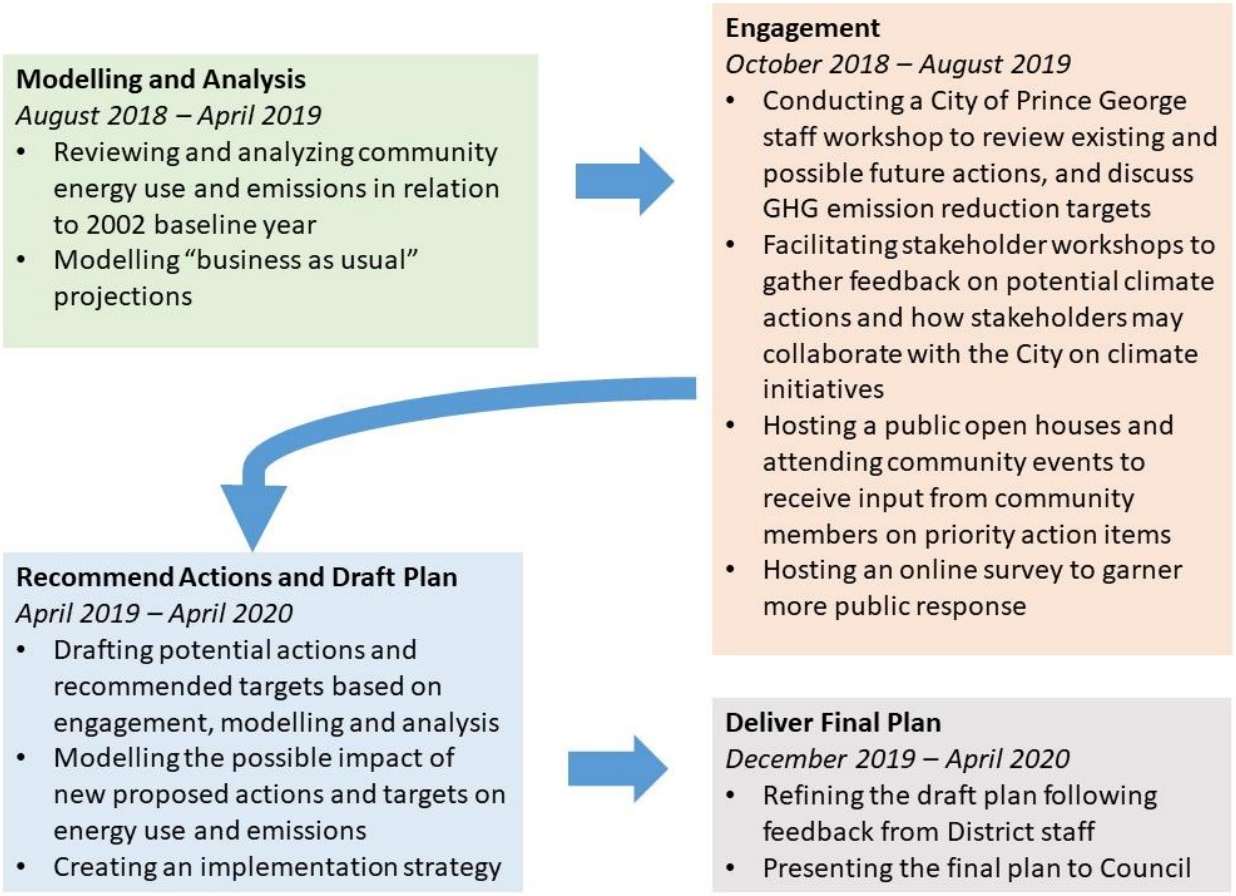
The DRES has also proven itself to be resilient with cold spells of weather. During an extreme cold spell in January 2020, the temperature dropped to a low of -44 degrees Celsius. The DRES was however able to heat all of the buildings it is connected to without the help of any backup natural gas.

* https://princegeorge.ca/City%20Services/Pages/Utilities/DistrictEnergy.aspx

## Climate Change Mitigation Plan Development

In summer 2018, the City of Prince George, in collaboration with the Community Energy Association, began the process of creating a Climate Change Mitigation Plan (CCMP). The planning process consisted of four main steps, as illustrated in Figure 12.

*Figure 12 – Development of the Prince George Climate Mitigation Plan*



# Where Prince George is Now

*View of downtown Prince George. Source: City of Prince George*

## Community Emissions

Using modelling and analysis, Prince George's community emissions for 2017, and emissions projections to 2050 were calculated. Data was collected from several sources to summarize Prince George's energy use and GHG inventory at the community level for buildings, transportation and solid waste for 2017. More details on the modelling and analysis are in Appendix B.

As detailed in Appendix B, a number of exclusions are made, such as large industry.

### Current Emission Profile

In 2017, the latest year for which a full community inventory could be calculated, Prince George emitted 555,000 tonnes of $CO_2e$, with the highest contributor being from mobility fuels at 289,000 tonnes of $CO_2e$ (52%), followed by natural gas at 184,000 tonnes of $CO_2e$ (33%). A breakdown by fuel used in Prince George is shown in Figure 13, and by sector in Figure 14.

*Figure 13 – Proportion of community energy consumption, emissions, and energy expenditure by fuel and waste in 2017, as a percentage*

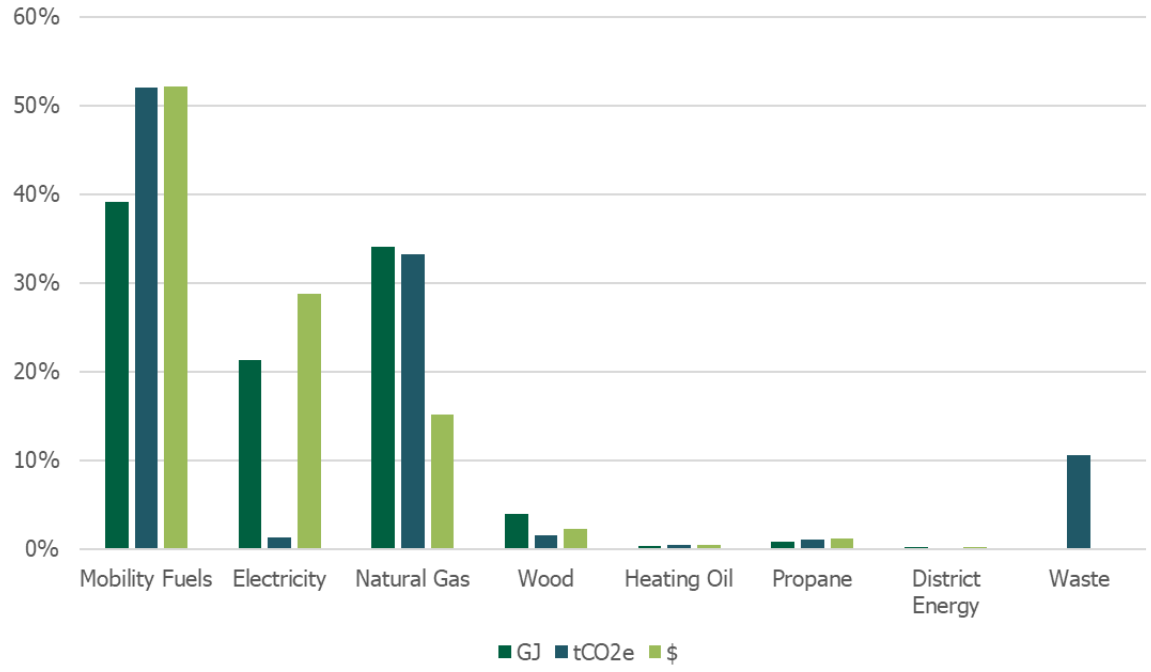
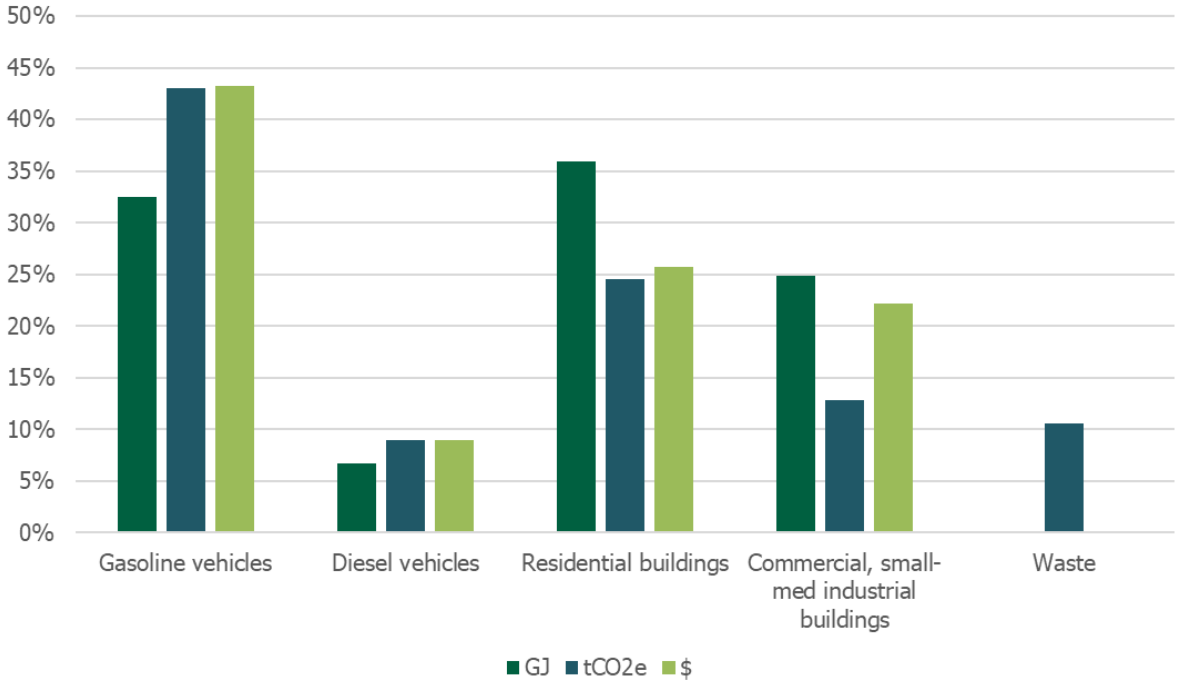



*Figure 14 – Proportion of energy consumption, emissions, and energy expenditure by sector in 2017, as a percentage*




Approximately $245 million was spent on energy by the community of Prince George, with the breakdowns shown in Figure 13 and Figure 14. Mobility fuels comprised 52%, electricity 29%, natural gas 15%, heating oil 0.4%, propane 1.1%, wood 2.2%, and downtown

renewable energy 0.1% (accounting for rounding errors). By sector, transportation accounts for 52%, while residential buildings are 26%, and commercial and small-med industrial buildings are 22%.

Vehicle fuels comprise both the largest source of emissions, and the greatest source of expenditure. Electricity on the other hand is a large source of expenditure, but because of its low GHG intensity comprises just a small part of emissions. Most emissions from buildings are a result of natural gas, which is also the third largest source of energy expenditure. Heating oil, propane, and wood are all a small source of emissions and of community energy expenditures. The emissions and energy expenditures from the use of the downtown renewable energy system are by far the smallest component of the community's energy and emissions footprint as it consumes industrial biomass waste heat, and because the energy consumption is very small relative to the other energy sources. Emissions from waste are a smaller but still significant part of the inventory, and no energy consumption or energy expenditures can be attributed to it.

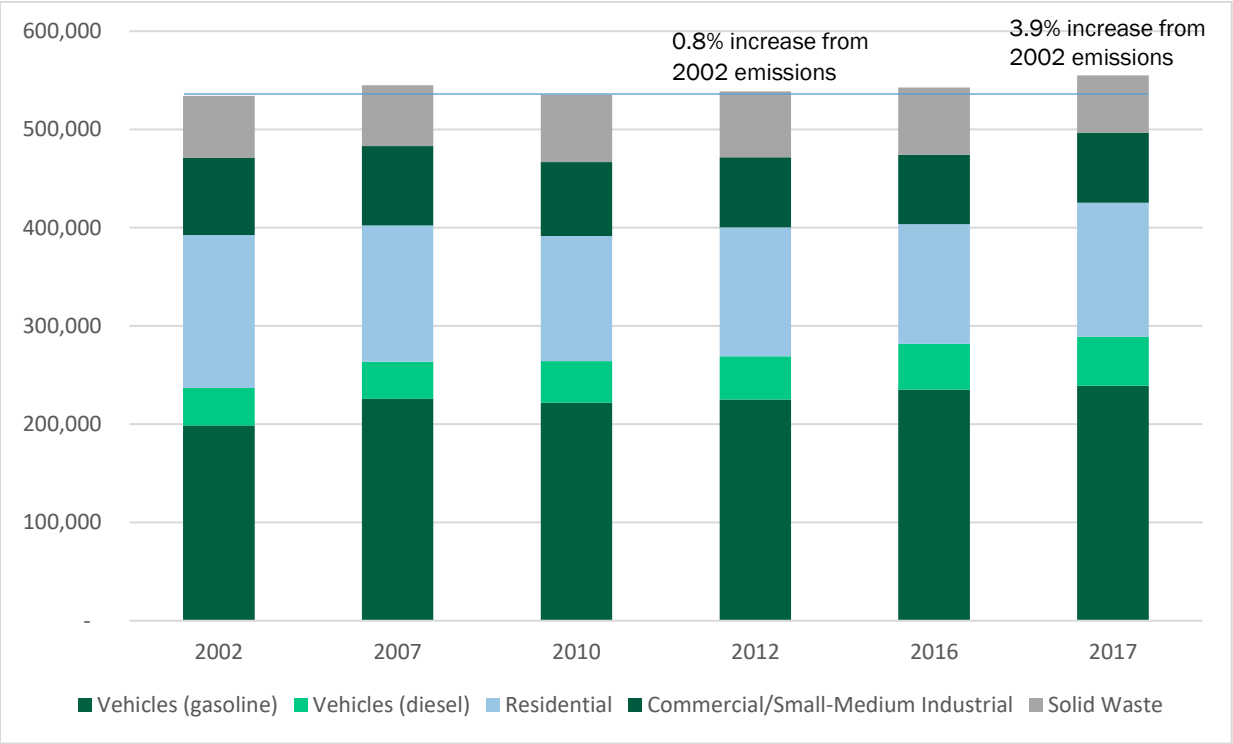
Compared with other communities in BC, Prince George's emissions are as expected based on the proportion and types of single-occupancy vehicles, its low density, and colder climate. Compared with Kelowna, it appears that there may in particular be an opportunity for Prince George to reduce its emissions from solid waste. These comparisons are explored in more detail in Appendix F.

## Performance

### *Year on year*

The six full inventory years are shown in Figure 15. Total emissions vary from a low of 534,000 tonnes of $CO_2e$ in 2002, to a high of 555,000 tonnes in 2017, with some variation in intervening years.

*Figure 15 – Comparison of the six full community inventory years by sector*




Emissions from gasoline and diesel increased substantially from 2002 to 2017, with gasoline increasing by 20% and diesel by 31%. Helping to compensate for these increases, emissions from the residential and commercial / small-medium industrial sectors decreased by 12% and 10% respectively, while solid waste decreased by 6.6%.

### *Community Target*

A comparison of the inventory emissions with the community GHG target is shown in Figure 16 for overall emissions, and in Figure 17 for per capita emissions.

The community GHG target was a 2% reduction from 2002 levels by 2012.

Although it was a modest community GHG reduction target, it still proved difficult to achieve. The community came close to achieving this target, but a recent spike in emissions has pushed the community in the wrong direction. This spike has been principally due to growth in gasoline consumption. Community GHG emissions increased about 0.8% from 2002 to 2012, and by 2017 had increased by about 3.9%.

*Figure 16 – Comparing inventory trajectory with the community GHG target for overall emissions*

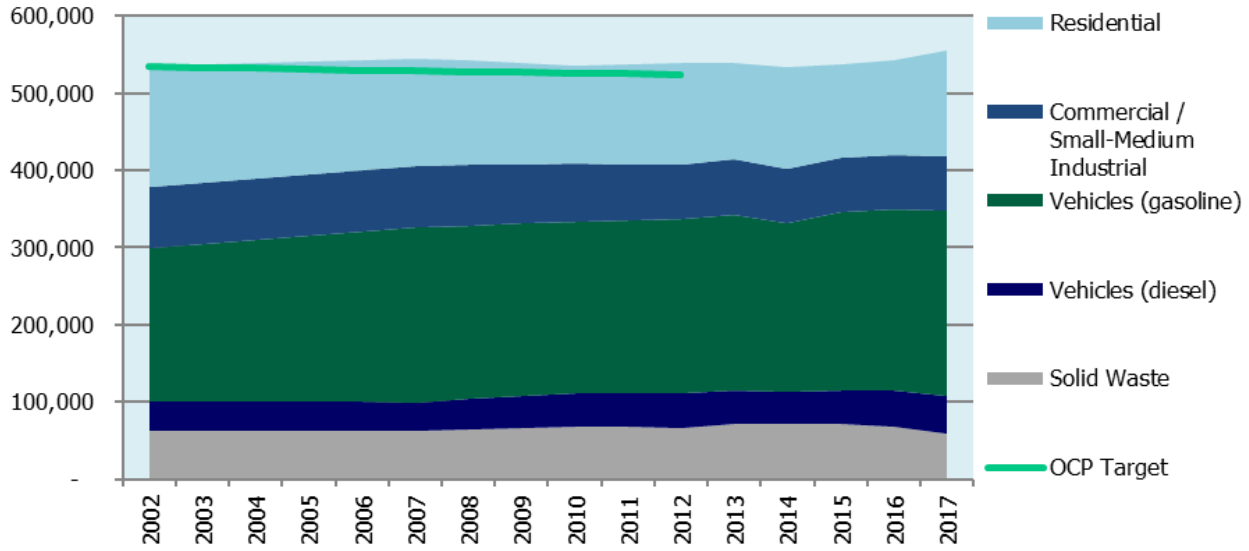



*Figure 17 – Comparing inventory trajectory with the community GHG target for per capita emissions*

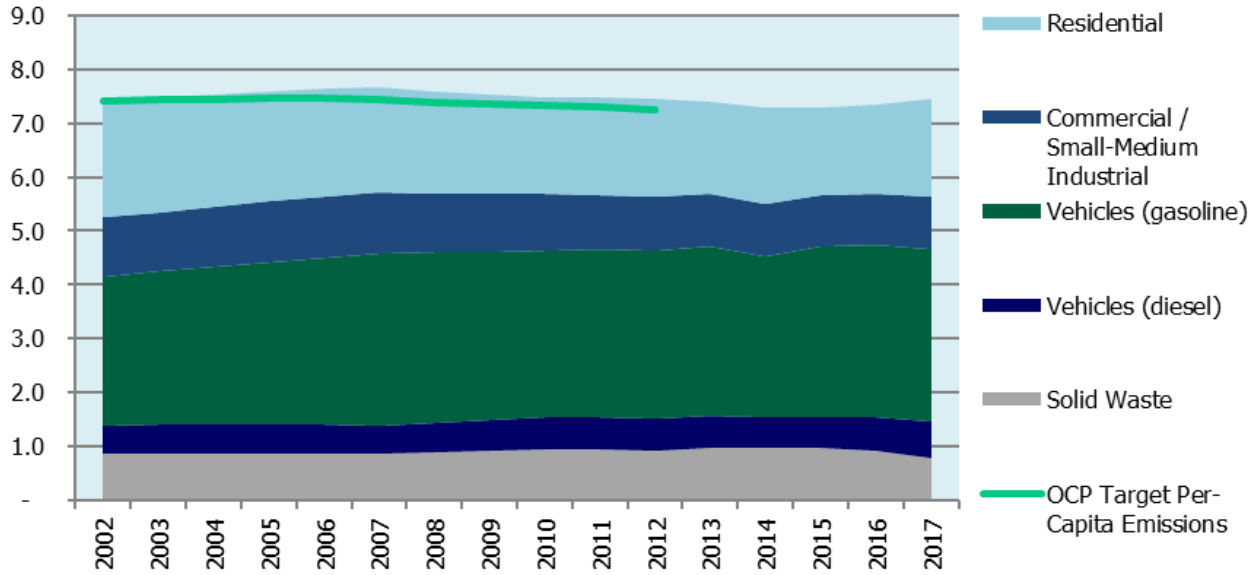



Figure 17 is interesting as it removes the impact of a changing population. Per capita emissions were almost the same in 2017 as they were in 2002, while there has been some fluctuation in the intervening years. Note that most growing communities in BC are able to reduce per capita emissions, principally by keeping growth compact.

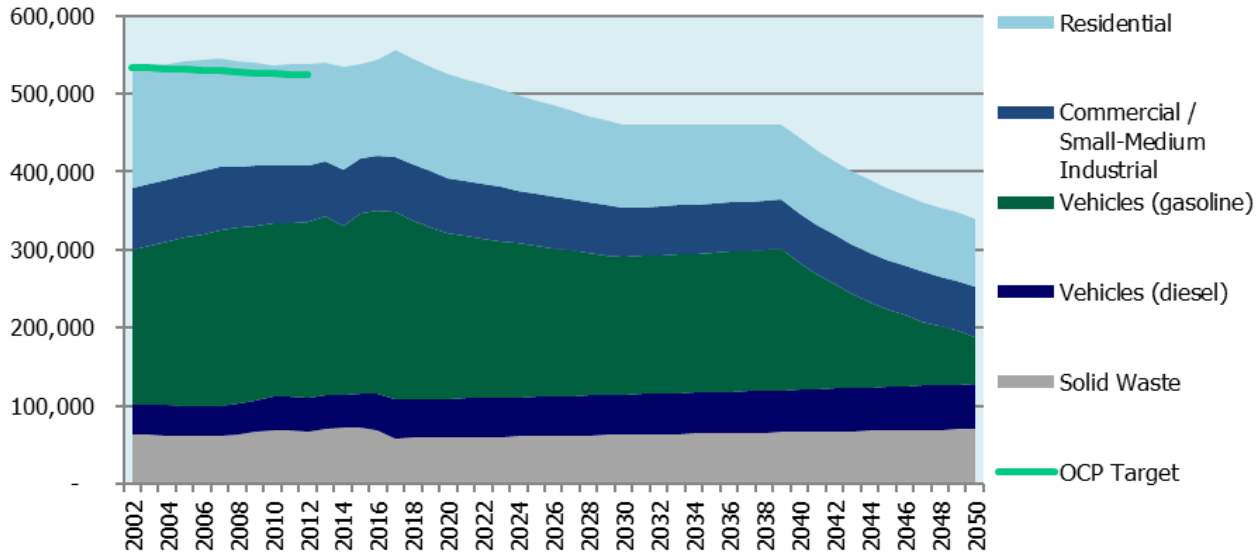
## Looking Forward

Figure 18 is the same as Figure 16 and contains all of the inventory emissions data, but has a Business As Usual (BAU) trajectory extending through to 2050.

*Construction of Multi Unit Residential Buildings in Prince George. Source: City of Prince George*

BAU emissions for the City are assumed to decrease steadily from 2020 to 2030, due to the impacts of various Federal and Provincial policies as outlined in the Business As Usual textbox. From 2030 to 2040 emissions remain steady, until the zero emissions vehicle mandate starts to have a substantial impact, as all new Light Duty Vehicles purchased in BC must have zero emissions.

*Figure 18 – BAU GHG emissions to 2050*



**What does Business As Usual mean?**

Business As Usual, or BAU, is a way of describing what is estimated to happen if the City does not try to reduce emissions going forwards. A number of factors are taken into account. Population growth is key: as the number of people increase in a community, more buildings are needed and more vehicles are driven on roads. Other things that are taken into account include:

- Changing climate patterns, change the way that energy is consumed in buildings
- Impacts of policies already adopted by higher levels of government, such as:
  - Renewable and low carbon fuel standards
  - Vehicle emissions standards
  - Purchases of electric vehicles by the public, especially those driven by the Zero Emissions Vehicles mandate
  - The greening of the BC Building Code (progressive steps towards net zero energy ready buildings by 2032)

Note that if the policies do not proceed as currently expected, or if e.g. BC Building Code improvements are not locally enforced, then BAU emissions will not reduce as currently anticipated.

## Corporate Emissions

Corporate emissions refer to emissions associated with City operations. The City has been primarily focused on creating corporate energy and emissions inventories related to BC Climate Action Charter (CAC) and CARIP requirements, however it has also created several inventories for FCM's Partners for Climate Protection (PCP). The most recent complete CAC inventory reviewed at the time of conducting inventory work for this report is 2017. Since this CCMP is intended to help meet PCP milestones, a 2017 inventory that meets PCP criteria was also created as described in the following Current Emissions Profile section.

The CAC inventory is described in Appendix C. The corporate inventory methodology and assumptions are described in Appendix D. A repeatable methodology for future corporate inventories is described in Appendix E.

**Corporate Reporting for Partners for Climate Protection Reporting vs. Climate Action Charter**

**BC Climate Action Charter (CAC) Reporting** is the reporting conducted by local governments in BC each year to receive their Climate Action Revenue Incentive Program (CARIP) grant. It includes fuels used through the local governments' traditional services including:

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

Note that policing (i.e. RCMP Buildings and Fleet) and emissions from solid waste (sent to landfills) are not included in BC CAC reporting. Fuel from contracted services and from staff-owned vehicles on mileage for City work are however included in fuel inventories. Any buildings that are leased out by the City or paid by the operator would not be included in CAC inventories (e.g. restaurants in parkades or seniors centres) as these do not fall under traditional services.

**FCM's Partners for Climate Protection (PCP)** reporting is conducted by local governments if they wish to hit PCP corporate milestone 1. It includes anything that is under "operational control" of the local government. The inventory data needs to be organized into the following five "activity sectors":

- Buildings (electricity, natural gas data) – *includes buildings leased by the City; includes RCMP*
- Street Lights (electricity)
- Water and Sewer (electricity, natural gas, propane) – *including treatment plants*
- Vehicle Fleet (gasoline and diesel) – *includes contracted services providing traditional services (contracts over $25,000); includes staff-owned vehicles used for City work.*
- Solid Waste

Inventories for PCP must include energy consumed by everything a local government owns (e.g. buildings, fleet) and/or operates including leased buildings and contracted services. But building spaces that the City leases (e.g. PG Tourism) are not included in PCP inventories as the City does not have "full authority to introduce and implement operating policies at the operation". Unlike CAC reporting, PCP reporting includes solid waste, and the City-owned RCMP building.

**Note:** Transit fleet is excluded from both because neither is it a traditional service nor is it under the "operational control" of the City.

## Current Emissions Profile

The City of Prince George prepared a corporate energy and emissions inventory using the PCP methodology in 2002 and 2009 based on available data at that time. A 2011 report prepared for the FMC PCP Milestones 4 and 5, examined and compared the two PCP inventories and found significant discrepancies in corporate inventories, particularly for vehicle gasoline and diesel use and solid waste. Appendix D includes a summary of how PCP corporate inventory data should be organized, as well as other background inventory information. Table 3 below shows the 2002 and 2009 corporate inventory and a comparison with 2017 data by fuel types. The 2002 data has been corrected from the inventory provided in the 2005 reporting, by using the corporate diesel and gasoline consumption from 2003, which is considered reasonably reliable data, and therefore used as a surrogate for 2002.

*Table 3 – Comparison of 2002, 2009 and 2017 PCP Corporate Inventory by Fuel Types*

| | PCP INVENTORIES | | |
|---|---|---|---|
| Fuel Type | 2002 | 2009 | 2017 |
| Electricity (kWh) | 35,571,400 | 35,802,223 | 35,105,683 |
| Natural Gas (GJ) | 82,355 | 88,160 | 54,352 |
| Gasoline (L) | 286,901 | 286,260 | 278,097 |
| Diesel (L) | 586,091 | 0 | 894,559 |
| Diesel (L) – Contracted Services | | | 432,550 |
| Propane (L) | Not collected | Not collected | 20,535 |
| DRES (GJ) | n/a | n/a | 20,680 |
| Biodiesel B5 (L) | 0 | 1,031,890 | - |
| Solid Waste (metric tonnes) | 1,118 | 1,643 | 768 |
| **Total tonnes $CO_2e$** | **7,445** | **9,253** | **8,148** |

*2002 data for diesel and gasoline consumption uses 2003 data which is more reliable*

There are a number of issues identified with the 2002 and 2009 inventory as described in the *2011 City of Prince George Greenhouse Gas Management: PCP Milestone 4 and 5 Report* prepared by Stantec. For example, there is an unexplained increase in diesel (biodiesel) volume in 2009, and the estimated volume for solid waste seems significantly high and was based on a number of assumptions on volume and weight.

A positive feature of the inventories, which we have confidence in based on the data, is that natural gas consumption has dropped significantly between 2009 and 2017 due to several City buildings connecting to the Downtown Renewable Energy System.

The data for 2017, although collected for the BC Climate Action Charter reporting, is considered more reliable than 2002 and 2009 inventory data, because the methodology for

collecting and converting data to an emissions inventory is better documented and follows established methods from the annual Provincial published guideline reports*. The solid waste inventory data was provided by Waste Management and seems to be consistent with the expected proportion of corporate waste being approximately 1% compared to the community waste generated annually.

*Table 4 – 2017 Inventory by PCP Reporting Categories*

| | 2017 PCP INVENTORY | | | |
|---|---|---|---|---|
| Activity Sector | Data | Units | GJ | $tCO_2e$ |
| **Buildings** | | | | |
| Electricity | 15,893,170 | kWh | 57,215 | 175 |
| Natural Gas | 53,294 | GJ | 53,294 | 2,658 |
| DRES | 20,680 | GJ | 20,680 | 71 |
| Propane (heat) | 7,895 | L | 202 | 12 |
| *Sub-Total* | | | *131,391* | *2,916* |
| **Streetlights** | | | | |
| Electricity | 4,933,322 | kWh | 17,760 | 54 |
| **Water and Sewer** | | | | |
| Electricity | 14,256,472 | kWh | 51,323 | 157 |
| Natural Gas | 1,058 | GJ | 1,058 | 53 |
| *Sub-Total* | | | *52,381* | *210* |
| **Vehicle Fleet** | | | | |
| Gasoline | 278,097 | L | 9,639 | 655 |
| Diesel | 894,559 | L | 34,602 | 2,376 |
| Diesel (Contracted Services) | 432,550 | L | 16,731 | 1,149 |
| Propane | 12,640 | L | 323 | 20 |
| *Sub-Total* | | | *61,295* | *4,200* |
| Solid Waste | 772 | tonnes | | 768 |
| **TOTAL** | | | **262,827** | **8,148** |

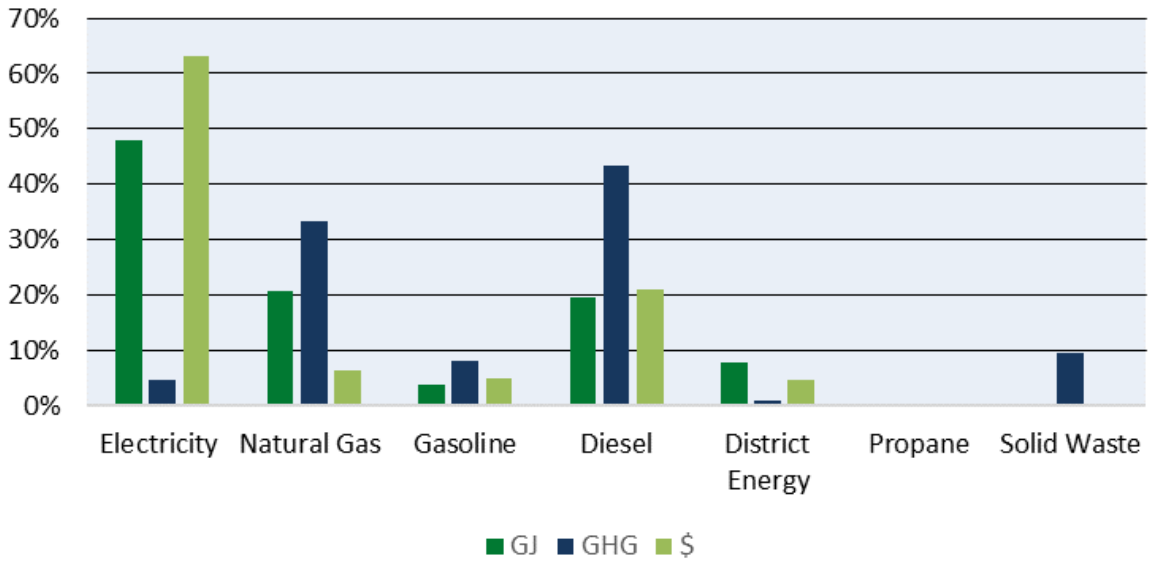
***Contracted Services** = 17,302 hrs. Assumes 25l/hr of diesel consumption as an estimated average in lieu of actual data; contracts >$25k; capital projects removed*
***Natural Gas** = from finance records; includes leased buildings owned by City; includes old RCMP building as 2002 and 2009 inventories included RCMP buildings under "public safety"*
***DRES** = includes new RCMP building; does not include WIDC building*
***Propane** = includes 12,640 L from fleet and 7,895 L probably from buildings heat*
***Electricity** = City owned + PG Tourism and Initiatives PG leased space (est. 128,016 kWh)*
***Gasoline** = includes staff-owned vehicles used for City services*

* 2017 B.C. Best Practices Methodology for Quantifying Greenhouse Gas Emissions, Ministry of Environment and Climate Change Strategy, 2017.

The costs to the City for the above energy consumption in 2017 is estimated at approximately $6.1 million. The proportional costs can be attributed to:

- Electricity = 63%
- Diesel = 21%
- Natural gas = 6%
- Gasoline = 5%
- DRES (heat purchased) = 5%

*Figure 19 – Proportion of corporate energy consumption, emissions, and energy expenditure by fuel in 2017, by PCP categories, as a percentage*




While electricity accounted for 48% of the corporate energy use, it contributed only 5% of the total corporate GHG emissions because of its low GHG intensity. Conversely, diesel use accounted for only 20% of the corporate energy consumption, but contributed 43% of the total corporate GHG emissions. Similarly, natural gas use contributed 21% of the energy consumption, but accounted for 33% of the total corporate GHG emissions. The DRES supplied approximately 35% percent of the corporate building space heating, but only contributed 1% of the GHG emissions. Solid waste contributed 9% of emissions.

This comparison demonstrates that the greatest gains in reducing GHG emissions will be through the reduction in diesel, natural gas, and gasoline consumption, as well as the production of solid waste. The conservation of electricity consumption or heat from the Downtown Renewable Energy System, while reducing costs to the City, would have less of an impact on GHG emissions given their lower emission factors per GJ than other energy sources.

