



Shift into Neutral:

City of Fort St. John Carbon Neutral Plan

Prepared by:

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Acknowledgments

The City of Fort St. John and the Pembina Institute would like to thank the Shift into Neutral Team for providing input into this plan.

Executive Summary

Fort St. John will be a community where nature lives, families flourish, and businesses prosper
~Fort St. John Strategic Plan, 2010-2011~

The City of Fort St. John is a signatory of the B.C. Climate Action Charter, and as such has committed to be carbon neutral in municipal operations by 2012.¹ This plan outlines Fort St. John's 2010 greenhouse gas (GHG) inventory and articulates the plan to meet our commitment under the Climate Action Charter, and to reduce our GHG emissions, energy use and costs.

The complete report contains:

- Overview of the B.C. context (Chapter 1),
- Description of the process to create and implement this plan (Chapter 2),
- Summary of Fort St. John's 2007 and 2010 emissions inventory (Chapter 3),
- Summary of Fort St. John's action planning to reduce emissions (Chapter 4),
- Discussion of target setting and offsets (Chapter 5), and
- Next steps and recommendations (Chapter 6).

Fort St. John has formed a Shift into Neutral (SiN) Team, with members from across the City's departments. The SiN team will be responsible for implementing the Carbon Neutral Plan, and will also be responsible to report to Council on the team's progress.

Corporate Inventory: 2008 and 2010

A baseline inventory is an inventory that will be used as a way to measure progress towards reducing emissions over time. Any future inventories can be compared to the baseline inventory to see how emissions have changed, and ideally, to see the impact of actions as they are implemented. Fort St. John has elected to use 2008 as the baseline year.

In 2008, Fort St. John used 90,204 GJ of energy, at a cost of \$1,385,375, which produced emissions of 2,652 tonnes of CO₂e.

As a comparison, in 2010, Fort St. John used 106,579 GJ of energy, at a cost of \$1,661,208, which produced emissions of 3,276 tonnes of CO₂e. Figure 1 below illustrates the 2010

¹ The provincial government has extended the deadline to comply with this commitment into 2013.

emissions broken down by total expenditures (\$), total energy used (GJ) and total emissions (tonnes of CO₂e).

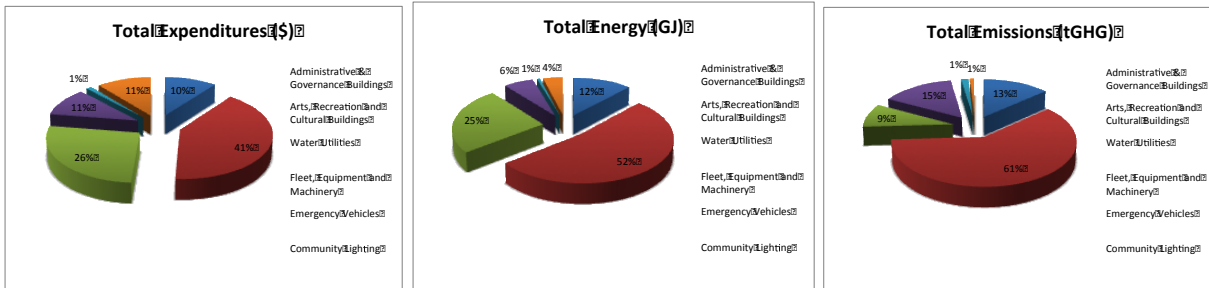


Figure 1 - Total expenditures, total energy consumed and total emissions, 2010

Although it is difficult to identify concrete trends with only two data points, the SiN Team used the information in the two inventories to identify opportunities to reduce energy use, costs and greenhouse gas emissions.

Action Planning

The SiN Team met three times to identify and prioritize the actions that are identified as part of this Plan. The actions in this section are identified as *now*, *next* or *later*. *Now* indicates that the action is a current priority for implementation. *Next* indicates that the action is a high priority, and the action is next in-line for implementation. *Later* indicates that an action has been identified, but it is not yet a priority for implementation.

For each action that has been identified as a *now* priority, a member of the SiN Team has been identified as the lead for that project, and is responsible for reporting back to the SiN Team and to Council on the progress of that project. Please see the table below for a summary of all actions currently identified as a *Now* priority. For a complete list of all identified actions, please see the complete report.

Table 1 - Now priority actions for implementation

| Infrastructure and Land Use | Fleet and Transportation | Alternative Energy | Buildings | Planning and Monitoring |
|-----------------------------|----------------------------|--|-------------------------------------|------------------------------------|
| Water System Master Plan | Alternative fuel for fleet | District energy system for Centennial Park Arena | Retrofit municipal buildings | Carbon neutral plan implementation |
| Reduce snow removal costs | Reduce fleet use | Renewables at the pump stations | Recommissioning of civic facilities | Carbon fund policy |
| | | Microhydro at the South Lagoon | Lighting retrofit | Green procurement policy |
| | | Wind and solar PV streetlight pilot | Benchmarking of civic facilities | Green building policy |

| | | |
|--------------------------------|----------------------|--|
| Prefeasibility for wind energy | Behavioural campaign | Comprehensive asset management program |
| | | Building monitoring software |
| | | Vehicle right-sizing policy |
| | | Dark sky policy |

Additional details on these actions, including project description, key staff involved in the project and project plans are available in the larger report.

Achieving Carbon Neutrality: Targets

Based on the 2008 and 2010 inventories, the SiN Team identified a recommended target for reducing emissions at the corporate scale. The SiN Team assessed the business-as-usual emissions that were projected (based on Fort St. John’s growth), and estimated the impact of key priority actions (identified during the action planning step) if implemented. The SiN Team also considered the B.C.-wide emissions reduction target set by the provincial government. Finally, the SiN team considered what level of greenhouse reductions is necessary to mitigate the most serious impacts of climate change.

Based on these considerations, the SiN Team recommends the following targets:

- 14% reduction in GHG emissions below 2008 levels by (year-end) 2014
- 21% reduction in GHG emissions below 2008 levels by (year-end) 2017
- 33% reduction in GHG emissions below 2008 levels by (year-end) 2020
- 80% reduction in GHG emissions below 2008 levels by (year-end) 2050

Figure 2 illustrates the targets in comparison to the projected business-as-usual emissions. Figure 2 also illustrates some of the prioritized actions identified during the action planning and target setting workshops to illustrate the potential emissions reduction. If all actions are implemented, Fort St. John should be on-track to achieve the 2017 and 2020 targets.

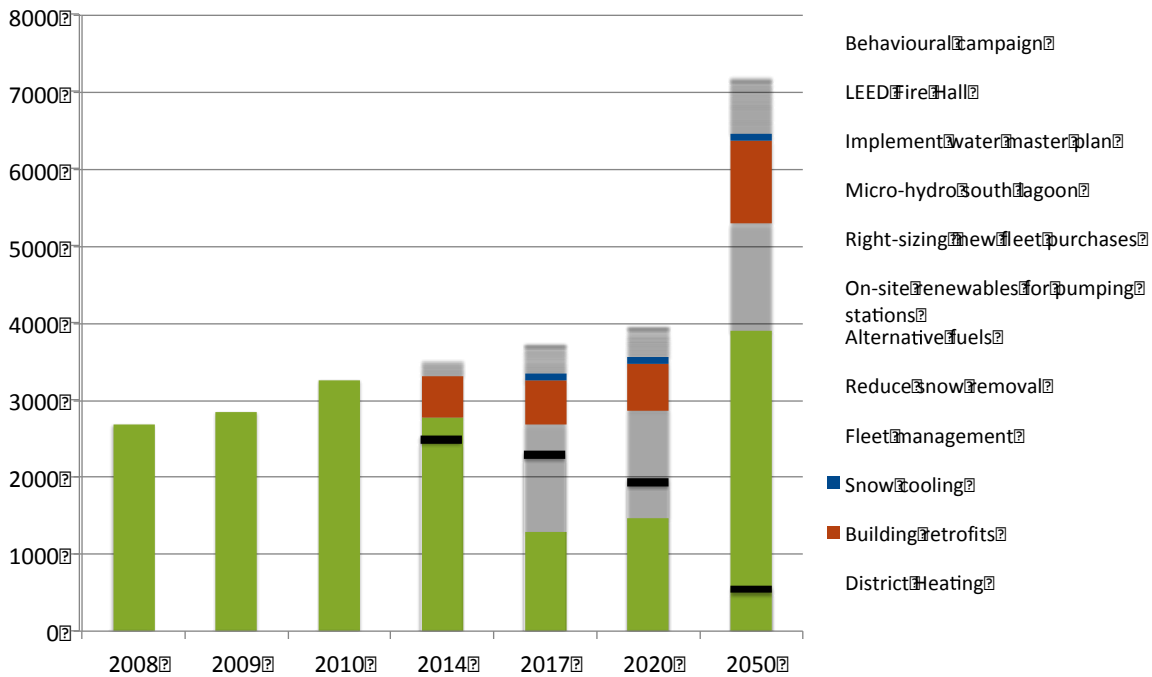


Figure 2 - Fort St. John reduction targets

The SiN Team is confident that it will be possible to identify and implement enough reduction opportunities to achieve these targets. The targets are ambitious, but achievable.