*Figure 20 – Breakdown of 2017 Corporate Energy Use by PCP Reporting Categories, GJ*

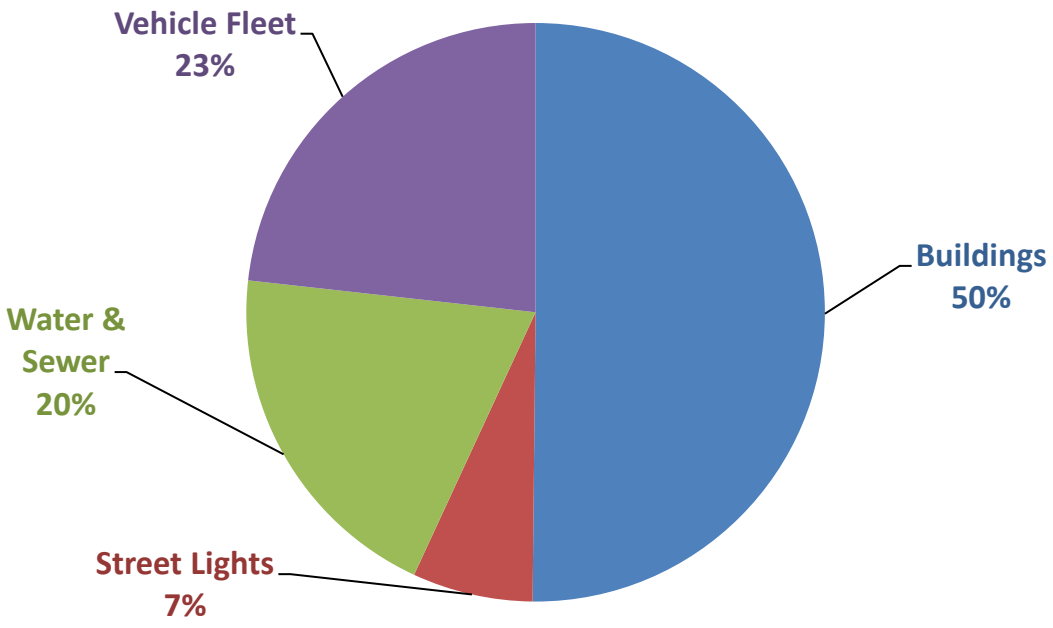
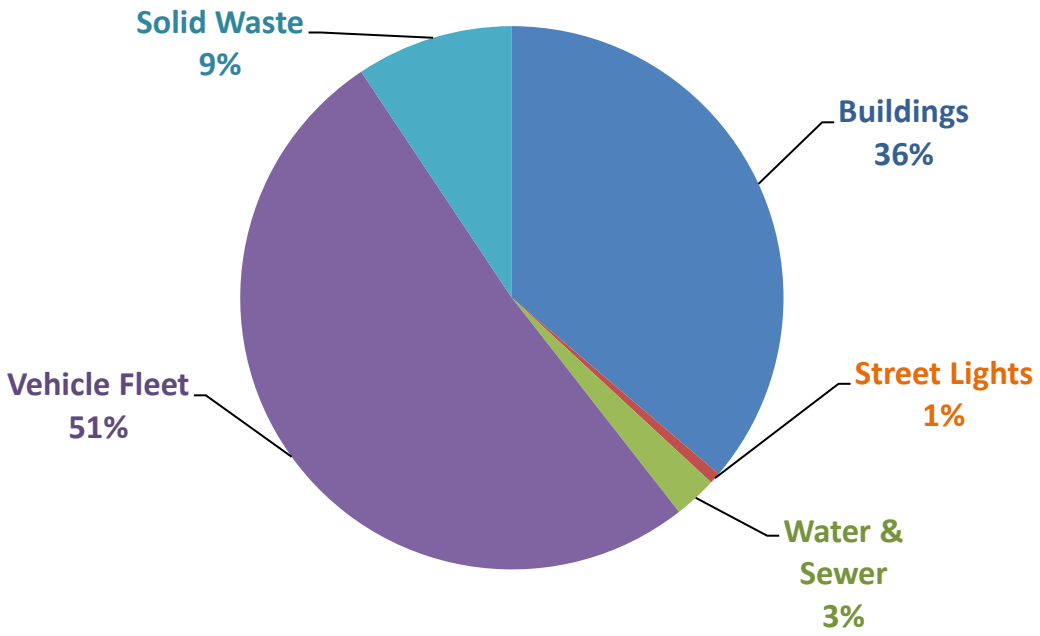



*Figure 21 – Breakdown of 2017 Corporate GHG Emissions by PCP Reporting Categories, $tCO_2e$*




Compared with other communities in BC, Prince George's corporate emissions are as expected based on climate, snowfall, and density. It does however have slightly lower per

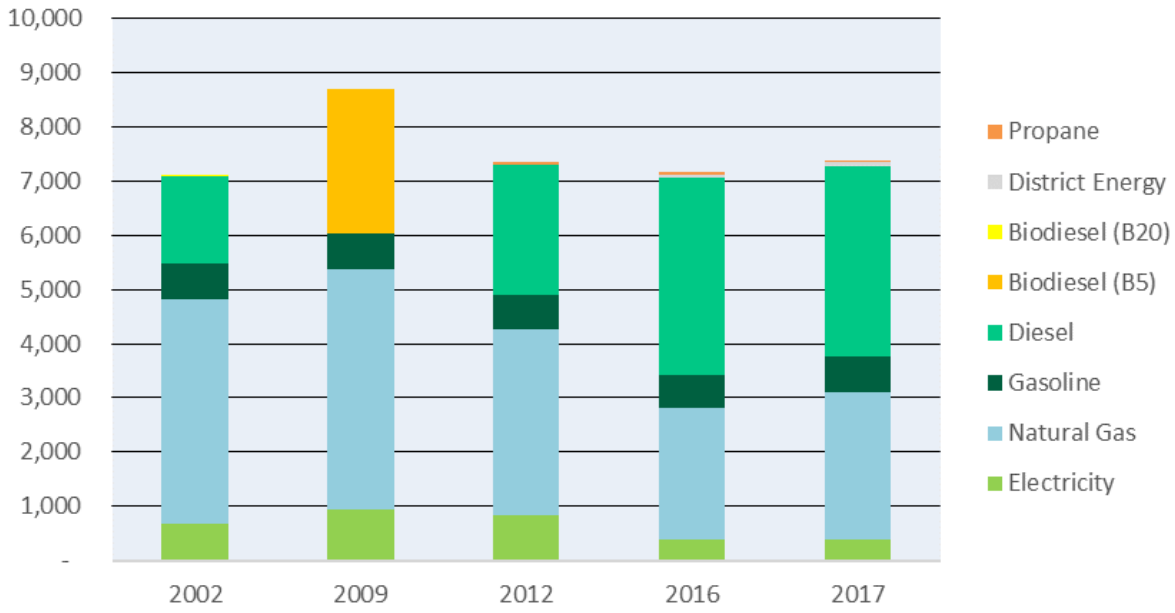
capita corporate emissions than the City of Kamloops which is probably at least partly due to the addition of the Downtown Renewable Energy System and connection of civic buildings. These comparisons are explored in more detail in Appendix F.

## Performance

### *Year on Year*

Five (5) inventory years, are compared in Figure 22.

*Figure 22 – Five Inventory Years Showing Corporate GHG Emissions in tCO2e from Fuel Consumption*

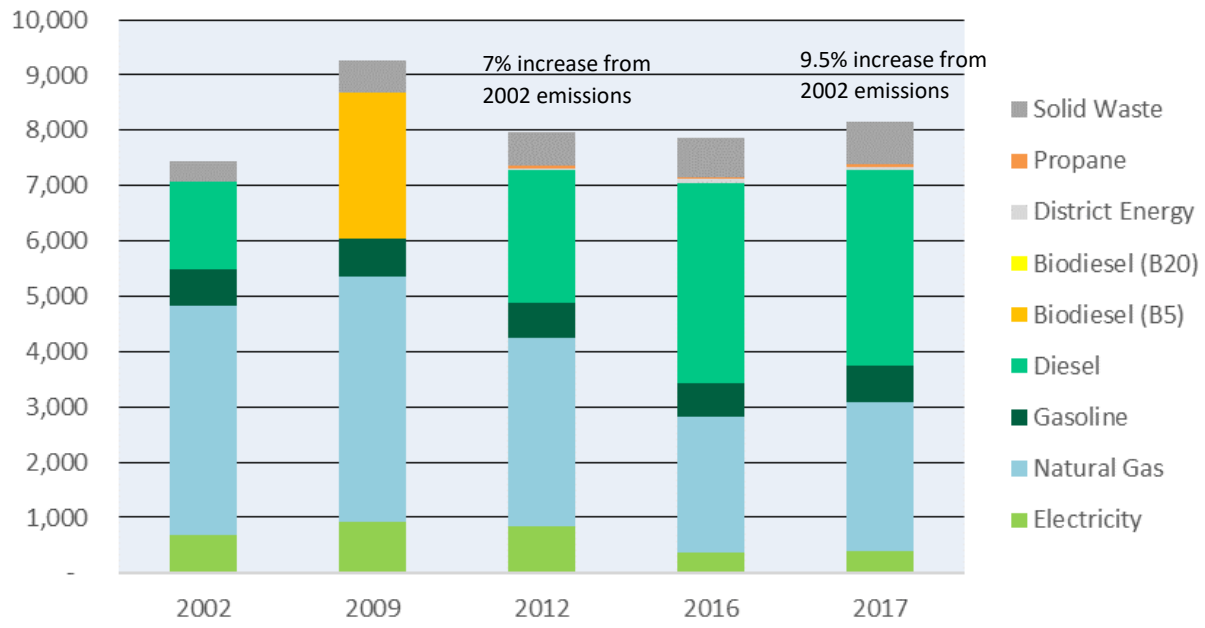



Total corporate GHG emissions for energy consumption (not including solid waste) varies from a low of 7,084 $tCO_2e$ in 2002, to a high of 8,691 $tCO_2e$ in 2009, with some variation in other years (see Figure 22). Much of the reduction in corporate GHG emissions can be attributed to the DRES system offsetting natural gas use for space heating in a number of City owned buildings, though this decrease is offset by a 50% increase in diesel for the years 2016 and 2017 vs. 2012 (3,631 and 3,525 $tCO_2e$ vs. 2,401 $tCO_2e$).*

Figure 23, which includes solid waste, shows that in the years between 2012 and 2017, where data is considered more reliable (see Appendix D for details), there is a slight variation between years with GHG emissions tracking between 7,857 $tCO_2e$ to 8,148 $tCO_2e$.

* Note that there are concerns that the biodiesel (B5) figure in 2009 could be incorrect.

*Figure 23 – Five PCP Inventory Years Showing Corporate GHG Emissions in tCO2e including Solid Waste*



### *Corporate Target*

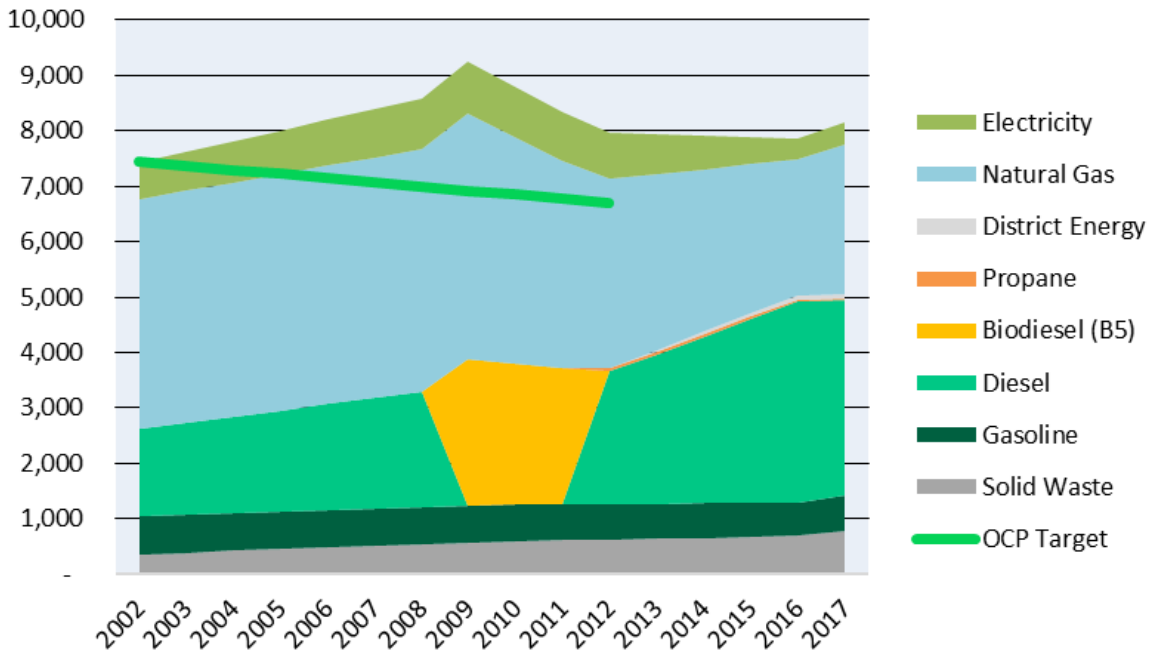
In 2007, the City of Prince George Energy and GHG Management Plan identified a Corporate GHG target as a 10% reduction from 2002 levels by 2012. Based on data from the 2007 report, and with a corrected 2002 corporate Partners for Climate Protection (PCP) baseline emissions of 7,445 $tCO_2e$, the City would have needed to reduce its corporate emissions by 744 tonnes to a level of 6,701 $tCO_2e$ by 2012.

Corporate emissions data for PCP reporting in 2012 indicates that the total GHG emissions were estimated at 7,979 $tCO_2e$, which is 534 $tCO_2e$, or 7% more than the total emissions estimated in 2002. After 2012, the City trended closer to the target, with the most notable achievement being the reduction of natural gas consumption for building space heating with the commissioning of the City's DRES. After the 2012-2013 commissioning period for the DRES, corporate data shows a significant decline in natural gas consumption; however, starting in 2016 corporate emissions begin to trend upwards with increases in diesel consumption, and natural gas in 2017. By 2017, corporate emissions are estimated to be 9.5% greater than they were in 2002.


*Under the hood of one of the City's electric cars. Source: City of Prince George.*

Figure 24 represents the actual "overall" trend in corporate GHG emissions based on data from 2002, 2009, 2012, 2016, and 2017. The green target line is based on the 10% target reduction from 2002 to 2012, and extended to 2017.

*Figure 24 – Comparing Corporate GHG Emissions with the Corporate Emissions Target*

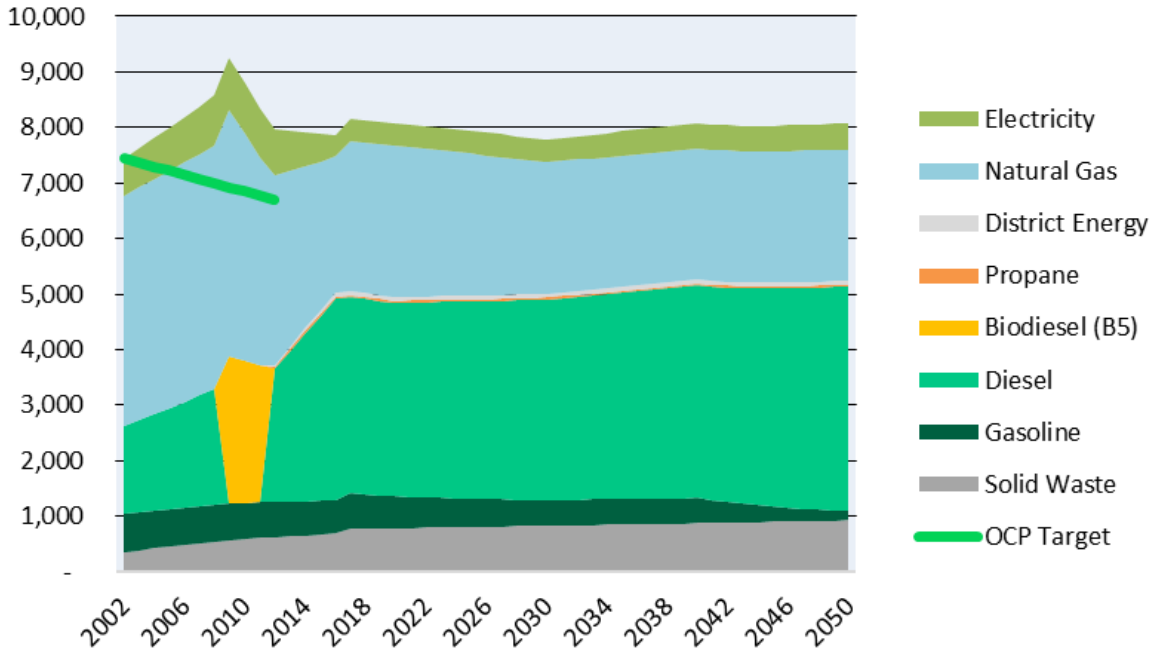



## Looking Forward

This section estimates long-term corporate emissions based on a "Business As Usual" (BAU) scenario. This BAU assumes that the City continues to undertake its service delivery from 2017 onwards without any significant changes in the energy type and quantity or the volume of solid waste produced. In looking ahead to illustrate potential trend lines in long-term corporate emissions, the data from the 2014 to 2017 CARIP reports was considered.

Figure 25 shows a BAU trend line extending out 33 years to 2050, using the post DRES years of 2014 to 2017 inventory data. It was used assuming that City services will increase over time with population growth, requiring more energy. The same BAU assumptions for community emissions were used for corporate emissions. Note that unlike the BAU trend for community emissions in Figure 18, corporate emissions do not exhibit the same decrease after 2020. This is due to the majority of fleet vehicles being heavy-duty, and thus not subject to the same Federal emissions standards nor the Clean BC Plan's zero-emission vehicle mandates for light-duty vehicles.

*Figure 25 – Corporate GHG Emissions BAU Trend to 2050*



## Engagement

To ensure that the Climate Change Mitigation Plan was shaped by stakeholders and members of the public, the City of Prince George provided a comprehensive set of opportunities for ideas on future climate actions to be shared. Appendix G outlines in detail the feedback from the engagement activities undertaken during the development of this plan. A brief summary is provided in this section.

### Internal Stakeholder Workshops

City staff consultation consisted of a series of meetings with various departments. Key points from each of the internal meetings are summarized below by department.

*Table 5 – Summary of Actions from Internal Stakeholder Meetings*

| Department | Community Actions | Corporate Actions |
|---|---|---|
| **Planning and Development** | • Adjust Revitalization Tax Exemption (RTE) bylaws to focus on environmental performance more:<br>  ○ EVs and Downtown Renewable Energy System connections<br>  ○ Step Code Part 3 buildings (will require further analysis and consultation before turning into a mandatory requirement)<br>• Shift from vacant rural to single family residential, introducing potential Step Code opportunities and laneway housing opportunities | • Continue to be part of the BC Hydro Energy Wise network, building its employee conservation engagement program and continuing to reduce its corporate GHG footprint<br>• Institute corporate sustainability policies for new buildings |
| **Public Works** | • Organics diversion – expand options and find ways to improve the public uptake of current organics program | • Refine solid waste volume estimation methods to improve accuracy (high proportion of the City's corporate solid waste is organic)<br>• Pilot scale EVs as part of the corporate fleet, still under evaluation<br>• Anti-idling within the fleet<br>• Continue to conduct and refresh several energy efficiency projects within its buildings<br>• Accelerate LED streetlight replacement program |

| Department | Community Actions | Corporate Actions |
|---|---|---|
| | | • Reduce community water consumption (would help reduce corporate electricity consumption)<br>• Staff education (e.g. anti-idling policy, vehicle maintenance, corporate GHG targets)<br>• Corporate waste diversion<br>• Improve sustainable procurement policy in RFPs |
| Community Services | | • Build new buildings like the RCMP building to higher efficiency standards at the beginning rather than retrofitting<br>• Refresh energy assessments on existing buildings<br>• Ongoing retrofitting includes LED lighting replacement for corporate buildings, parking, as well as streetlights<br>• Energy assessments of corporate buildings and pump stations |
| Infrastructure Services | • Expand Downtown Renewable Energy System<br>• Active transportation and traffic calming infrastructure – more bike lanes and trails<br>• Explore shifting towards electric and natural gas buses with BC Transit strategy | • New buildings built to energy efficient standards<br>• Develop corporate transportation measures / plan |
| External Relations | • Explore holding a public open house / town hall and a survey. Focus on actions that people can do that will tangibly make a difference to GHGs, such as organics diversion<br>• Collaboration and leverage with UNBC | |

| Department | Community Actions | Corporate Actions |
|---|---|---|
| | • Education (e.g. have an elected official join the BC Municipal Climate Leadership Council)<br>  ○ Make sure to link adaptation, mitigation, and economic development in messaging | |
| **Finance** | • Formalize Carbon Neutral Reserve Fund, possibly as a reserve bylaw<br>• Downtown Renewable Energy System – discussion on finances | • Formalize Carbon Neutral Reserve Fund, possibly as a reserve bylaw<br>• Downtown Renewable Energy System – discussion on finances<br>• Procurement policy – should include energy efficiency |

In addition to the internal departmental meetings, separate BC Hydro Community Energy Management Assessment (CEMA) workshops on EVs and buildings were held.

The CEMA – Electric Vehicle Supply Equipment (CEMA EVSE) Module workshop examined Prince George's readiness to incorporate EVSE at the community and corporate levels. Full results from the workshop can be found in Appendix G. Overall, Prince George is taking a proactive approach towards incorporating EV infrastructure including Level 2 station installations and updated bylaws with EV installation requirements.

*CEMA Buildings event. Source: CEA*

### Prince George's Commitment to Low Emission Transportation

Prince George is a participating municipality, through the Fraser-Fort George Regional District, in co-funding the planning study for Charge North. The Charge North project is a community-led project that engages 43 local governments from south of Kamloops to Haida Gwaii in order to develop an electric vehicle (EV) charging station network of over 2,780 km.

Prince George was a recent recipient of an Emotive grant from the Province. The grant supported promotion of EV adoption. The City, in conjunction with the local EV drivers' association, showcased EVs at three public events (SummerFest, FallFest, and the Farmers' Market) and completed a video to profile local EV drivers and address myths about EVs in northern climates.


*Electric vehicle owners join for the announcement of Northern Development Initiative Trust's (NDIT) contribution towards addition EV charging stations. January 2020. Source: Prince George Matters, via NDIT*

The CEMA Buildings Workshop examined Prince George's current and prospective commitments to building energy efficiency initiatives. Full results from the workshop can be found in Appendix G. Though only limited action has been taken thus far on new construction and retrofits, Prince George is being proactive in developing GHG reduction targets, seeking and allocating funding to drive energy efficient construction, and improving communications to inform stakeholders and the public on its building-related actions.

## External Stakeholder Workshops

External stakeholder consultation consisted of two workshops, one main session with representatives from 19 public and private stakeholders, and another focused on mitigation and adaptation which was attended by over 20 people from a range of public and private stakeholders.

The main session took place on December 4, 2018 and assessed the status and developed recommended priority actions in six topics including new and existing buildings, transportation, waste, land use, and renewable energy.

*External stakeholder session, December 4, 2018. Source: CEA*

On the whole, building construction and retrofits in Prince George do take advantage of energy efficiency programs despite some barriers such as public awareness and uptake, and a lack of local standards for improvements. Therefore, suggested actions were focused primarily on education, incentives, and public outreach for energy efficient buildings.

Transportation was a major area of interest for those that participated in the engagement sessions. It was recognized that Prince George is a driving-dominant community and requires substantial improvement to its public transit system. A suite of proposed actions focused on adjusting transit schedules and routes to better match demand, along with dedicated active transport corridors to alleviate traffic congestion and improve public health.

Waste diversion in the city is another important issue that was raised, as the current recycling program is being complicated by plastic repurposing and resale value, citizens filling their recycling bins with garbage, as well as the lack of current organics diversion. A public campaign to improve awareness on waste contamination in the recycling stream was suggested, along with the development of an organic waste diversion program.

Regarding renewable energy, there were suggestions that the City's Downtown Renewable Energy System could be expanded by adding supply heat from Canfor's biodiesel and co-generation plants, as well as adding more buildings to the system to increase demand. Incentivizing heat pumps to replace natural gas was also discussed, as well as creating a business case for solar installations using data from the University of Northern BC (UNBC) and Aboriginal Housing Society (AHS).

The mitigation and adaptation workshop highlighted the need for specific GHG reduction targets in specific sectors like solid waste and transportation, as well as significant attention on provincial wildfire response due to its contributions to GHG emissions. This workshop was attended by over 20 people from a range of private and public stakeholders in October 2018. Discussion focused on three sectors:

1. Air improvement by working with the Prince George Air Improvement Roundtable (PGAIR) to do another roundtable and continue lobbying for air quality;
2. Refining the Chamber of Commerce's Carbon Neutral work linking businesses with students who can help move towards carbon neutrality by closing the gap between student enthusiasm and practical action; and,
3. Capacity limitations on working with industry, with some businesses not having programmable thermostats nor the time to do basic energy retrofits.

Takeaways from the session were:

- Specific GHG reduction targets in specific sectors such as solid waste or transportation
- Providing industry with better direction when reducing their own emissions
- Organizing a GHG/energy leadership group similar to that for PGAIR
- Significant attention placed on provincial wildfire response due to GHG emission contribution

## Public Engagement

Public engagement was conducted through in-person and online events: a public open house and booths at two community events, and an online survey, engaging over 800 community members in the process. Each event had display boards, handouts, a prioritization activity and City staff available for discussions.


*Public Open House, summer 2019. Source: City of Prince George*

At the events, priority recommended actions spanned all sectors, including improved active transportation corridors and public transportation, more EV charging infrastructure and electrifying City fleets, organics diversion and improved curbside recycling, increased tree planting and associated incentives, and inclusion of energy efficiency measures and solar installations as part of updates to building codes.

The online survey garnered over 500 responses from the community and asked the public to indicate a level of support for five key topic areas, and then specific climate actions for each of these topics. Transportation scored highest by a fair margin as the climate action topic that respondents supported, followed by renewable energy and food/waste, with buildings and land use scoring lowest, relative to the others but still with significant support. The specific actions with the greatest public support identified through the engagement process, were: i) investigating opportunities to expand existing organics program and divert organics from the landfill; ii) continuing to support local food production by providing space for farmer's markets and community gardens; and iii) identifying regulatory measures to protect and grown the urban forest canopy. To keep informed about the City's progress on the CCMP, respondents preferred updates through the City's social media platforms and the

City's website. Lastly, respondents were relatively evenly spread on the education topics they would like to see the City provide information on, with active transportation, land use planning, and the Downtown Renewable Energy System ranking highest.


*Climate change plan feedback at farmers market, summer 2019. Source: City of Prince George*

## What We Can Do: Recommended Climate Actions

Based on staff consultation, best practices and feedback from stakeholder and public engagement sessions, 35 community and 34 corporate actions were identified to implement over the next five years and beyond. They are summarised in this section, and described in detail in Appendix H.

For community actions, these actions fall within the following categories:

1. *Buildings and Infrastructure*
2. *Renewable Energy*
3. *Land Use and Community Plans*
4. *Transportation*
5. *Waste Management*

For corporate actions, the categories are as follows:

1. *Buildings and Infrastructure*
2. *Renewable Energy*
3. *Transportation*
4. *Waste Management*
5. *Policy, Decision Making and Reporting*


*Electric vehicle charging station at Prince George City Hall. Source: CEA*

The actions support the achievement of the four objectives outlined in the *Green Energy and Reduce Carbon Emissions* section of Prince George's OCP (see text box). The full list of actions by category are outlined in Appendix H of this plan. They include a description, timeframe for implementation, the department or position responsible for implementation, and possible community partners and external funding sources. Furthermore, each action is assessed based on the amount of effort required, cost, GHG, and economic impacts.

*Green Energy and Reduce Carbon Emissions* Objectives from OCP:

1. Reduce energy use and GHG emissions generated by existing buildings through retrofits or redevelopment and the introduction of renewable energy technologies.
2. Increase energy efficiency, use of renewable energy, and reduce GHG emissions for new buildings.
3. Improve energy efficiency, use of renewable energy, and reduce GHG emissions for City owned buildings and facilities.
4. Recognize the role of our natural environment in climate change mitigation and greenhouse gas emission reduction in land use decisions.

A summary table of community and corporate actions is shown below.

*Table 6 – Climate Actions Summary Table*

| | | 0-2 yrs | 2-5 yrs | 5+ yrs |
|---|---|---|---|---|
| **Buildings (Community)** | | | | |
| B1 | Continue supporting capacity-building opportunities for building industry professionals in construction of energy efficient buildings | Y | | |
| B2 | Engage with the building community on the BC Energy Step Code | Y | | |
| B3 | Plan for the Provincial implementation of the BC Energy Step Code, and consider requiring higher levels of energy efficiency for new builds | | Y | |
| B4 | Partner with grant providers and energy companies on delivery and promotion of energy conservation education and grant programs for new and existing buildings | | Y | |
| B5 | Investigate opportunities to work with industry and higher education partners on economic opportunities around energy efficient new buildings | | | Y |
| B6 | Investigate methods to encourage local businesses to improve efficiency, such as through collaboration with the Chamber of Commerce Carbon Reduction Project | | | Y |
| B7 | Investigate financing models for implementing a comprehensive residential energy efficiency retrofit campaign | | | Y |
| **Buildings and Infrastructure (Corporate)** | | | | |
| MB1 | Lead by example and construct civic facilities at least one step above current level Energy Step Code and demonstrate utilization of wood in structural components | Y | | |
| MB2 | Continue to convert local government owned streetlights to LED when up for replacement. | Y | | |
| MB3 | Utilize energy management tracking and information system for City buildings and infrastructure | Y | | |
| MB4 | Conduct energy audits of existing facilities and infrastructure, and implement energy efficiency improvements. | | Y | |
| MB5 | Implement energy management practices into building maintenance procedures | | Y | |
| MB6 | Examine optimal siting, orientation and design options for new buildings | | | Y |
| MB7 | Investigate energy recovery options from facilities | | | Y |
| **Renewable Energy (Community)** | | | | |
| E1 | Continue to identify community connection opportunities for DRES | Y | | |
| E2 | Utilize the DRES in a public information campaign that demonstrates benefits | Y | | |

| | | 0-2 yrs | 2-5 yrs | 5+ yrs |
|---|---|---|---|---|
| E3 | Investigate opportunities to increase both supply and demand of renewable energy | | | Y |
| **Renewable Energy (Corporate)** | | | | |
| ME1 | Continue to identify municipal connection opportunities for DRES | Y | | |
| ME2 | Investigate opportunities to increase both supply and demand of renewable energy options on municipal buildings and infrastructure | | | Y |
| **Land Use and Community Plans (Community)** | | | | |
| L1 | Continue to encourage a complete, compact community through appropriate measures. | Y | | |
| L2 | Continue to support local food production by preserving properties in the ALR | Y | | |
| L3 | Continue to support local food production by providing space for farmer's markets and community gardens | Y | | |
| L4 | Identify regulatory measures to protect and grow the urban forest canopy | | Y | |
| L5 | Update Urban Forestry Management Plan to include climate change targets | | Y | |
| L6 | Amend parking requirements to require bike parking and EV charging stations | | Y | |
| L7 | Apply the Community Lifecycle Infrastructure Costing (CLIC) Tool to all major OCP amendment and rezoning applications to assess costs to the City | | Y | |
| L8 | Update the subdivision servicing bylaw to allow alternative design standards such as LED streetlights and alternative permeable surfaces | | Y | |
| L9 | Investigate opportunities to prioritize and implement safe and reliable active transportation options into street design for new, rehabilitated and replacement roads. | | Y | |
| L10 | Investigate the ability to implement 30 km/hr speed limit in the downtown core to encourage walking and cycling | | | Y |
| L11 | Investigate opportunities to expand the City's support to improve local food production | | | Y |
| **Transportation (Community)** | | | | |
| T1 | Expand efforts on planning and implementation of pedestrian / cycling infrastructure | Y | | |
| T2 | Implement recommendations identified in Transit Future Plan | Y | | |
| T3 | Continue to support PGAIR's initiatives that seek to reduce greenhouse gas emissions and improve air quality | Y | | |
| T4 | Develop an EV strategy to increase community-wide uptake of low carbon vehicles | | Y | |
| T5 | Enforce annual anti-idling campaign | | Y | |
| T6 | Partner with BC Transit to look at opportunities to convert transit fleet to low carbon fuels | | Y | |
| T7 | Consider including car idling restrictions in Clean Air Bylaw | | | Y |
| T8 | Consider supporting car share cooperatives and ride hailing services | | | Y |
| T9 | Investigate collaboration opportunities with major local employers to reduce emissions associated with commuting to work, e.g. carpooling | | | Y |
| T10 | Consider collaborations with energy suppliers for low-carbon fuel options | | | Y |
| T11 | Develop downtown Transportation Demand Management Strategy to inform next steps for single occupancy vehicles. | | | Y |
| T12 | Consider surveying residents to improve dataset on travel modal split. | | | Y |
| **Transportation (Corporate)** | | | | |
| MT1 | Maintain membership in and progress through fleet certification programs, such as Fleet Champions | Y | | |
| MT2 | Continue to phase out light duty diesel trucks and replace with high efficiency gasoline models and consider hybrid / electric options for all fleet vehicles | Y | | |
| MT3 | Re-activate anti-idling campaign with all City staff | | Y | |

| | | 0-2 yrs | 2-5 yrs | 5+ yrs |
|---|---|---|---|---|
| MT4 | Analyse fleet fuel consumption data semi-annually and implement efficiency opportunities | | Y | |
| MT5 | Conduct and implement a green fleet study including phased implementation schedule | | Y | |
| MT6 | Encourage City staff to walk or cycle to work beyond bike to work week, such as offering flexible start times, providing secure bicycle parking, shower facilities, etc. | | Y | |
| MT7 | Explore and implement online digital options for office functions | | Y | |
| **Waste Management (Community)** | | | | |
| W1 | Continue implementation of recommendations identified in 2016 Water Conservation Plan to reduce community-wide water usage | Y | | |
| W2 | Investigate opportunities to expand existing organics diversion program | | Y | |
| **Waste Management (Corporate)** | | | | |
| MW1 | Continue implementation of recommendations identified in 2016 Water Conservation Plan to reduce City operations' water usage | Y | | |
| MW2 | Evaluate waste creation from City facilities and provide educational information to internal staff members | Y | | |
| MW3 | Manage waste creation at City facilities, such as composting food waste | | Y | |
| **Policy, Decision Making and Reporting** | | | | |
| MA1 | Prepare a Climate Action Strategy and 5 year work plans | Y | | |
| MA2 | Report on climate action in the City's Annual Report, to FCM at regular intervals, and incorporate actions/measures into public information materials | Y | | |
| MA3 | Identify local GHG emission reduction priorities and success factors in Federal/Provincial infrastructure grants | Y | | |
| MA4 | Update methodology for calculating corporate GHG emissions | Y | | |
| MA5 | Continue to run staff behavioural initiatives and campaigns to encourage energy efficiency practices in the workplace | Y | | |
| MA6 | Integrate emissions reduction targets into new and existing City plans and policies and continue to report on progress annually; similarly, incorporate relevant goals/objectives from other City plans and strategies into Climate Action priorities | | Y | |
| MA7 | Consider appropriate resourcing (financial and staff) for realizing climate action goals and priorities | | Y | |
| MA8 | Formalize assignment of the CARIP grant into an energy and greenhouse gas emissions reduction fund that can support municipal and community projects | | Y | |
| MA9 | Update current Sustainable Procurement Policy guidelines | | Y | |
| MA10 | Perform a review every 5 years of emission reduction targets and actions to identify if implemented actions are achieving targets | | Y | |
| MA11 | Incorporate Community Based Social Marketing (CBSM) training into actions. | | Y | |
| MA12 | Demonstrate leadership as a municipality on climate change mitigation through having an elected official join the BC Municipal Climate Leadership Council and engage with local partners on research and development and education and capacity building opportunities | | | Y |
| MA13 | Commit to long-term community engagement on carbon emissions reduction | | | Y |
| MA14 | Review and Update Climate Change Action Plan every 5 to 10 years to ensure targets and actions are on-track and align with leading practices | | | Y |
| MA15 | Investigate opportunities to provide community grants related to energy and greenhouse gas emissions reduction, in alignment with the actions in this plan | | | Y |
| MA16 | Consider developing a Corporate Land Use Plan to identify opportunities for climate change mitigation and adaptation. | | | Y |

# What Prince George Can Achieve


*Electric vehicle charging event at UNBC. Source: City of Prince George*

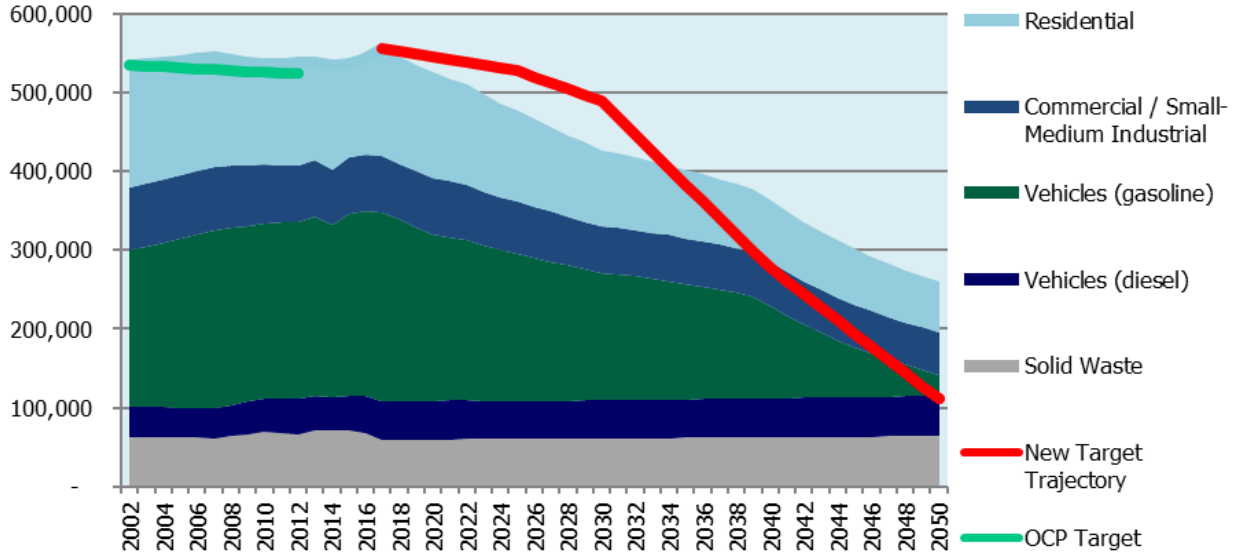
## Modelling Climate Actions - Community

The complete list of community climate actions was modelled to estimate the potential GHG emission reductions by sector and by action. More detail on the modelling is in Appendix B.