Recommendations

The recommendations below are for consideration by Council, and will enable Fort St. John to continue to be a leader on climate, energy and sustainability action in B.C.

Recommendations: Process

- Continue to implement the SiN Team process outlined in Chapter 2 of the report. This includes convening the SiN Team quarterly to check in on the progress of identified action priorities, and completing action planning brainstorm and prioritization annually. The SiN Team should report to Council on progress on existing projects and recommended new projects annually.
- Align the SiN Team process with the strategic planning and budgeting processes already underway in Fort St. John.
- Use the Carbon Neutral Dashboard as an input to existing budget planning processes to ensure actions that are identified as a priority in the Dashboard are appropriately accounted for in the budget.
- Use the Carbon Neutral Dashboard to report regularly to Council on progress on emissions reduction initiatives. Consider the information in this tool when doing yearly

strategic planning processes to ensure that the objectives, progress and actions articulated in the Carbon Neutral Dashboard align with Fort St. John's overall planning and objectives.

- Include the greenhouse gas impacts and associated costs in staff reports to Council for all new projects.
- As a next step for the Carbon Neutral Dashboard, identify measurable indicators for each of the categories on the dashboard, and develop a process to collect the indicator data and to begin to report on trends. Some possible indicators for consideration could be: services provided per tonne of GHGs, vehicle kilometres travelled per tonne of GHGs, services provided per tonne of GHG, etc. These and other potential indicators could be considered for tracking and reporting.
- Assign specific responsibility and accountability for GHG reductions. This could include adding GHG reduction accountability into employee job descriptions and annual performance reviews.
- Develop a communication strategy to engage all Fort St. John staff in the implementation of the Carbon Neutral Plan.

Recommendations: Corporate Inventory

- Adopt the 2008 as the baseline year for corporate emission reduction targets. Adopt the following corporate GHG targets:
 - 14% below 2008 levels by (year-end) 2014
 - 21% below 2008 levels by (year-end) 2017
 - 33% below 2008 levels by (year-end) 2020
 - 80% below 2008 levels by (year-end) 2050
- Implement all projects identified in Chapter 4, and continue to identify new opportunities for reductions.
- Create an internal Carbon Fund to allocate resources for future emissions reduction projects at either the corporate or community level. A recommended next step of this plan will be to determine how this fund should be designed and implemented.
- Require (as part of any new service agreement or contract) that contractors report the fuel and/or energy used to deliver any traditional service included in Fort St. John's corporate inventory. This information must be included in Fort St. John's corporate inventory (and reported to the provincial government) going forward.
- Implement a process to monitor and track energy consumption for individual buildings and vehicles. This may include implementing energy management software. By tracking individual buildings, vehicles and the performance of renewable energy installations, the impact of specific emissions reduction actions will be much easier to quantify. As well, significant increases or decreases in energy consumption will be flagged (and addressed if necessary) much more quickly. The additional data will also assist in future action planning.

Shift into Neutral

Fort St. John's Carbon Neutral Plan

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1. Introduction

Fort St. John will be a community where nature lives, families flourish, and businesses prosper

~Fort St. John Strategic Plan, 2010-2011~

The City of Fort St. John is a signatory of the B.C. Climate Action Charter, and as such has committed to be carbon neutral in municipal operations by 2012.² This plan outlines Fort St. John's 2010 greenhouse gas (GHG) inventory and articulates the plan to meet our commitment under the Climate Action Charter, and to reduce our GHG emissions, energy use and costs.

The intension of this plan is to explicitly integrate climate and energy planning into the everyday operation of the City of Fort St. John, and therefore this report also documents our approach to the development and implementation of the plan.

1.1 B.C. Context

Most GHG emissions are released by burning fossil fuels such as gasoline, coal, and natural gas. Buildings, vehicles, waste and land-use planning in municipalities can have a significant effect on a community's overall emissions.

The release of GHG emissions is a significant contributor to human-caused climate change, and many B.C. communities are already feeling the effects of climate change, which include increasingly frequent water shortages and extreme weather events, increased stress on fisheries and forests (including pine beetle infestations), and higher costs for insurance coverage. In 2007, to begin to address the challenge posed by climate change, the provincial government passed the *GHG Reduction Act*. This act set a province-wide target to reduce GHG emissions by at least 33 percent by 2020, and 80 percent by 2050 (compared to 2007 levels). In 2008, Bill 27 was also enacted, which included a requirement for local governments to include targets and policies to reduce their community's GHG emissions in their Official Community Plans. Local governments were not required to adopt the same targets as the provincial government; however, actions at the local level will contribute to achieving B.C.'s overall GHG reduction target.

As part of the broader strategy to achieve B.C.'s reduction targets, the Climate Action Charter was developed to encourage local governments to make their own operations carbon neutral by 2012, to measure and report on their community's emissions, and to work toward creating more compact, complete, energy efficient communities. Fort St. John signed the Climate Action Charter in 2008.

² The provincial government has extended the deadline to comply with this commitment into 2013.

1.2 Connection to Other Plans and Initiatives

The development of the Carbon Neutral Plan is one component of Fort St. John’s approach to sustainability overall in the City. The Carbon Neutral Plan is primarily focused on reducing energy use and GHG emissions, and this is admittedly only one component of sustainability. However, this narrower approach has allowed us to plan how we will meet our requirements under the Climate Action Charter and Bill 27, and has also allowed us to pilot an approach to integrate climate, energy and sustainability planning across all departments in the City. If successful, Fort St. John could incorporate additional sustainability categories for both the corporate and community scale into this process.

The following paragraphs outline how the development of the Carbon Neutral Plan is in line with Fort St. John’s overall strategy and vision, as outlined in the Official Community Plan and the Strategic Plan.

Strategic Plan

For the development of the 2010 – 2011 Strategic Plan, Fort St. John City Council initiated a public consultation process to better understand the priorities that residents felt their municipal government should be focusing on. See the image below for a summary of the strategic planning process.

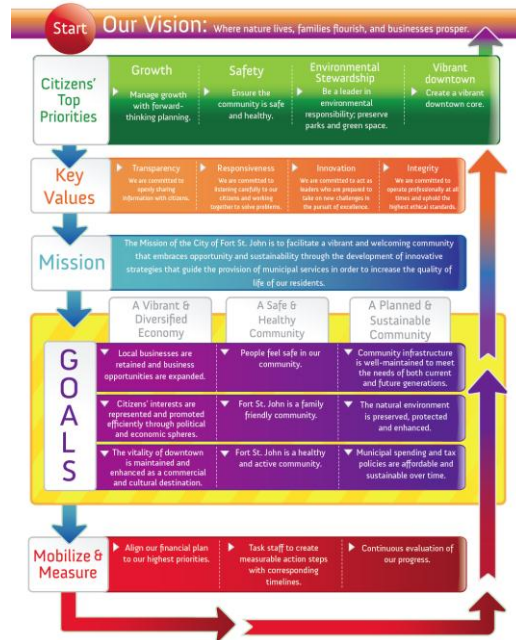


Figure 3 - Fort St. John Strategic Plan

Fort St. John’s Strategic Plan clearly identifies the development of a more sustainable community as a key priority. It references both Fort St. John’s commitment to carbon neutrality (by signing the Climate Action Charter), and the requirement (legislated through Bill 27) that all

B.C. communities set targets, develop policies and actions to reduce GHG emissions. Fort St. John's Community Energy and Emissions Plan (the CEEP) and this Carbon Neutral Plan are helping to move Fort St. John in that direction.

Official Community Plan

The community consultation process and the development of Fort St. John's Strategic Plan helped to inform the most recent update of Fort St. John's Official Community Plan (last amended February 27, 2012).³ The vision statement identified in the Official Community Plan is the same as was identified in the Strategic Plan: "Fort St. John will be a community where nature lives, businesses prosper, and families flourish". As part of this vision, the priorities of environmental sustainability have been identified as GHG reduction, water use reduction and efficient land use.