As seen in Figure 26, total emissions are expected to decline. The decline is expected to be lower than the new target trajectory until 2033, if all actions are fully implemented.

The most significant reductions will come from switching to low or zero emission passenger vehicles, and constructing or renovating buildings that generate less emissions.

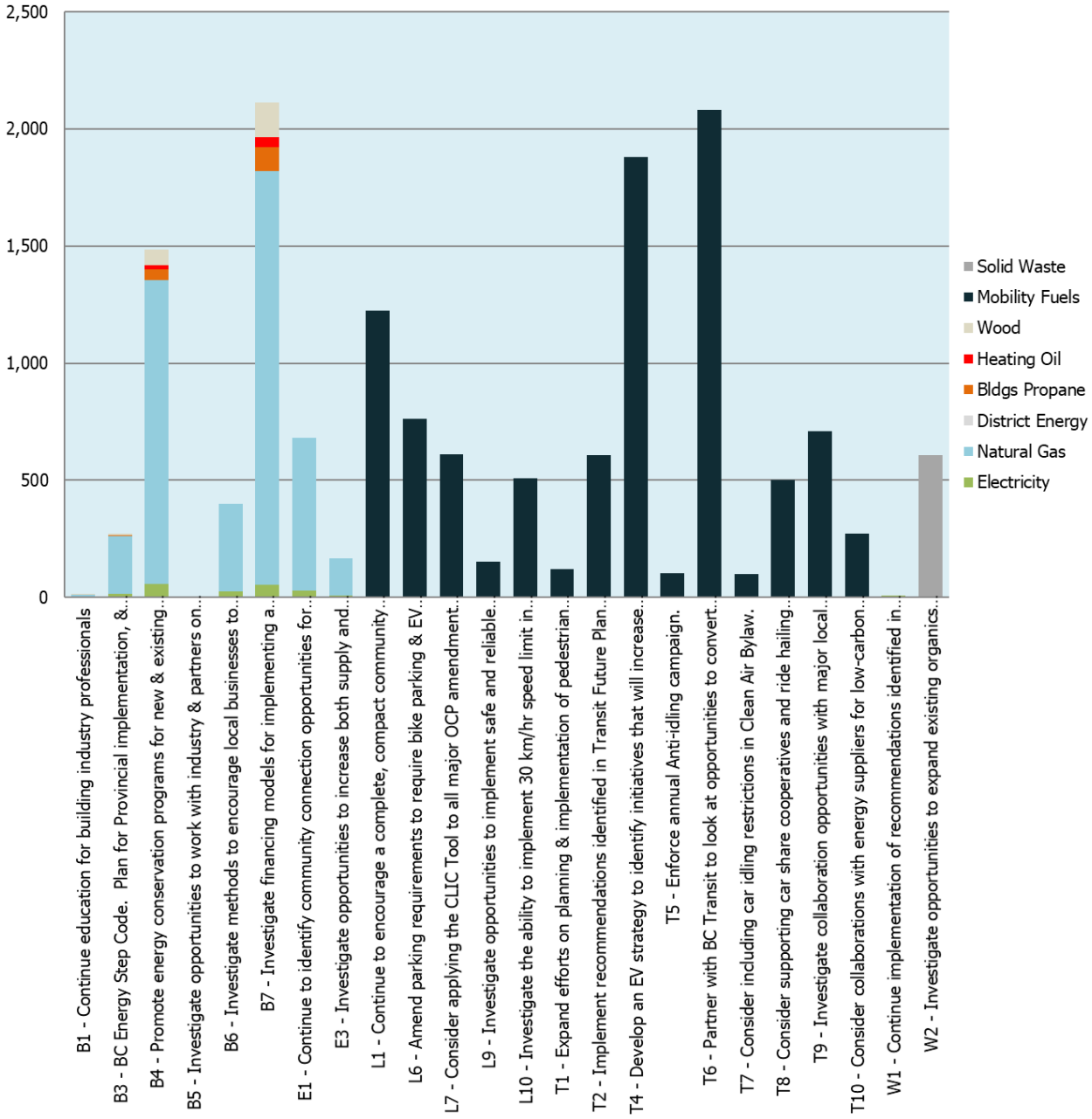
*Figure 26 – Planned Community GHGs by Sector, tonnes/year*




As depicted in Figure 27, the top five community actions that will achieve the largest reductions in GHG emissions over the next five years are:

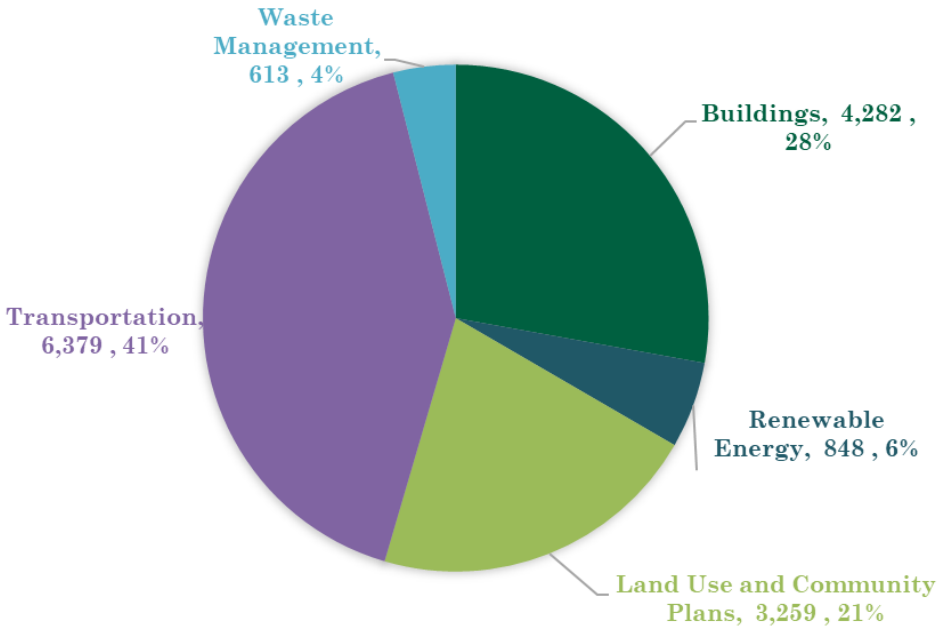
- B7 – Investigate financing models for a comprehensive residential energy efficiency retrofit campaign (assuming implementation);
- T5 – Partnering with BC Transit to look at opportunities to convert the transit fleet to low carbon fuel;
- T3 – Develop an EV strategy to identify initiatives that will increase the community-wide uptake of low carbon vehicles;
- B4 – Promote energy conservation programs for new and existing buildings; and,
- L1 – Continue to encourage a complete, compact community through appropriate measures.

*Figure 27 – Community GHG Savings by Action in 2025, tonnes/yr*




Action impacts can also be represented in terms of how much each action category will contribute towards the community 2025 emissions target. This information is shown in Figure 28.

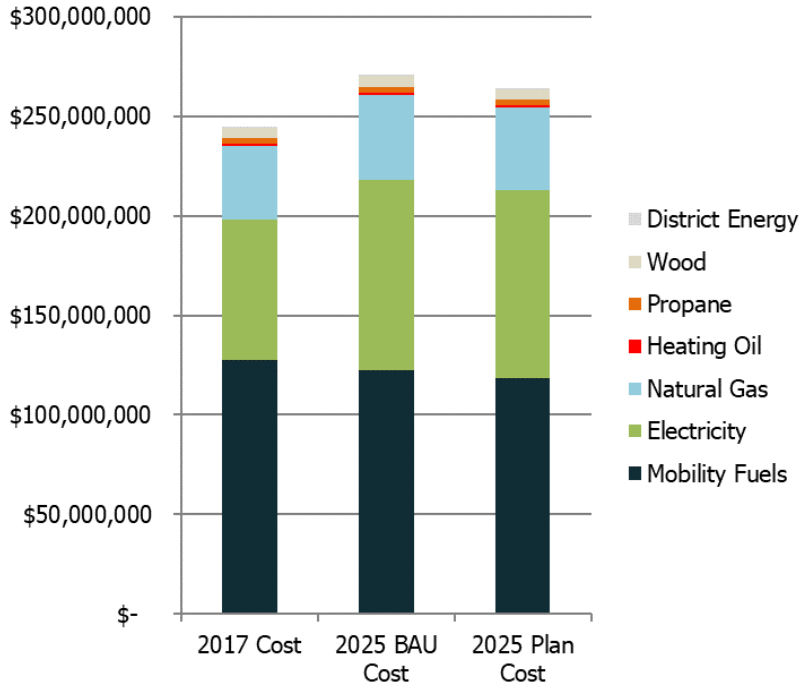
*Figure 28 – Community GHG Emissions Reductions from Each Action Category in 2025*




In addition to reducing emissions, the planned community climate actions will lower energy costs compared to BAU levels in 2025, as illustrated in Figure 29. Total community energy costs in Prince George are forecasted to be about $270 million in 2025 compared to $245 million in 2017. By executing the planned climate actions, energy costs are expected to be $264 million in 2025, resulting in a $6.5 million savings in 2025. For each type of fuel, cost savings are also expected, with mobility fuels experiencing the most reductions at $3.8 million.

Details of estimated community energy expenditure savings by action are contained in Appendix J.

*Figure 29 – Community Energy Costs 2017 and 2025, $/yr*




## Greenhouse Gas Emissions Reductions Targets – Community

Prince George has set new short-term targets that are realistic and pragmatic to ensure that the community can achieve them in addition to maintaining long-term targets that demonstrate strong municipal leadership. These targets are updates to the 2012 target from the 2007 Energy and GHG Management Plan. Based on the modelling of existing and proposed climate actions as well as feedback from stakeholder and public engagement sessions and staff consultation, the following new GHG emission reduction targets have been established:

- 2025 – 5%
- 2030 – 12%
- 2040 – 50%
- 2050 – 80%

*Building sidewalks. Source: City of Prince George*

**Why change the baseline year to 2017?**

The baseline year for both Community and Corporate targets has been changed to 2017 for the 2020 Climate Change Mitigation Plan. In the 2007 Energy and GHG Management Plan it was 2002. This means that reduction targets will now be compared to the 2017 inventory.

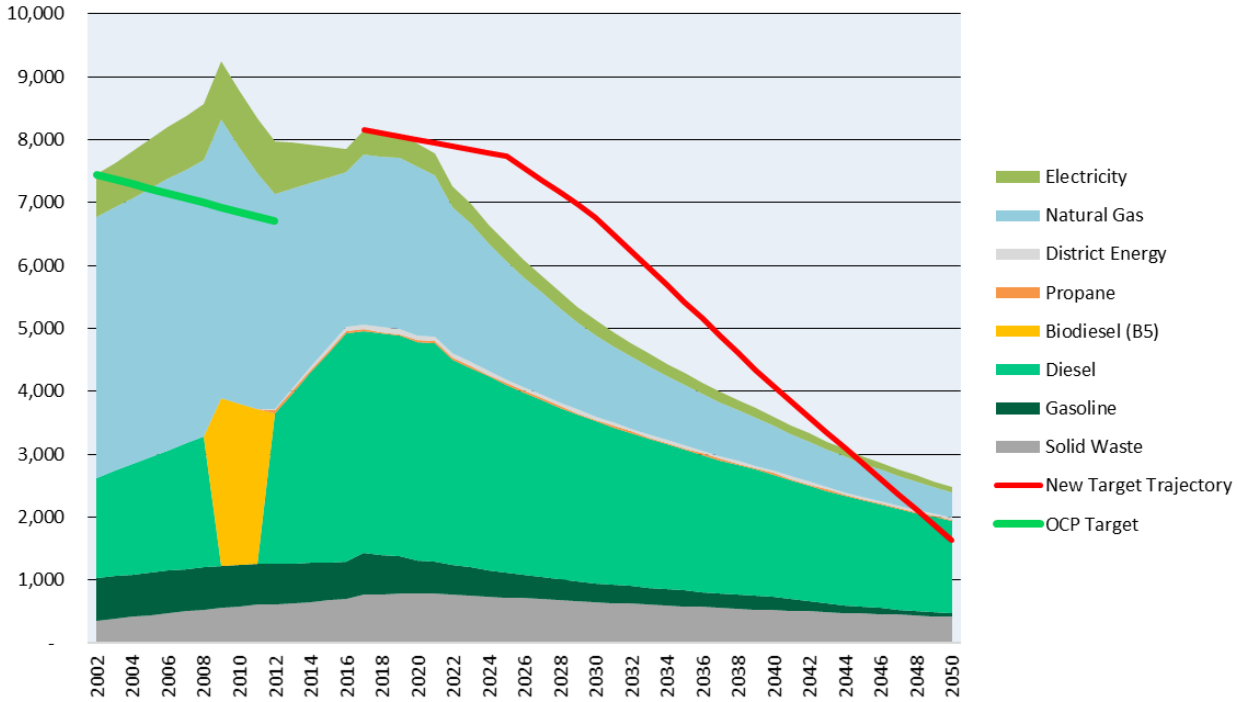
It has been changed to 2017 due to the improved accuracy and reliability of the greenhouse gas emissions dataset. Plus since it is a more recent dataset compared to baseline years such as 2002 and 2009, 2017 accurately depicts Prince George's current state and demonstrates where best to target emissions reductions. Prince George's long-term community target is aligned with the Province's commitment in CleanBC.

## Modelling Climate Actions – Corporate

The complete list of corporate climate actions was modelled to estimate the potential GHG emission reductions by sector and by action. More detail on the modelling is in Appendix D.

Total emissions are expected to decline as shown in Figure 30. The most significant reductions will be from energy audits of existing buildings and subsequent adopted energy efficiency measures, and a green fleet study resulting in the switching of fleet vehicles to electric or other low carbon options. With current actions and timelines, corporate emission reductions will be reasonably close to the 80% target by 2050, as recommended in the CleanBC Plan. Additional actions on fleet conversion from diesel to electric are recommended, as they are the largest contributor of emissions in 2050.

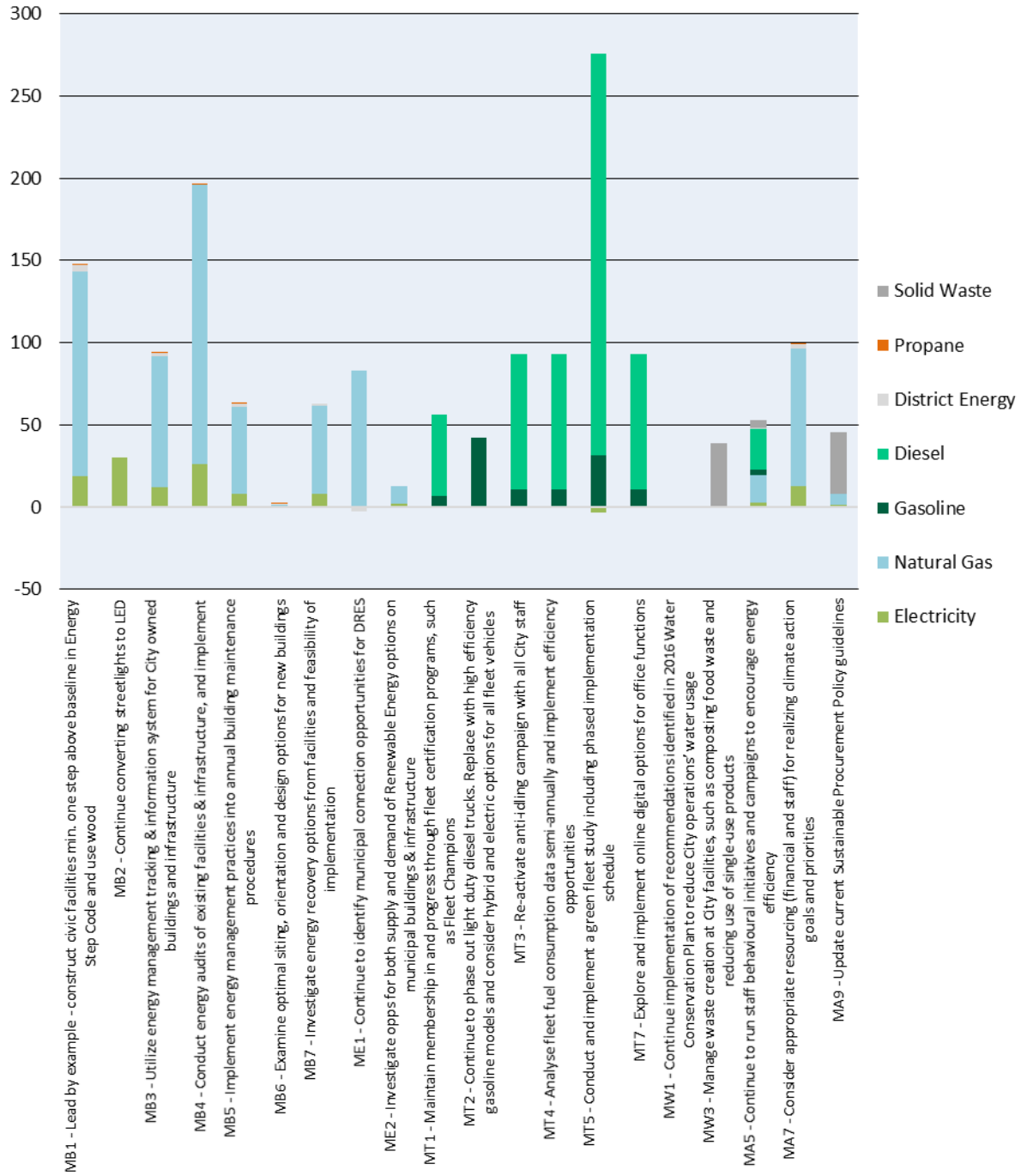
*Figure 30 – Planned Corporate GHGs by Sector, tonnes/year*




As depicted in Figure 31, the top five corporate actions that will achieve the largest reductions in GHG emissions over the next five years are:

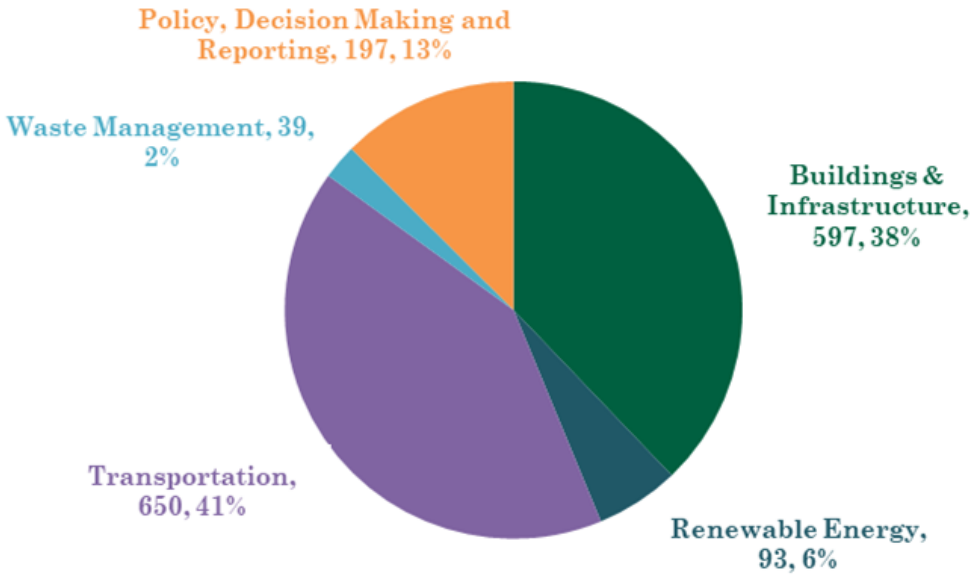
- MT5 - Conduct and implement a green fleet study including a phased implementation schedule;
- MB4 - Conduct energy audits of existing facilities and infrastructure, and implement;
- MB1 - Lead by example - construct civic facilities at least one step above baseline in Energy Step Code and use wood;
- MA7 - Consider appropriate resourcing (financial and staff) for realizing climate action goals and priorities (note that this is primarily a facilitating action and is essential for completing the other actions, as covered in the section Implementation for Success); and,
- MB3 - Utilize energy management tracking and information systems for City owned buildings and infrastructure.

*Figure 31 – Corporate GHG Savings by Action in 2025, tonnes/yr*




Action impacts can also be represented in terms of how much each action category will contribute towards the corporate 2025 emissions target. This information is shown in Figure 32.

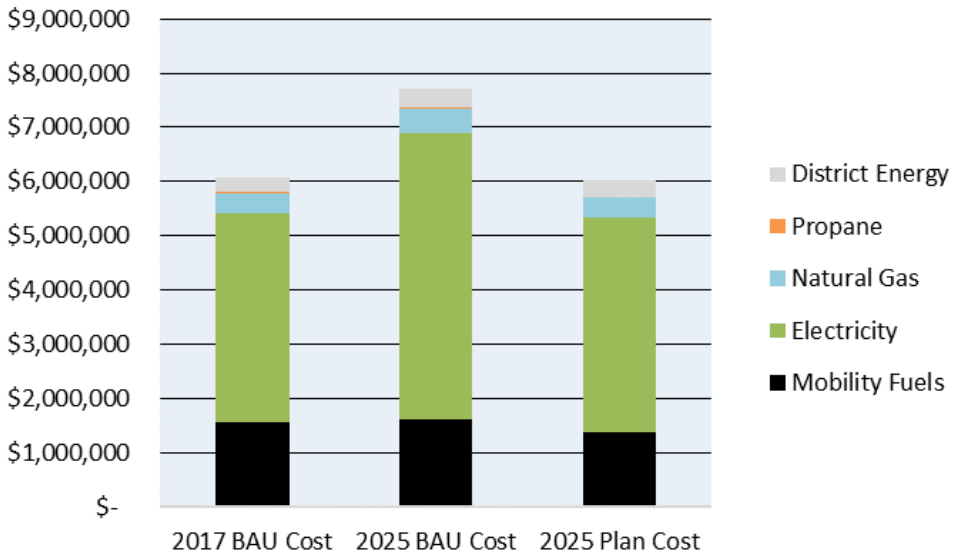
*Figure 32 – Corporate GHG Emissions Reductions from Each Action Category in 2025*




In addition to reducing emissions, the planned corporate climate actions will lower energy costs compared to BAU levels in 2025, as illustrated in Figure 33. Total corporate energy costs in Prince George are forecasted to be about $7.7 million in 2025 compared to $6.1 million in 2017. By executing the planned climate actions, this is expected to save $1.7 million in 2025. For each type of fuel, cost savings are also expected, with electricity experiencing the largest reduction at $1.32 million, followed by mobility fuels at $230,000.

Details of estimated corporate energy expenditure savings by action are contained in Appendix J.

*Figure 33 – Corporate Energy Costs 2017 and 2025, $/yr*



### Greenhouse Gas Emissions Reductions Targets – Corporate

Prince George had previously set a corporate target of 10% reduction in GHGs vs. 2002 data for 2012 in its 2007 Energy and GHG Management Plan. Based on the modelling of existing and proposed climate actions as well as feedback from stakeholder and public engagement sessions and staff consultation, the following new GHG emission reduction targets have been established:

- 2025 – 5%
- 2030 – 17%
- 2040 – 50%
- 2050 – 80%

As previously mentioned for community reduction targets, the year 2017 was selected as the baseline year for the 2020 Climate Change Mitigation Plan due to the accuracy and reliability of the greenhouse gas emissions dataset. Prince George's long-term corporate target is aligned with the Province's commitment in CleanBC.

# Implementation for Success


*Clearing snow from a sidewalk. Source: City of Prince George*

Several key factors are important for the successful implementation of community energy and emission reduction plans based on research conducted by CEA, QUEST and Smart Prosperity.* 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 City of Prince George is fortunate to already have some political, staff, and community/stakeholder support for a number of the identified actions, and some financial resources. However, to complete all of the identified actions in the timeline identified, additional support, capacity and resources would be needed.

To gain additional support and resources, it is suggested that the co-benefits of actions, such as saving money in the community, economic development, improving social equity, community health, and leveraging external sources of funding, be emphasized. These are described in detail in the section: The Case for Reducing Greenhouse Gas Emissions.

On capacity and resources, the City could greatly benefit from a dedicated staff position or positions (one for community actions and one for corporate actions), who have access to funds to implement actions (community work plan supported by the CEMA EV and Buildings workshops) and can support institutionalization of climate action. Fortunately, the City can potentially access funding from the Federation of Canadian Municipalities, BC Hydro and FortisBC to fund these positions.

* Community Energy Implementation Framework.

Funding sources that communities typically use for climate action are shown in Table 7. Although the City already sets aside its Climate Action Revenue Incentive Program (CARIP) rebate, this should be formalised to ensure that it continues to be set aside in the future. The City should also consider other internal funding sources in order to accelerate action. Internal funding sources can be used to leverage external funding to great effect.

Recommendations from this section are based on CEA's research, and also on completing FCM's mitigation maturity assessment for Prince George. See Appendix L for the latter.

*Table 7 – Funding Sources BC Local Governments Typically Use for Climate Action*

| Internal Funding Sources | External Funding Sources |
|---|---|
| 1. CARIP rebate allocated for climate action.<br>2. Climate/carbon fund (Summerland has a green revolving fund for corporate actions, Vernon also has one which can also be used for community actions).<br>3. Forgone revenue, e.g. the City could choose to charge less for a building permit for a highly efficient new building and forego that revenue.<br>4. General revenue (e.g. property taxes).<br>5. Recycling and solid waste user fees / tipping fees.<br>6. Building permit fees and other service fees charged by Development Services (e.g. a surplus in revenue can be used to fund permit rebates for energy efficient new construction).<br>7. Electrical utility and water user fees. | 1. BC Hydro and FortisBC funding for dedicated staff positions.<br>2. UBCM Gas Tax Agreement Funds.<br>3. FCM's Green Municipal Fund supports plans, studies, capital projects and pilot projects for environmental initiatives in a number of focus areas.<br>4. Northern Development Initiative Trust grants for community economic and educational initiatives in nine economic sectors (e.g. capital investment for renewable energy systems, electric vehicle charging stations).<br>5. Federal government programs such as the Low Carbon Economy Challenge and Clean Energy Innovation Program.<br>6. Provincial government programs such as the Clean Energy Vehicle Program, BikeBC Program and CleanBC Communities Fund.<br>7. Emotive grants for EV educational events to foster greater EV adoption.<br>8. Farm Credit Canada's AgriSpirit Fund for capital projects in rural communities.<br>9. FortisBC energy efficiency incentives for new home construction and FortisBC and CleanBC Better Homes incentives for increasing energy efficiency in existing buildings.<br>10. BC Housing, FortisBC and BC Hydro for education or demonstration projects to encourage the building industry to construct low energy and GHG emission homes. |

With regards to institutionalization, ideas on how this can be done are shown in Table 8.

*Table 8 – Ways Local Governments can Institutionalize a Climate Change Mitigation Plan*

| | |
|---|---|
| Incorporate | Embed climate action into other planning documents such as the OCP, bylaws and policies, and departmental/master plans. Climate action could also be incorporated into City staff job descriptions. Some communities report on climate action or sustainability implications in reports to Council. |
| Budget | Embed climate action into the budgeting process. |
| Monitor | Monitor indicators as outlined in the Monitoring and Evaluation section. |
| Convene | Host regular meetings to discuss implementation with internal and/or external stakeholders. |
| Report | Report regularly to Council on progress and accomplishments. Climate action is already included in the Annual Report, but could include monitoring indicators as listed in the Monitoring and Evaluation section. |
| Renew | Prepare for plan renewal approximately every five years. |

The City already:

- Incorporates climate action into some over-arching documents such as the Official Community Plan;
- Reports regularly on climate action to Council by including it in its Annual Report;
- Has joined PCP, and was one of the first municipalities in Canada to progress through all 5 milestones in both the community and corporate categories;
- Informally sets aside its CARIP rebate, for climate action; and,
- Renews its plan, as this is a renewal of the older plan (2011).

In addition to these actions, the City should consider:

- Getting a dedicated staff person(s) is a high priority as it would be foundational in driving forward the recommended actions. External funding may be accessed, e.g. from FCM, BC Hydro, or FortisBC. See 0 for sample work plans for Community and Corporate Energy Managers, based on activities identified by this project;
- Formalising how the CARIP rebate is set aside for climate action. See Appendix J for suggested language;
- Convening a Community Climate Action Advisory Committee, including representatives from the public and other external stakeholders;
- Reporting on climate action implications, similar to financial implications, in reports to Council;
- Include climate action implications when making capital and operational budget requests and how project may contribute to or impede GHG reduction targets (ie. Questica);

- Incorporating climate action into job descriptions of other City staff. Climate action is the responsibility of many departments, and there is greater chance of success if responsibility is shared;
- Budgeting more for climate action. For example, it could be a line item in the budgeting process;
- Identifying monitoring indicators that are easy to track to help ensure that progress is being made
- Reporting on aforementioned indicators more regularly to Council;
- Reconfirming more PCP milestones by submitting these documents to FCM. This could then be included in the Annual Report or reported to Council, and would help to raise the profile of climate action within the City; and,
- Renewing this plan again in five years.

## Monitoring and Evaluation

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

*Garbage pickup. Source: City of Prince George*

Suggested indicators for community climate action are shown in Table 9. Two types of indicators are recommended. Primary indicators measure community energy consumption and GHG emissions, while secondary indicators can quantify the indirect success of various actions (all indicators are secondary unless otherwise specified). The following table provides a description of these indicators, the measures of success, data sources for each indicator, and frequency of reporting. Annual progress reporting should be planned by the staff person responsible. Note that some of these KPIs correspond with other City planning documents, such as the Official Community Plan Five Year Monitoring Report, and the City's 2020 Levels of Service work. The monitoring metrics may be re-evaluated and prioritized through the Climate Action Strategy process.

*Table 9 – Ways Local Governments can Monitor and Evaluate Climate Action Progress – Community Emissions*

| | Indicators | Measures of Success | Data Sources |
|---|---|---|---|
| Overall – primary indicator | 1. Community GHG emissions | Reduction in community emissions from 2017 levels:<br>• 2025 – 5%<br>• 2030 – 12%<br>• 2040 – 50%<br>• 2050 – 80% | Provincial energy and emissions data at the community level, and Kent Group fuel sales data for area gas stations. |
| Overall – primary indicator | 2. Community energy usage | Average household and commercial energy use shows downward trend to 2050.<br><br>Annual fuel sales (gas and diesel) decreases over time to 2050. | Provincial energy and emissions data at the community level, Kent Group fuel sales data for area gas stations. |

| | Indicators | Measures of Success | Data Sources |
|---|---|---|---|
| Existing buildings | 3. # of energy efficiency incentives distributed for building efficiency upgrades | Average increase in incentive use. | Summary data from BC Hydro, FortisBC (and other entities as applicable, e.g. Province). |
| New buildings | 4. # of buildings at each level of the BC Energy Step Code | Increase in number of new buildings constructed to various levels of the Step Code. | Permit applications. |
| Renewable Energy | 5. # of renewable energy buildings installations | Increase in number of buildings adding heat pumps, solar and other energy sources. | Permit applications if possible. Solar could be obtained from BC Hydro's net metering program. Heat pumps may be impossible. |
| Land Use | 6. # of new residential units in growth areas | Increase in percentage of new residential units in growth areas, split by type, with a focus on multi-family. | Building permit / development applications. Links to OCP Monitoring Report, which tracks this, and units by housing type. |
| Transport | 7. # of EVs registered in the community | Increase in number of EVs registered in the community. | ICBC's *Quick statistics* for the Media Manual, or Province. |
| Transport | 8. Infrastructure to promote active transportation | Increase in number of km of new cycling and pedestrian networks, and locations to lock/store bicycles. Also, capital investment in transportation infrastructure. | Public Works and Infrastructure Services.<br><br>Capital investment is also in OCP Monitoring Report. |
| Transport | 9. Commuting / personal travel mode split | Increase in travel around Prince George by ride share, public transit, walking or cycling. | Census data, Google Environmental Impacts Explorer, and other.<br><br>Number of transit rides tracked by OCP Monitoring Report. |

| | Indicators | Measures of Success | Data Sources |
|---|---|---|---|
| Other | 10. Amount of organics diverted from landfill | Increase in organics at composting facility (once upgraded). | City of Prince George and Regional District.<br><br>Amount of waste collected per household also of tangential interest, which is tracked by OCP Monitoring Report. |
| Other | 11. Percentage of tree canopy cover | Increase in urban tree canopy. | GIS Department LIDAR data. |
| Other | 12. Per capita water consumption | Decline in water use. | Litres of water consumed per capita per day (L/c/d), averaged over a calendar year, for both residential and Industrial, Commercial and Institutional (ICI) users. From OCP Monitoring Report. |
| Other | 13. # of citizens engaged | High participation levels at events, in surveys, and through other means of feedback. | Registration/Attendee lists at events, survey forms completed, etc. |

Suggested indicators for corporate climate action are shown in Table 10. Two types of indicators are recommended. Primary indicators measure corporate energy consumption and GHG emissions, while secondary indicators can quantify the indirect success of various actions (all indicators are secondary unless otherwise specified). The following table provides a description of these indicators, the measures of success, data sources for each indicator, and frequency of reporting. Annual progress reporting should be planned by the staff person responsible.

*Table 10 – Ways Local Governments can Monitor and Evaluate Climate Action Progress - Corporate Emissions*

| | Indicators | Measures of Success | Data Sources |
|---|---|---|---|
| Overall – primary indicator | 1. Corporate GHG emissions | Reduction in corporate emissions from 2017 levels:<br>• 2025 – 5%<br>• 2030 – 17%<br>• 2040 – 50%<br>• 2050 – 80% | Environmental Services |

| | Indicators | Measures of Success | Data Sources |
|---|---|---|---|
| Overall – primary indicator | 2. Corporate energy usage | Average building energy use declines over time to 2050.<br><br>Annual fuel sales (gas and diesel) decreases over time to 2050. | Corporate Energy Manager, if one has been hired |
| Expenditures | 3. Corporate energy expenditures | Average building energy expenditure declines over time to 2050.<br><br>Annual fuel sales (gas and diesel) decreases over time to 2050.<br><br>Note that the price per unit of energy can have a significant energy impact. Energy consumption may go down or hold steady while energy expenditures may still rise. | Finance Department |
| Existing buildings | 4. # of energy audits conducted for building efficiency upgrades | # of audits performed annually. | Corporate Energy Manager |
| Existing buildings | 5. # of lights converted to LEDs | Decrease in building/streetlight electricity usage and cost. | Corporate Energy Manager |
| New buildings | 6. # of buildings at each level of the BC Energy Step Code | New buildings constructed to various levels of the Step Code (note: not applicable for all building types). | Corporate Energy Manager |
| Renewable Energy | 7. # of buildings connected to DES | Increase in number of buildings added to DRES, and amount of energy purchased from the DRES. | Corporate Energy Manager |
| Transport | 8. # of fleet vehicles which are electric | Decrease in fossil fuel energy use, emissions, and cost. | Corporate Energy Manager |

| | Indicators | Measures of Success | Data Sources |
|---|---|---|---|
| Other | 9. Waste management in City facilities | Decrease in waste tonnage taken from City facilities.<br><br>Waste tonnage diverted. | Waste pickup frequency, tonnage removed. But note that this data has been difficult to obtain accurately. |
| Other | 10. Revolving energy efficiency fund (if and when established) | Dollars are being disbursed from the fund in a targeted and effective way. | Corporate Energy Manager |
| Other | 11. Water consumption | Decline in water use. | Usage data on water utility bills / metering system |

# Appendix A. Acronyms

| | |
|---|---|
| ALR | Agricultural Land Reserve |
| BAU | Business as Usual |
| CAC | Climate Action Charter |
| CARIP | Climate Action Revenue Incentive Program, administered through the Province of BC |
| CAS | Climate Action Secretariat |
| CBSM | Community Based Social Marketing |
| CCMP | Community Climate Mitigation Plan |
| CDD | Cooling Degree Day |
| CDP | Climate Disclosure Program |
| CEA | Community Energy Association |
| CEEI | Community Energy and Emissions Inventory (inventories created by the Province for each local government) |
| CLIC | Community Lifecycle Infrastructure Costing |
| $CO_2$ | Carbon Dioxide |
| $CO_2e$ | Carbon Dioxide equivalent |
| DCC | Development Cost Charge |
| DPA | Development Permit Area |
| DRES | Downtown Renewable Energy System |
| EV | Electric Vehicle |
| FCM | Federation of Canadian Municipalities |
| 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. Carbon dioxide is the most important anthropogenic GHG.) |
| GJ | Gigajoules (one of the standard measures of energy) |
| GMF | Green Municipal Fund |
| GTI | Getting To Implementation |
| HDD | Heating Degree Day |
| 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) |
| LED | Light Emitting Diode |
| LEED | Leadership in Energy and Environmental Design |
| NDIT | Northern Development Initiative Trust |
| OCP | Official Community Plan |
| PCP | FCM-ICLEI's Partners for Climate Protection |
| PUMA | Prism Utility Monitoring and Analysis |
| 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. |
| RDFFG | Regional District of Fraser-Fort George |
| RGS | Regional Growth Strategy |
| RTE | Revitalization Tax Exemption |
| UNBC | University of Northern BC |

# Appendix B. Details on Community Energy and Emissions Inventory and Projections

This appendix contains details on the community energy and emissions inventory and projections for Prince George.

## Inventories

Prince George's inventories were created using data for buildings and waste obtained from the Province of BC, and data on gasoline and diesel sales from Prince George gas stations obtained from Kent Group. Based on the data compiled, full inventory years are: 2007, 2010, 2012, 2014, 2015, 2016, and 2017. Partial inventory information was also obtained for 2013 and 2018, which was also factored in to the model.

Emissions factors for inventory years are shown in the following table, and are sourced from the Province of BC.

*Table 11 – Emissions factors used for inventory years, $tCO_2e/GJ$*

| GHG/GJ, by Year | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gasoline | 0.067 | 0.067 | 0.067 | 0.067 | 0.067 | 0.067 | 0.067 | 0.066 | 0.066 | 0.066 | 0.066 | 0.067 | 0.067 | 0.067 | 0.068 | 0.068 | 0.066 |
| Diesel | 0.071 | 0.071 | 0.071 | 0.071 | 0.071 | 0.071 | 0.071 | 0.070 | 0.070 | 0.069 | 0.068 | 0.068 | 0.068 | 0.068 | 0.069 | 0.069 | 0.068 |
| Mobility fuels | 0.067 | 0.067 | 0.067 | 0.067 | 0.067 | 0.067 | 0.067 | 0.067 | 0.067 | 0.067 | 0.067 | 0.067 | 0.067 | 0.068 | 0.068 | 0.068 | 0.067 |
| Electricity | 0.005 | 0.006 | 0.006 | 0.006 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.005 | 0.004 | 0.004 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| Natural gas | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 |
| Wood | 0.019 | 0.019 | 0.019 | 0.019 | 0.019 | 0.019 | 0.019 | 0.019 | 0.019 | 0.019 | 0.019 | 0.019 | 0.019 | 0.019 | 0.019 | 0.019 | 0.019 |
| Heating oil | 0.068 | 0.068 | 0.068 | 0.068 | 0.068 | 0.068 | 0.068 | 0.068 | 0.068 | 0.068 | 0.068 | 0.068 | 0.068 | 0.068 | 0.068 | 0.068 | 0.068 |
| Propane | 0.061 | 0.061 | 0.061 | 0.061 | 0.061 | 0.061 | 0.061 | 0.061 | 0.061 | 0.061 | 0.061 | 0.061 | 0.061 | 0.061 | 0.061 | 0.061 | 0.061 |
| Downtown Renewable Energy System | - | - | - | - | - | - | - | - | - | - | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |

As can be seen, some of the emission factors have changed over time. The emission factors for mobility fuels have decreased as a result of the Renewable and Low Carbon Fuel Requirements Regulation. The emissions factor for electricity has recently decreased as a result of ongoing efforts to decarbonise the electricity grid.

The buildings and waste data sources have been the Province of BC's Community Energy and Emissions Inventory (CEEI) data,* and utilities and landfill waste data at the utility level.†

Assumptions made with respect to the inventories are as follows:

- The Province of BC made a series of standard assumptions in the creation of the CEEI data, which are outlined on the CEEI webpage: https://www2.gov.bc.ca/gov/content/environment/climate-change/data/ceei. The CEEI inventory years in the preceding charts are 2007, 2010, and 2012.
- The Province of BC made other assumptions for the other buildings and landfill waste emissions information, which are outlined in the community level spreadsheets on the Provincial Inventory webpage: https://www2.gov.bc.ca/gov/content/environment/climate-change/data/provincial-inventory
- In creating the inventories, CEA made other assumptions in addition to these:
    - Because the Province had removed transportation data from its most recent release of the 2007, 2010, and 2012 CEEI data, and has not provided any for any other year either, CEA had to obtain gas station sales information from Kent Group.

In addition to some methodological challenges to using fuel sales data‡, a major drawback is fuel sales through card lock stations are not included with the data. This means that many commercial diesel vehicles are excluded. Based on a previous release of the CEEI data, and making assumptions based on population growth, commercial vehicles may have accounted for 150,000 tonnes in 2012. If that is approximately accurate, then that would constitute a considerable omission as Prince George's 2012 GHG emissions are estimated at 540,000 tonnes of $CO_2e$ excluding most commercial vehicles.

Despite a data request to ICBC, it was not possible to obtain data on the number of vehicles of different types that are registered within City limits. This data would have been useful to compare with the gasoline and diesel vehicle fuel sales, and also to identify trends (e.g.

* https://www2.gov.bc.ca/gov/content/environment/climate-change/data/ceei
† https://www2.gov.bc.ca/gov/content/environment/climate-change/data/provincial-inventory
‡ The fuel sales approach to estimating transportation energy consumption and emissions is different to the one that the Province has taken with CEEI before. It will include tourism and through-traffic, while the Province's approach would have only included vehicles registered in the community. For a discussion on the pros and cons of the different approaches see 'Assessing vehicular GHG emissions, a comparison of theoretical measures and technical approaches' by Pacific Analytics. https://www2.gov.bc.ca/assets/gov/environment/climate-change/z-orphaned/ceei/ceei-comparison-study.pdf

vehicle ownership per capita, and types of vehicles including growth in electric or hybrid vehicles).

Emissions from large industry are not included. Based on the Canadian Government's *Greenhouse gas emissions from large facilities* database*, in 2017, the largest industrial sources of emissions in the municipal boundary produced about 500,000 tonnes of $CO_2e$. In order, they are Canfor's Prince George Pulp and Paper and Intercontinental Pulp Mills, Canfor's Northwood Pulp Mill, and Husky's Refinery.†

Emissions from Land Use, Land Use Change, and Forestry are also not included.

## Projections

CEA's QuickStart model was used both to calculate the BAU trajectory, and to estimate the potential GHG reductions that could be achieved. Developed in 2010 on behalf of BC Hydro and used by approximately 65 communities to date, the model builds on information including population and community energy and emissions inventory data.

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 forward.

As previously described, there are full or partial inventory years that describe the community's emissions profile from 2007-2018. From 2019 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 and low carbon transportation fuel standards.
- An average annual decrease of 1.2% in natural gas consumption per residential connection is included, as FortisBC does in its planning.
- How the impacts of a changing climate will affect building energy consumption.

* The Federal Government requires public reporting for any GHG source that produces more than 10 kt. The database can be found at: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/greenhouse-gas-emissions/large-facilities.html

† The Spectra Energy Transmission natural gas mainline is also placed within the municipal boundary by the database's map, and produced about 1,300,000 tonnes of $CO_2e$ in 2017, but only a small proportion of this should be attributed to Prince George as the mainline stretches from Alberta to Vancouver, passing by Prince George.

The final assumption had the following methodology:

- 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 (median impact scenario) used as a proxy. It is a more conservative scenario.
- Decreases in residential heating oil and propane consumption assumed to be proportional to projected decreases in Heating Degree Days (HDD's).
- Decreases in residential and commercial natural gas consumption assumed to be proportional to decreases in HDD's and the proportions of natural gas consumed for space heating for each sector, and that proportion obtained from the Navigant 2017 Conservation Potential Review for FortisBC Gas.
- Decreases in residential and commercial electricity consumption assumed to be proportional to decreases in HDD's and the proportions of electricity consumed for space heating for each sector. However, for residential this is partially offset by, and for commercial more than offset by the proportions of electricity consumed for space cooling for each sector and how this will increase proportional to projected increases to Cooling Degree Days (CDD's). These proportions obtained from the 2016 Navigant Conservation Potential Review for BC Hydro.

### 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 can vary greatly between communities, and depend on the assumptions made. CEA has conducted research on the impacts that different actions can have.

Details on the impacts of individual actions on GHGs are shown in the report.

# Appendix C. Corporate Inventory Using Climate Action Charter Methodology

In more recent years, the City has been focused on corporate energy and emissions inventory related to BC Climate Action Charter (CAC) and CARIP requirements and the most recent complete inventory reviewed for this reporting for the City of Prince George is 2017.

Under the established defined scope and boundaries for calculating local government emissions through the BC *Climate Action Charter*, the City has not been required to provide data associated with the GHG emissions from decomposing solid waste or RCMP buildings or fleet.

Figure 5 shows the energy data collected for the City's CAC corporate operations for 2017, and the conversion of the different energy sources to equivalent tonnes of $CO_2$.

*Table 12 – Corporate Energy Consumption Calculated as Part of BC CAC Reporting*

| | 2017 BC Climate Action Charter (CAC) INVENTORY | | | |
|---|---|---|---|---|
| | **Data** | **GJ** | **Factor** | **$tCO_2e$** |
| Electricity (kWh) | 35,105,683 | 126,380 | 0.00306 | 387 |
| Natural Gas (GJ) | 54,356 | 54,356 | 0.04987 | 2,711 |
| Gasoline (L) | 278,097 | 9,639 | 0.067971 | 655 |
| Diesel (L) | 894,559 | 34,602 | 0.06867 | 2,376 |
| Contracted Services Diesel (L) | 432,550 | 16,731 | 0.06867 | 1,149 |
| District Energy (Heat) (GJ) | 18,747 | 18,747 | 0.003442 | 65 |
| Propane (L) | 20,535 | 525 | 0.060608 | 32 |
| Total | | 260,980 | | 7,374 |
| *Natural Gas does not include old RCMP building* | | | | |
| *DES does not include new RCMP building* | | | | |

*Figure 34 – Breakdown of 2017 Corporate Energy Consumption for the City of Prince George, in GJ*

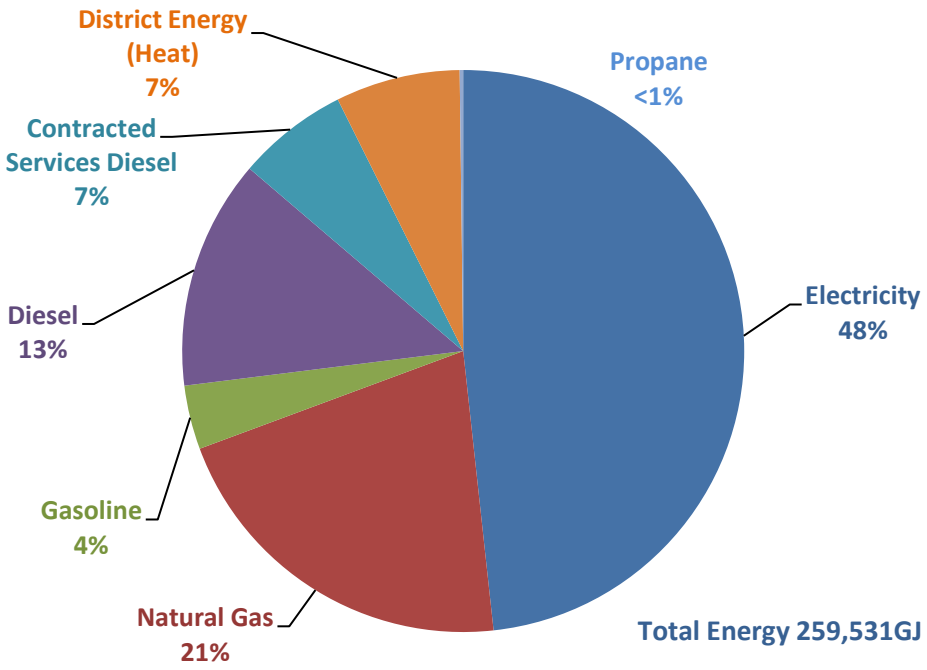
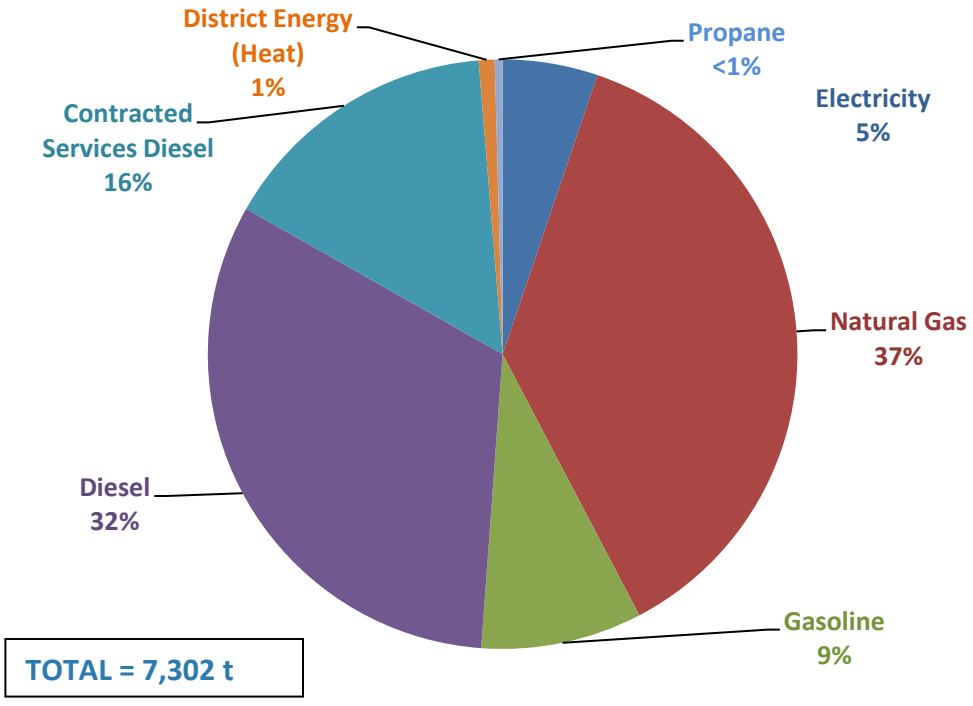



*Figure 35 – Breakdown of 2017 Corporate GHG Emissions from BC CAC Reporting, in $tCO_2e$*



Similar to the PCP emissions comparison, while electricity accounted for 49% of the corporate energy use, it contributed only 5% of the total corporate GHG emissions because of its low GHG intensity. Conversely, diesel use accounted for only 13% of the corporate energy consumption, but contributed 33% of the total corporate GHG emissions. Similarly, natural gas use contributed 20% of the energy consumption, but accounted for 36% of the total corporate GHG emissions. The DRES supplied approximately 35% percent of the corporate building space heating, but only contributed 1% of the GHG emissions attributed to heating buildings.

The total 2017 corporate GHG emissions, using the CAC reporting guidelines, is estimated to be 7,302 $tCO_2e$ which is approximately one (1) percent of the total Prince George community GHG emissions estimated at 560,000 tonnes of equivalent $CO_2$ from 2016 data.

# Appendix D. Corporate Inventory Methodology and Assumptions

It should be noted, that while the City has over a decade of experience in collecting energy data, there have been revisions to methodologies used year by year, changes in sources for certain data, and in some cases data gaps for certain years. In addition, the factors used in converting energy types to GHG emissions have varied over years following annually updated "BC Best Practices Methodology for Quantifying Greenhouse Gas Emissions"[20]. Therefore, while the data is still useful and helps illustrate trend lines, there are challenges with making precise comparisons between years.

There are differences in the way energy and emissions data is collected and organized for the FCM's Partners for Climate Protection (PCP) and for the Province's Climate Action Charter (CAC) and CARIP reporting. For Provincial reporting as part of the Climate Action Charter and CARIP, those emissions related to "traditional services" are accounted for including:

- Administration and governance;
- Drinking water, stormwater and wastewater operations;
- Solid waste collection, transportation and diversion;
- Roads and traffic operations;
- Arts, culture and recreation services; and,
- Fire protection.

CARIP reporting requires the City to track energy use, usually through tracking purchases, for hydroelectricity, gasoline, diesel, propane and other fuels that create GHG emissions. These are usually accounted for through vehicles use, space heating, lighting and running equipment. Fuel purchased by Contractors conducting services for the City (e.g. snow clearing) are not included in CARIP figures as the carbon tax for contracted services is not refundable to the City. However, reporting for CAC does include contracted services fuel consumption.

PCP reporting is different in three ways. First, this reporting requires the inclusion of data on the quantity and composition of solid waste generated by the City operations. This is included because the decomposition of solid waste generates GHG emissions. Second, PCP includes any fuel consumed for any asset that is operated by the City or where the City has a sphere of influence and control over that asset. Therefore, unlike CAC reporting, RCMP is included and leased buildings are included. Third, the organization of the corporate emissions data is different. PCP requires emissions from traditional services to be organized and reported based on service areas rather than on energy types, as follows:

- Buildings and facilities;
- Street lighting and traffic signals;

[20] Note: in this project the same factors have been used for corporate and community inventories and modeling.

- Water and wastewater treatment;
- Municipal fleet (including contracted traditional services); and,
- Corporate solid waste.

Each year the BC government provides "BC Best Practices Methodology for Quantifying Greenhouse Gas Emissions" for local governments to describe what to measure and what GHG emission factors to use for different sources. The City tracks all its corporate expenditures on fuels and electricity, and so data is readily available for creating inventories. However, the data needs to be organized and compiled for this purpose.

Over the years, there have been challenges with collecting data on fuel use from contracted services, on the quantity of solid waste, and on fuel consumed when staff vehicles are used for providing traditional services. In order to address some inventory data gaps, assumptions were needed in order to develop a best estimate of total emissions for these specific categories. More information is known on the inventory methods from 2011 to 2017, relative to the 2002 and 2009 inventory years. As such, the discussion on inventory methods will focus on these more recent years.

Considerable effort was undertaken to assess the various data sources for the 2017 inventory year. The intent is to have the highest level of confidence in the data for 2017 such that the City can use this as a reliable baseline inventory going forward.

### BC Hydro – Electricity

BC Hydro provides the City with monthly invoices for street lights, traffic/pedestrian signals, buildings and facilities. The City uses a tracking system provided by Artic Fox Energy. The City also leases space within a building, housing PG Tourism (and formerly Initiatives PG). The property manager provides the hydro consumption data for the leased office space to the City to include in the inventory.

This data is considered to be reliable.

### Natural Gas

Natural gas is used for heating and hot water in many City owned buildings and this is tracked through monthly invoices from FortisBC and gas resellers, and also by using the Artic Fox Energy tracking system. The "Master Summary" of gas use which tracks Fortis and resellers gas purchased provides consumption data for six (6) buildings: PG Multiplex, New City Yard (18th Ave), Elksentre Arena, Aquatic Centre, Civic Centre, and the City Hall.

The monthly gas accounts data set is used for all other natural gas data. The breakout of assets is important in this data set to ensure the proper building assets are included or excluded from the different reporting requirements. The building manager for the leased space housing PG Tourism provides the natural gas consumption data to the City.

This data is considered to be reliable.

## Vehicle Fleet

All City fleet vehicles use fuel from a card lock system at the 18th Avenue yard. Diesel and gasoline consumption is tracked by vehicle and department. Occasionally, fire trucks use other non-City card lock systems within Prince George, and these are including in the fuel tracking inventory. The City ensures that RCMP vehicles, except for the Community policing vehicles, are not included in the corporate inventory for CAC but included in the PCP reporting. The City's fuel tracking is organized by:

- City Fleet – gasoline
- City Fleet – diesel
- Fire Services – gasoline
- Fire Services – diesel
- RCMP - gasoline
- Sewer Lift Stations – diesel
- Water stations – diesel
- Fleet – propane

This data is considered to be reliable.

## Staff Vehicle Use for City Services

Staff who use their own vehicles as part of their service delivery, submit their work-related mileage through payroll forms, and this is added to an inventory and tracked for annual totals. Each staff mileage is converted to fuel use by knowing the vehicle class and fuel type. Each vehicle class is provided with an estimated average fuel efficiency (see Table 13 – below). So the primary data collected is fuel type, vehicle class, and mileage.

*Table 13 – Input Spreadsheet for Staff Vehicle Use (2015 Data)*

| Vehicle Class | Kms | Est. Fuel Efficiency (L/100 Km) | Est. Litres |
|---|---|---|---|
| Light-Duty Vehicle (Class 1 & 2) - Gasoline | 45,941 | 10.3 | 4,732 |
| Light-Duty Vehicle (Class 1 & 2) - Diesel | 0 | 7.7 | 0 |
| Light Truck/SUV/Van (Class 3 & 4) - Gasoline | 269,030 | 14.7 | 39,547 |
| Light Truck/SUV/Van (Class 3 & 4) - Diesel | 39,043 | 12.5 | 4,880 |

This data is considered somewhat reliable in that assumptions are required and average estimates for fuel efficiency are used. Fuel use and associated GHG emissions from staff

vehicles accounts for approximately 4% of the total corporate vehicle use. As such, this inventory data is unlikely to have a significant effect on skewing the overall inventory results.

### Propane

Propane is largely used in forklifts, ice resurfacers, pothole patchers, and in an Atco trailer that houses some offices. The fuel is purchased through a bulk system and tracked by City financial staff.

This data is considered reliable.

### Downtown Renewable Energy System (DRES)

Lakeland Mills Ltd. provides heat generated by burning biomass to the City's DRES, which pipes hot water to several downtown buildings in order to supply space heating and hot water. Monthly tracking of each building's heat (in MWh) is prepared for billing purposes. For the corporate inventory, the total MWh for the six City owned buildings is compiled each year and converted to GJ of energy. The largest demand for DRES heat is from the Four Seasons Pool and the lowest demand is from the Coliseum ice arena.

The City uses the "Calculating Indirect GHG Emissions from Imported Steam of District Heating" methodology and spreadsheet calculator provided by the BC Climate Action Secretariat. This methodology factors in the efficiency of the system, the feedstock moisture content and the proportion of biomass used as part of the system. Since there is no actual data on the efficiency of the downtown renewable energy system, the calculations assumes a conservative efficiency of 65%. The emissions calculation also assumes a biomass feedstock moisture content of 50%. The DRES is assumed to use 100% biomass, although there may be a small amount (<5%) of natural gas used in the system's peaking boilers when Lakeland has a planned shut-down for maintenance.

The City also collects DRES Energy Billings per month since 2012. Table 14 – below shows the total for 2017. For CARIP and Provincial CAC emissions reporting the RCMP and WIDC building is not included. For PCP reporting, the RCMP is included, but not the WIDC building as this is not owned by the City.

*Table 14 – Total DRES Billings for 2017*

| 2017 Totals per building | | |
|---|---|---|
| **Building** | **2017 MWh totals** | **Converted to GJ** |
| City Hall | 747.4 | 2690.6 |
| Coliseum | 267.9 | 964.3 |
| Civic Centre | 1109.0 | 3992.2 |
| Four Seasons | 2045.3 | 7363.0 |
| Library | 333.2 | 1199.4 |
| Art Gallery | 704.8 | 2537.4 |
| RCMP | 537.0 | 1933.1 |
| WIDC | 378.1 | 1361.1 |
| **Total** | **7253.7** | **26113.2** |

This data is considered reliable.

## Contracted Services

The City contracts out some of its service delivery such as street maintenance and snow clearing, and infrastructure repairs. This work falls within the scope of traditional municipal services. Contracted services involve a variety of heavy equipment types and sizes with different fuel efficiencies. All contracted equipment is assumed to use diesel.

Invoices from contractors provide the primary data for the City to estimate emissions from this category. The finance department provides the data from invoices over $25,000 that use external equipment. This is reviewed by the Public Works staff who have knowledge of hired equipment.

Two key assumptions are used. First, an average charge out rate of $125 per hour is used to convert invoiced amount to the estimated operating hours. Second, the City assumes an average fuel efficiency rate of $25/hr. These assumptions provide the ability to reasonably estimate emissions from contracted services, while utilizing the current invoicing requirements from contractors.

On average, between 2015 – 2016, contracted heavy equipment accounted for 34% of the total diesel used for City services.

This data is considered to be of questionable reliability and an improved methodology for it should be considered.

## Solid Waste Quantity and Composition

Emissions from solid waste decomposition is not required to be tracked by municipalities who have signed on to the BC Climate Action Charter, and is not reported in annual CARIP reports.

However, as a signatory to the FCM Partners for Climate Protection, the City has conducted a couple of solid waste inventories. The last corporate inventory for solid waste emissions

data was conducted in 2009. Volumes of solid waste from corporate operations in 2009 were estimated based on records from Waste Management for each facility. The 2009 estimate indicated 1,643 $tCO_2e$ of emissions were attributed to corporate solid waste decomposition.

Waste Management has supplied the total pick-ups of solid waste at each City facility for 2017. Based on this data, 772 tonnes of solid waste were picked up from City facilities, assuming the bins were 80% full at each pick-up.

Using the GHG emissions factor of 0.994295/tonne results in 767.6 $tCO_2e$ of additional corporate emissions that would be accounted for through the PCP inventory scope. Based on the 2017 total corporate GHG emissions (8,148 $tCO_2e$), accounting for emissions resulting from decomposing corporate solid waste would add an additional 9.5% to total corporate emissions.

This data is considered to be of questionable reliability because assumptions are required to estimate the volumes, average waste volume to weight ratios are used, and the relative composition of the waste is not known which can affect the actual GHG emissions.

# Appendix E. A Repeatable Methodology for Future Corporate Inventories

This section describes a repeatable methodology for future and comparable corporate GHG inventories. The energy and emissions data situation is dynamic, so the recommendations in this section will likely change in the future. For up-to-date information on the current situation, contact CEA or the Climate Action Secretariat.

The City currently uses Arctic Fox to track and record energy use for electricity and natural gas usage for buildings and assets. It then combines this information with vehicle fuel data, contracted services, and other data sets in a spreadsheet designed by the City, and uses this for CAC / CARIP reporting. With rearrangement, the available data can be used for PCP reporting. The current process is cumbersome and creating challenges.

It is recommended that the City purchase an annual software licence in order to streamline the process of creating reports for CAC and PCP. This should reduce the number of challenges being faced. In addition, this will assist with creating inventory consistency in the event that staff changes lead to different people preparing reports over the years.

SoFi is the recommended tool because it has been selected by the Province of BC to be the official replacement of Smart Tool. All protocols and GHG emission factors will be automatically uploaded to it and the tool can also automatically receive data from BC Hydro and FortisBC. The tool can also be used as an energy management tool to the same extent that Arctic Fox is currently being used (although for more detailed energy management the City may wish to purchase a more specialised tool). The tool can also be used for CAC, PCP, and CDP reporting. The annual cost is estimated to be the same as for Arctic Fox, or slightly less. Some set up time will be needed for adjustment for PCP processes because of differences between PCP and CAC requirements. The tool currently requires no additional fee to conduct PCP reporting in addition to CAC, but a modest additional fee is required for CDP reporting.

Note that SoFi can be purchased either directly through the Province or from GHG Accounting Services. Although there is no setup fee through the Province, but there is a setup fee through GHG Accounting Services (approximately equal to the annual fee), it is recommended to take the latter route. This is because of the additional functionality (including PCP and CDP reporting, and expanding reporting to include water, solid waste, and other items). In addition, GHG Accounting Services are likely to be able to onboard the City more quickly than the Province would be able to. Purchasing through GHG Accounting Services would also allow the tool to be expanded to cover community energy and emissions inventories should the City wish, although this has an additional setup fee and ongoing annual maintenance fee.

Other tools were also evaluated, but discounted. PUMA is an excellent energy management tool and it can be used for CAC reporting (and apparently tailored for PCP reporting), but its costs are reportedly too high. The FCM-ICLEI Partners for Climate Protection tool would be an

excellent tool for PCP reporting and it is free, but the primary reason it has been discounted is because it is not currently set up for CAC / CARIP or CDP reporting, and because it has no energy management capability.

**Recommendation**

It is recommended that the City of Prince George to switch from its current arrangement of its tracking spreadsheet and Arctic Fox, to using SoFi. This arrangement should have the same (or potentially slightly less) financial outlay, but the increased functionality of SoFi should lead to much greater efficiency for City staff and a reduction in errors.

This recommendation is a specific corporate action in this plan.

Regarding collection of raw data, some updating in methods will be needed in energy data tracking going forward. In addition, methods for collecting data on contracted services and corporate solid waste quantities and composition will be needed to provide more confidence in future inventories.

As a result of the evaluation of the current corporate inventory methods, the key areas of improvement include contracted services, staff vehicle fuel use, and tracking solid waste.

| Data Needed | How to Obtain Data – Currently Recommended Method |
|---|---|
| BC Hydro - Electricity | Continue the current methodology using SoFi, Arctic Fox (or similar software) to track all electrical use (street lights, traffic/pedestrian signals, City buildings and facilities and leased building space used for traditional service delivery). If possible, building electrical consumption could be separated out in order to track conservation measures over time.<br>• In order to provide data in the form for PCP reporting, the electrical data should be separated into the following categories that best fit with PCP's list of five activity areas:<br>  ○ Buildings and Facilities (including leased space);<br>  ○ Street Lighting and Traffic Signals; and,<br>  ○ Water and Wastewater Treatment Plants and Pump Stations.<br>• Do not include electrical usage for PCP reporting from building space that the City leases from others for its use if it does not have operational control over the building space. |
| Natural Gas | Continue tracking natural gas use through SoFi, Arctic Fox (or similar software), purchases from FortisBC/resellers, and obtaining natural gas consumption from building managers for leased space.<br>• In order to provide data in the form for PCP reporting, the natural gas data should be separated into the following categories:<br>  ○ Buildings and Facilities (including leased space); and,<br>  ○ Water and Wastewater Treatment Plants. |

| Data Needed | How to Obtain Data – Currently Recommended Method |
|---|---|
| | • Do not include natural gas usage for PCP reporting from building spaces that the City leases from others for its use if it does not have operational control over the building space. |
| Vehicle Fleet | Continue tracking fuel using the card lock system at 18th Ave Yard using the current breakdown as described in Appendix 1.<br>• This data will be used for PCP under the "Municipal Fleet" activity category. |
| Staff Vehicles Used for City Services | Continue tracking kilometers under the four vehicle and fuel classes using an estimated average fuel efficiency for each class as per Appendix 1.<br>• Recommend adding a vehicle class for hybrid vehicle and an average fuel efficiency.<br>• On a voluntary basis, have staff track and submit their normal city driving fuel efficiency for a week using the vehicle they use for work, if that vehicle is equipped with a fuel economy reading. This would be used to confirm their individual vehicle efficiency data with the averages. City to adjust averages as warranted. This data should be maintained separately for review. |
| Propane | Continue tracking propane consumption for City equipment. Confirm if any City vehicles are currently using propane (e.g. Bylaw Services vehicles).<br>• This data for ice equipment will be used for PCP reporting under "Buildings and Facilities".<br>• If there are propane vehicles within the City fleet, then this data would be included in the PCP reporting under "Municipal Fleet". |
| Downtown Renewable Energy System – Space Heating | Continue using the methodology as described in Appendix 1.<br>• This would be included in PCP reporting under "Buildings and Facilities".<br>• Include the RCMP building for PCP reporting. |
| Contracted Services | The methodology described in Appendix 1 relies on significant assumptions and averages that may result in unreliable data. However, there are challenges with revising invoices to provide more detailed information on type of equipment and L/hr diesel consumption rates.<br>• City to use either the charge out rate (as an indication of the type of equipment used) or have equipment type on contractor invoices and the City to record diesel use by major equipment types (TBD by City). |

| Data Needed | How to Obtain Data – Currently Recommended Method |
|---|---|
| | • This data is required for PCP if contracted services are for traditional services that are normally provided by the City of Prince George, and would be included in the "Municipal Fleet" activity.<br>• Include only contracts that are over $25,000/year, and exclude capital projects (this is the CAC recommendation, but PCP will accept this as well).<br>• As a preferred option to the above, and recognizing that this may pose challenges for equipment contractors, require contractors to note their fuel consumption for City work (traditional services) either on their invoices or provided to the City on a scheduled basis (e.g. quarterly). |
| Solid Waste Quantity and Composition | Continue to have Waste Management collect the number of pick-ups for each bin at City facilities tracked with the size of bins. Ensure the assumptions regarding the average "fullness" of the bins, the average density of the solid waste (weight calculation) and waste composition is maintained from year to year in order to establish a trend line. The key variables recorded by Waste Management will be the number of bins, changes in the size of bins, and the frequency of emptying in a year.<br>• Data on solid waste is required for PCP reporting, but not CAC reporting.<br>• An option is to conduct an audit of several bins to assess actual "fullness", weight and composition of solid waste. |

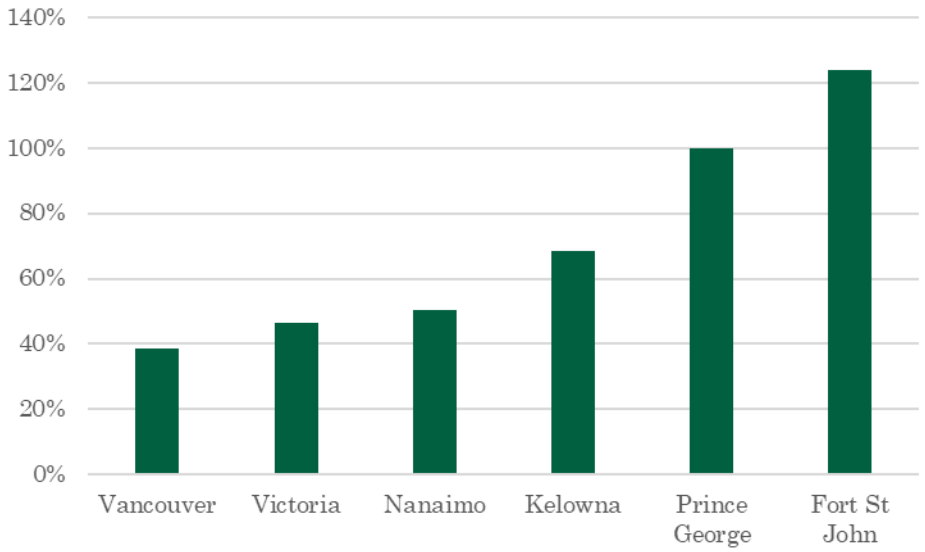
# Appendix F. Comparing the Community and Corporate Inventories with Other Communities

This appendix compares the City of Prince George's Community and Corporate inventories with other communities in British Columbia.

## Community Inventories Comparison

Figure 36 compares per capita GHG emissions for Prince George with other BC communities as a percentage of Prince George's emissions, using the Province of BC's energy and emissions data (for 2012 and 2016)[21]. Prince George has among the highest per capita emissions of the communities compared.

*Figure 36 – Comparing 2016 Per Capita Community GHG Emissions for Prince George with Other BC Communities, as a Percentage of Prince George's Emissions*




Per capita emissions shown in Figure 36 follow a trend. Communities with a higher proportion of cars versus tucks, and more dense communities with greater flexibility on transportation choices have reduced emissions. Similarly, the trend also appears to approximately follow climate, particularly when comparing the three Interior communities with the ones on the West Coast.