Section 8.1 (Air priorities) in the OCP identifies that a key objective is to achieve the city-wide GHG reduction target of 1% below 2007 levels by 2020, 6.5% below 2007 levels by 2025, and 12% below 2007 levels by 2030. These GHG reduction targets are focused at the community-scale; however, municipal operations make up a portion of Fort St. John's emissions, and creating a clear plan to reduce municipal emissions demonstrates leadership and allows us to "get our house in order" while tackling the challenge of community-wide emissions.

This Carbon Neutral Plan presents the 2010 corporate inventory, and provides a summary of completed and ongoing actions and next steps. These actions are reported as *now* (for initiatives currently underway), *next* (for initiatives identified as the next priority for Fort St. John), and *later* (for initiatives that are not prioritized for immediate implementation, but are on the books for potential implementation in the future). Finally, this report then provides an overview of Fort St. John's recommended corporate emissions reduction target.

The information in the report will be presented as follows:

- Fort St. John's approach and process for creating the Carbon Neutral Plan (Chapter 2),
- Corporate emissions inventory for 2008 and 2010 (Chapter 3),
- Action planning and prioritization (Chapter 4),
- Target setting and potential offset liability (Chapter 5), and
- Conclusions, and recommendations for adoption by Council (Chapter 6).

³ An Official Community Plan (OCP) is a legally required document that guides how City Council and staff make decisions about future uses and development in Fort St. John. It makes bold statements of what local residents want the community to be in 5, 10, and 20 years, and sets guiding principles and priorities for staff and Council to follow when working day to day on behalf of residents. (See http://www.fortstjohn.ca/index.php?option=com_content&view=article&id=504&Itemid=308 for more information).

2. Shift into Neutral: the Process

Fort St. John is committed to reducing emissions from our operations as much as possible first, and then pursuing other options (if necessary) to meet our commitment under the Climate Action Charter.

The objectives of the Carbon Neutral Plan are two-fold.

1. To demonstrate leadership by developing a plan to reduce GHGs, energy use and cost from our own operations; and
2. To develop a process to engage staff across all city departments to develop and implement the Carbon Neutral Plan, and to make energy and climate change a key consideration for decision-making in Fort St. John.

The first objective focuses explicitly on the purpose and intent of the plan itself, and on the resulting initiatives and actions. The second objective is to use the Carbon Neutral Plan as a way to test and implement a process to embed climate, energy and sustainability decision-making into all departments across the City. In time, this process could be expanded to include all of the energy, climate and sustainability initiatives at both the corporate and community scale.

This chapter will provide a description of the process that was implemented to develop and implement the Carbon Neutral Plan.

2.1 SiN Team

Reducing emissions from our corporate operations requires cooperation from Council, as well as all City departments and staff. To ensure that all key staff would have the opportunity to provide input as we developed the Carbon Neutral Plan (the Plan), we formed the Shift into Neutral Team (the SiN Team) to engage key staff in the process of creating the Plan, and to ensure the Plan's implementation going forward. The SiN Team will support the collective efforts of the City staff and departments to reduce GHGs, energy use and costs, and will help staff to develop the capacity to implement innovative projects and initiatives.

SiN Team Mandate:

- Through cross-departmental coordination and with the support of Council and senior management, the mandate of the team is to reduce energy use and emissions from

municipal operations. The team will set, and work towards meeting, carbon neutral targets.

SiN Team Approach:

- Catalyze the implementation of reduction measures that can be undertaken within ‘business as usual’ operations;
- Suggest new energy/GHG reduction projects, and clarify the resources needed for implementation;
- Track and monitor actions on approved projects, and report on progress to senior management and Council;
- Assist in the data collection needed to assess performance and effectiveness of actions;
- Engage other staff in conservation efforts.

SiN Team Members:

| Name | Title |
|--|--|
| Grace Fika | Director of Corporate Affairs |
| Jim Rogers | Director of Protective Services |
| Diana Burton | Deputy Clerk |
| Marty Paradine | Corporate Sustainability Manager |
| Steve McLain | Facilities Manager |
| Les Irvine, Don Demers, Jeremy Garner | Roads and Grounds Superintendent; Director of Public Works; Utilities Superintendent |
| Victor Shopland | Director of Infrastructure and Capital Works |
| TBD | City Planner; Director of Development |

The following staff members will be invited to SiN Team meetings on an as-needed basis:

| Name | Title |
|--|--|
| Jeanne Walsh | Safety and Emergency Management Coordinator |
| Mike Roy | Director of Finance |
| Evelyn Ross | RCMP Support Manager |
| Fred Burrows | Fire Chief |
| Sarah Cockerill and/or Stephanie Peters | Director of Community Services; Community Development Coordinator |

SIN Team Structure and Schedule:

- Chair: Diana Burton
- Technical Lead: Marty Paradine
- Executive Champion: Dianne Hunter
- Schedule: Team to meet quarterly (with additional sub-meetings as needed), and report to Council twice a year. The Carbon Neutral Plan will be updated annually.

Process to Create the Carbon Neutral Plan

The SiN Team was created at the end of 2011. From the end of 2011 through the beginning part of 2012, the SiN Team met three times for separate workshops to outline the process for creating the Plan, and to provide input into the content of the Plan itself.

Workshop 1 – Project kickoff and formation of the SiN Team. Key content: Introduction to climate science, GHG emissions and Fort St. John’s corporate GHG inventory.

Workshop 2 – Action Planning. Key content: Identification of past and current emissions reduction projects, and brainstorm new project ideas.

Workshop 3 – Action Prioritization and Target Setting. Key content: Prioritize brainstormed actions, and identify an ambitious but achievable emissions reduction target.

The intention of this process was to create an integrated approach to addressing corporate GHG emissions. Throughout the workshops, the SiN Team identified the desired future (the ideal approach to corporate energy and GHG planning), the current reality (the current approach in Fort St. John to corporate energy planning), and the project steps necessary to move Fort St. John towards the desired future. Please see Appendix 2 for a detailed description of Fort St. John’s integrated approach to creating the Carbon Neutral Plan and to reducing corporate GHG emissions, energy use, and costs.

2.2 Carbon Neutral Dashboard

As part of the process of creating the Carbon Neutral Plan, Fort St. John created an internal tracking and communications tool called the Carbon Neutral Dashboard. The Carbon Neutral Dashboard gives a summary of each category related to carbon neutrality, and an at-a-glance snapshot of initiatives underway. As a next step, measurable indicators should be developed and tracked to ensure that Fort St. John is on the path to achieving its carbon neutral goals.

The Carbon Neutral Dashboard will be used to report to Council on the progress of initiatives, and will be used to propose potential new initiatives to be considered as part of Fort St. John’s annual strategic planning process. Thus, initiatives listed as “future opportunities” on the Dashboard are suggested actions that have yet to be endorsed by Council.

There are currently five categories on the Carbon Neutral Dashboard. In Table 2 below, the five categories are outlined, along with the key rationale for tracking actions in these categories. The rationale for each category references impacts at both the corporate and at the community scale. This is because the intention is that eventually all sustainability initiatives that Fort St. John is undertaking will be tracked on the dashboard.⁴

Table 2 - Carbon Neutral Categories

| Carbon Neutral Category | Key Rationale |
|------------------------------------|---|
| Infrastructure and Land Use | Community lighting and water treatment and delivery account for more than half of Fort St. John’s electricity use, providing unique opportunity for cost and electricity savings. Land use is probably the most important factor in long term reductions at the community and corporate level. Creating more compact and complete communities reduces infrastructure costs; makes alternative energy and district energy technologies more viable; encourages more walking and cycling; improves transit options; and preserves land for agricultural, commercial and industrial uses, parks, and habitat protection. |
| Fleet and Transportation | Fleet and machinery account for 13% of Fort St. John’s GHG emissions. Reducing kms travelled, using low-carbon fuels, and improving vehicle efficiency through vehicle sizing, maintenance, and driving practices are key strategies to reduce overall cost and the GHG footprint of the fleet. At the community level, a transportation system focused on addressing local mobility needs can decrease GHG emissions, improve community health and safety, and allow access for all. |
| Alternative Energy | By promoting clean and renewable energies, we can reduce our GHG footprint, increase our energy self-sufficiency, and situate Fort St. John as a leader in a growing clean technology sector. Wind power, solar power, solar water heaters, geothermal heat, biomass heat, and the development of district energy systems are some of the alternatives available in the region, which we can develop to create jobs and a sustainable energy base. |
| Buildings | Buildings are the main source of energy use and emissions, accounting for 85% of our corporate carbon footprint. Green building practices increase the efficiency of buildings and their use of energy, water, and materials, and reduce building impacts on human health and the environment, through better siting, design, construction, operation, maintenance, and removal. To meet our long-term targets, we will need to retrofit most of our buildings and ensure that new buildings—which will contribute to our footprint the next 50 to 80 years—are built to the highest environmental standards. |
| Planning and Monitoring | The ultimate goal is for sustainability best practices to become business as usual. This is enabled by the adoption of green policies at the municipal level, and by working with allies to encourage supportive provincial and federal policies. It also requires that systems be put in place to track indicators, monitor progress towards set targets, and assess the effectiveness of actions taken. |

⁴ This will require that the dashboard be updated and expanded to include all relevant sustainability categories (for example, including water and food categories). However, the format and the use of the dashboard could remain the same.