[21] Data from an older release of CEEI is used for 2012 transportation data and which includes commercial fleets, and is then assumed to increase proportionally with population to 2016. The most recent 2016 buildings and solid waste data is also used, except the considerations for FortisBC and the Commercial / Small-Medium Industrial sector outlined in Appendix 1 are taken into account, i.e. large industrial emissions are still excluded.

CEA created a community inventory of energy usage for the City of Kelowna for the 2016 year using an identical methodology to the Prince George inventory, therefore Table 1 compares inventory intensities between the two communities for the 2016 year.

*Table 15 – Community Inventory Intensities for 2016 for Kelowna and Prince George*

| Community Inventory Intensities, 2016, per capita | Kelowna | Prince George | % difference |
|---|---|---|---|
| Gasoline, GJ | 41.1 | 46.8 | 12% |
| Diesel, GJ | 4.3 | 9.2 | 53% |
| Residential electricity, GJ | 15.9 | 13.6 | -17% |
| Residential other, GJ | 20.8 | 35.2 | 41% |
| Commercial/Small-Med Industrial electricity, GJ | 17 | 17.6 | 3% |
| Commercial/Small-Med Industrial other, GJ | 15.2 | 21.1 | 28% |
| **TOTAL, GJ** | **114.2** | **143.4** | **20%** |
| | | | |
| Community Solid Waste, t $CO_2e$ | 0.4 | 1 | 60% |

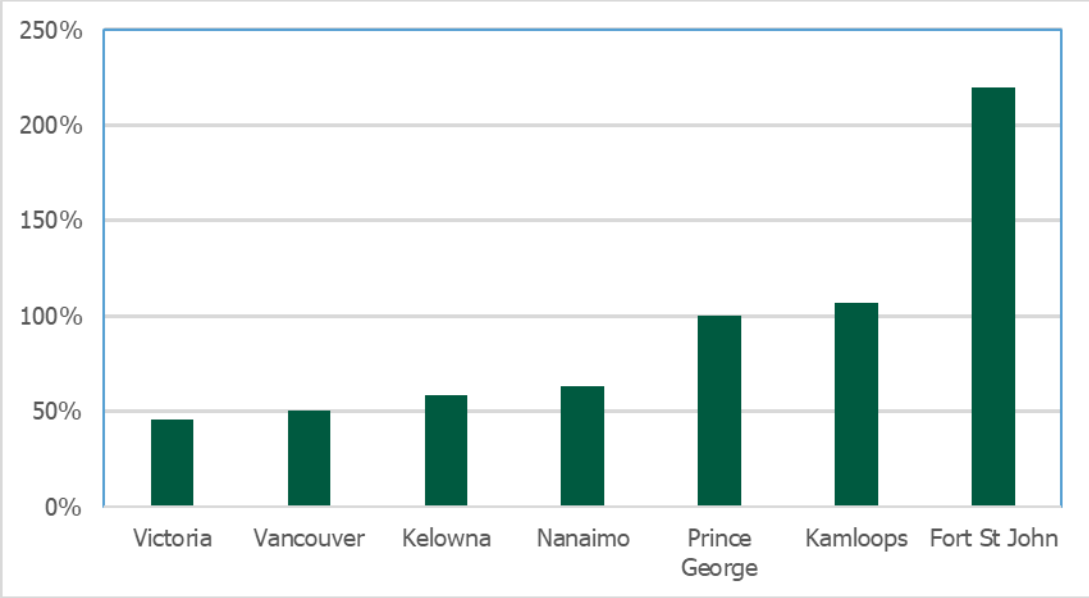
A difference in average vehicle size and a less compact community are the likely explanations for the increase in intensity factor for gasoline for Prince George. An increase in heating requirements is the probable cause for the increase in per capita energy use for residential "other" (natural gas, wood, heating oil and propane consumption). Prince George's industrial base is the likely explanation for the increase in diesel GJ per capita because there will be more commercial vehicle traffic, and the commercial / small-medium industrial factors. The increase in community solid waste may point to further opportunities with waste management for Prince George – including the fact that Kelowna sends about 30% less waste to the landfill per capita than Prince George does. However it may also reflect issues with the collection of solid waste data by the Province. Interestingly, Prince George has lower per capita residential electricity consumption, which likely reflects higher cooling requirements in Kelowna in the summer months.

Despite the challenges posed by its climate, there are many opportunities for the City of Prince George to continue improving its community GHG emission footprint.

## Corporate Inventories Comparison

Figure 37 compares the per capita GHG emissions for the City's corporate operations with other cities in BC as a percentage of the City of Prince George's emissions. This is using data from CARIP reports prepared by the individual cities, which only contain data on traditional services and use a consistent methodology to ensure a like-for-like comparison. Prince George has among the highest per capita emissions of the communities compared.

*Figure 37 – Comparing 2016 Per Capita Corporate GHG Emissions for Prince George with Other BC Communities, as a Percentage of Prince George's Emissions*




There are factors which may be causing Prince George to be at a higher per capita GHG rate than cities such as Vancouver, Kelowna and Nanaimo. For example, the colder weather and more snow affecting Prince George will mean more energy used for space heating and diesel used for snow clearing and applying traction material. In addition, Prince George is less compact than other communities, which means more fuel is needed to provide services such as road maintenance, building inspection, and solid waste collection on a per capita basis. A contributing factor to Prince George having a per capita GHG rate lower than Kamloops is likely the addition of the Downtown Renewable Energy System in Prince George and connection of civic buildings.

# Appendix G. Stakeholder and Community Engagement

The following briefly summarizes the stakeholder and consultation process involved in the development of the CCMP. For a full description of consultation activities, please refer to the City's CCMP Consultation Report.

## Summary

The consultation process for Prince George's Climate Change Mitigation Plan, which engaged over 800 people, was held through a series of workshops and meetings for internal and external stakeholders, as well as events open to the public and an online survey. Suggestions for actions were collected in six key subject areas: new buildings, existing buildings, transportation, land use, food and waste, and renewable energy.

Internal consultation was held for City staff and included a series of meetings and workshops. Actions were split into corporate and community levels for the six subject areas. Top common threads for community and corporate were improving building energy efficiency, policy development and organics diversion. The CEMA electric vehicle (EV) workshop yielded several priority actions ranging from updated incentive programs, improved Level 2 infrastructure in municipally-owned facilities, and increased proportion of EVs within the City's fleet. The CEMA buildings workshop also yielded investigation of funding opportunities and reallocation of CARIP funds for high GHG reduction projects, and the development and implementation of incentive programs and new policies.

For external consultation, two workshops were conducted for private and public stakeholders. It was concluded that although Prince George is proactive in taking advantage of building energy efficiency programs, a risk-averse population and lack of local standards necessitates action on education, incentives, and public outreach. As well, a driving-dominant culture and underutilized transit system yielded a suite of actions focused on improving transit efficiency such as increased bus schedules to reduce transfer times and dedicated active transportation corridors to alleviate road congestion and improve public health. Waste diversion was also a common priority, with improvements to the curbside recycling system and establishing an organics diversion program as priority actions mentioned by the stakeholders. Note that the City does not have control over the curbside recycling program. Expansion of the City's Downtown Renewable Energy System and incentivizing heat pumps as a means of replacing natural gas were highlighted, while establishing GHG reduction targets in solid waste and transportation, along with attention on Provincial wildfire response were raised during the mitigation and adaptation workshops.

From the three public engagement events, improving public transit and waste diversion through improved curbside recycling and organics diversion were seen as crucial. Active transportation corridors for walking and cycling, inclusion of energy efficiency measures into building code updates, and increased tree planting were also highlighted as priority actions.

The online public survey received over 500 responses from community members, and transportation scored highest among general subject areas, followed by renewable energy

and food/waste. However, looking at specific actions, the highest scores were both from food/waste: organics diversion and local food production. In contrast, increased building wood usage and EV support received the least community support online. Respondents preferred to receive updates to the Climate Change Mitigation Plan through the City's social media platforms and the City website, with updates to active transportation, land use planning, and the Downtown Renewable Energy System as preferred topic areas.

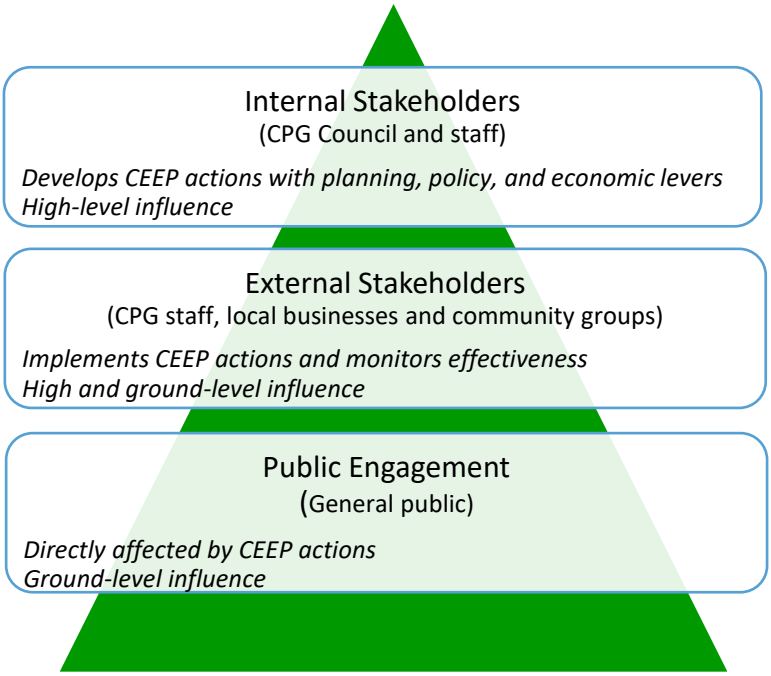
Overall, there was considerable enthusiasm from both stakeholders and the public, with emphasis on transit, active transportation, and waste diversion as initial areas for the City to prioritize as it develops climate action initiatives.

Directly consulting with the local community is essential when developing a Community Energy and Emissions Plan (CEEP). The main objective is to assess the needs and priorities of key stakeholder groups and the public on climate change policies and areas of influence such as buildings and transportation to inform actions and recommendations for the CEEP.

Consultation and outreach can be conducted using several methods, from workshops and meetings, to education campaigns, open houses, and surveys. Choosing the appropriate mode(s) of engagement is important to ensure you reach a broad audience and obtain a range of input. Proper stakeholder consultation has a three-fold benefit:

- Empowerment and ownership of climate change activities;
- Identification and mitigation of risks that may hinder or impede CEEP progress; and
- Overall increased awareness of the effects of climate change and potential actions to mitigate/adapt.

City of Prince George Council, staff, local businesses, community groups and the public were all engaged as part of the consultation process in order to better understand the needs and priorities of the overall community as illustrated in the following diagram.


Internal Stakeholders
(CPG Council and staff)
Develops CEEP actions with planning, policy, and economic levers
High-level influence
External Stakeholders
(CPG staff, local businesses and community groups)
Implements CEEP actions and monitors effectiveness
High and ground-level influence
Public Engagement
(General public)
Directly affected by CEEP actions
Ground-level influence

## Stakeholder Outreach

Outreach and consultation activities for the CEEP were categorized into three areas: Internal, external, and public. Events associated with each area are summarized below, while full details for each event can be found in the Appendices.

### Internal Stakeholder Meetings

City staff consultation consisted of a series of meetings with various departments, along with separate workshops on electric vehicles (EVs) and buildings through the Community Energy Management Assessment (CEMA). Common corporate actions of note among the internal meetings were improved waste diversion since a high percentage of overall waste is organic in nature, acceleration of LED lighting in buildings and streetlights, and development/refining of policies relating to building energy efficiency. Community actions of note included a focus on energy efficiency for new and existing buildings such as Step Code adoption for new buildings, and adjustment of Revitalization Tax Exemption bylaws, education linking climate change adaptation, mitigation, and economic development, as well as organics diversion, which ties in well with corporate organics diversion.

The CEMA EV workshop yielded several priority actions ranging from updated incentive programs, improved Level 2 infrastructure in municipally-owned facilities, and increased proportion of EVs within the City's fleet. Actions from the CEMA buildings workshop spanned from investigating funding opportunities, to the development of incentive programs and new policies, to the reallocation of Climate Action Revenue Incentive Program (CARIP) funds for high GHG reduction projects. There was also an emphasis on publicly profiling energy and GHG-related activities in the City's annual report, periodic progress reports, and building energy displays.

Key points from each of the internal meetings are summarized below by department.

<u>Planning and Development</u>

**Corporate Actions:**

- Continue to be part of the BC Hydro Energy Wise Network, building its employee conservation engagement program and continuing to reduce its corporate GHG footprint.
- Continue to replace streetlights.
- Institute corporate sustainability policies for new buildings.

**Community Actions:**

- Adjust Revitalization Tax Exemption (RTE) bylaws to focus more on environmental performance:

    - EVs and downtown renewable energy system connections; and,
    - Step Code Part 3 buildings (will require further analysis and consultation before turning into a mandatory requirement).
- Shift from vacant rural to single family residential, introducing potential Step Code opportunities and laneway housing opportunities.
- Explore shifting towards electric and natural gas buses.

Public Works

**Corporate Actions:**

- Refine solid waste volume estimation methods to improve accuracy (high proportion of the City's corporate solid waste is organic).
- Pilot scale EVs as part of the corporate fleet, still under evaluation.
- Anti-idling within the fleet.
- Continue to conduct and refresh several energy efficiency projects within its buildings.

Community Services

**Corporate Actions:**

- Build new buildings like the RCMP building to higher efficiency standards at the beginning rather than retrofitting.
- Refresh energy assessments on existing buildings.
- Ongoing retrofitting includes LED lighting replacement for corporate buildings, parking, as well as streetlights.

Engineering

**Corporate Actions:**

- Accelerate LED streetlight replacement.
- Energy assessments of corporate buildings and pump stations.
- Reduce community water consumption (would help reduce corporate electricity consumption).
- New buildings built to energy efficient standards.
- Staff education (e.g. anti-idling policy, vehicle maintenance, corporate GHG targets).
- Corporate waste diversion.
- Improve sustainable procurement policy - RFPs may no longer include this information in them.
- Develop corporate transportation measures / plan.

**Community Actions:**

- Expand Downtown Renewable Energy System.
- Active transportation and traffic calming infrastructure – more bike lanes and trails.
- Organics diversion – expand options and find ways to improve the public uptake of current organics program.

External Relations

**Community Actions:**

- Explore holding a public open house / town hall and a survey. Focus on actions that people can do that will tangibly make a difference to GHGs, such as organics diversion.
- Collaboration and leverage with UNBC.
- Education (e.g. have an elected official join the BC Municipal Climate Leadership Council).
- Make sure to link adaptation, mitigation, and economic development in messaging.

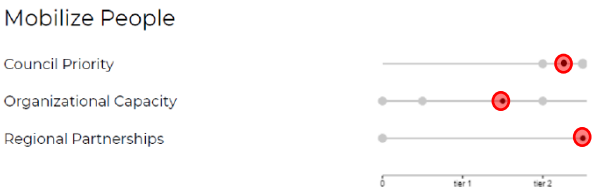
Finance

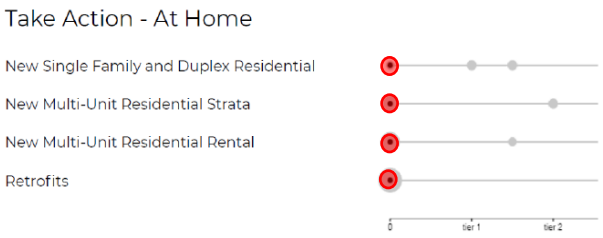
**Corporate and Community Actions:**

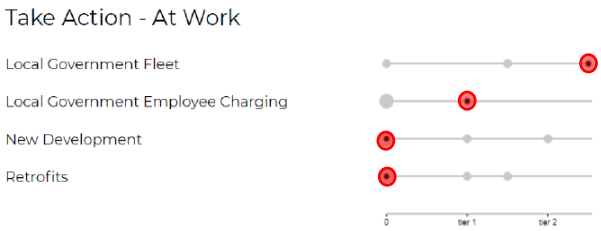
- Formalize Carbon Neutral Reserve Fund, possibly as a reserve bylaw.
- Downtown Renewable Energy System – Finances discussion.
- Procurement policy – should include energy efficiency.

### CEMA EVSE Module

The CEMA – Electric Vehicle Supply Equipment (CEMA EVSE) Module workshop examined Prince George's readiness to incorporate EVSE at the community and corporate levels. Benchmark scores for different EVSE criteria are illustrated below, showing the City's progress in red, compared to leading BC communities in grey, followed by a summary of high impact and easy to implement actions. Overall, Prince George is taking a proactive approach towards incorporating EV infrastructure including Level 2 station installations and updated bylaws with EV installation requirements, despite the lack of a regional charging station network and local uptake.

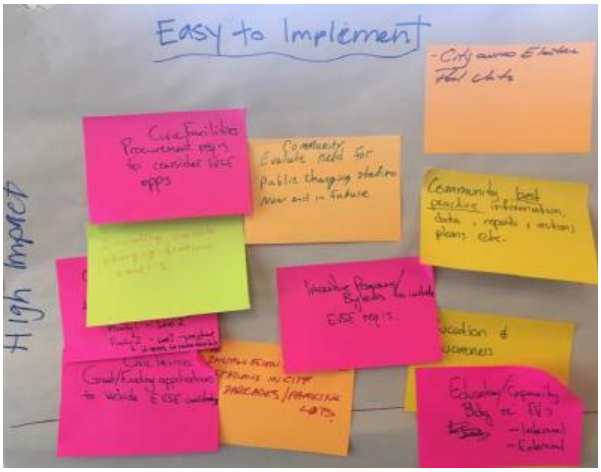





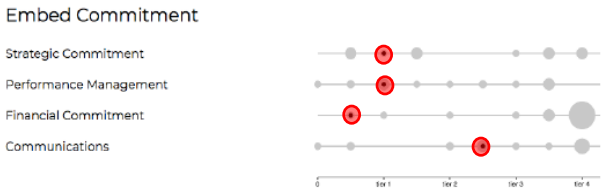
## High Impact/Easy to Implement Actions:

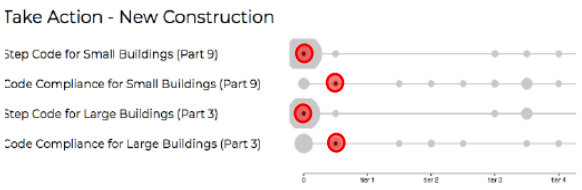


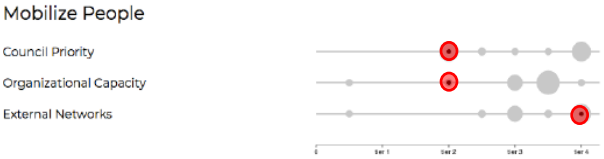

- City-owned EVs.
- Evaluate community need for public charging stations now and into the future (strategic planning).
- Installation of Level 2 stations in municipally-owned parkades/parking lots, and curbside.
- Update incentive programs (DCC) and bylaws to include requirements on EV infrastructure.
- Education and capacity building around EVs and supply equipment – both internal (corporate) and external (community).
- Compile community best practices from other jurisdictions, i.e. information, data, reports, action plans, etc. and identify applicability to Prince George.
- Civic facilities procurement requests to consider EVSE opportunities - Priority #1 is Level 2 infrastructure and Priority #2 is Level 3 (DC Fast Charging) after feasibility analysis.

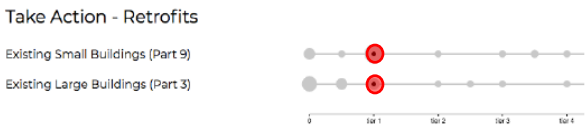
## CEMA Buildings Workshop

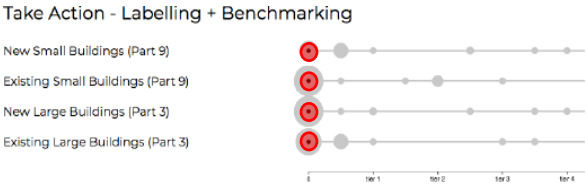
The CEMA Buildings Workshop examined Prince George's current and prospective commitments to building energy efficiency initiatives. Benchmark scores for different EVSE criteria are illustrated below, showing the City's progress in red, compared to leading BC communities in grey, followed by a summary of high impact and easy to implement actions. Though only limited action has been taken thus far on new construction and retrofits, Prince George is being proactive in developing GHG reduction targets, seeking and allocating funding to drive energy efficient construction, and improving communications to inform stakeholders and the public on its building-related actions.




### High Impact/Easy to Implement Actions:


- Specific GHG reduction targets for building sector.
- Inform and lead the development of incentive programs, new policies, implementation, and reporting.
- Connect with College of New Caledonia for existing building energy index research project.
- Investigate funding opportunities through FCM grants or other programs to encourage energy efficient construction with incentives.
- Make CARIP funds available for community energy management programs where there is a high impact of reducing GHGs.

- Create CARIP funding policy – assemble cross-functional team to set criteria, figure out how to target what the funds are spent on (e.g. potential CARIP Reserve Fund).
- Building Permit Incentive Rebate – maximum amount for first come, first serve for Energy Advisor testing in both new construction and retrofits.
- Enhance web information on local renewable energy and energy efficiency.
- Add community energy and GHG progress in annual report and communicate out via separate progress report to Council and the community.
- Building energy dashboards / displays – electronic/Downtown Renewable Energy System.
- Make Spatial Community Energy, Carbon and Cost Characterization (SCEC$^3$) model results public.
- Informational displays at entrance of each Downtown Renewable Energy System-connected building that describes greenhouse gas reductions.
- Mobilize the public to attend Council meetings to raise the profile of climate action.

### External Stakeholder Workshops

External consultation consisted of two workshops, one main session with representatives from 19 public and private stakeholders, and another focused on mitigation and adaptation which was attended by over 20 people from a range of public and private stakeholders.

The main session assessed the status and developed priority actions in six topics including new and existing buildings, transportation, waste, land use, and renewable energy. On the whole, building construction and retrofits in Prince George do take advantage of energy efficiency programs such as Step Code despite a risk-averse public and lack of local standards for improvements. Therefore, actions were focused primarily on education, incentives, and public outreach for energy efficient buildings.

Transportation is a major area of focus for Prince George as it is a driving-dominant community and requires substantial improvement to its public transit system. A suite of actions focused on adjusting transit schedules and routes to better match demand, along with dedicated active transport corridors to alleviate traffic congestion and improve public health.

Waste diversion in the city is another major area of interest, as the current recycling program is being complicated by plastic repurposing and resale value, citizens filling their recycling bins with garbage, as well as the lack of current organics diversion. A public campaign to reduce waste entering the recycling stream is being suggested, along with the development of an organic waste diversion collection and education program.

Regarding renewable energy, the City's Downtown Renewable Energy System could be expanded by adding supply heat from Canfor's biodiesel and co-generation plants, as well as adding more buildings to the system to increase demand. Incentivizing heat pumps to replace natural gas is also being considered, as well as creating a business case for solar installations using data from the University of Northern BC (UNBC) and Aboriginal Housing Society (AHS).

The mitigation and adaptation workshop highlighted the need for specific GHG reduction targets in specific sectors like solid waste and transportation, as well as significant attention on Provincial wildfire response due to its contributions to GHG emissions.

### Main External Consultation Workshop

This session took place on December 4, 2018 and included representatives from 19 public and private stakeholders. Six areas were discussed for which current states and suggested action items and opportunities were introduced. Summaries for each topic are presented below.

#### Buildings (New)

**Status:** Though Prince George (PG) has the most affordable housing real estate of any major community in BC, new construction in the community presents a higher risk as home owners are more risk-averse, resulting in undesirability for engineered wood and wood foundations, despite PG being well known for wood construction. Nevertheless, the City has been leading sessions on Step Code, and new City buildings are encouraged to link to the existing downtown renewable energy system. A 3-storey building has already been developed to Step 3, with a 200 unit building to be built to Step 4.

**Actions:** Nearly all of the actions suggested were for community buildings and these included:

- Refining educational material to be more easily understandable and dispel myths about construction in Northern communities (e.g. cross-laminated wood, engineered wood in general).
- Notify the Province of the City's willingness to consult for Step Code implementation and support Step Code uptake through education and building of capacity through the College of New Caledonia.

#### Buildings (Existing)

**Status:** Though local home owners have a proactive "DIY" approach, there is a knowledge gap as no local standard exists for improvements, and could therefore benefit from guidance from both the City and builder community as a whole. For example, FortisBC offers the Energy Conservation Assistance Program (ECAP) to fund basic home energy retrofits for lower income homeowners, as well as an energy advisor to support small/medium commercial and industrial buildings. The University of Northern BC (UNBC) also has the Active Energy Management Program which takes savings from upgrades to do new projects, a model that could be replicated.

**Actions:**

- City to encourage retrofits by offering incentives, as well as to educate homeowners on construction materials and how to get the best value.
- Use a trusted third party to promote the Energy Conservation Assistance Program (ECAP) to the public instead of it being delivered directly from FortisBC.
- Consider a recognition/award system for local businesses that employs innovative energy and waste reduction methods during retrofits as a means of increasing public awareness.

### Renewable Energy

**Status:** Prince George is engaged in several renewable energy projects, including a City-owned Downtown Renewable Energy System (DRES) heating several downtown core buildings, a commercial scale biodiesel plant owned by Canfor, wood pellet production from the local sawmill, and small-scale solar installations by UNBC and the Aboriginal Housing Society (AHS).

**Actions:**

- Expand the utilization of the City's DRES with the intent to add more buildings to the system, while also looking at additional heat sources such as the waste heat from Canfor's biodiesel and co-generation plants.
- Incentivize heat pumps to replace natural gas.
- Create a business case for solar installations through the analysis of solar data from UNBC and AHS.

### Land Use

**Status:** Though land use bylaws still allow most residential developments to be single lots, the City is doing a good job with infill development, particularly through its incentives-based approach. Despite several empty and poor quality spaces downtown, UNBC is encouraged by the City's efforts to improve both density and safety downtown, particularly since there are currently few high-density rental options available.

**Actions:** Common theme from the actions suggested is the need for more high-density housing, including:

- Rezoning river front land from industrial to residential, placing higher-density housing in College Heights Mall, and changing rental structure to encourage more 4-plexes and apartment buildings.
- Revitalization of downtown followed by new developments.
- Add underground parking to increase ground floor space downtown.
- Exploring pedestrian only streets downtown.

### Transportation

**Status:** As a Northern community, driving is the dominant transportation method, with residents often owning multiple vehicles. Demand for transit is there, but the current system is too inefficient and infrequent. Many people have a bad impression of public transit in the area as well. As for EVs, the lack of infrastructure combined with a lack of local dealerships willing to sell or service EVs has made it extremely difficult to justify. Nevertheless, the City purchased a Chevy Bolt in 2018, and shares a Nissan Leaf with Fraser-Fort George Regional District, Northern Health and UNBC. Active transportation in the city is a challenging issue, as infrastructure is not supportive of cycling, leading to safety concerns, and clearing of highway roads for cycling is sporadic.

**Actions:** The majority of transportation actions focus on improving transit use, including:

- Moving transit routes closer to new apartment complexes.
- Adjusting schedules to better match UNBC class start and end times.
- Replacing school buses with free bus passes for high school students.
- Exploring rapid transportation to/from the airport.
- For EVs, the City and AHS should explore a shared EV fleet as well as options for electric or natural gas buses.
- New dedicated transportation corridors for active transport under consideration.

### Solid Waste

**Status:** Recycling in the community is a challenge. No blue bin program exists for businesses, and no home for plastics is available as repurposing technology isn't viable, nor is the resale value of plastics financially feasible. Furthermore, only half of residents participate in the curbside recycling program with some adding waste to "fill up" bins for pick-up, introducing contaminants into the recycling stream, and complicating the separation process. On the other hand, new funding is coming for organic waste diversion, with UNBC exploring onsite composting. Still, organics capture is a challenge due to animal issues at the Regional District depot, as well as challenges in centralizing waste collection.

**Actions:**

- Changing the mentality of residents filling their recycling bins with waste to get "their money's worth" is a priority.
- Aligning pickup schedules to mirror Surrey/Vancouver (garbage every 2 weeks, recycling/composting every week).
- Education programs and studies for local compost waste capture.
- Analyzing policies from the surrounding region to establish best practices for future waste policies.

### Mitigation and Adaptation Workshop

This workshop was attended by over 20 people from a range of private and public stakeholders in October 2018. Discussion focused on three sectors:

1. Air improvement by working with the Prince George Air Improvement Roundtable (PGAIR) to do another roundtable and continue lobbying for air quality;
2. Refining the Chamber of Commerce's Carbon Neutral work linking businesses with students who can help move towards carbon neutrality by closing the gap between student enthusiasm and practical action; and,
3. Capacity limitations within industry, as noted by the Sinclar Group's energy efficiency work, with some businesses not having programmable thermostats nor the time to do basic energy retrofits.

Takeaways from the session were:

- Specific GHG reduction targets in specific sectors such as solid waste or transportation.
- Providing industry with better direction when reducing their own emissions.
- Organizing a GHG/energy leadership group similar to that for PGAIR.
- Significant attention placed on provincial wildfire response due to GHG emission contribution.

## Public Engagement

Public engagement was conducted through in-person and online events: a public open house and booths at two community events, and an online survey, engaging over 800 community members in the process. Each event had display boards, handouts, a prioritization activity and City staff available for discussions. Details for each event are outlined in this section.

At the events, priority actions spanned all sectors, including improved active transportation corridors and public transportation, more EV charging infrastructure and electrifying City fleets, organics diversion and improved curbside recycling, increased tree planting and associated incentives, and inclusion of energy efficiency measures and solar installations as part of updates to building codes.

The online survey garnered over 500 responses from the community and asked the public to indicate a level of support for five key topic areas, and then specific climate actions for each of these topics. Transportation scored highest by a fair margin as the climate action topic that respondents supported, followed by renewable energy and food/waste, with buildings and land use scoring lowest. Interestingly, the highest scores for specific actions were both from the food/waste category (organics diversion and supporting local food production). Tree planting and active transportation also scored relatively high as specific actions. As specific actions, increased building wood usage and support for EVs ranked lowest among respondents. To keep informed about City progress on the Climate Change Mitigation Plan, respondents preferred updates through the City's social media platforms and the City's

website. Lastly, respondents were relatively evenly spread on the education topics they would like to see the City provide information on, with active transportation, land use planning, and the Downtown Renewable Energy System ranking highest.

### Public Open House

The public open house was held at the main library on June 12, attended by 65 community members with 55 voting on priority actions. A wide range of actions were suggested across all areas with some highlights being revising bus schedules, converting municipal fleets to EVs and expanding EV infrastructure, increasing local food production, and expanding renewable energy installations of solar and geothermal.

#### New Buildings

- Update building codes to include energy efficiency measures and options for solar and EV plugins.
- Require a percentage of new homes to be small and wheelchair accessible.

#### Retrofits

- Include heat pumps in retrofit incentive program.
- Maintain buildings at appropriate temperatures so that heating systems work properly.

#### Transit

- Revise how bus route schedules sync at hubs to improve connections, especially outside business hours.
- Improve weekend schedules.
- Free transit programs for children/seniors, and during bad air quality or very cold weather.

#### Active Transportation

- Traffic circles at intervals on 8$^{th}$ and 12$^{th}$, effectively closing them to all but local traffic.
- Dedicated (not multi-use) bike lanes.
- Anti-idling campaign - no drive-thru, banning except during “normal” driving.

- Cycling campaign – community bike share fleet, crackdown on bike thefts (bait bikes), more bike parking, cycling education.

### EVs

- Convert fleet to EVs, beginning with frequent stopping fleets (garbage, recycle trucks, buses).
- Municipal EV purchase incentives, especially for heavy machinery.
- Expand EV charging network (e.g. Level 3 stations at shopping malls).

### Carpooling

- Incentivize and facilitate carpooling, penalize RVs, large trucks, and "coal rolling."

### Waste

- Tax or ban single-use items (straws, plastic bags, cups).
- Curbside compost pickup.
- Ban/fine for recyclables in garbage.
- Mandatory recycling in apartments and shared living spaces.
- Explore waste-to-energy (incineration).

### Food

- Tax rebates and incentives for carbon capture farming.
- Reduction/elimination of pesticides and herbicides.
- Convert unused lawns to food production, could sell produce at Farmer's Market.
- Incorporate food production into design of new buildings.

### Land Use

- Moratorium on subdivisions outside bowl until more infill done on inside of bowl.
- Require trees on:
    - Streets of new developments; and,
    - On boulevards (e.g. 5$^{th}$ and 15$^{th}$ Avenues) to replace asphalt.
- Do not "surplus" parkland/green belts to developers to reduce tree clearing.

### Renewable Energy

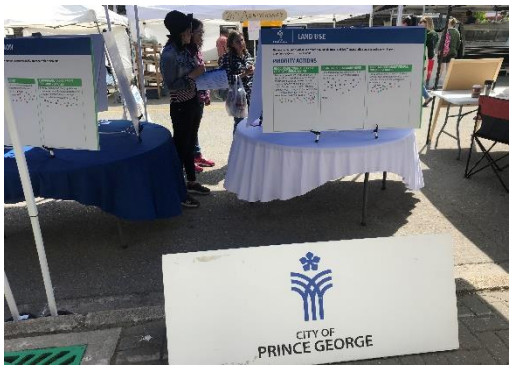
- Solar geothermal for heat capture in summer/heating in winter.
- Municipal incentives for renewable energy installations.
- Other community projects to consider: "Drake Landing Solar Community" and "City of Nelson Community Solar Garden."

- Mandate all downtown buildings to be part of Downtown Renewable Energy System.
- Mandate percentage of new builds and retrofits to use 60% solar or geothermal by 2021.
- Establish PG Community Solar Association.

### Other

- Include consideration for low carbon operations when considering companies for RFP contracts.
- Grants and supports for sustainability focused non-profits in PG.
- Explore methods on removing micro-plastics from wastewater treatment effluent.
- Climate change education program.

## Farmers' Market Booth




The Farmers' Market event was held June 22. From approximately 200 people who were engaged at the booth, 139 of them voted on priority actions. Attendees were asked to provide input on a wide range of topics including: buildings, transportation, greenspace, and food and waste. Actions on improving public transportation, active transportation, and waste diversion were among the most requested.

### Buildings

- Promote mixed-use buildings downtown.
- Encourage builders to incorporate geothermal and solar in new installations.

### Transportation

- More efficient public transportation so that people can use it (hour plus long waits not acceptable):
    - Smaller, more efficient buses (most are empty); and,
    - Improve HandyDART (aging population requires more mobility options).
- Improved and more interconnected walking/bike paths, separated bike lanes on major routes.
- Maintain walking/bike paths during all four seasons (winter especially).
- Public EV charging stations downtown.
- Incentives for EV home chargers (e.g. discounts on city taxes).
- Moving City towards 100% EV fleet.

### Greenspace

- Don't infill into native urban green spaces, protect them.
- Ban pesticide/herbicide use (residential, commercial, municipal).
- More community grants for green projects.
- Parks in new subdivisions (similar to The Bowl in the 1970s).

### Food and Waste

- Bylaw change to encourage urban agriculture (e.g. chicken coops, local food initiatives).
- Organics diversion (curbside composting, banning organics from garbage).
- Improved curbside recycling program, allow more material types for recycling.
- Divert food waste from supermarkets to increase food access for low-income individuals.

### Other

- Climate initiatives need to be inclusive of all communities and income levels.
- Improve air quality, particularly odours from saw mill.
- Accessible, incentivized community consultation (mobility-friendly, include honorariums).

## Lheidli T'enneh Memorial Park Booth

The Lheidli T'enneh Memorial Park event was held July 11 with 30 people engaged at the booth and voting on priority actions. Specific suggestions from the people engaged are summarized below.

- Stop clear-cutting (also decreases wind-driven erosion and drying of soil).
- Solar homes over solar farms.
- Tree-planting incentives.
- Education campaign to purchase less, and when doing so, products with durability and longevity.
- Municipal fuel tax to discourage vehicle use/encourage cycling.
- Educated advisory service to help individuals install heat pumps, solar, etc.
- Community solar garden.