Please see Appendix 2 for Fort St. John's current Carbon Neutral Dashboard. This dashboard is a living document, and will be updated by the SiN Team to report to Council on the status of GHG reduction projects.

3. Corporate Emissions Inventory

This chapter provides an overview of Fort St. John's 2008 and 2010 corporate GHG inventories. The first two sections of this chapter will provide a refresher on where GHG come from for a corporate inventory, and on the scope for reporting corporate emissions to the provincial government. Summaries of both the 2008 and 2010 inventories will then be presented.

3.1 A Refresher

3.1.1 Where do emissions come from?

GHGs are produced when fossil fuels, such as diesel, gasoline or natural gas, are burned to produce energy. For example, using natural gas to heat a municipal building, or using gasoline to power a fleet vehicle. GHGs can also be produced from agricultural practices (such as methane from cow manure) or from landfills, although this is not relevant for calculating corporate emissions inventories.

When calculating a municipality's total emissions inventory, the type of fuel used in municipal operations is very important to consider. This is because GHG emission intensity factors vary for each energy source. In other words, for each unit of energy produced, different fuels emit a different amount of GHG emissions. In B.C., electricity is primarily produced from hydropower, and therefore produces fewer GHGs than if B.C. electricity came from a dirtier source such as coal. Per unit of energy consumed, electricity in B.C. also produces fewer GHGs than a fuel type such as natural gas.

For the purposes of a municipal corporate inventory, GHG emissions are produced when energy is utilized to heat, light or power municipal operations. This can include operating municipal buildings and operating the municipal fleet. Section 3.1.2 outlines the scope in more detail for Fort St. John's corporate inventory.

3.1.2 Provincial Scope for Carbon Neutral GHG Inventories

The Ministry of Community, Sport and Cultural Development (MCSCD) outlined a specific scope for local governments for completing their annual GHG inventory. The MCSCD scope standardizes what activities are in-scope for carbon neutral inventory reporting for all local governments in B.C. Figure 4 outlines all activities that are in-scope for the annual carbon neutral GHG inventories.

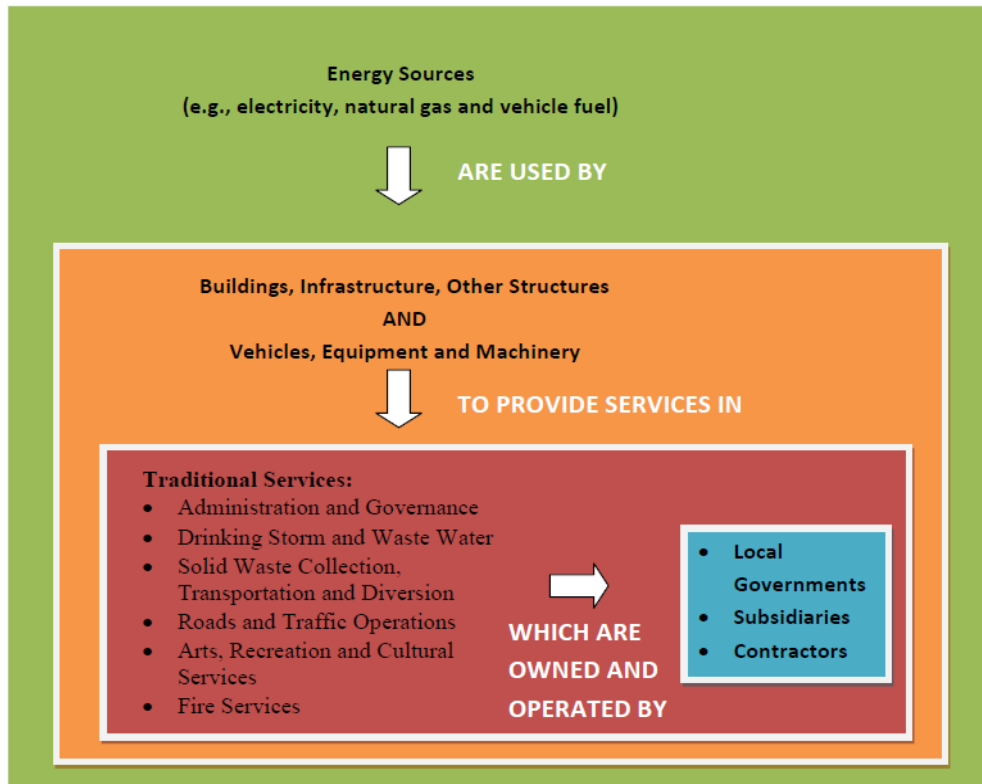


Figure 4 - In-scope activities for annual GHG reporting to the Province

The MCSCD has subdivided local governments’ energy use into two categories: *buildings, infrastructure and other structures* and *vehicles, equipment and machinery*. Any energy used in either category that produces GHGs should be included in a local government’s annual GHG inventory.

The MCSCD has also identified six traditional service areas that define the in-scope activities for carbon neutral reporting:

- Administration and governance
- Drinking, storm and waste water
- Solid waste collection
- Roads and traffic operations
- Art, recreation and cultural services
- Fire services;

Any service provided by B.C. local governments that fall within these six categories are considered in-scope for carbon neutrality. The inventory must include emissions from these activities whether the activities are carried out by the local government, by contractors or by local government subsidiaries.

For contracted services, local governments must report emissions associated with the delivery of contracts that are:

- New or renewed after June 1, 2012, and
- Over \$25,000 value in any calendar year, and
- In scope based on the traditional services categories (EXCEPT for contracts under the category of administration and governance).

To put municipalities across the province on equal footing, certain activities are excluded from corporate inventories. Specifically, emissions from the following sources do not have to be reported:

- Landfill
- Transit services
- Police services
- New construction (facilities, roads, etc.)
- Primary power generation
- Social housing
- Tree farms
- Community sources (e.g., residential or commercial emissions)

For more details, see the MCSCD's carbon neutral scope summary table in Appendix 3.

3.2 2008 Corporate Inventory: Baseline

A baseline inventory is an inventory that will be used as a way to measure progress towards reducing emissions over time. Any future inventories can be compared to the baseline inventory to see how emissions have changed, and ideally, to see the impact of actions as they are implemented. Fort St. John has elected to use 2008 as the baseline year.

In 2008, Fort St. John used 90,204 GJ of energy, at a cost of \$1,385,375, which produced emissions of 2,652 tonnes of CO₂e. The City of Fort St. John has chosen to report its inventory based on end use, and therefore the inventory figures below are broken out into the following categories:

- Administrative and governance buildings;
- Arts, recreation and cultural buildings;
- Water utilities;
- Fleet, equipment and machinery;
- Emergency vehicles; and
- Community lighting.

Table 3 below is a summary of the 2008 inventory, and further breaks down each category into the total GHGs produced based on the fuel type used.

Table 3 - Inventory Summary Table, Total Emissions, 2008

| Category | Total tonnes CO ₂ e by energy type | | | | | TOTAL |
|---|---|----------------|---------------|---------------|--------------|----------------|
| | Electricity | Natural Gas | Gasoline | Diesel | Propane | |
| Administration and Governance Buildings | 26.45 | 449.64 | 0.00 | 0.00 | 0.00 | 476.10 |
| Arts, Recreation and Cultural Buildings | 77.33 | 1223.27 | 0.00 | 0.00 | 0.00 | 1300.61 |
| Water Utilities | 162.24 | 112.37 | 0.00 | 0.00 | 0.00 | 274.61 |
| Fleet, Equipment and Machinery | 0.00 | 0.00 | 125.30 | 435.47 | 16.81 | 577.58 |
| Emergency Vehicles | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Community Lighting | 22.76 | 0.00 | 0.00 | 0.00 | 0.00 | 22.76 |
| TOTAL | 288.79 | 1785.29 | 125.30 | 435.47 | 16.81 | 2651.66 |

3.3 2010 Corporate Inventory

In 2010, Fort St. John used 106,579 GJ of energy, at a cost of \$1,661,208, which produced emissions of 3,276 tonnes of CO₂e. Figure 5 below illustrates the 2010 emissions broken down by total expenditures (\$), total energy used (GJ) and total emissions (tonnes of CO₂e).

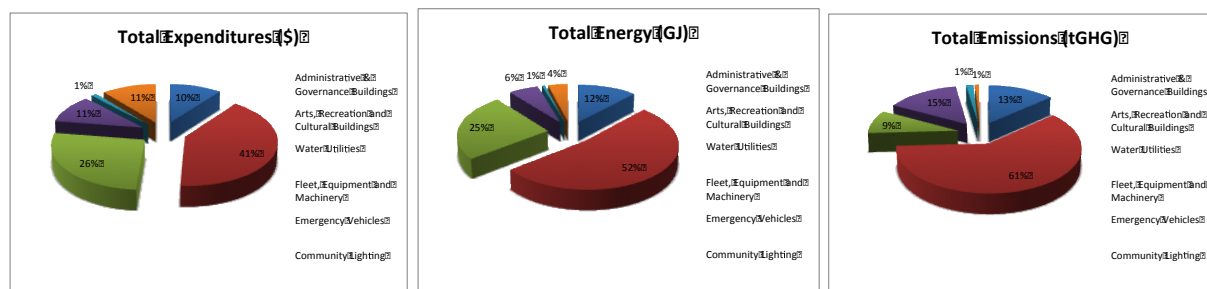


Figure 5 - Total expenditures, total energy consumed and total emissions, 2010

As is illustrated above, the total expenditures or total energy use are not directly proportionate to the total number of GHG emissions. For example, the category of community lighting accounts for 11% of total energy expenditures, but represents only 4% of the total energy used, and only 1% of the City’s total GHG emissions. Conversely, the category of fleet, equipment and machinery also accounts for 11% of total energy expenditures, and 6% of the City’s total energy use, but accounts for 15% of the City’s total GHG emissions.

The fuel that was used can explain these differences. In the case of community lighting, electricity is the primary fuel used, which is a relatively clean fuel from a GHG perspective. In the case of the fleet, the primary fuel used was gasoline and diesel, which produces a relatively high amount of GHG emissions per unit of energy converted.

Table 4 below is a summary of the 2010 inventory, and further breaks down each category into the total GHGs produced based on the fuel type used.

Table 4 – Inventory Summary Table, Total Emissions, 2010

| Category | Total tonnes CO ₂ e by energy type | | | | | TOTAL |
|---|---|----------------|---------------|---------------------|-------------|----------------|
| | Electricity ⁵ | Natural Gas | Gasoline | Diesel ⁶ | Propane | |
| Administration and Governance Buildings | 26.81 | 420.07 | 0.00 | 0.00 | 0.00 | 446.88 |
| Arts, Recreation and Cultural Buildings | 114.02 | 1905.75 | 0.00 | 0.00 | 0.00 | 2019.76 |
| Water Utilities | 147.64 | 125.87 | 0.00 | 0.00 | 0.00 | 273.51 |
| Fleet, Equipment and Machinery | 0.00 | 0.00 | 126.76 | 335.32 | 4.96 | 462.08 |
| Emergency Vehicles | 0.00 | 0.00 | 12.01 | 35.74 | 0.00 | 47.76 |
| Community Lighting | 25.89 | 0.00 | 0.00 | 0.00 | 0.00 | 25.89 |
| TOTAL | 314.35 | 2451.68 | 138.78 | 371.07 | 4.96 | 3275.87 |

3.4 Comparing Inventories: 2008 – 2010

With only two data points, it is difficult to identify concrete trends. It is possible that any differences observed may be due in part to incomplete and inconsistent data⁵, the construction of new facilities⁶, or could be due to weather variations between 2008 and 2010. As additional inventories are completed and data collection practices are improved, Fort St. John will be able to report on the trends observed in emissions with greater certainty and accuracy. To date, the inventories are useful in identifying opportunities for reductions, but are not yet useful in identifying clear emissions trends.

However, to enable action planning and target setting, the SiN Team examined the 2008 and 2010 inventories and projected the likely increase in emissions in 2014, 2017, and 2020 based on the expected population growth in Fort St. John. Between 2008 and 2010, Fort St. John’s corporate emissions have increased overall by 19%. Electricity consumption increased by 8%, natural gas consumption increased by 27%, gasoline consumption increased by 9%, diesel consumption decreased by 17%.

Figure 6 below illustrates the potential increase in emissions if no emissions reduction actions are implemented.⁷

⁵ For example, in 2008, there is no data for the emergency vehicles category.

⁶ For example, the Pomeroy Sports Centre was constructed in 2010.

⁷ Projected emissions were calculated using Fort St. John’s average population growth rate of 2% per year. This is a conservative estimate of the potential increase in emissions because it does not account for the construction of new facilities.

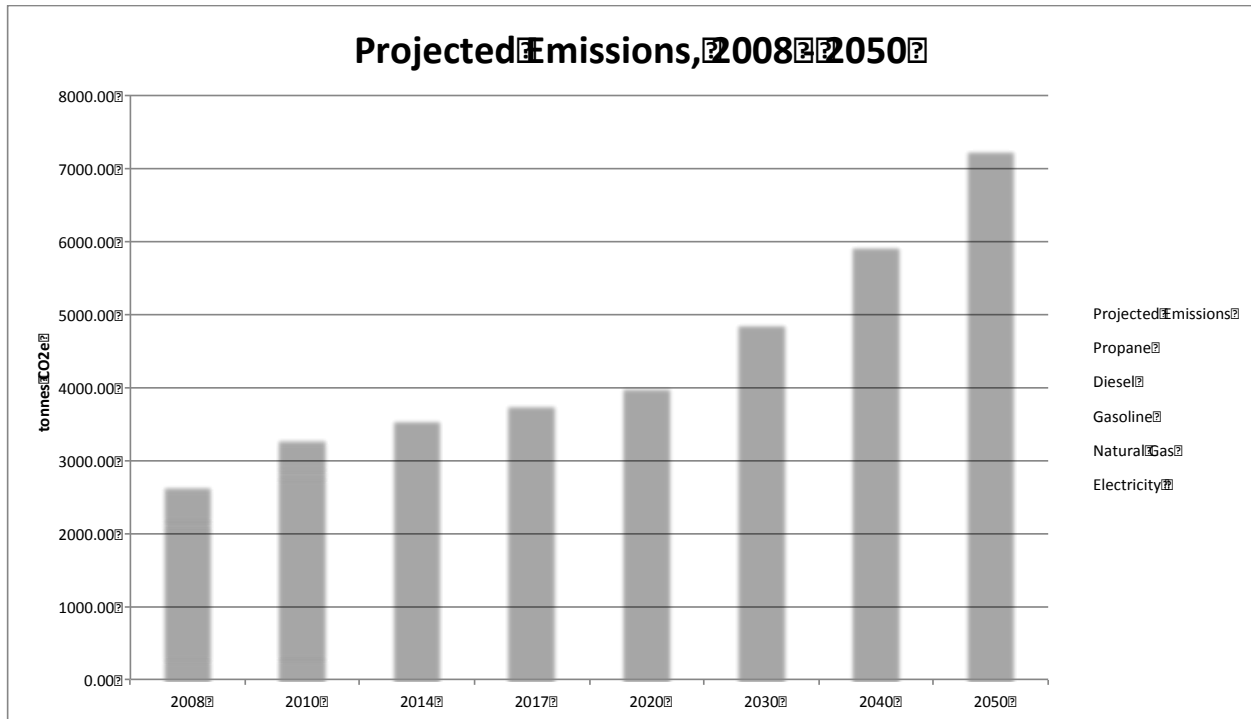


Figure 6 - Projected Emissions, 2008 – 2050

4. Action Planning

The SiN Team met three times to identify and prioritize the actions that are identified as part of this Plan. The actions in this section are identified as *now*, *next* or *later*. *Now* indicates that the action is a current priority for implementation. *Next* indicates that the action is a high priority, and the action is next in-line for implementation. These actions may need additional staff or budget capacity to implement, and this will be accounted for during the budget and strategic planning cycles. *Later* indicates that an action has been identified, but it is not yet a priority for implementation.