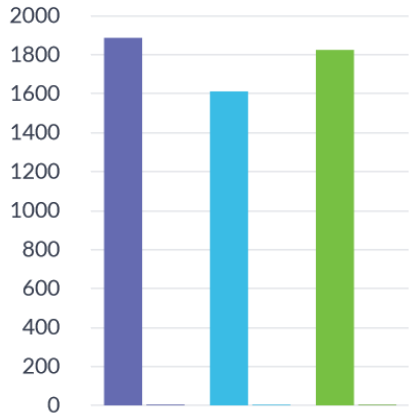
## Online Survey

The online survey titled "Community Survey - Prince George Climate Change Mitigation Plan" received 506 responses to nine questions over a 50-day period (June 11 – July 31). Most of the questions are summarized in chart format below for suggested actions, and were scored on a scale of 1-5, with 5 as a very high priority. Overall, the top actions across all subject areas were:

1. Diversion of yard, garden, and kitchen waste from the landfill (4.33)
2. Supporting local food production (4.27)
3. Planting/growing more trees (4.17).

### Q1: Buildings

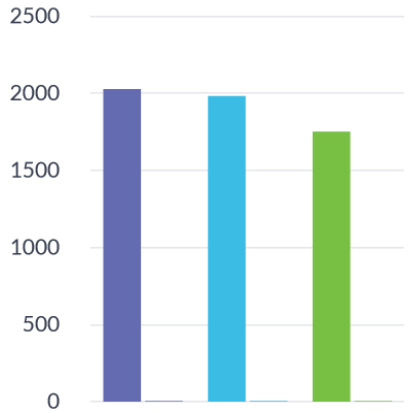
Building new energy-efficient buildings was ranked highest among respondents with retrofitting of existing buildings closely behind. There was less interest in using more wood.




| Choice | Score | Average |
|---|---|---|
| Build New Energy-Efficient Buildings | 1887 | 3.85 |
| Retrofit Existing Buildings | 1825 | 3.72 |
| Use more Wood in Buildings | 1612 | 3.29 |

### Q2: Transportation

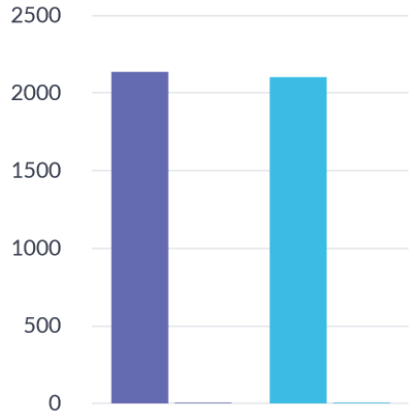
Active transport ranked highest at 4.11 with public transit improvement closely behind at 4.01.




| Choice | Score | Average |
|---|---|---|
| Support Active Travel | 2028 | 4.11 |
| Improve Transit | 1983 | 4.01 |
| Encourage Electric Vehicles | 1752 | 3.55 |

## Q3: Waste and Food

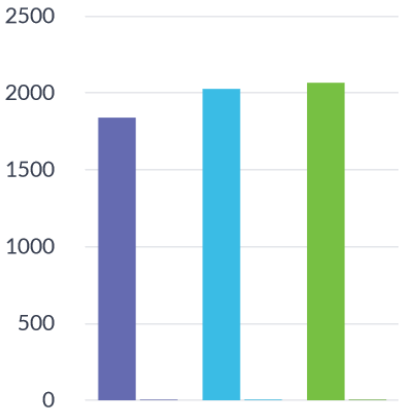
Scores for yard/organics waste diversion and local food production ranked 1, 2 among respondents overall across all areas, emphasizing their importance.




| Choice | Score | Average |
|---|---|---|
| Divert yard, garden, and kitchen waste from landfill | 2137 | 4.33 |
| Support Local Food Production | 2103 | 4.27 |

## Q4: Land use

Increased tree planting ranked highest among land use actions. Improving streets to increase emphasis on people rather than just vehicles followed closely behind, while connected and compact urban living trailed considerably behind.

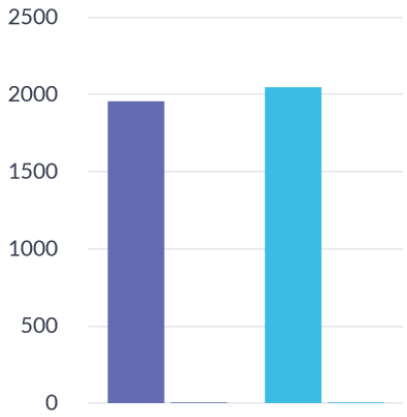



| Choice | Score | Average |
|---|---|---|
| Plant and Grow More Trees | 2067 | 4.17 |
| Make Streets about People, Not just Vehicles | 2027 | 4.09 |
| Encourage Connected and Compact Urban Living | 1840 | 3.71 |

## Q5: Renewable Energy

Increasing the number of connections to the Downtown Renewable Energy System ranked highest at 4.14, with the use of organics for renewable natural gas (RNG) slightly lower at

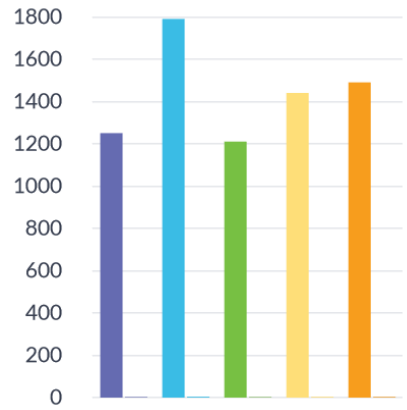
3.95. Note that the use of organics for RNG would require organic waste diversion and capture, which happens to rank highest among all actions (see Q3).




| Choice | Score | Average |
|---|---|---|
| Increase Connections to Downtown Renewable Energy System | 2047 | 4.14 |
| Use Organics to produce Renewable Natural Gas | 1956 | 3.95 |

## Q6: Priority Subject Areas

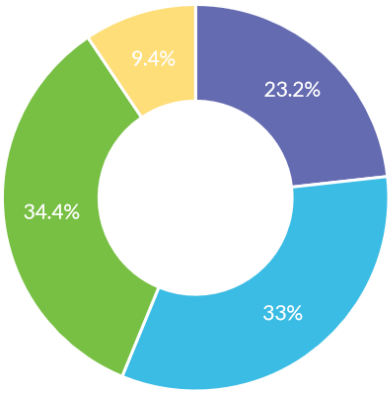
Among all subject areas, transportation ranked highest among respondents by a large margin (3.65), with the next two areas, Renewable Energy and Waste and Food off by a significant margin (3.04 and 2.93 respectively). The remaining two areas, Buildings and Land Use, trailed even more significantly at 2.55 and 2.47 respectively.




| Choice | Score | Average |
|---|---|---|
| Transportation | 1791 | 3.65 |
| Renewable Energy | 1491 | 3.04 |
| Waste and Food | 1441 | 2.93 |
| Buildings | 1251 | 2.55 |
| Land Use | 1211 | 2.47 |

**Q7: How can the City assist you in becoming informed on updates to the Climate Change Mitigation Plan?** (Multiple Choice responses, more than one could be chosen)

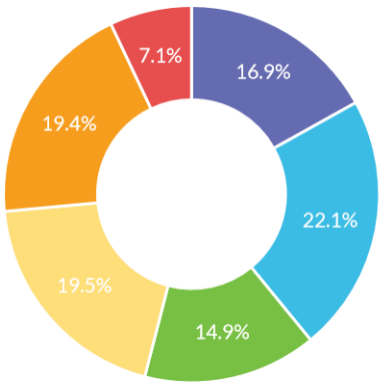
From responses, providing information on internet platforms such as social media and the City website are preferred.




| Choice | Total |
|---|---|
| Provide information on the City social media platforms | 343 |
| Provide information on the City website | 329 |
| Hold educational sessions | 232 |
| Other - please describe | 94 |

**Q8: Please identify Climate Change Mitigation education topics you'd like to see the City provide.** (Multiple choice responses, more than one could be chosen)

Active transportation, land use planning, and the Downtown Renewable Energy System are the most popular education topics on Climate Change Mitigation, with energy efficient buildings and EVs trailing.




| Choice | Total |
|---|---|
| Active transportation options | 323 |
| Land use planning | 285 |
| Downtown Renewable Energy System | 283 |
| Energy efficient buildings, such as our LEED standard RCMP building, and the BC Energy Step Code | 247 |
| Electric fleet vehicles | 218 |
| Other - please describe | 103 |

### Q9: Summary of Additional Comments

Out of 506 overall respondents, 215 provided additional comments. The top five topics discussed are summarized below.

| Action | Tally | Additional details |
|---|---|---|
| Waste reduction/recycling/composting | 28 | Recycling in apartment buildings, incentives for industry, curbside emphasis, recycling audit program |
| Improve transit options and frequency | 21 | Transit service too slow, inconsistent |
| EVs/stations | 16 | More options to purchase locally, electrify municipal fleets, local incentives |
| More renewables | 15 | Solar, wind, improved connections to Downtown Renewable Energy System |
| Active transportation, discouraging vehicles, bike lanes | 14 | Hart Highway access for pedestrians/cyclists, mandatory bike storage in new buildings |