The SiN Team will keep the Carbon Neutral Dashboard up-to-date with the *now* and *next* priority actions, and this will be used to report to Council on the status of projects and next steps. The SiN Team will also repeat the action brainstorm and planning session each year to continuously identify new ideas and opportunities.

For each action that has been identified as a *now* priority, a member of the SiN Team has been identified as the lead for that project, and is responsible for reporting back to the SiN Team and to Council on the progress of that project. For each of these projects, a project tracking sheet has been created, and these will be used to report back to the SiN Team.

In the sections below, the process for action prioritization is outlined. The second section identifies the staff lead for each project and includes a short description of each of the actions identified as *now*. Additional details on each project are included on the project tracking sheets, including expected project benefits; links to strategic goals, OCP priorities, and other plans; project team; key stakeholders; project vision and current reality; and short-term goals and milestones for 2012 – 2013. The last section in this chapter presents the estimated GHG reductions expected from each action.

Please see Appendix 4 for a complete list of all the actions that were identified during the action planning process (i.e., all actions identified as *now*, *next* and *later*).

4.1 Process for Action Prioritization

The SiN Team began the action planning process by identifying all actions that were already underway or were already “on-the-books” as a potential future action. The SiN Team then went through a brainstorming process to identify new opportunities for emission reductions.

To prioritize the list of new and existing actions, the SiN Team developed a set of decision-making criteria. The five criteria selected by the team are outlined below with the key evaluation questions used to evaluate each possible action.

Table 5 - Action Planning Decision-making Criteria

| Decision-making criteria | Key evaluation questions |
|--------------------------------|---|
| GHG and energy reduction | <p>What is the potential for GHG reductions from the project?</p> <p>What is the potential for energy savings from the project?</p> |
| Feasibility | <p>Is the project technically feasible?</p> <p>Is the project politically feasible?</p> |
| Capacity and capacity-building | <p>Does the project help build internal capacity to manage energy use and GHG emissions?</p> <p>Does Fort St. John currently have the internal capacity to implement the project?</p> |
| Community benefits | <p>Does the project have significant community and social benefits?</p> <p>How does the project support Fort St. John’s strategic objectives related to community building and livability?</p> |
| Economic benefits | <p>Does the project have significant economic benefits?</p> <p>How does the project support Fort St. John’s strategic objectives related to economic growth and support for local businesses?</p> |

For each of the five decision-making criteria, each potential action was given a score of 0 to 3. The intention of the scoring system was not simply to implement the actions that received the highest score. Instead, the process of scoring the actions spurred conversation and debate within the SiN Team to help narrow down the top actions.

Once the top actions were identified, the SiN Team sorted the actions into the categories of *now*, *next* or *later*.

In Section 4.2 below, the actions that have identified as a current priority (*now*) are listed with a short description of the project. The staff lead and staff support are also listed.

4.2 Prioritized Actions

4.2.1 Infrastructure and Land Use

Water System Master Plan

Staff lead: Victor Shopland

Support: Jeremy Garner, Marty Paradine

Description: The purpose of this plan is to take a comprehensive look at the existing system, its capacity, costs, limitations and areas for development. The community is growing and it is essential that water volumes and storage capacities are adequate. One of the highest single costs that the City has is the cost of the electricity that is required to pump water up from the wells. Adequate storage to buffer peak demands will but peak power consumption requirements, proper looping of the water distribution system will provide more consistent water pressure and reduce potential quality or quantity issues. The plan will also look at the existing pipe system and provide guidance for the replacement of ageing or undersized pipes. The study will look at potential areas of city growth and any supply or storage issues that may be related to this growth, as well as the estimated time left before a major system supply source will have to be developed. This will include options for a second water source, or expanding the existing supply system, plus the costs related to each.

Reduce Snow Removal Costs

Staff lead: Don Demers

Staff support: Planner

Description: This project will explore opportunities to reduce snow removal costs. Plow patterns, frequencies and use of various pieces of equipment in different configurations can be considered. Looking at such things as street designs in all new developments will allow for proper snow storage on the boulevards and reduce operational costs. Purchasing equipment that can be utilized year round and not only during the winter season, results in upfront capital cost savings. The average annual snow removal cost for the past five years has been \$1,073,798.00 and the City is continuing to experience steady growth every year.

4.2.2 Fleet and Transportation

Alternative Fuel for Fleet

Staff lead: Marty Paradine

Staff support: Jeanne Walsh

Description: Research the viability of using alternative fuels for City fleet, such as compressed natural gas, biodiesel, electricity etc. The fleet is responsible for 15% of corporate GHG emissions and this project will aid in reducing those emissions.

Reduce Fleet Use

Staff lead: Don Demers

Staff support: Marty Paradine, Diana Burton, Jeremy Garner, Jeanne Walsh

Description: This project will look at any opportunities for the City to reduce fleet use in the organization. A fleet use reduction plan would see a cost reduction in both the capital and operating budget. Fleet Management is a 2013 strategic priority for the Public Works department. This project is a component of that strategic priority.

4.2.3 Alternative Energy

District Energy System for Centennial Park Area

Staff lead: Marty Paradine

Staff support: Steve McLain

Description: Comprehensive district energy and energy conservation measures (ECM) study for Centennial Park facilities to be implemented. This project aims to utilize refrigeration waste heat and reduce corporate GHGs and energy costs.

Renewables at the Pump Stations

Staff lead: Marty Paradine

Description: Use on-site renewable energy generation at pumping stations such as wind, solar, and micro-hydro to be more resilient to energy price fluctuations and help with reducing electricity demand charges. This project will investigate the potential in Fort St. John.

Microhydro at the South Lagoon

Staff lead: Marty Paradine

Staff support: Victor Shopland

Description: Utilize South lagoon outfall via micro-hydro to generate electricity. This project turns a liability (waste going into the river) into an asset (electricity generation source) and will generate revenue for the City.

Wind and Solar PV Streetlight Pilot

Staff lead: Marty Paradine

Description: Pilot an off-grid streetlight/trail lighting option that is powered by a wind/PV hybrid system. Project offers an opportunity to reduce operating expenditure and validate a lighting option for areas with lack of electricity infrastructure.

Prefeasibility for Wind Energy

Staff lead: Marty Paradine

Description: Look for potential sites for a wind energy project in Fort St. John, at first, then regionally. This project has potential to generate revenue for the city and utilize idle land (e.g., lagoon sites).

4.2.4 Buildings

Retrofit Municipal Buildings

Staff lead: Jim Rogers

Staff support: Steve McLain

Description: Identify retrofit opportunities through assessment of electrical infrastructure, building envelope design, and mechanical systems upgrades (HVAC). Capitalize on opportunities to create efficiencies in building sustainability and operational cost containment.

Recommissioning of Civic Facilities

Staff lead: Jim Rogers

Staff support: Steve McLain

Description: Utilize existing and new building management software programs to optimize operational parameters for civic infrastructure. The goal would be to maximize efficiency in operational and non-operational periods. Utilize building metrics from benchmarking to adjust building set-up to improve functionality and efficiency.

Lighting Retrofit

Staff lead: Steve McLain

Description: Utilize building assessment information to make lighting retrofits where applicable.

Benchmarking of Civic Facilities

Staff lead: Jim Rogers

Description: Establish benchmarks to help compare, analyze and improve building metrics in the areas of utilities, maintenance, janitorial, and sustainability (e.g., Portfolio Manager).

Behavioural Campaign

Staff lead: Grace Fika

Staff support: Diana Burton

Description: Launch a behavioural campaign aimed at achieving organizational environmental objectives through recruiting, developing and motivating individual staff to do their jobs in an environmentally friendly way, and in a way that helps the City to reduce GHG emissions from our operations. Develop an organizational “culture”, through TEAM building, communication and action planning, that incorporates environmental awareness and action in our day-to-day activities.

4.2.5 Planning and Monitoring

Corporate Energy and Emissions Plan Implementation

Staff lead: Marty Paradine

Staff support: Diana Burton

Description: Develop and implement a plan to facilitate implementation of corporate energy projects and aid in the coordination of said projects interdepartmentally. This plan will help achieve carbon neutrality and cost savings in a formalized and organized manner.