## Appendix H. Details of Actions – Community and Corporate

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| **Buildings and Infrastructure (Community)** | | | | |
| *Actions ongoing or in progress (0-2 years)* | | | | |
| Ongoing | B1 | Continue to support capacity-building opportunities to ensure building industry professionals are knowledgeable in construction of energy efficient buildings. | The City can continue to look for opportunities to support education for building industry professionals on energy efficient new construction, such as the BC Energy Step Code. Good partners may be the local chapter of the Canadian Home Builders Association (CHBA Northern BC), the College, UNBC, CEA, and BC Housing. Many communities across BC have found ways to do this.<br><br>There are a number of ways that the City could support, e.g.:<br>• organise and lead sessions;<br>• provide funding towards sessions, or seek funding for sessions;<br>• provide speakers / staff to attend;<br>• help to promote sessions through its networks; and,<br>• provide free or discounted venue space.<br><br>There have already been a number of educational sessions in the community on the Step Code and energy efficient new buildings, by CHBA Northern BC, CEA, and BC Housing.<br><br>Target audiences can include builders, developers, trades, architects, home designers, and also realtors.<br><br>These education sessions can be combined with community consultations on the Step Code, as many other BC communities have done (see B2).<br><br>**Co-benefits:** this action will have economic and risk management co-benefits by helping the building industry prepare for coming code changes. Health co-benefits through more comfortable buildings with better ventilation.<br><br>**Outcome:** this action will be continuous. | Development Services<br><br>Environmental Services as support |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | Effort Costs GHG impacts Economic impacts | |
| Ongoing | B2 | Engage with the building community on the BC Energy Step Code. | The City has provided its notice of consultation to the Province. The City has been engaging with the building industry on Step Code, and should continue to do so.<br><br>The City should consider doing this through events and surveys. Note that CEA has ready-made survey materials, workshop agendas and table questions. CEA may be able to leverage funding to support the City with this, e.g. from FortisBC for builders breakfasts. This step can also be combined with education (see B1).<br><br>Note that there may be policy options for implementing the Step Code. Several that have been explored by CEA following the direction of staff at the City are in Appendix J.<br><br>**Co-benefits:** this action will have economic and risk management co-benefits by helping the building industry prepare for coming code changes. Health co-benefits through more comfortable buildings with better ventilation.<br><br>**Outcome:** this action will have a discrete outcome (or series of outcomes) of a decision to reference the Step Code or not, and if so, then how to do it.<br><br>Effort Costs GHG impacts Economic impacts | Development Services<br><br>Environmental Services as support |
| *Actions to implement in near future (2-5 years)* | | | | |
| 2-5 years | B3 | Plan for the Provincial implementation of the BC Energy Step Code, and consider requiring higher levels of energy efficiency for new builds. | The City will plan for Provincial implementation of the BC Energy Step Code. It will also consider implementing the BC Energy Step Code, making it mandatory or providing incentives, as numerous other communities in BC have done.<br><br>The City should note that:<br>• If it chooses to make Step Code a regulation, that there is a BC Hydro grant that can be used for the building industry, so long as the City decides to make Step 1 a requirement. | Development Services<br><br>Environmental Services as support |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | • There may be barriers that impede the construction of more efficient buildings. E.g. some communities have reduced set backs in their zoning bylaws, so as not to penalise buildings that are built with thicker walls to accommodate more insulation. These can be looked at as part of the process.<br><br>Suggested steps are:<br>1. Investigate funding opportunities and incentives for Step Code implementation. Particularly the BC Hydro grant that can be used for the building industry.<br>2. Investigate barriers that the City may have that impede the construction of more efficient buildings.<br>3. Continue educating and consulting with the building industry, B1 and B2.<br>4. Create a plan for referencing the Step Code. This plan could include, for example: education and awareness, incentives, and increasing steps towards regulation combined with feedback / further consultation from the building industry. Another consideration is that the City may wish to make public disclosure of energy labels mandatory.<br><br>Note that early discussions have indicated that good initial opportunities may be to include the Step Code in the Revitalization Tax Exemptions for Part 3 buildings, and also as a rezoning policy for Part 9 buildings. There may be other opportunities for incentives, e.g. some communities (e.g. Kimberley) have had success with building permit fee rebates for Part 9 buildings.<br><br>See Appendix J for more suggestions on how to proceed with the Step Code, and draft language around policy tools that could be used.<br><br>**Co-benefits:** this action will have economic co-benefits by reducing community energy expenditures. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax. Health co-benefits through more comfortable buildings. | |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | **Outcome:** this action will have a discrete outcome (or series of outcomes) of referencing the Step Code through incentives or regulation.<br><br>Effort Costs GHG impacts Economic impacts | |
| 2-5 years | B4 | Partner with grant providers and energy companies on delivery and promotion of energy conservation education and grant programs for new and existing buildings. | The utilities and Province provide incentives for energy conservation. When the City has the capacity to promote these programs it should do so.<br><br>This may include:<br>• Advertising FortisBC's New Home program as part of building permit applications for all new residential homes;<br>• Promoting energy retrofit programs offered by BC Hydro, FortisBC and Efficiency BC, particularly those geared towards low income families such as the Energy Saving Kits and Energy Conservation Assistance Program; and,<br>• Promoting programs for businesses to the business community.<br><br>**Co-benefits:** this action will have economic co-benefits by reducing community energy expenditures. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax. Social co-benefits by reducing energy expenditures for income qualifying households. Health co-benefits through more comfortable buildings.<br><br>**Outcome:** this action will be continuous.<br><br>Effort Costs GHG impacts Economic impacts | Development Services<br><br>Environmental Services as support |
| *Actions to investigate feasibility* | | | | |
| Potential | B5 | Investigate opportunities to work with industry and higher education partners on economic opportunities | The trend to energy efficient new construction in BC, Canada, and around the world presents opportunities for Prince George with wood product innovation. E.g. prefabricated homes, prefabricated panels, and Cross-Laminated Timber. Local industry could benefit.<br><br>Wood products have a number of benefits as a construction material, such as having lower embodied energy, and the fact that they embody carbon. | Economic Development<br><br>Development Services |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | around energy efficient new buildings. | This action requires working closely with the Economic Development Group, and should be incorporated into the Economic Development Plan. Other community partners may be very interested, including UNBC, PICS, and local industry partners.<br><br>**Co-benefits:** this action will have economic and risk management co-benefits by preparing the local building industry for coming changes to building practices and the BC Building Code.<br><br>**Outcome:** this action will be continuous.<br><br>Effort Costs GHG impacts Economic impacts | Environmental Services as support |
| Potential | B6 | Investigate methods to encourage local businesses to improve efficiency, such as through collaboration with the Chamber of Commerce Carbon Reduction Project. | The Chamber of Commerce has been working with UNBC students to improve the efficiency of local businesses for several years. Staff at the Chamber have approached the City to know what future plans the City may have on promoting carbon reduction to local business that the Chamber could be involved.<br><br>In addition, FortisBC has an energy advisor to support small and medium commercial and industrial buildings. This could be promoted to businesses, and potentially form part of the package with the Chamber.<br><br>When the City has capacity, it could:<br>• Promote energy reducing initiatives through the business licence renewal process. This is an easy way to target many businesses. Many other communities in BC have done this.<br>• Discuss with the Chamber ways to further raise the profile of businesses that engage and make improvements.<br><br>**Co-benefits:** this action will have economic co-benefits by reducing business and community energy expenditures. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax.<br><br>**Outcome:** specific outcomes, but action could be continuous. | Economic Development<br><br>Development Services<br><br>Environmental Services as support. |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | Effort Costs GHG impacts Economic impacts | |
| Potential | B7 | Investigate financing models for implementing a comprehensive residential energy efficiency retrofit campaign. | The extent to which this action is pursued will depend on the availability of staff capacity.<br><br>A number of communities across BC have conducted comprehensive residential energy efficiency retrofit campaigns, which have supported improved energy efficiency in existing buildings. The City of Prince George could look for opportunities to do the same, for example through offering incentives. External funding programs can assist with this. For example, the City of Campbell River developed a program and offered incentives using funding from BC Hydro. It is strongly recommended to collaborate with BC Hydro and Fortis.<br><br>The City has also, in the past, worked with NRCan (Canmet) on energy mapping (SCEC3). The City could look at replicating this project again, and use it to help with targeting initiatives. Mapping results could also be made public.<br><br>The City could take a Community Based Social Marketing (CBSM) approach to influencing behaviour. Some staff could take the CBSM training and then undertake specific projects (in the medium to long-term). See the CBSM action.<br><br>The City could consider developing a simple ROI tool to help people who are considering building a home or conducting renovations, if it is believed that this could be effective. People make decisions based on short-term benefits such as aesthetic values, but if they had access to simple data on energy savings then they might be more inclined to make decisions based on longer-term benefits. The City had previously developed a concept web-based tool to do this but it was never launched.<br><br>Another opportunity with retrofits is to look at heat pumps. Homes that currently use electric baseboards in Prince George are excellent candidates to be retrofitted with a ductless air source heat pump. There are incentives available from BC Hydro, and this will lead to substantial electricity savings in shoulder seasons. Electric resistance heat, such as baseboards, will still be needed during the coldest times of the year. | Environmental Services<br><br>Development Services |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | **Co-benefits:** this action will have significant economic co-benefits by reducing community energy expenditures, and by stimulating residents to hire local contractors (e.g. heat pump and furnace installers, and insulators). Risk management co-benefits by reducing exposure to rising energy prices and carbon tax. Social co-benefits by reducing energy expenditures for households. Health co-benefits through more comfortable buildings.<br><br>**Outcome:** this action should have a discrete outcome of the creation and implementation of an energy efficiency retrofit campaign. It is possible for the campaign to be implemented more or less on a continuous basis.<br><br>Effort Costs GHG impacts Economic impacts | |
| **Buildings and Infrastructure - Corporate** | | | | |
| *Actions ongoing or in progress (0-2 years)* | | | | |
| Ongoing | MB1 | Lead by example and construct civic facilities that are at least one step above the current level in the Energy Step Code and demonstrate utilization of wood in the structural components of buildings. | Establish a policy to include an evaluation of the opportunities to achieve, the highest level of energy efficiency and the lowest GHG emissions as far as possible within all major capital projects.<br><br>The City could adopt third party rating systems (such as Step Code, ASHRAE, EnerGuide for equipment ratings, etc.) to help guide its decisions.<br><br>The City should also consider using innovative building materials that are sourced locally or could be produced locally, or innovative methods, with the intention to support or inspire local industry with developing these products (see the action on 'Work with industry on economic opportunities around energy efficient new buildings').<br><br>The City has made a commitment to build with wood first, and this commitment should be maintained. Sustainably sourced, non-primary growth wood, has lower embodied carbon emissions than most other construction materials and also stores some carbon within it. In addition to these benefits, through leading by example the City can encourage other parties to build with sustainably sourced wood. | Infrastructure Delivery<br><br>Facilities Maintenance |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | **Co-benefits:** this action will have economic co-benefits by reducing corporate energy expenditures, and by increasing the local building industry's exposure to energy efficient building practices and building with wood. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax.<br><br>**Outcome:** this action will have a discrete outcome of the establishment of a policy, but then be continuous.<br><br>Effort Costs GHG savings Financial savings | |
| Ongoing | MB2 | Continue to convert local government owned streetlights to LED when up for replacement. | This is in process, but could potentially be accelerated. GHG savings will be minimal because BC Hydro electricity has such low carbon emissions, but financial savings for the City will be quite impressive.<br><br>The City could also continue with installation of solar powered outdoor lighting in select circumstances. GHG savings will still be minimal, but they can also serve as useful demonstrations of solar technology.<br><br>**Co-benefits:** this action will have economic co-benefits by reducing corporate electricity expenditures. Risk management co-benefits by reducing exposure to rising electricity prices.<br><br>**Outcome:** this action will be continuous.<br><br>Effort Costs GHG impacts Financial savings | Public Works – Utilities Division |
| Ongoing | MB3 | Utilize an energy management tracking and information system for City owned buildings and infrastructure. | The City could do this in order to better monitor energy consumption at its buildings. This could include installing networked meters that read at frequent intervals and EMS software. Further discussion would be required to determine details.<br><br>**Co-benefits:** this action will have economic co-benefits by reducing corporate energy expenditures. Risk management co-benefits by reducing exposure to rising energy prices, and coming to a clearer understanding of where and how energy is used in the City, and demonstrate were energy use can be reduced. | Environmental Services<br><br>Facilities Maintenance |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | **Outcome:** this action will have a discrete outcome of implementing the system, but then implementation will be continuous.<br><br>Effort Costs GHG impacts Financial savings | |
| *Actions to implement in near future (2-5 years)* | | | | |
| 2-5 yrs | MB4 | Conduct energy audits of existing facilities and infrastructure, and implement energy efficiency improvements. | New energy assessments should be conducted, and budget set aside to complete improvements.<br><br>Most buildings have not had an assessment done for at least 5 years (in some cases 10), and in that timeframe the situation has changed. E.g. the price of electricity has gone up substantially, the price of some technologies like LED lights have substantially decreased, and new technologies like heat pump water heaters have become available.<br><br>One particular area of opportunity could be the complex of facilities at the Aquatic Centre and CN Place. There may be opportunities for ice waste heat recovery to aquatic facilities, and a number of the buildings are due for renovations.<br><br>Energy assessments could be tied with formal asset management condition assessments of civic / utility facilities.<br><br>Although the effort and costs will be fairly substantial, this action is key for the City to make substantial reductions in GHG emissions and realise substantial financial savings. In addition, there can often be grant funding available to assist with the funding of energy assessments and the recommended improvements, e.g. from FCM.<br><br>**Co-benefits:** this action will have economic co-benefits by reducing corporate energy expenditures. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax. | Environmental Services<br><br>Asset Management<br><br>Community Services and Public Safety |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | **Outcome:** this action will have discrete outcomes such as the completion of energy assessments on key buildings, but the implementation of the recommendations will likely take a number of years. Then this action will need to be repeated.<br><br>Effort Costs GHG impacts Financial savings | |
| 2-5 yrs | MB5 | Implement energy management practices into annual building maintenance procedures. | Annual maintenance and safety inspections by building staff provide a convenient opportunity to incorporate energy management objectives. Specific actions include:<br>• Check programming of thermostats and lighting controls<br>• Check and replace weather stripping on doors and windows as necessary<br>• Monitor annual energy consumption to identify abnormal energy use<br>• Assess condition and maintenance dates of HVAC and hot water equipment<br><br>**Co-benefits:** this action will have economic co-benefits by reducing corporate energy expenditures. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax.<br><br>**Outcome:** this action will have a discrete outcome of incorporating energy management into annual building maintenance procedures, but then implementation will be continuous.<br><br>Effort Costs GHG impacts Financial savings | Environmental Services<br><br>Asset Management<br><br>Community Services and Public Safety |
| *Actions to investigate feasibility* | | | | |
| Potential | MB6 | Examine optimal siting, orientation and design options for new buildings for emissions reductions and | Consider establishing a policy so that when future facilities are developed there is consideration of emission reductions and energy savings opportunities through site selection, orientation, and design.<br><br>Some examples:<br>• Site selection to link to the district heating system;<br>• Waste heat recovery (e.g. from an arena) ; and/or, | Infrastructure Delivery<br><br>Facilities Maintenance |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | energy savings opportunities. | • Facility alignment and layout to enhance opportunities for solar gain (passive design) or solar PV.<br><br>**Co-benefits:** this action will have economic co-benefits by reducing corporate energy expenditures. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax.<br><br>**Outcome:** this action will have a discrete outcome of the establishment of a policy, but then be continuous.<br><br>Effort Costs GHG savings Financial savings | |
| Potential | MB7 | Investigate energy recovery options from facilities and feasibility of implementation. | This could include arena waste heat recovery, sewage waste heat recovery, and biogas generation from bio-solids digestion (as the City has been doing already).<br><br>**Co-benefits:** this action will have economic co-benefits by reducing corporate energy expenditures. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax.<br><br>**Outcome:** this action would have discrete outcomes of the evaluation and implementation of opportunities.<br><br>Effort Costs GHG impacts Financial savings | Public Works<br><br>Community Services and Public Safety<br><br>Environmental Services as support |
| **Renewable Energy (Community)** | | | | |
| *Actions ongoing or in progress (0-2 years)* | | | | |
| Ongoing | E1 | Continue to identify community connection opportunities for Downtown Renewable Energy System (DRES) | The DRES has substantially reduced carbon emissions, particularly with the corporate carbon footprint. It also helps to keep energy dollars local.<br><br>Opportunities to expand the system should be pursued where feasible, so long as the benefits – carbon reductions and local economic development – are balanced with the business case of the system. Council direction and approval may be needed.<br><br>Planning / policy tools could play a role in encouraging connection to the DRES. | Council may decide which department would need to lead, but input and involvement from Public Works Dept., Economic |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | Informational displays could be installed at the entrance of DRES-connected buildings that describe that it is connected, and the GHG reductions.<br><br>Considerations around the DRES should be congruent with the 2019 study on the system.<br><br>**Co-benefits:** this action may have economic co-benefits through keeping energy dollars local. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax.<br><br>**Outcome:** this action will be continuous.<br><br>Effort Costs GHG impacts Economic impacts | Development and Development Services would be needed. |
| 2-5 yrs | E2 | Utilize the Downtown Renewable Energy System in a public information campaign that demonstrates operations and the wide-ranging environmental and economic benefits. | The DRES brings substantial benefits to the community, and these should be communicated. Because the DRES is mostly buried infrastructure, it is easily forgotten by the public.<br><br>This action could have substantial GHG reduction impacts if it is successful at establishing more DRES connections.<br><br>**Co-benefits:** will have few direct co-benefits, because it is about describing the benefits that the DRES brings. If it is successful at expanding the DRES, it will have the same co-benefits as E1.<br><br>**Outcome:** this action will be continuous.<br><br>Effort Costs GHG impacts Economic impacts | Public Works<br><br>Environmental Services<br><br>External Relations |
| *Actions to investigate feasibility* | | | | |
| Potential | E3 | Investigate opportunities to increase both supply and demand of community-based | There are options to look at increasing supply and demand of community-based renewable energy options in addition to the DRES. These options include renewable natural gas (RNG), heat pumps, and solar photovoltaic systems.<br><br>For RNG, FortisBC would be an important partner, and capturing landfill gas from the Foothills landfill could be a good supply-side project. The City should | Public Works<br><br>Environmental Services |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | renewable energy options. | investigate the feasibility of creating renewable natural gas/biogas from local organic waste sources.<br><br>For heat pumps, contact CEA who are conducting research in this area.<br><br>**Co-benefits:** this action may have economic co-benefits through reducing energy expenditures, keeping energy dollars local, and expanding local businesses or creating new ones. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax.<br><br>**Outcome:** although this action will be continuous, it will have discrete outcomes of the development of renewable energy projects.<br><br>Effort Costs GHG impacts Economic impacts | Fraser-Fort George Regional District |
| **Renewable Energy (Corporate)** | | | | |
| *Actions ongoing or in progress (0-2 years)* | | | | |
| Ongoing | ME1 | Continue to identify municipal connection opportunities for Downtown Renewable Energy System. | The DRES has been a major reducer of corporate carbon emissions, and helps to keep energy dollars local.<br><br>Opportunities to expand the system should be pursued where feasible, so long as the benefits – carbon reductions and local economic development – are balanced with the impacts to the City's budget.<br><br>Considerations around the downtown renewable energy system should be congruent with the 2019 study on the system.<br><br>**Co-benefits:** this action may have economic co-benefits through keeping energy dollars local and reducing corporate energy expenditures. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax.<br><br>**Outcome:** this action is continuous.<br><br>Effort Costs GHG impacts Financial savings | Public Works<br><br>Infrastructure Delivery |
| *Actions to investigate feasibility* | | | | |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| Potential | ME2 | Investigate opportunities to increase both supply and demand of Renewable Energy options on municipal buildings and infrastructure. | Corporate buildings will have opportunities for renewable energy systems, including connecting to the Downtown Renewable Energy System (DRES), using heat pumps, waste heat recovery, and solar. These opportunities should be found and implemented to reduce the corporate carbon footprint and improve energy sustainability, and to lead by example and reduce community emissions.<br><br>A policy should be adopted so that opportunities are evaluated during major building retrofits, new construction, and energy assessments. If no opportunities exist then the City should consider making the building "ready" for renewable energy systems. A building that is "solar ready", "DRES ready", or "waste heat recovery ready" can have sharply lower installation costs when the time is right for an installation. Often the costs of making a building "ready" are incremental.<br><br>**Co-benefits:** this action may have economic co-benefits through keeping energy dollars local, providing additional work to local businesses, and reducing corporate energy expenditures. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax.<br><br>**Outcome:** this action has a discrete outcome of establishing a policy, but then implementation will be continuous.<br><br>Effort Costs GHG impacts Financial savings | Environmental Services<br><br>Community Services and Public Safety<br><br>Asset Management |
| **Land Use and Community Plans (Community)** | | | | |
| *Actions ongoing or in progress (0-2 years)* | | | | |
| Ongoing | L1 | Continue to encourage a complete, compact community through appropriate measures. | Through the Revitalization Tax Exemption bylaws the City has been encouraging growth in key areas. The City could consider using additional measures to encourage this.<br><br>The City could explore attracting more large employers to designated growth areas such as the downtown, e.g. increasing UNBC's presence downtown.<br><br>Parking requirements can also have a large impact on land use. They can create large car parks, which creates spread out communities that are | Development Services<br><br>Infrastructure Planning and Engineering<br><br>Economic Development |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | pedestrian and transit unfriendly, which in turn further encourages vehicle dependency. This can become a cycle and be difficult to break. The Transit Future Plan includes considerations on this. Looking for opportunities to revise parking requirements in the OCP and bylaws can encourage a more complete, compact community.<br><br>This could also include investigating opportunities to prioritize and incentivize development in priority growth areas and discourage development in outlying areas of the municipality.<br><br>**Co-benefits:** this action will have economic co-benefits through reducing energy expenditures on mobility fuels, and reducing municipal infrastructure / service costs. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax. Social co-benefits by increasing transportation options. Health co-benefits such as increasing access to active transportation options and improved air quality.<br><br>**Outcome:** this action will be continuous.<br><br>Effort Costs GHG impacts Economic impacts | Transportation and Technical Services<br><br>Bylaw Services |
| Ongoing | L2 | Continue to support local food production by preserving properties in the Agricultural Land Reserve (ALR). | Local food reduces "food miles" i.e. the number of miles food must travel to get from the producer to the plate. There can also be economic benefits to keeping food dollars local and not exporting them.<br><br>**Co-benefits:** this action will have economic co-benefits through keeping food dollars local and supporting local businesses. Risk management co-benefits by reducing exposure to rising food prices. Social co-benefits by increasing community connections. Health co-benefits such as increasing access to healthy local food.<br><br>**Outcome:** this action will be continuous.<br><br>Effort Costs GHG impacts Economic impacts | Development Services<br><br>Infrastructure Planning and Engineering |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| Ongoing | L3 | Continue to support local food production by providing space for farmer's markets and community gardens. | Many communities support local food production through farmers markets and community gardens. Some go further and have edible landscaping, or support community greenhouses. Local food reduces "food miles" i.e. the number of miles food must travel to get from the producer to the plate. There can also be economic benefits to keeping food dollars local and not exporting them.<br><br>The City already supports the local farmers market. For example there is a market every Saturday in a building in the downtown, and in the summer months a portion of a street is shut down for additional vendors, and there are occasional larger special events. The City could consider additional actions to support the farmers market, such as facilitating larger road closures as necessary. The City of Penticton does this, and it is a major tourist attraction.<br><br>The City should provide a supporting role with actions on community gardens, edible landscaping, and community greenhouses. UNBC may be a good partner.<br><br>**Co-benefits:** same as L2.<br><br>**Outcome:** this action is continuous.<br><br>Effort Costs GHG impacts Economic impacts | Community Services and Public Safety<br><br>Strategic Initiatives and Partnerships<br><br>Environmental Services |
| *Actions to implement in near future (2-5 years)* | | | | |
| 2-5 yrs | L4 | Identify regulatory measures to protect and grow the urban forest canopy. | Measures to protect and grow the urban forest, and tree canopy cover, can help beautify the community and make it a more pleasant environment for active transportation. They can also help reduce the urban heat island effect and cooling loads in the summer, and reduce the impacts of storm water on grey infrastructure. There are also some minor carbon capture benefits to this action. This action strongly relates to L5.<br><br>Also see Appendix J.<br><br>**Co-benefits:** this action will have economic co-benefits such as increasing the value of people's properties and desirability of the community, and reducing demands on storm water infrastructure and cooling loads. Risk management | Environmental Services<br><br>Development Services<br><br>Parks and Solid Waste |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | co-benefits include reducing exposure to climatic changes (storm water and increasing cooling loads). Health co-benefits through improved air quality and mental health (access to nature).<br><br>**Outcome:** this action is continuous, but may have discrete outcomes such as updating the Tree Protection Bylaw.<br><br>Effort Costs GHG impacts Economic impacts | |
| 2-5 yrs | L5 | Update Urban Forestry Management Plan to include climate change targets. | This action will have the same benefits as L4, and strongly relates to it.<br><br>Also see Appendix J.<br><br>**Co-benefits:** same as L5.<br><br>**Outcome:** this action will have the discrete outcome of an updated Urban Forestry Management Plan.<br><br>Effort Costs GHG impacts Economic impacts | Environmental Services<br><br>Parks and Solid Waste |
| 2-5 yrs | L6 | Amend parking requirements to require bike parking and electric vehicle charging stations. | EV requirements for new buildings, as highlighted in the EV strategy action, should be incorporated when the parking bylaw is updated. Bike parking is also key for active transportation.<br><br>**Co-benefits:** this action will have economic co-benefits through reducing energy expenditures on mobility fuels. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax. Social co-benefits by increasing transportation options. Health co-benefits such as increasing access to active transportation options and improved air quality.<br><br>**Outcome:** this action will have a discrete outcome of amended parking requirements.<br><br>Effort Costs GHG impacts Economic impacts | Development Services<br><br>Bylaw Services |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| 2-5 yrs | L7 | Apply the Community Lifecycle Infrastructure Costing (CLIC) Tool to all major OCP amendment and rezoning applications to assess both short-term and long-term costs to the City of Prince George. | Applying this tool will help to provide the justification for a more complete and compact community. A more complete and compact community should have reduced infrastructure costs, reducing upward pressure on taxes.<br><br>**Co-benefits:** same as L1.<br><br>**Outcome:** this action will have using the CLIC Tool for major OCP amendment applications.<br><br>Effort Costs GHG impacts Economic impacts | Development Services<br><br>Infrastructure Planning and Engineering<br><br>Asset Management |
| 2-5 yrs | L8 | Update the subdivision servicing bylaw to allow alternative design standards such as LED streetlights and alternative permeable surfaces. | This bylaw was reviewed in 2014, and provisions are in place for alternative design standards. Applicants may vary the standards of the bylaw through an application to Development Services for Council approval. Alternative design standards are currently typically proposed by the applicant (i.e. they are not a requirement).<br><br>There may be opportunities in updating this bylaw to make alternative standards the business as usual. Potential areas are: road cross-section, sidewalks, alternative permeable surfaces, LED streetlights.<br><br>**Co-benefits:** this action will have economic co-benefits through reducing municipal infrastructure / service costs. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax, and climatic changes. It may have other co-benefits depending on what is included in the bylaw.<br><br>**Outcome:** this action has a discrete outcome of the updating of the bylaw.<br><br>Effort Costs GHG impacts Economic impacts | Development Services and Infrastructure Services |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| 2-5 yrs | L9 | Investigate opportunities to prioritize and implement safe and reliable active transportation options into street design for new, rehabilitated and replacement roads. | Reconfigure streets to be 'living streets' / 'complete streets' - including formalizing hierarchy (pedestrian - bike - transit - truck - car). This is a policy decision, followed by street reconfiguration as streets are regularly scheduled for resurfacing / reconstruction for pavement maintenance or installation of utilities. If new streets are required, design to support connectivity.<br><br>Streets can also be designed to have traffic calming measures, to help ensure vehicles drive to the speed limit. This helps encourage active transportation by increasing safety.<br><br>**Co-benefits:** this action will have economic co-benefits through reducing energy expenditures on mobility fuels, and reducing municipal infrastructure / service costs by reducing the need for new roads. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax. Social co-benefits by increasing transportation options. Health co-benefits such as increasing access to active transportation options and improved air quality.<br><br>**Outcome:** this action will be continuous.<br><br>Effort Costs GHG impacts Economic impacts | Infrastructure Planning and Engineering<br><br>Transportation and Technical Services |
| *Actions to investigate feasibility* | | | | |
| Potential | L10 | Investigate the ability to implement 30 km/hr speed limit in the downtown core to encourage walking and cycling over vehicle usage. | 30km/hr speed limit helps to make the community safer and more appealing for pedestrians and cyclists, and could be applied to parts of the downtown. It also improves accessibility for people of all ages. Examples: Rossland, Wells, Summerland, Penticton.<br><br>**Co-benefits:** this action will have economic co-benefits through reducing energy expenditures on mobility fuels. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax. Social co-benefits by increasing transportation options. Health co-benefits such as increasing access to active transportation options and improved air quality.<br><br>**Outcome:** this action would be continuous. | Transportation and Technical Services |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | Effort Costs GHG impacts Economic impacts | |
| Potential | L11 | Investigate opportunities to expand the City's support to improve local food production. | There is a strong connection between local food production and poverty reduction. It is recommended that the City of Prince George evaluate opportunities to expand the City's support to improve local food production and support systems that provide food security.<br><br>This could include reviewing the zoning bylaw and design guidelines to ensure they support local food production, evaluate the potential for increased agricultural capacity in the future and/or creating an urban food strategy. In addition, the City could support capacity building and learning opportunities for residents to learn how to grow food locally.<br><br>**Co-benefits:** same as L2.<br><br>**Outcome:** this action will be continuous.<br><br>Effort Costs GHG impacts Economic impacts | Environmental Services<br><br>Strategic Initiatives and Partnerships. |
| **Transportation (Community)** | | | | |
| *Actions ongoing or in progress (0-2 years)* | | | | |
| Ongoing | T1 | Expand efforts on planning and implementation of pedestrian and cycling infrastructure. | The City of Prince George approved the Active Transportation Plan in 2011 to guide the development of a continuous and safe Active Transportation Network. A status update on the plan was performed in 2018, where it was determined that 17% of the actions are complete and 38% of the actions are partial, ongoing or underway. It is recommended that the City continue to implement the actions identified in the 2011 Plan and monitoring progress.<br><br>This includes:<br>• Ensuring pedestrian circulation and connectivity and improving consistency and connectivity of cycling lanes;<br>• Implement additional safe bike parking options, particularly in the downtown where availability is limited;<br>• Keeping active transportation pathways clear of debris and snow;<br>• Continuing participation in events such as bike to work week; | Infrastructure Planning and Engineering<br><br>Transportation and Technical Services |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | • Continuing facilitation of occasional street closures for special events e.g. farmers market; and,<br>• Pursuing grant funding for additional pedestrian and cycling infrastructure.<br><br>It is also recommended that the City evaluate whether the 2011 Active Transportation Plan should be updated in 2021.<br><br>**Co-benefits:** this action will have economic co-benefits through reducing energy expenditures on mobility fuels, and reducing municipal infrastructure / service costs by reducing the need for roads. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax. Social co-benefits by increasing transportation options. Health co-benefits such as increasing access to active transportation options and improved air quality.<br><br>**Outcome:** this action will be continuous.<br><br>Effort Costs GHG impacts Economic impacts | |
| Ongoing | T2 | Implement recommendations identified in Transit Future Plan to improve frequency and reliability of public transit service. | Opportunities to improve the transit service should be pursued, and would likely boost transit usage. This action involves implementation of the Transit Future Plan.<br><br>The Transit Future Plan includes such items as improving the frequency of transit especially along key routes, supporting the UNBC course schedule, improving transit infrastructure, and integrating the plan into other City plans and policies such as land use.<br><br>Supporting the shift hours of major employers, such as mills, may also be a good opportunity. Providing real-time arrival information for transit riders would also be beneficial. Regarding the connection with land use, ensuring that connections are made between land use and transit is important, e.g. targeting development along major transit corridors. | Infrastructure Planning and Engineering<br><br>Transportation and Technical Services |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | Free transit could also be offered for major community or sporting events. There are direct benefits to having people try alternative modes of transportation during large events. Experience has shown that people will be more likely (at worst, less reluctant) to use transit after having a good experience at a special event.<br><br>Another opportunity could be to work with the School District and provide high school students with free bus passes, instead of providing them with school buses.<br><br>There is currently no transit service to the airport, and this could be another opportunity should demand warrant.<br><br>**Co-benefits:** this action will have economic co-benefits through reducing energy expenditures on mobility fuels, and reducing municipal infrastructure / service costs by reducing the need for roads. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax. Social co-benefits by increasing transportation options. Health co-benefits such as improved air quality.<br><br>**Outcome:** this action will be continuous.<br><br>Effort Costs GHG impacts Economic impacts | |
| Ongoing | T3 | Continue to support PGAIR's initiatives that seek to reduce greenhouse gas emissions and improve air quality. | PGAIR has several initiatives that relate to reducing greenhouse gas emissions in addition to improving air quality. These include several transportation initiatives such as supporting active transportation, electric vehicles and public transit, anti-idling programs and raising awareness of driving more efficiently. Sometimes local air quality initiatives may not align with reducing greenhouse gas emissions and vice versa. The City should continue working with PGAIR to ensure that air quality initiatives align with emissions reductions goals.<br>The improvement in air quality also has a local economic benefit, e.g. through health impacts, and by making Prince George a more livable community.<br><br>**Co-benefits:** will depend on the initiatives supported, but all will have the health co-benefit of improved air quality. | PGAIR<br><br>Environmental Services |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | **Outcome:** this action is continuous.<br><br>Effort Costs GHG impacts Economic impacts | |
| *Actions to implement in near future (2-5 years)* | | | | |
| 2-5 yrs | T4 | Develop an electric vehicle strategy to identify initiatives that will increase the community-wide uptake of low carbon and electric vehicles. | There are several specific actions the City can take to prepare for low carbon and electric vehicles:<br>• Set up charging stations at highly visible locations, preferably where there are many amenities (e.g. downtown). There are currently very few EV charging stations in Prince George, and although more are planned, it is important to monitor their usage as there are an increasing number of electric vehicles.<br>• Continue collaborating with Charge North, the Northern and Cariboo regional EV charging network being run by CEA.<br>• Have standards for City capital projects (i.e. parkades, parks, facilities) so EV charging is available for staff and the public. If budget is lacking, ensure that new facilities are at least "EV ready".<br>• Encourage or require new buildings to be "EV ready", or have EV charging stations already installed. Analysis indicates 80% of charging will be done at home.<br>• Include EV charging infrastructure in sustainability guidelines for new buildings / developments.<br>• Ensure permitting processes (for renovations particularly) are set up to smoothly address EV charging infrastructure.<br>• Expand use of low carbon and EVs for the local government fleet to demonstrate the viability of the technology.<br>• Conduct or support initiatives to raise awareness of EVs among the public.<br>• Provide opportunities for other electric transport (e.g. e-bike and e-scooters) to charge.<br>• Outreach to local vehicle dealerships to increase local availability of EVs and EV servicing. | Environmental Services<br><br>Public Works<br><br>Infrastructure Services<br><br>Development Services<br><br>Fleet Services, for City fleet |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | • Consider the opportunities and challenges that innovative and advanced vehicle technologies, such as autonomous vehicles, may bring to the community.<br><br>CEA and BC Hydro would be excellent partners for this action.<br><br>**Co-benefits:** this action will have economic co-benefits through reducing energy expenditures on mobility fuels. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax. Health co-benefits through improved air quality.<br><br>**Outcome:** this action will be continuous, but will have a number of specific deliverables such as the creation and implementation of standards for City capital, installation of EV charging stations, conducting initiatives and events, etc.<br><br>Effort Costs GHG impacts Economic impacts | |
| 2-5 yrs | T5 | Enforce annual Anti-idling campaign. | Many communities in BC conduct campaigns to reduce idling. The City worked with PGAir in the past on a community-wide Vehicle Idle-Free Program which was developed to educate businesses, local government, educational institutions, and residents on the benefits of implementing an Idle-Free program for their fleets and personal vehicles to increase fuel efficiencies and to reduce harmful vehicle emissions. The City could find ways to support PGAIR to run continuous anti-idling campaigns.<br><br>Example: Northern Rockies Regional Municipality has run an innovative approach, using a carrot rather than a stick to encourage people not to idle. The municipality runs a campaign called “Idle-less October” in Fort Nelson, with sweet treats left on the windshields of non-idling vehicles and labels saying “Thank you for not idling!”<br><br>Also see T6.<br><br>**Co-benefits:** same as T4. | Environmental Services<br><br>Bylaw Services<br><br>Public Works |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | **Outcome:** this action will have discrete outcomes.<br><br>Effort Costs GHG impacts Economic impacts | |
| 2-5 yrs | T6 | Partner with BC Transit to look at opportunities to convert the local BC Transit fleet to a low carbon fuel. | The City should partner with BC Transit on a study to look at opportunities to convert the local BC Transit fleet to a low carbon fuel. The priority should be to reduce GHG impacts as much as possible, whilst considering cost implications, and maintaining minimum service requirements. Electricity, hybrid, and natural gas vehicles are all options.<br><br>**Co-benefits:** this action will have economic co-benefits through reducing energy expenditures on mobility fuels and transit fuel costs. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax. Social co-benefits by increasing the viability of the transit system. Health co-benefits through improved air quality.<br><br>**Outcome:** this action will have discrete outcomes, e.g. a study, and then potentially the implementation of that study.<br><br>Effort Costs GHG impacts Economic impacts | Infrastructure Planning and Engineering<br><br>Transportation and Technical Services |
| *Actions to investigate feasibility* | | | | |
| Potential | T7 | Consider including car idling restrictions in Clean Air Bylaw. | Many communities in BC have bylaws in place to reduce idling. Good places to target may be at schools and nurseries, in order to help protect the health of children. The City has already done this outside the municipal office.<br><br>Also see T4.<br><br>**Co-benefits:** same as T6.<br><br>**Outcome:** this action will have a discrete outcome of the establishment of a bylaw.<br><br>Effort Costs GHG impacts Economic impacts | Environmental Services<br><br>PGAIR |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| Potential | T8 | Consider supporting car share cooperatives and ride hailing services. | This action is dependent on staff capacity.<br><br>Any BC community that wants car sharing to be available can contact a car share cooperative to determine next steps. One organisation, Modo, has indicated its willingness to have this conversation with any community in BC, but the community may need to purchase enough shares in the coop to realise it, e.g. the Town of Sidney with Modo.<br><br>The City should consider whether the time is right to support a car share cooperative in the community.<br><br>Car share cooperatives have the potential to have positive impacts on GHG emissions and economic impacts. People that join car share cooperatives often then drive less. Families that join can often get rid of a vehicle. Multi Unit Residential Buildings near car share cooperatives can have less space dedicated for parking, reducing costs and space associated with parking.<br><br>Ride hailing services can also become a useful addition to the transportation suite.<br><br>**Co-benefits:** this action will have economic co-benefits through reducing energy expenditures on household mobility fuels and reducing the need for car ownership. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax. Social co-benefits by increasing access to vehicles. Health co-benefits through reducing vehicle ownership and hence improving air quality.<br><br>**Outcome:** this action will have discrete outcomes.<br><br>Effort Costs GHG impacts Economic impacts | TBD upon interest from external stakeholder |
| Potential | T9 | Investigate collaboration opportunities with major local | Collaboration with major employers such as industries, schools and Northern Health can uncover opportunities to reduce commuting-related transportation emissions. | Community Services and Public Safety |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | employers to encourage carpooling or other measures to reduce emissions associated with commuting to work. | Canfor already uses charter buses for facility crew delivery. At Lakeland Mill, carpooling is informal and many shift workers participate.<br><br>The City could consider a month-long campaign similar to Bike to Work Week called "Carpool Month." It could encourage large employers in the community to compete against each other with as many staff carpooling to work as possible.<br><br>**Co-benefits:** this action will have economic co-benefits through reducing energy expenditures on mobility fuels. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax. Health co-benefits through improving air quality.<br><br>**Outcome:** this action would be continuous.<br><br>Effort Costs GHG impacts Economic impacts | Environmental Services<br><br>PGAIR<br><br>City staff may lead this, or an external stakeholder. |
| Potential | T10 | Consider collaborations with energy suppliers for low-carbon fuel options. | Energy suppliers may be able to provide other low-carbon fuel options particularly suited for medium and heavy-duty vehicles, such as natural gas, or hydrogen.<br><br>These refuelling stations need a critical mass of return-to-base vehicles to be viable. The City may have some fleet vehicles that could be converted from diesel to natural gas to meet its carbon-neutral operations commitments. Collaborating with other local return-to-base fleets (such as BC Transit, school board, waste haulers, and industry / commercial operators) could provide the critical mass to make refuelling stations viable.<br><br>It is recommended that the City continue to monitor the viability of these other low carbon fuels for medium and heavy-duty vehicles, as well as progress with EV's for these vehicle types.<br><br>FortisBC would make an excellent partner for any action involving natural gas. | Environmental Services<br><br>Fleet Services<br><br>Transportation and Technical Services<br><br>Infrastructure Planning and Engineering |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | **Co-benefits:** this action may have economic co-benefits through reducing energy expenditures on mobility fuels. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax. Health co-benefits through improving air quality.<br><br>**Outcome:** the establishment of this action would have a number of specific outcomes, such as the installation of refuelling stations and the conversion of vehicle fleets. Implementation would likely be ongoing.<br><br>Effort Costs GHG impacts Economic impacts | |
| Potential | T11 | Develop downtown Transportation Demand Management Strategy for single occupancy vehicles. | Develop a Downtown Transportation Demand Strategy that considers a complete street lens and all modes of transportation. This would include evaluating how the City invests in downtown parking and collects revenue for parking, and could scale pricing signals based on carpooling, transit prioritization, cycling and pedestrian prioritization.<br><br>**Co-benefits:** this action may have economic co-benefits through reducing energy expenditures on mobility fuels, reducing need for parking, and increases City's revenues from parking. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax. Social co-benefits by providing more transportation options. Health co-benefits through improving air quality.<br><br>**Outcome:** the establishment of this action would have a specific outcome of the development of the strategy, but implementation would be ongoing.<br><br>Effort Costs GHG impacts Financial savings | Infrastructure Services |
| Potential | T12 | Consider surveying residents to improve dataset on travel modal split. | The City should consider surveying its residents to get a better dataset of the modal split of all users. This data should also include those under 15 years of age, and the unemployed. Data should be compared with Google's Environmental Impacts Explorer.<br><br>**Co-benefits:** this action will not have any direct co-benefits, but will help to provide the data to target other transportation actions and realise those co-benefits. | Infrastructure Services |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | **Outcome:** the establishment of this action would have a specific outcome of an improved dataset on travel modal split.<br><br>Effort Costs GHG impacts Financial savings | |
| **Transportation (Corporate)** | | | | |
| *Actions ongoing or in progress (0-2 years)* | | | | |
| Ongoing | MT1 | Maintain membership in and progress through fleet certification programs, such as Fleet Champions. | The City of Prince George is an E3 Fleet Member (a fleet certification system developed by the Fraser Basin Council), and achieved a Silver rating in 2010. The City also pledged to join West Coast Electric Fleets, as an On-Ramp Partner in 2016. Making continued progress through these programs would reduce emissions.<br><br>Programs such as the E3 fleet and FleetSmart (a Natural Resources Canada toolkit) provide excellent resources for actions to maximize the efficiency of fleet use.<br><br>**Co-benefits:** this action will have economic co-benefits through reducing the City's energy expenditures on mobility fuels. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax. Health co-benefits through improving air quality.<br><br>**Outcome:** this action is continuous.<br><br>Effort Costs GHG impacts Financial savings | Environmental Services<br><br>Fleet Services |
| Ongoing | MT2 | Continue to phase out light duty diesel trucks and replace with high efficiency gasoline models and consider hybrid and electric options | The City should continue this work. It should also revisit and implement the 2017 EV Suitability Assessment as part of this. It identified opportunities for the City to purchase 7 EVs.<br><br>The GHG impacts and financial savings can be substantial.<br><br>**Co-benefits:** same as MT1. | Environmental Services<br><br>Fleet Services |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | for all fleet vehicles when appropriate for use. | **Outcome:** this action has a discrete outcome of purchasing vehicles with lower / zero emissions.<br><br>Effort Costs GHG impacts Financial savings | |
| *Actions to implement in near future (2-5 years)* | | | | |
| 2-5 yrs | MT3 | Re-activate Anti-idling campaign with all City staff. | The City already created an anti-idling policy in 2010. An anti-idling campaign should be reactivated.<br><br>**Co-benefits:** same as MT1.<br><br>**Outcome:** this action has a discrete outcome of reactivating the campaign.<br><br>Effort Costs GHG impacts Financial savings | Environmental Services<br><br>Fleet Services |
| 2-5 yrs | MT4 | Analyse fleet fuel consumption data semi-annually and implement efficiency opportunities. | The City already tracks fuel use for each vehicle within the fleet, except for the EVs. This valuable information should be analysed, to identify opportunities such as the need for repairs or differences in driving behaviour between operators. This data can also be used to determine if fleet emission reduction actions are working. Electricity consumption for the EVs should start being tracked.<br><br>**Co-benefits:** same as MT1.<br><br>**Outcome:** this action has a discrete outcome of analysing the data for opportunities, but then ongoing data collection and analysis is continuous.<br><br>Effort Costs GHG impacts Financial savings | Environmental Services<br><br>Fleet Services |
| 2-5 yrs | MT5 | Conduct and implement a green fleet study including phased implementation schedule. | The City should make a plan to update its 2010 green fleet corporate plan. The City should look at opportunities for right sizing, and further opportunities for fuel switching such as light duty vehicles to electric and medium/heavy duty vehicles to electric, hydrogen or compressed natural gas. The study could also conduct a fleet routing review (optimising trips taken), and through operator behaviour including routine checks of vehicle systems and driver training for fuel efficiency. | Public Works |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | Note that there may be an opportunity for the City to generate revenue by fuel switching within its own fleet, thanks to the Low Carbon Fuel Standard. This should be incorporated into any business case analysis.<br><br>Substantial GHG and financial savings are possible through this action. Note that funding can be available from FCM for the capital costs of fuel switching vehicles, e.g. Capital Regional District has recently received substantial funding.<br><br>**Co-benefits:** same as MT1.<br><br>**Outcome:** this action has a discrete outcome of conducting a study, but implementation will be ongoing.<br><br>Effort Costs GHG impacts Financial savings | |
| 2-5 yrs | MT6 | Encourage City staff to walk or cycle to work beyond bike to work week, such as offering flexible start times, providing secure bicycle parking and shower facilities, and/or offering prizes. | Providing amenities like safe and secure (bike lockers) bicycle racks and showering facilities can help enable City staff to leave their vehicles at home and commute to work by foot or bike. Some organisations also help their employees purchase bicycles, e.g. through discounts at bike shops or through an interest free loan. This could be tied with the City's wellness initiatives. Other opportunities include a carpool program, and providing staff with more opportunities to work remotely.<br><br>Emissions from staff commuting are not included within a corporate inventory, but instead in the community inventory. GHG and economic impacts will be negligible, but this action mainly represents an opportunity to show leadership.<br><br>**Co-benefits:** this action will have economic co-benefits through reducing energy expenditures by City employees on mobility fuels. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax. Health co-benefits through active transportation and improving air quality.<br><br>**Outcome:** this action will have discrete outcomes. | Community Services and Public Safety<br><br>Human Resources<br><br>Public Works |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | Effort Costs GHG impacts Economic impacts | |
| 2-5 yrs | MT7 | Explore and implement online digital options for office functions. | Explore and implement online digital options for office functions. E.g. online meeting platforms to reduce travel, utilizing digital signatures and reducing printing.<br><br>**Co-benefits:** same as MT1.<br><br>**Outcome:** this action will have discrete outcomes of putting these systems in place<br><br>Effort Costs GHG impacts Economic impacts | IT<br><br>Human Resources |
| **Waste Management (Community)** | | | | |
| *Actions ongoing or in progress (0-2 years)* | | | | |
| Ongoing | W1 | Continue implementation of recommendations identified in 2016 Water Conservation Plan to reduce community-wide water usage. | The City should continue to encourage water conservation in the community. The City already has a Water Conservation Plan, and this action should align with implementation of that.<br><br>Community water conservation can be encouraged through many means, including restrictions on garden watering in summer, public education, expanding water metering, and providing rebates. Regarding rebates, the City could partner with BC Hydro in order to reduce the cost of energy and water efficient appliances, as several other BC communities do. CBSM could link into this, and this action could be aligned with existing education.<br><br>Corporate and community water conservation supports a reduction in corporate energy consumption because it reduces needs for treatment and pumping. It may also help defer the need for new capital investment, and links to climate adaptation as it reduces stress on water resources.<br><br>GHG impacts will be negligible because it reduces electricity consumption, that has a very low GHG intensity. However electricity has a relatively high cost, and this action will also help to defer the need for development of new water infrastructure. | Environmental Services |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | **Co-benefits:** this action will have economic co-benefits through supporting a reduction in corporate energy consumption because it reduces needs for treatment and pumping, and potentially helping to defer the need for new capital investment. Risk management co-benefits by reducing exposure to rising electricity prices, and reducing exposure to climatic changes by reducing stress on water resources.<br><br>**Outcome:** this action is continuous.<br><br>Effort Costs GHG impacts Economic impacts | |
| *Actions to implement in near future (2-5 years)* | | | | |
| 2-5 yrs | W2 | Investigate opportunities to expand existing organics program and divert organics from the landfill. | The City should find ways to expand take up of the existing compost program.<br><br>Other possible actions include: working with grocery stores and restaurants to divert waste, investigating the feasibility of an anaerobic digestion facility, implementing a curbside yard waste pick up and/or encouraging backyard composting.<br><br>The City may be able to take advantage of external funding opportunities for organics diversion.<br><br>**Co-benefits:** this action will have economic co-benefits through potentially helping to defer the need for new capital investment (i.e. landfill expansion or new landfill). Risk management co-benefits by reducing exposure to increasing regulations around waste.<br><br>**Outcome:** this action is continuous.<br><br>Effort Costs GHG impacts Economic impacts | RDFFG<br><br>Public Works<br><br>Environmental Services |
| **Waste Management (Corporate)** | | | | |
| *Actions ongoing or in progress (0-2 years)* | | | | |
| Ongoing | MW1 | Continue implementation of recommendations | See W1 for justification and benefits.<br><br>The City can lead by example with its own facilities. | Community Services and Public Safety |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | identified in 2016 Water Conservation Plan to reduce City operations' water usage. | **Co-benefits:** same as W1.<br><br>**Outcome:** this action has a discrete outcome of identifying ways to conserve water, but implementation will be ongoing.<br><br>Effort Costs GHG impacts Financial savings | Public Works<br><br>Environmental Services |
| Ongoing | MW2 | Evaluate waste creation from City facilities and provide educational information to internal staff members. | The City is evaluating how much waste it creates at its facilities, and identifying measures to reduce waste with staff.<br><br>This action needs to proceed to MW3.<br><br>**Co-benefits:** same as W2.<br><br>**Outcome:** this action is continuous.<br><br>Effort Costs GHG impacts Financial savings | Community Services and Public Safety<br><br>Public Works |
| *Actions to implement in near future (2-5 years)* | | | | |
| 2-5 yrs | MW3 | Manage waste creation at City facilities, such as composting food waste and reducing use of single-use products. | The City should look at opportunities to divert organics from landfill, reduce use of single-use plastics, and recycle more through its own operations.<br><br>This is potentially a big opportunity at some locations, e.g. the CN Centre. Events for example, do not need to have plastic water bottles and juice bottles, paper plates and plastic cups.<br><br>Successes to date have included the availability of water filling stations in civic buildings reducing the creation of plastic water bottle waste, and the creation of the green team and green events at the Civic Centre.<br><br>**Co-benefits:** same as W2.<br><br>**Outcome:** this action has a discrete outcome of developing a policy, but implementation will be ongoing. | Community Services and Public Safety<br><br>Public Works |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | Effort Costs GHG impacts Financial savings | |
| **Policy, Decision Making and Reporting (Corporate)** | | | | |
| *Actions ongoing or in progress (0-2 years)* | | | | |
| 0-2 yrs | MA1 | Prepare a Climate Action Strategy and 5 year work plans. | The City should create an overarching, public facing document that combines its mitigation and adaptation plans. This will be the Climate Action Strategy. It will include an implementation plan that will include reviewing and clearly articulating action items with internal stakeholders and setting timelines and work plans on a 5 year basis, and reporting annually to Council.<br><br>If implemented, the GHG and financial savings will be considerable.<br><br>**Co-benefits:** none independently, but will help to implement other actions.<br><br>**Outcome:** discrete outcomes, as listed.<br><br>Effort Costs GHG impacts Financial savings | Environmental Services |
| 0-2 yrs | MA2 | Report on climate action in the City's Annual Report, to FCM at regular intervals, and incorporate actions/measures into public information materials. | This links with MA1.<br><br>By providing a way to monitor, it can feed back in to positive actions by the City and therefore lead to savings.<br><br>Reporting to FCM helps the City stay up-to-date within the PCP program.<br><br>**Co-benefits:** none independently, but will help to implement other actions.<br><br>**Outcome:** discrete outcomes, as listed.<br><br>Effort Costs GHG impacts Financial savings | Environmental Services<br><br>External Relations |
| 0-2 yrs | MA3 | Identify local GHG emission reduction priorities and success factors in Federal/Provincial | GHG emission reduction criteria are increasingly being incorporated into Federal / Provincial infrastructure grants. It is imperative that the City identify and consider these factors to continue to successfully obtain these grants.<br><br>**Co-benefits:** economic co-benefits include being able to leverage additional sources of external funding in to the community, which can translate into local | Environmental Services<br><br>Infrastructure Delivery |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | infrastructure grants. | projects and jobs. Implementing these projects can also reduce corporate and community energy expenditures.<br><br>**Outcome:** action is continuous.<br><br>Effort Costs GHG impacts Financial savings | |
| 0-2 yrs | MA4 | Update methodology for calculating corporate GHG emissions. | The City should look at changing how it calculates its corporate GHG emissions. The current method is cumbersome and prone to errors, and does not allow easy facilitation between the various types of reporting (Climate Action Charter, Partners for Climate Protection, or Carbon Disclosure Project).<br><br>It is recommended that the City of Prince George switch from its current arrangement of its tracking spreadsheet and Arctic Fox, to using SoFi. This arrangement should have the same (or potentially slightly less) financial outlay, but the increased functionality of SoFi should lead to much greater efficiency for City staff and a reduction in errors.<br><br>Although by itself this action is unlikely to create large GHG or financial savings, it is essential in order to be able to track the savings from other actions.<br><br>**Co-benefits:** economic co-benefits through saving staff time by increasing efficiency and reducing errors.<br><br>**Outcome:** this action has a discrete outcome of developing a policy, but implementation will be ongoing.<br><br>Effort Costs GHG impacts Financial savings | Environmental Services |
| Ongoing | MA5 | Continue to run staff behavioural initiatives and campaigns to encourage energy efficiency | Energy efficient behaviour should be encouraged among staff, e.g. switching lights off, waste reduction, sweater day, turning off space heaters.<br><br>BC Hydro has a program to support this. | Environmental Services |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | practices in the workplace. | **Co-benefits:** economic co-benefits through reducing corporate energy expenditures.<br><br>**Outcome:** this action has a discrete outcome of developing an initiative, but implementation will be ongoing.<br><br>Effort Costs GHG impacts Financial savings | |
| 0-2 yrs | MA6 | Integrate emissions reduction targets into new and existing City plans and policies and continue to report on progress annually; similarly, incorporate relevant goals/objectives from other City plans and strategies into Climate Action priorities. | The community and corporate energy and emissions plans should be integrated into other plans.<br><br>E.g.:<br>- OCP update;<br>- Climate Change Adaptation Strategies;<br>- Economic Development Strategy;<br>- Transportation Plans;<br>- Asset Management Roadmap;<br>- Water Conservation Plan; and,<br>- Social Planning Documents.<br><br>This should also include reviewing the process for City land acquisition and disposition through a Policy that considers climate change opportunities, whether through infrastructure investment, land agreements and land use prioritization mechanisms to advance climate change priorities.<br><br>**Co-benefits:** none independently, but will help to implement other actions.<br><br>**Outcome:** this action has a discrete outcome of the integration of these plans into other City plans, but it will take several years to realise.<br><br>Effort Costs GHG impacts Economic impacts | All Departments |
| *Actions to implement in near future (2-5 years)* | | | | |
| 2-5 yrs | MA7 | Consider appropriate resourcing | It is recommended to hire at least one staff person to work on and investigate the actions in this plan. Preferably one for community, and one for corporate. | City Manager |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | (financial and staff) for realizing climate action goals and priorities. | This could be funded by BC Hydro and FortisBC. The work plan could be at least partly determined by the CEMA buildings and EV workshops.<br><br>See 0 for a sample work plan.<br><br>An additional idea for financial resourcing, in addition to other actions, is to establish a revolving energy fund. Many public bodies in BC, e.g. Health Authorities, have established these, where the savings from energy efficiency projects are allocated to a fund that can be used to fund more energy efficiency projects. This establishes a virtuous cycle, and ensures that there is funding for corporate energy and money saving initiatives. The District of Summerland and City of Vernon have also established these.<br><br>**Co-benefits:** none independently, but will help to implement other actions.<br><br>**Outcome:** this action has a discrete outcome of establishing more resourcing (financial and staff), for realizing climate action.<br><br>Effort Costs GHG impacts Financial savings | Environmental Services<br><br>Finance |
| 2-5 yrs | MA8 | Formalize assignment of the CARIP grant into an energy and greenhouse gas emissions reduction fund that can support municipal and community projects. | The City already has an informal process whereby the CARIP grant is assigned into an energy / GHG conservation fund. This could be formalised and used to help fund corporate and community initiatives. It should contain a policy on what the funds should be used for.<br><br>This action is strongly recommended.<br><br>See Appendix J for drafted language.<br><br>The City now has an annual line item in the capital plan for energy efficiency projects, which is an excellent step.<br><br>**Co-benefits:** this action will have economic co-benefits through leveraging external sources of funding. Plus, this action will facilitate many other actions. | Finance<br><br>Environmental Services |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | **Outcome:** this action has a discrete outcome of the formalising of the fund.<br><br>Effort Costs GHG impacts Economic impacts | |
| 2-5 yrs | MA9 | Update current Sustainable Procurement Policy guidelines. | The City has a sustainable procurement policy, but it could be improved. It needs to be ensured that they are implementable, and incorporate the following:<br>• Energy considerations;<br>• Life Cycle Costing; and,<br>• Vehicle purchasing guidelines.<br><br>Effort and costs to update the guidelines will be low. GHG impacts should be high. There will be costs to implementing the policy beyond business as usual.<br><br>On energy considerations, ideas include:<br>• Preference for local sourcing;<br>• Guidelines for selecting appropriate vehicles ('rightsizing');<br>• Guidelines for fuel selection;<br>• Preference for products with specific environmental labelling / rating (Energy Star, Environmental Choice, EcoLogo); and,<br>• Requiring recycled content in paper purchases.<br><br>Life Cycle Costing (LCC) considers the total capital and operating costs over the lifetime of the purchase. For example, purchasing a more expensive pump that uses less energy than conventional pumps may save more money over its lifetime. GHG emissions can also be included in LCC analyses to identify options with the lowest life cycle emissions.<br><br>For new vehicles, the objective is to ensure that all vehicles are the most energy efficient, but still meet minimum service requirements. This should be evaluated based on:<br>• Anticipated usage of vehicles (e.g. engine size, vehicle weight, load capacity, passenger capacity, and operational terrain); and, | Procurement<br><br>Environmental Services<br><br>Infrastructure Services<br><br>Public Works<br><br>Fleet Services |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | • Life cycle considerations (e.g. life cycle emissions, residual costs / values of vehicle being replaced, capital costs, maintenance costs, fuel costs, resale values).<br><br>**Co-benefits:** this action will have economic co-benefits through reducing corporate energy expenditures. Risk management co-benefits by reducing exposure to rising energy prices and carbon tax. Health co-benefits by improving air quality regarding vehicle purchases.<br><br>**Outcome:** this action has a discrete outcome of updating the policy, but implementation will be ongoing.<br><br>Effort Costs GHG impacts Financial savings | |
| 2-5 yrs | MA10 | Perform a review every 5 years of emission reduction targets and actions to identify if implemented actions are achieving targets. | This action involves analysis of progress compared to GHG reduction targets that have been identified. It is an extremely important action, and can identify successful and unsuccessful actions. If the learnings are followed through on, they should lead to substantial GHG savings.<br><br>**Co-benefits:** none independently, but will help to implement other actions.<br><br>**Outcome:** reports every 5 years.<br><br>Effort Costs GHG impacts Economic impacts | Environmental Services |
| 2-5 yrs | MA11 | Incorporate Community Based Social Marketing (CBSM) training into actions. | Staff could conduct CBSM training and incorporate it into actions, particularly actions to encourage energy efficiency retrofits in the residential and commercial sectors, active transportation, public transit use, reducing water consumption, organics diversion (including purchases of the existing compost program) and also energy efficient behaviour in corporate buildings.<br><br>**Co-benefits:** none independently, but will help to implement other actions.<br><br>**Outcome:** this action has a discrete outcome of staff conducting the training.<br><br>Effort Costs GHG impacts Economic impacts | Environmental Services |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| *Actions to investigate feasibility* | | | | |
| Potential | MA12 | Demonstrate leadership as a municipality on climate change mitigation through having an elected official join the BC Municipal Climate Leadership Council and engage with local partners on research and development and education and capacity building opportunities. | Having an elected official join the BC Municipal Climate Leadership Council would help ensure that the City leads and learns from other communities.<br><br>In addition, the City should seek and engage with other partners. E.g. UNBC, CNC, Northern Health, and industry and businesses. UNBC and CNC can help in terms of analysis, research and development, education and capacity-building, demonstration projects, etc. Students could be involved with information gathering and project design. In addition, these stakeholders are trusted by different parts of the public and could help to advance public support for particular initiatives.<br><br>The City should also participate in climate mitigation projects that other local stakeholders undertake.<br><br>**Co-benefits:** none independently, but will help to implement other actions.<br><br>**Outcome:** although this action is continuous, it also has discrete outcomes such as having an elected official join the BC Municipal Climate Leadership Council.<br><br>Effort Costs GHG impacts Economic impacts | City Council<br><br>External Relations<br><br>Environmental Services |
| Potential | MA13 | Commit to long-term community engagement on carbon emissions reduction. | Examples of this can include:<br>• Engage residents in developing and implementing climate solutions through collective, 'bottom-up', informal, organizational and institutional initiatives. One opportunity could be to expand PG Air's air quality objectives to include GHGs.<br>• Change collective behaviour to reduce carbon footprints.<br>• Build public support for (and contributions to) low-carbon climate policies and actions focused on the green economy (e.g. Bioenergy Day), ecological resilience and sustainable communities, in order to achieve GHG targets, short- and long-term, as well as other provincial climate change goals. | Environmental Services<br><br>External Relations |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | • Build capacity and resilience to plan and respond to climate change adaptation and mitigation.<br>• An awards or grant program. The City already offers funding for many other initiatives (e.g. events, meetings, neighbourhood projects, tournaments) but does not offer funding for environmental initiatives. This could potentially be funded through CARIP rebates.<br><br>**Co-benefits:** none independently, but will help to implement other actions.<br><br>**Outcome:** this action would be continuous.<br><br>Effort Costs GHG impacts Economic impacts | |
| Potential | MA14 | Review and update Climate Change Action Plan every 5 to 10 years to ensure targets and actions are on-track and align with leading practices. | The City could consider adopting other municipal best practices, such as a target for 100% renewable energy by 2050, and/or GHG reduction targets that are consistent with 1.5°C temperature change (i.e. 45% reduction by 2030 and 100% by 2050). A number of communities in BC have adopted a 100% renewable energy by 2050 target, including large communities such as Vancouver and Victoria and small communities such as Rossland and New Denver.<br><br>A number of communities are also adopting targets consistent with the IPCC's 1.5°C report (45% below 2010 levels by 2030, and 100% by 2050).<br><br>If the City adopts one of these best practices, it should also lead by example in its corporate operations.<br><br>The City should also have a 5-year review cycle for its community and corporate energy and emissions plans, in addition to checking in on action status annually.<br><br>**Co-benefits:** none independently, but will help to implement other actions.<br><br>**Outcome:** this action would be continuous, but may have discrete outcomes such as the adoption of new targets. | Environmental Services |

| Timing | Action # | Action | Notes | Possible Lead* |
|---|---|---|---|---|
| | | | Effort Costs GHG impacts Economic impacts | |
| Potential | MA15 | Investigate opportunities to provide community grants related to energy and greenhouse gas emissions reduction, in alignment with the actions laid out in this plan. | Some municipalities provide community grants related to energy and greenhouse gas emissions reduction. This could help achieve some of the actions in this plan, particularly actions that the City does not wish to lead.<br><br>GHG and economic impacts could be considerable, but would depend on what actions are funded.<br><br>**Co-benefits:** depends on the projects that are funded, but many co-benefits could result.<br><br>**Outcome:** this action would have a discrete outcome, of establishing a community grant program.<br><br>Effort Costs GHG impacts Economic impacts | Environmental Services<br><br>Community Services and Public Safety |

# Appendix I. Sample Work Plans for Community and Corporate Energy Managers

## Community

| | Activity Name | Description | Year 1 Deliverables (2020) | Year 2 Deliverables | Year 3 – 5 Deliverables | Years 5+ |
|---|---|---|---|---|---|---|
| **TAKING ACTION: BUILDINGS AND INFRASTRUCTURE** | | | | | | |
| **Mandatory Deliverables** | | | | | | |
| | ***Education and Outreach*** | Opportunities to improve energy efficiency in both new and existing buildings can be well supported through education and training. | Complete engagement and outreach activities to inform builders and future homeowners of FortisBC Energy Step Code incentive program.<br><br>Complete engagement and outreach activities to inform renovation contractors and homeowners about BC Hydro, Fortis BC and Efficiency BC programs for existing buildings.<br><br>Encourage local business to improve efficiency:<br>• Promote energy reducing initiatives through the business | Coordinate energy efficiency and Energy Step Code education and training for new construction builders, developers, trades, architects, home designers, realtors, homeowners;<br>• Organize and lead session<br>• Provide funding for sessions or seek funding for sessions.<br>• Provide speakers / related City staff attend.<br>• Promote session through City networks. | | |

| | Activity Name | Description | Year 1 Deliverables (2020) | Year 2 Deliverables | Year 3 – 5 Deliverables | Years 5+ |
|---|---|---|---|---|---|---|
| | | | licence renewal process. This is an easy way to target many businesses. Many other communities in BC have done this.<br>• Discuss with the Chamber to find ways to further raise the profile of businesses that engage and make improvements.<br><br>Complete education and outreach to new home builders about "EV readiness". | Provide free or discounted venue space to host training.<br><br>Develop a program to promote and encourage energy efficient new construction in the community;<br>• Tours of energy efficient buildings.<br>• Demonstrate projects.<br>• Design competition.<br>• Awards.<br><br>Develop a program to promote/educate residents about BC Hydro incentives for adoption of air source heat pumps. | | |
| | ***Step Code adoption*** | Advance energy efficient new construction. | Coordinate energy efficiency and Energy Step Code education and training for new construction builders, developers, trades, architects, home designers, realtors, homeowners;<br>• Organize and lead session. | Investigate barriers that the City may have that impede the construction of more efficient buildings. E.g. some communities have reduced set backs in their zoning bylaws, so as not to penalise buildings that are built with thicker | Implement program to promote and encourage energy efficient new construction in the community;<br>• Tours of energy | |

| | Activity Name | Description | Year 1 Deliverables (2020) | Year 2 Deliverables | Year 3 – 5 Deliverables | Years 5+ |
|---|---|---|---|---|---|---|
| | | | • Provide funding for sessions or seek funding for sessions.<br>• Provide speakers/related City staff attend.<br>• Promote session through City networks.<br>• Provide free or discounted venue space to host training.<br><br>Investigate building energy benchmarking and develop implementation plan, collaborate with community partners – such as CNC, UNBC. | walls to accommodate more insulation.<br><br>Create a plan for referencing the Step Code. This plan could include, for example: education and awareness, incentives, and increasing steps towards regulation combined with feedback / further consultation from the building industry. Another consideration is that the City may wish to make public disclosure of energy labels mandatory.<br><br>Implement building energy benchmarking plan. | efficient buildings.<br>• Demonstration projects.<br>• Design competition / Awards. | |
| | ***Maintain the City's Wood First Commitment*** | The City has made a commitment to build with wood first, and this commitment should be maintained. Sustainably sourced, non-primary growth wood, has lower | Initiate collaboration with Prince George Economic Development Group to advance wood product innovation (e.g. pre-fab homes, pre-fab panels, and cross laminated timber). Potential collaborators | Advance initiatives identified in initial collaboration. | | |

| | | Activity Name | Description | Year 1 Deliverables (2020) | Year 2 Deliverables | Year 3 – 5 Deliverables | Years 5+ |
|---|---|---|---|---|---|---|---|
| | | | embodied carbon emissions than most other construction materials and also stores some carbon within it. In addition to these benefits, through leading by example the City can encourage other parties to build with sustainably sourced wood | include UNBC, PICS and local industry partners such as Winton Homes. | | | |
| | | ***Reduce energy consumption by residents*** | Comprehensive residential energy efficiency retrofit campaign. | Evaluate opportunity to conduct residential energy efficient retrofit campaign, for example through offering incentives. External funding programs can assist with this.<br><br>Review previous energy mapping completed by NRCan and evaluate replication of this project. | Develop a ROI tool to support individuals building a home or conducting renovations to demonstrate financial opportunities associated with deep energy retrofits. | | |
| | | ***Policies and Bylaws*** | Update the subdivision servicing bylaw. | | Evaluate opportunities in updating this bylaw to make alternative standards the business as usual, e.g. Potential | | |

| | | Activity Name | Description | Year 1 Deliverables (2020) | Year 2 Deliverables | Year 3 – 5 Deliverables | Years 5+ |
|---|---|---|---|---|---|---|---|
| | | | | | areas are: road cross-section, sidewalks, alternative permeable surfaces, LED streetlights. | | |
| **TAKING ACTION: TRANSPORTATION** | | | | | | | |
| **Mandatory Deliverables** | Active and Assisted | | | | | | |
| | 4 | ***Active Transportation Planning and Improvements*** | Continue or increase efforts on planning and implementation for pedestrian and cycling infrastructure. | Install additional bike parking (safe) downtown and throughout City.<br><br>Increase maintenance schedule for active transportation pathways (clear of debris and snow).<br><br>Promote bike to work week and incentive community participation with prizing.<br><br>Promote active transportation choices for City staff and feature them on City communications (social media, newsletters) | Review initial installation of bike parking and install additional as needed.<br><br>Review available amenities for City staff to actively commute to work, develop an improvement plan if required (bike lockers and showers). | | |

| | Activity Name | Description | Year 1 Deliverables (2020) | Year 2 Deliverables | Year 3 – 5 Deliverables | Years 5+ |
|---|---|---|---|---|---|---|
| | | | to demonstrate leadership to community. | | | |
| | **Improve Transit Service** | Support the Transportation Planner with opportunities to improve the transit service, and therefore improve transit usage. | Support with implementation of the 2013 Transit Future Plan. | Continue supporting implementation of the 2013 Transit Future Plan. | Continue supporting implementation of the 2013 Transit Future Plan. | |
| | Low Carbon Transportation | | | | | |
| | ***Low Carbon/ Electric Vehicle Adoption*** | Conduct initiatives that will increase community-wide uptake of low carbon and electric vehicles (EV). | Continue participation in Charge North initiative to install EV charging in City and regionally.<br><br>Evaluate opportunity to install EV charging in City in addition to Charge North infrastructure.<br><br>Continue collaborating with the Northern and Cariboo regional EV charging network.<br><br>Develop EV charger readiness standards for City | Collaborate with BC Transit on a study to look at opportunities to convert the local BC Transit fleet to a low carbon fuel.<br><br>Evaluate car-sharing opportunity in PG and invite existing car shares to advise/ consult (e.g. Modo).<br><br>Organize a carpool month to encourage large employers in the community to compete against each other. | Collaborate with local dealerships to increase the percentage of EVs on their lot.<br><br>Implement or support implementation of car share programs (Modo or other). | Collaborate with large regional employers, such as industries, school and Northern Health to uncover opportunities to reduce commuting related transportation emissions.<br><br>Collaborate with Fortis BC on natural gas conversions (from diesel). |

| | Activity Name | Description | Year 1 Deliverables (2020) | Year 2 Deliverables | Year 3 – 5 Deliverables | Years 5+ |
|---|---|---|---|---|---|---|
| | | | capital (i.e. parkades, parks facilities).<br><br>Demonstrate City commitment to low carbon and electric-vehicles through fleet purchases. | Provide incentives for participation.<br><br>Raise awareness of EV's, e.g. through City events, and consider EV specific show case. | | |
| **TAKING ACTION: RENEWABLE ENERGY** | | | | | | |
| | Further Renewable Energy Adoption | | | | | |
| | ***Demonstrate renewable energy*** | Promote utilization of Downtown Renewable Energy System (DRES). | Evaluate opportunities to encourage community connection to DRES.; City planning/policy tools could play a role.<br><br>Investigate opportunity to increase both supply and demand of Renewable Natural Gas use by residents; design a program to encourage businesses and residents to sign up to RNG. | | | |

| | Activity Name | Description | Year 1 Deliverables (2020) | Year 2 Deliverables | Year 3 – 5 Deliverables | Years 5+ |
|---|---|---|---|---|---|---|
| | | | | | | |
| ADDITIONAL ACTIVITIES | | | | | | |
| | | | | | | |
| | *Education and Outreach* | Increase awareness of applicable initiatives. | Review anti-idling campaign and update if required, undertake campaign with internal staff.<br><br>The City can support activities that help to change out old inefficient wood stoves with new clean-burning wood stoves, and educate regarding how to prepare and store wood for winter. | Consider updating Clean Air Bylaw to include restrictions on idling. | . | |
| | *Waste Management* | Organics diversion. | Complete education and outreach about at-home composting (vermi, backyard, etc.); partner with a local organization to coordinate education and training. | | | |
| | *Water Conservation* | Reduce water waste. | Promote water conservation. | Implement identified water conservation opportunities. | | |

| | | Activity Name | Description | Year 1 Deliverables (2020) | Year 2 Deliverables | Year 3 – 5 Deliverables | Years 5+ |
|---|---|---|---|---|---|---|---|
| | | | | Develop a plan to expand water metering and provide rebates for water conservation. | | | |
| | | ***Food Production*** | Support local food production, e.g. farmers markets. | Consider additional actions to support the farmers market, such as facilitating larger road closures as necessary. | | | |
| | | ***Resourcing*** | Pursue external funding for community energy manager/specialist staff position. | Collaborate with Fortis BC, BC Hydro, FCM and other funding sources to secure funds and establish separate role or additional responsibilities for existing staff individual.<br><br>Formalise the assignment of the CARIP grant into an energy and GHG conservation fund | Allocate funds and identify individuals to complete Community Based Social Marketing training. | | |
| | | ***Leadership*** | Leadership, cross-learning, and working with stakeholders. | Evaluate opportunities to collaborate with other partners. E.g. UNBC, CNC, Northern Health, industry and businesses. UNBC and CNC can help in terms of analysis, research and | Encourage an elected official join the BC Municipal Climate Leadership Council to help ensure that the City | | Establish long-term, deep community engagement through;<br>• Engage residents in developing and implementing |

| | | Activity Name | Description | Year 1 Deliverables (2020) | Year 2 Deliverables | Year 3 – 5 Deliverables | Years 5+ |
|---|---|---|---|---|---|---|---|
| | | | | development, education and capacity-building, demonstration projects, etc.<br><br>Be amendable to participate in climate mitigation projects that other local stakeholders undertake.<br><br>Begin integration of climate mitigation plan into OCP update, Climate Change Adaptation Strategies, Economic Development Strategy, Transportation Plans, Asset Management Roadmap, Water Conservation Plan, and Social Planning documents. | leads and learns from other communities<br><br>Continue integration of Climate Change Mitigation Plan actions into other City plans. | | climate solutions through collective, 'bottom-up', informal, organizational and institutional initiatives. One opportunity could be to expand PG Air's air quality objectives to include GHGs.<br>• Change collective behaviour to reduce carbon footprints.<br>• Build public support for (and contributions to) low-carbon climate policies and actions focused on the green economy (e.g. Bioenergy Day), ecological resilience and sustainable communities, in order to achieve GHG targets, short- and long-term, as well as other provincial climate change goals.<br>• Build capacity and resilience to plan and respond to climate change adaptation and mitigation. |

| | | Activity Name | Description | Year 1 Deliverables (2020) | Year 2 Deliverables | Year 3 – 5 Deliverables | Years 5+ |
|---|---|---|---|---|---|---|---|
| | | | | | | | • An awards or grant program. The City already offers funding for many other initiatives (e.g. events, meetings, neighbourhood projects, tournaments) but does not offer funding for environmental initiatives. This could potentially be funded through CARIP rebates.<br><br>Evaluate best practices for GHG targets and consider adoption for City, i.e. 45% reduction in GHG emissions by 2030 and 100% by 2050. |
| | | ***Maintaining Existing Infrastructure*** | Protect and grow the urban forest/tree canopy cover, | Identify required measures to protect and grow the urban forest, and tree canopy cover. | | | |

## Corporate

| | | Activity Name | Description | Year 1 Deliverables (2020) | Year 2 Deliverables | Year 3 – 5 Deliverables | Years 5+ |
|---|---|---|---|---|---|---|---|
| **TAKING ACTION: BUILDINGS AND INFRASTRUCTURE** | | | | | | | |
| **Mandatory Deliverables** | | | | | | | |
| | 1 | ***Maintain the City's "Wood First" Commitment*** | The City has made a commitment to build with wood first, and this commitment should be maintained. Sustainably sourced, non-primary growth wood, has lower embodied carbon emissions than most other construction materials and also stores some carbon within it. In addition to these benefits, through leading by example the City can encourage other parties to build with sustainably sourced wood. | Communicate commitment to build with wood first to relevant City staff, i.e. Engineering and Public Works, Planning and Development.<br><br>Incorporate wood first requirement into all new construction procurement contracts. | Year 1 Continued | Year 1 Continued | Year 1 Continued |
| | 2 | ***Step Code adoption*** | Commit to building Energy Efficient Facilities. | Establish a policy to include an evaluation of the opportunities to achieve, the highest level of energy efficiency and the lowest | Collaborate with industry and evaluate opportunities to use innovative building materials that are | | |

| | Activity Name | Description | Year 1 Deliverables (2020) | Year 2 Deliverables | Year 3 – 5 Deliverables | Years 5+ |
|---|---|---|---|---|---|---|
| | | Optimize siting and orientation of new buildings. | GHG emissions as far as possible within all major capital projects.<br><br>Establish a policy so that when future facilities are developed there is consideration of emission reductions and energy savings opportunities through site selection and layout. | sourced locally or could be produced locally, or innovative methods, with the intention to support or inspire local industry with developing these products | | |
| 3 | **Reduce corporate energy consumption** | Convert local government owned streetlights to LED.<br><br>Conduct energy audits of existing facilities and infrastructure.<br><br>Incorporate energy management into annual building maintenance procedures. | Complete installation of LED streetlights.<br><br>Conduct energy assessments for outstanding facilities and infrastructure.<br><br>Research grant funding opportunities for implementation (e.g. FCM).<br><br>Update building staff maintenance procedures to include; | Install solar powered outdoor lighting in appropriate circumstances (can serve as a useful demonstration of renewable/solar technology).<br><br>Allocate budget to complete improvements identified through energy assessments.<br><br>Investigate an energy management information system for all city-owned buildings; could include installing networked | Complete improvements identified by energy assessment.<br><br>Install EMS (energy management information system) at City-owned facilities; phase implementation, install at largest energy draws first. | Repeat assessments and complete upgrades.<br><br>Complete installation of EMS on City-owned facilities.<br><br>Install educational displays to inform visitors and residents of energy consumption of City-owned facilities. |

| | | Activity Name | Description | Year 1 Deliverables (2020) | Year 2 Deliverables | Year 3 – 5 Deliverables | Years 5+ |
|---|---|---|---|---|---|---|---|
| | | | Evaluate energy recovery options from facilities. | • Check programming of thermostats and lighting controls.<br>• Check and replace weather stripping on doors and windows as necessary.<br>• Review/monitor annual energy consumption to identify abnormal energy use – address anomalies.<br>• Assess condition and maintenance dates of HVAC and hot water equipment. | meters that read at frequent intervals and EMS software.<br><br>Evaluate energy recovery options, including arena waste heat recovery, sewage waste heat recovery, and bio-gas generation from bio-solids digestion. | | |
| **TAKING ACTION: TRANSPORTATION** | | | | | | | |
| **Mandatory Deliverables** | Electrification of Transportation | | | | | | |
| | 4 | **Electric Vehicles** | Evaluate Electric Vehicle opportunity for City. | Complete pledge to join West Coast Electric Fleets. | Continue implementation of the 2017 EV Suitability Assessment. | Update 2010 green fleet corporate plan to understand opportunities for fuel switching. | |

| | | Activity Name | Description | Year 1 Deliverables (2020) | Year 2 Deliverables | Year 3 – 5 Deliverables | Years 5+ |
|---|---|---|---|---|---|---|---|
| | | | | Advance rating in E3 Fleet membership; currently Silver.<br><br>Start implementation of the 2017 EV Suitability Assessment. | | Research grant funding opportunities for implementation (e.g. FCM).<br><br>Develop a City vehicle purchasing policy to ensure that all new vehicles are the most energy efficient are evaluated based on:<br>• Anticipated usage of vehicles, and;<br>• Lifecycle consideratio ns. | |
| | Fleet Efficiency | | | | | | |
| | 6 | **Optimize use of existing fleet** | Complete fleet optimization initiatives. | Analyse data on fleet fuel consumption to identify efficiency opportunities. | Conduct a fleet routing review; find opportunities to reduce total vehicle kilometres traveled by combining activities, | | |

| | | Activity Name | Description | Year 1 Deliverables (2020) | Year 2 Deliverables | Year 3 – 5 Deliverables | Years 5+ |
|---|---|---|---|---|---|---|---|
| | | | | Ensure that there is driver training for fuel efficiency for all City staff that operate City vehicles/use their personal vehicles for work purposes.<br><br>Continue to implement remote work initiatives to reduce travel (through tablets); teleconferencing.<br><br>Implement efficient vehicle use initiatives into fleet operator policy;<br>Complete routine checks of vehicle systems (tire pressures, engine tuning). | reduction trips traveled, etc.<br><br>Implement fleet routing optimization.<br><br>Evaluate opportunities for corporate carpooling in City owned fleet. | | |
| **TAKING ACTION: RENEWABLE ENERGY** | | | | | | | |
| | Further Renewable Energy Adoption | | | | | | |
| | 7 | **Demonstrate renewable energy** | Find expansion opportunities for Downtown Renewable Energy System (DRES) | Review findings of 2019 study on DRES.<br><br>Install educational display at entrances of DRES- | Evaluate options/assess feasibility to expand DRES. | Evaluate renewable energy generation for major building | Implement renewable energy systems where possible. |

| | | Activity Name | Description | Year 1 Deliverables (2020) | Year 2 Deliverables | Year 3 – 5 Deliverables | Years 5+ |
|---|---|---|---|---|---|---|---|
| | | | Implement opportunities for renewable energy systems on corporate buildings. | connected buildings and inform visitors and residents of connection and associated GHG reductions. | Develop and adopt a policy that requires evaluation of renewable energy generation as part of all major building retrofits, new construction and energy assessment. | retrofits and new construction.<br><br>Research funding opportunities (e.g. grants) to support renewable energy generation. | |
| ADDITIONAL ACTIVITIES | | | | | | | |
| | | | | | | | |
| | 8 | **Related Activities** | Other improvement initiatives. | Complete switch from tracking spreadsheet and Arctic Fox to SoFi.<br><br>Investigate a revolving energy efficiency fund.<br><br>Incorporate energy considerations into purchasing policies including;<br>• Preference for local sourcing. | Develop a policy that incorporates life cycle costing into all major purchasing decisions. | | |

| | Activity Name | Description | Year 1 Deliverables (2020) | Year 2 Deliverables | Year 3 – 5 Deliverables | Years 5+ |
|---|---|---|---|---|---|---|
| | | | • Guidelines for selecting appropriate vehicles ("rightsizing").<br>• Guidelines for fuel selection.<br>• Preference for products with specific environmental labelling/rating.<br>• Requiring recycled content in paper purchases. | | | |
| | **Waste Management** | Organics diversions | Develop implementation plan to increase organics diversion and recycling from City facilities. | Develop a policy to require less waste (no plastic water bottles, paper plates or plastic cups) at corporate events. | | |
| | **Water Conservation** | Reduce water waste. | Review City Water Conservation Plan and identify opportunities to conserve water in its own operations. | Implement identified water conservation opportunities. | | |
| | **Staff-Focused Initiatives** | Educate and employ City staff to lead by example. | Review existing BC Hydro program and incorporate into City processes via incentives. | | Design a program to encourage and recognize staff who identify and implement GHG reduction measures. | |

# Appendix J. Energy Expenditure Savings by Action

Details on energy expenditure savings by action are contained in this appendix.

*Figure 38 – Community Actions – Estimates of Community Energy Expenditure Savings By Action, in 2025*

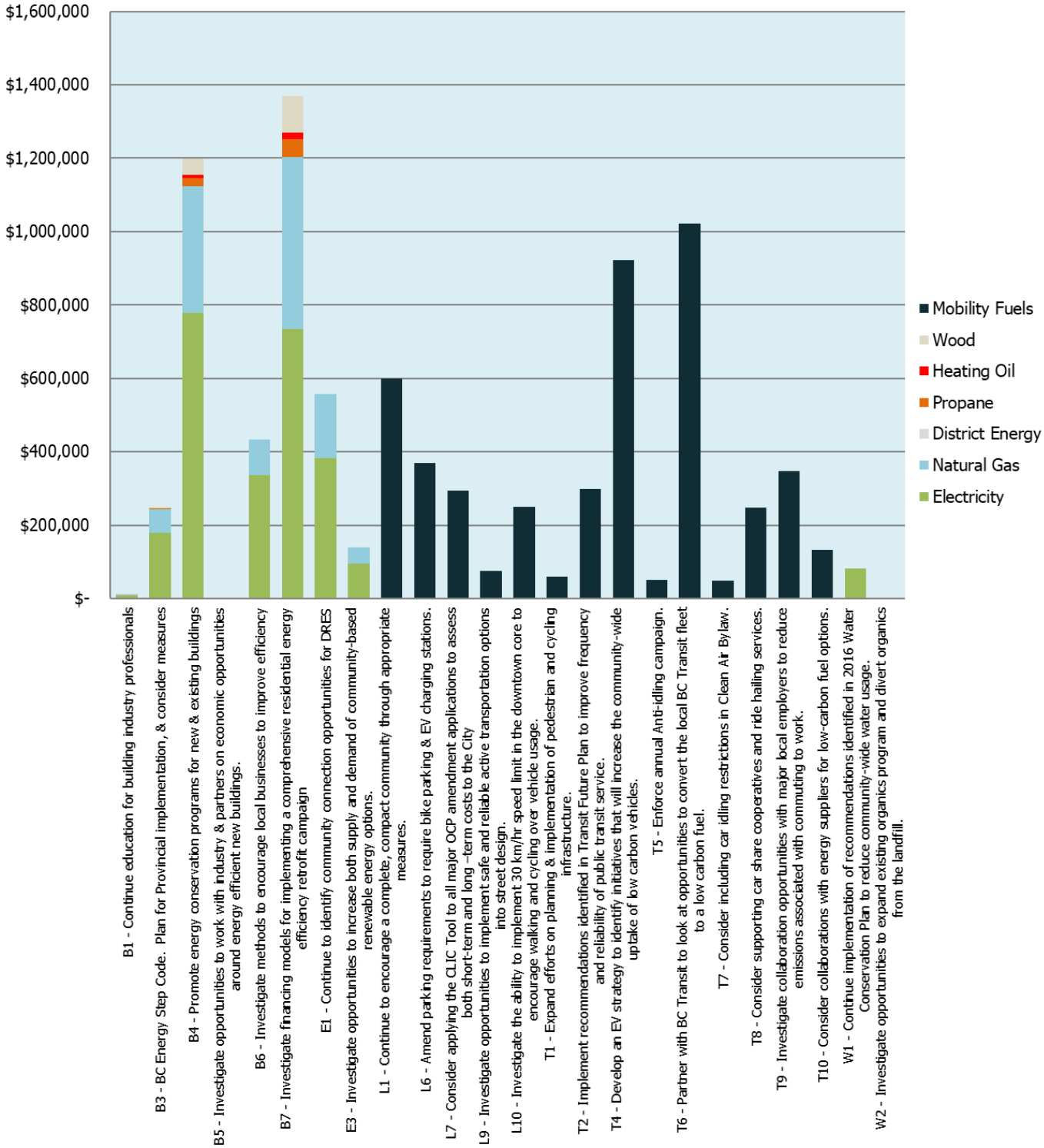
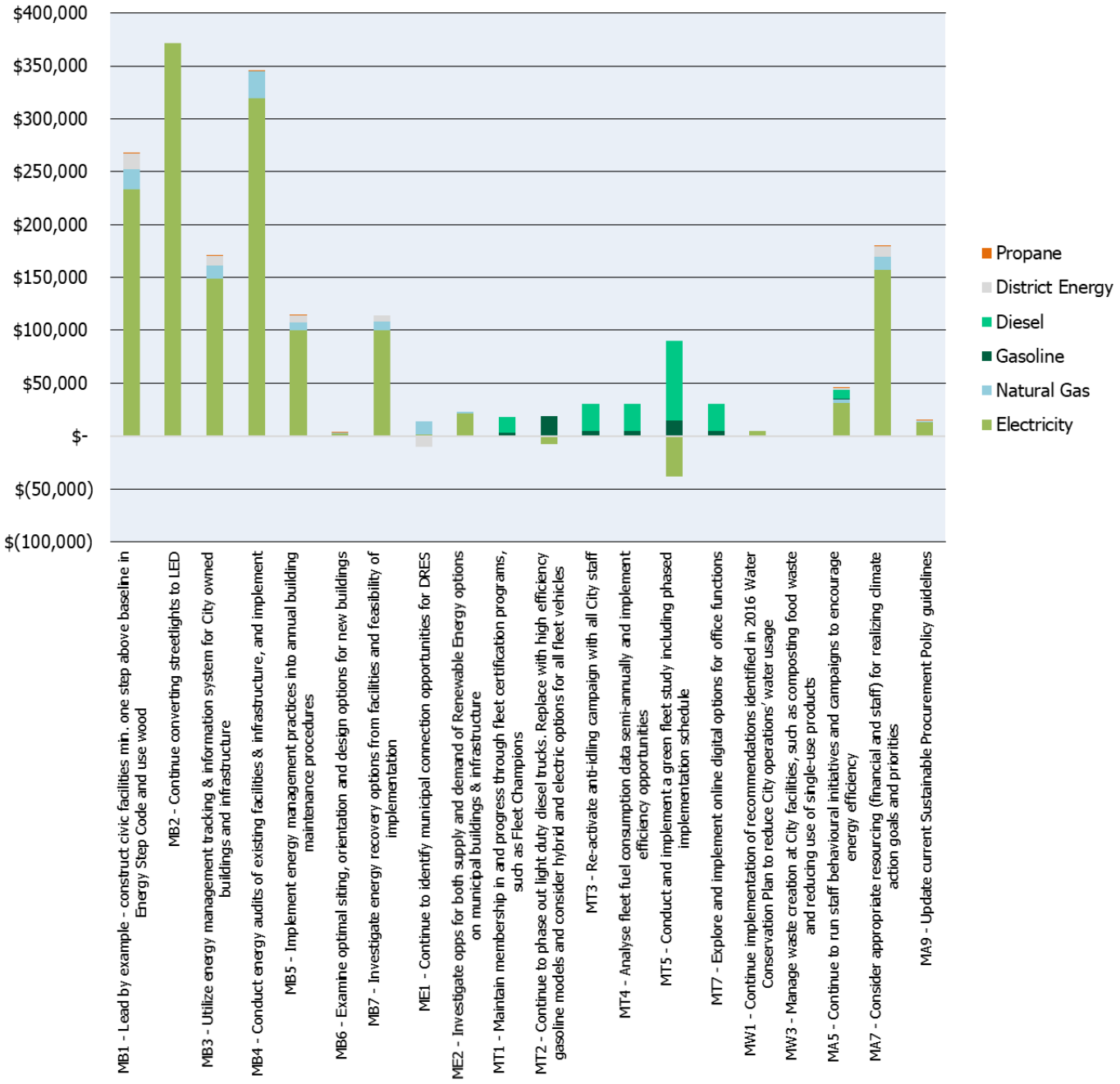


*Figure 39 – Corporate Actions – Estimates of Corporate Energy Expenditure Savings By Action, in 2025*



# Appendix K. Policy Tools

See ancillary document, *Policy Approaches to Reducing Community GHG Emissions*.

# Appendix L. Mitigation Maturity Assessment for Prince George

FCM has developed a self-assessment survey for communities to use to determine their maturity level with respect to climate change mitigation. The survey supports FCM's Municipalities for Climate Innovation Program (MCIP), and is based off QUEST Canada's Getting to Implementation (GTI) Strategies for Community Energy Planning. The survey has three competencies: Policy, Human Resources, and Technical. Each competency consists of a concept level and five steps. Depending on the step achieved, select GTI strategies were recommended to assist the community towards the next step. An online version of the mitigation assessment is available at https://mcahub.ca.

The mitigation assessment was completed for the City of Prince George, with results summarized below in Table 16. Descriptions of what the steps and GTI strategies mean are in the following two tables.

*Table 16 - Mitigation Maturity Assessment*

| Stream | Step achieved | Next Step | GTI Strategies recommended |
|---|---|---|---|
| Policy | 4 | 5 | 8: Monitor and Report<br>10: Plans Policies |
| HR | 0 | Concept | 1: Develop a Rationale<br>2: Engage Elected Officials<br>3: Governance<br>4: CEP Oversight<br>5: Engage Staff<br>6: Define the Value Proposition<br>7: Engage Community Stakeholders |
| Technical | 1 | 2 | 2: Engage Elected Officials<br>5: Engage Staff<br>7: Engage Community Stakeholders |

*Table 17 – Description of Steps from Mitigation Assessment*

| Steps | Policy | HR | Technical |
|---|---|---|---|
| Concept | Review Provincial requirements for climate change action, and establish objectives. | Good understanding of value among staff and politicians. Have committees. | Ability to collect the relevant inventory information. |
| 1 | Completed energy and emissions inventories, community and corporate. | Support from Council and senior staff, and received necessary training. | Completed energy and emissions inventories, community and corporate. |
| 2 | Have GHG emission reduction targets. | Task relevant municipal departments and local organizations with developing parts of the action plan. | Emissions reduction targets informed by technical analysis. |
| 3 | Developed a Plan to reduce energy and emissions. | Clearly defined roles and responsibilities for plan implementation. | Technically analysed actions and opportunities for GHG emissions reductions. |

| Steps | Policy | HR | Technical |
|---|---|---|---|
| 4 | Started to implement plan. | Regular progress reports. | Monitor performance of emissions reductions initiatives. |
| 5 | Tracking and monitoring of implementation. | Continual process of review and revision to improve implementation. And share and recognise successes. | Continually improve data quality and GHG tracking tools / systems. |

*Table 18 – Descriptions of Getting To Implementation (GTI) Strategies*

| GTI Strategy | Description |
|---|---|
| 1: Develop a Rationale | CEEPs can lead to much more than GHG reductions. Community energy planning can help mitigate risks, and has the potential to lead to widespread economic, health, social, resilience and environmental benefits. While GHG reductions are an important part of community energy planning, it is critical to define what other benefits the CEEP can generate. A critical success factor for CEEP implementation is defining how the CEEP will enable the community to meet its economic, health, social and resilience objectives. |
| 2: Engage Elected Officials | Council support is critical for implementation, as it provides direction, inspiration and impetus for local government staff, and the community, to prioritize community energy planning. Communities that take the time to engage with a political champion and Council on an ongoing basis may be better positioned to move forward on implementation.<br><br>Early engagement can help to surface key questions, considerations and possible challenges and can guide the CEEP implementation team to focus on the aspects of the plan that matter most to the community. |

| GTI Strategy | Description |
|---|---|
| 3: Governance | Communities that work to implement a CEEP with a business-as-usual approach will have limited success. Communities that have introduced new governance models to oversee and implement their plans have consistently proven that doing so will ensure that the CEEP remains top-of-mind for elected officials, local government staff and community stakeholders.<br><br>New governance models provide a platform for political, staff and community stakeholders to convene regularly. In some cases, they provide the legal framework needed to implement projects. This can ensure that a process is in place to monitor and report regularly on the implementation of the CEEP. |
| 4: CEEP Oversight | The department in which a CEEP sits can significantly impact implementation. For example, a CEEP can be led by the planning, community development or the economic development department. CEEPs may also be led by local NGOs or by the provincial/territorial government. |
| 5: Engage Staff | CEEPs cross more departmental boundaries than most local government initiatives and consequently require early and ongoing inter-departmental coordination and collaboration. Many local government departments should be involved in the development and implementation of the CEEP. Engagement should take place at the senior management and junior/intermediate staff level. |
| 6: Define the Value Proposition | While CEEPs are led by local governments, they are implemented by the community. Early and meaningful collaboration and coordination with community stakeholders is critical for fostering buy-in, ownership and accountability for implementation. Before engaging with stakeholders, it may be helpful to identify ways in which the CEEP can add value to their business models. |
| 7: Engage Community Stakeholders | CEEPs are typically led by local government and implemented by the community. Central to the success of a CEEP is effective and ongoing community stakeholder engagement and action by local government staff. |

| GTI Strategy | Description |
|---|---|
| 8: Monitor and Report | Based on research from the GTI initiative, 90 percent of CEEPs contain an energy and emissions reduction target, yet more than 20 percent of communities lack a structure to monitor progress toward their targets. Further, less than half of communities with a CEEP have conducted a follow-up energy and GHG emissions inventory once their CEEP was adopted to track the progress of implementation. Communities that do not monitor and report on progress may fail to secure long-term support and resources needed to implement a CEEP.<br><br>Monitoring and reporting on implementation can unlock significant opportunities to build ongoing support among elected officials, staff and community stakeholders. Precise, measurable and defensible data, when presented on an ongoing basis, can increase the overall confidence and support of senior decision makers. When the CEEP is monitored on an annual basis, successes can be celebrated which can in turn help build further support for implementation. The data can also provide frequent feedback loops to identify strengths and weaknesses as well as possible course corrections, if applicable. |
| 9: Develop an Implementation Budget | Effective CEEP implementation will require funding to support:<br><br>• A dedicated staff person(s);<br>• Project capital and operations and maintenance costs;<br>• Programs; and,<br>• Consultants. |
| 10: Plans and Policies | Community energy planning is a unique process that unlike most local government initiatives, crosses over many departmental and organizational boundaries. CEEPs, however, often fall short on being integrated into the existing plans and policies in local government because there typically lacks a process to integrate the CEEP once it has been adopted by Council. Local governments frequently operate in silos. Buildings and development, land use, transportation, and waste are planned for through separate processes.<br><br>Once a CEEP is adopted, consider taking the important step of integrating the CEEP into plans and policies immediately after CEEP adoption. |