Carbon Fund Policy

Staff lead: Marty Paradine

Description: Design and implement a policy for an internal Carbon Fund. This fund will be used to finance emissions reduction projects at the corporate and community level. This is an action that has been identified by the provincial government as a way to show progress towards carbon neutrality.

Green Procurement Policy

Staff lead: Marty Paradine

Staff support: Diana Burton, Grace Fika, Jeanne Walsh

Description: Write policies to control the purchasing of products, services, and contractors to ensure supply chain sustainability and life cycle analysis (LCA) benefits.

Green Building Policy

Staff lead: Marty Paradine

Description: Write and adopt policy for new municipal construction to reduce environmental footprint and minimize life cycle cost.

Comprehensive Asset Management Program

Staff lead: Marty Paradine

Staff support: Mike Roy, Victor Shopland

Description: Development of a proper asset management program with monitoring, centralization and integrated with City departments such as finance, planning, energy, and facilities. Such a program would allow for better planning related to infrastructure deficit, equipment replacement and maintenance costs. Furthermore, reporting on energy use, GHG emissions, and financials would be streamlined. Fleet Management is a 2013 strategic priority for the Public Works department. Fleet management is a subcomponent of overall asset management.

Building Monitoring Software

Staff lead: Jim Rogers

Staff support: Marty Paradine

Description: Assess the feasibility of an overall building monitoring/management system for civic facilities of which an energy management system would be intrinsic. Conduct research into integration issues and opportunities around existing control systems in facilities and other City software applications (e.g., Cityworks).

Vehicle Fleet Right-sizing Policy

Staff lead: Don Demers

Staff support: Jeremy Garner, Jeanne Walsh

Description: Create right-sizing policy for new fleet purchases. This policy will allow for the new purchase of vehicles or equipment using key guidelines. Vehicles and equipment will be

matched to the tasks they are required to do. Values such as capital costs, safety, fuel use, maintenance, insurance costs and resale will be considered for all purchases. Use of alternate fuels will also be considered. Fleet Management is a 2013 strategic priority for the Public Works department. This project is a component of that strategic priority.

Dark Sky Policy

Staff lead: Planner

Staff support: Marty Paradine

Description: “Dark sky” is a community wide light pollution reduction approach that is being adopted around the globe. The intent of the Dark Sky programs is to reduce light pollution and make it possible to have an unhindered view of the night sky. Numerous beneficial side effects of these programs have been scientifically reported including increased community safety and energy reduction.

4.3 Estimated GHG Reductions

To assist in the planning and prioritization of the actions, estimates of potential GHG reductions were prepared for the action planning and prioritization workshop. These reductions are estimates only and were used to demonstrate the order-of-magnitude reductions expected from each action. Actual reduction that result from the implementation of each action will depend on a variety of factors, including weather, individual operation of the building and fleet, and population growth. Not all prioritized actions were quantified, as some actions (such as plans, policies, monitoring and software) do not, in and of themselves, directly result in emissions reductions. In some cases, reductions from the specific actions identified were aggregated to estimate the reduction. See Table 6 below for the calculated emissions reductions.

Table 6 - Estimated Emissions Reductions from Select Actions

| Estimated Emissions Reduction (tonnes CO ₂ e) | | | | |
|--|------|------|------|------|
| | 2014 | 2017 | 2020 | 2050 |
| Infrastructure and Land Use | | | | |
| Water system master plan (actions include water pricing and business water reduction plan) | | 25 | 26 | 48 |
| Reduce snow removal costs | 81 | 86 | 92 | 166 |
| Fleet and Transportation | | | | |
| Alternative fleet fuel | | 46 | 49 | 88 |
| Reduce fleet use (fleet management, right sizing new vehicle purchase) | 87 | 92 | 97 | 177 |
| Alternative Energy | | | | |
| District Energy in Centennial Park Area | | 1400 | 1400 | 1400 |
| Renewable energy at pumping stations | | 39 | 42 | 76 |
| Micro-hydro for south lagoon | | 20 | 20 | 20 |
| Wind/PV streetlight pilot | | 3 | 3 | 3 |
| Buildings | | | | |
| Retrofit Buildings (general building retrofits, LEED Gold firehall) | 590 | 644 | 682 | 1221 |
| Behavioural campaign | 38 | 40 | 43 | 78 |

5. Achieving Carbon Neutrality: Target Setting and Offsets

5.1 Target Setting

Fort St. John is officially committed to carbon neutrality, however setting internal targets helps ensure that corporate emissions are on a downward trajectory, and helps measure progress in minimizing emissions (and offset purchases) as much as possible. It is helpful to set short, medium and long-term targets to measure progress in reducing emissions.

The SiN Team participated in a workshop to identify realistic targets for reducing emissions at the corporate scale. The SiN Team assessed the business-as-usual emissions that were projected (based on Fort St. John's growth), and estimated the impact of key priority actions (identified during the action planning step) if implemented. The SiN Team also considered the B.C.-wide emissions reduction target set by the provincial government. Finally, the SiN team considered what level of greenhouse reductions is necessary to mitigate the most serious impacts of climate change.

Based on these considerations, the SiN Team recommends the following targets:

- 14% reduction in GHG emissions below 2008 levels by (year-end) 2014
- 21% reduction in GHG emissions below 2008 levels by (year-end) 2017
- 33% reduction in GHG emissions below 2008 levels by (year-end) 2020
- 80% reduction in GHG emissions below 2008 levels by (year-end) 2050

Figure 7 illustrates the targets Fort St. John is recommending in comparison to the projected business-as-usual emissions. Figure 7 also illustrates some of the prioritized actions identified during the action planning and target setting workshops to illustrate the impact on overall emissions. If all actions are implemented, Fort St. John should be on-track to achieve its 2017 and 2020 targets.

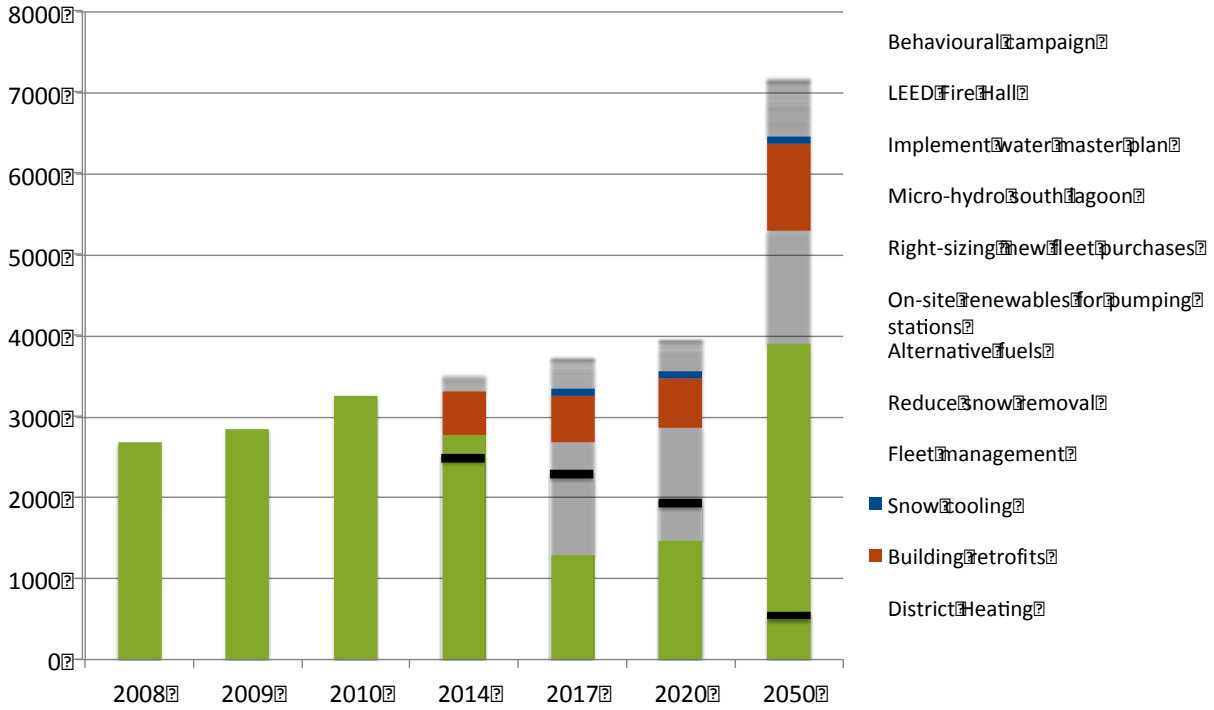


Figure 7 - Fort St. John reduction targets

The SiN Team is confident that it will be possible to identify and implement enough reduction opportunities to achieve these targets. The targets are ambitious, but achievable.

5.2 Achieving Carbon Neutrality: What will it cost?

Carbon neutrality means reducing emissions to zero. The provincial government has defined three ways for local governments to reduce their corporate emissions to work towards carbon neutrality.

Options:

1. Invest in a Green Communities Committee (GCC) supported project.
The GCC has identified four types of emission reduction projects (energy efficient building retrofits / fuel switching, solar hot water, household organic waste composting, and low emission vehicles) that local governments could undertake and has provided simplified formulas to assist in measuring the GHG reductions from these projects. These projects are considered to be pre-approved by the GCC and do not need additional external validation and verification.
2. Invest in Alternate Community GHG Reduction Projects.
This option allows local governments to identify additional ideas (beyond Option 1) for measurable emission reduction projects that could be undertaken outside their corporate emissions boundary. These projects must comply with the following project criteria:
 - *Emission reductions are outside the local government corporate emissions*

boundary: GHG reduction projects must be outside of the local government’s corporate emissions boundary, as defined in the *Carbon Neutral Workbook*.

- *Emission reductions have occurred before they are counted*: the amount of emission reductions being claimed in a given year must have occurred by the end of that year.
- *Emission reductions are credibly measured*: emission reductions must be credibly measured to ensure that emission reductions are real and have a climate benefit.
- *Emission reductions projects are beyond business as usual (BAU)*: projects must have started after September 26, 2007; must not be required to fulfill a federal or provincial government’s legislated or regulatory requirement; and meet one of three tests (financial, other barriers or common practice).
- *Accounting of emission reductions is transparent*: public reporting is required to ensure transparency and accountability.
- *Emission reductions are counted only once*: reductions must only be claimed once, so local governments must be able to demonstrate that the reductions have not been previously committed or sold as emission reductions.
- *Project proponents have clear ownership of all emission reductions*: the local government must demonstrate that it has exclusive rights to legal and commercial benefits of reductions associated with GHG reduction project.

3. Purchase Offsets from a Credible Provider.

This option allows for local governments to purchase offsets from a credible offset provider. The provincial government provides some guidance on the best practices for choosing an offset provider, and recommends choosing a high-quality offset provider. However, there is no enforced standard for purchasing offsets.

The carbon neutrality formula as defined by the provincial government is as follows:

$$\text{Local government emissions} - \text{option 1 \& 2 project reductions} - \text{option 3 offsets} = \text{ZERO}$$

(GHG inventory total)
(balance)
(offset)
(carbon neutral)

Option 1 and 2 above allow local governments to get credit for investing in local emissions reduction projects, even if they don’t directly reduce corporate emissions. Option 1 and 2 projects are likely to cost more per tonne to reduce emissions than purchasing offsets, but they have the additional benefits of investing in the local green economy, raising local awareness; fostering local technological innovation, and supporting the creation of green jobs.

If Fort St. John were to decide to purchase offsets to achieve carbon neutrality, without implementing any of the actions identified above to reduce emissions, based on 2010 emissions, the offset liability will be approximately \$81,900.⁸ This investment will need to be made every

⁸ This assumes 2% growth per year in emissions, and that the cost of offsets will be \$25 per tonne.

year starting with 2012 emissions to achieve our commitment to be carbon neutral. The offset liability will grow if our emissions continue to increase.

In 2014, under a business-as-usual emissions scenario, our offset liability will be about \$88,450. By reducing Fort St. John's energy demand, the total energy purchased is reduced and the total number of offset purchases required is also reduced. If we implement all the prioritized actions identified for 2014, Fort St. John's offset liability can be lowered to \$69,425 for that year. This translates to a savings of just under \$20,000 on offset purchases, and into approximately \$262,000 in energy costs savings. This adds up to an annual cost savings of about \$282,000 in 2014. By implementing GHG reduction projects, Fort St. John is not only demonstrating our environmental leadership, but also our fiscal responsibility.

The provincial government has also introduced the concept of "making progress towards carbon neutrality" as a supported way to comply with the Climate Action Charter. The "making progress" category allows communities to demonstrate, in the short term, that they are moving towards carbon neutrality by measuring, reducing or reporting on their emissions, without requiring that the community balance or offset their remaining emissions. The communities who are "making progress towards carbon neutrality" will not be considered carbon neutral under the Climate Action Charter.

One specific way that the GCC recommends making progress towards carbon neutrality is to implement an internal climate action reserve fund. This is a creative way to allocate budget to emissions reduction projects, and, if the fund is used for projects that reduce corporate emissions, will reduce the local government's offset liability over time.

One of the next steps of this report is to develop an internal climate action reserve fund (or carbon fund) for Fort. St. John.

6. Conclusions and Recommendations

The development of the Carbon Neutral Plan is intended to explicitly integrate climate and energy planning into the operations of the City. This report outlines the process that was undertaken to create this plan, and also articulates how this plan will be updated in the future. The actions that were identified in this report are actions that are either currently underway or have been prioritized by the SiN Team. This report helps to integrate the work that we have done on sustainability planning, corporate energy planning and community energy planning, and outlines a clear plan for how we will move forward to achieve our corporate targets.

The GHG reduction targets we have set for ourselves are bold, but achievable. We now have a clear sense of our total emissions and how these are changing over time. We recognize that reducing our emissions will be a significant challenge, and will require a significant shift away from business-as-usual. This report clearly shows us where we stand with our emissions, and provides a clear roadmap for future action. This is a significant achievement, and places us in an excellent position to increase our efforts to reduce emissions. To facilitate this shift, we recognize that there are internal processes and structures that will help to integrate the climate, energy and sustainability planning more seamlessly with the day-to-day operations of the City.

The recommendations below are for consideration by Council, and will enable Fort St. John to continue to be a leader on climate, energy and sustainability action in B.C.

Recommendations: Process

- Continue to implement the SiN Team process outlined in Chapter 2. This includes convening the SiN Team quarterly to check in on the progress of identified action priorities, and completing action planning brainstorm and prioritization annually. The SiN Team should report to Council on progress on existing projects and recommended new projects annually.
- Align the SiN Team process with the strategic planning and budgeting processes already underway in Fort St. John.
- Use the Carbon Neutral Dashboard as an input to existing budget planning processes to ensure actions that are identified as a priority in the Dashboard are appropriately accounted for in the budget.
- Use the Carbon Neutral Dashboard to report regularly to Council on progress on emissions reduction initiatives. Consider the information in this tool when doing yearly strategic planning processes to ensure that the objectives, progress and actions articulated

in the Carbon Neutral Dashboard align with Fort St. John's overall planning and objectives.

- Include the greenhouse gas impacts and associated costs in staff reports to Council for all new projects.
- As a next step for the Carbon Neutral Dashboard, identify measurable indicators for each of the categories on the dashboard, and develop a process to collect the indicator data and to begin to report on trends. Some possible indicators for consideration could be: services provided per tonne of GHGs, vehicle kilometres travelled per tonne of GHGs, services provided per tonne of GHG, etc. These and other potential indicators could be considered for tracking and reporting.
- Assign specific responsibility and accountability for GHG reductions. This could include adding GHG reduction accountability into employee job descriptions and annual performance reviews.
- Develop a communication strategy to engage all Fort St. John staff in the implementation of the Carbon Neutral Plan.

Recommendations: Corporate Inventory

- Adopt the 2008 as the baseline year for corporate emission reduction targets. Adopt the following corporate GHG targets:
 - 14% below 2008 levels by (year-end) 2014
 - 21% below 2008 levels by (year-end) 2017
 - 33% below 2008 levels by (year-end) 2020
 - 80% below 2008 levels by (year-end) 2050
- Implement all projects identified in Chapter 4, and continue to identify new opportunities for reductions.
- Create an internal Carbon Fund to allocate resources for future emissions reduction projects at either the corporate or community level. A recommended next step of this plan will be to determine how this fund should be designed and implemented.
- Require (as part of any new service agreement or contract) that contractors report the fuel and/or energy used to deliver any traditional service included in Fort St. John's corporate inventory. This information must be included in Fort St. John's corporate inventory (and reported to the provincial government) going forward.
- Implement a process to monitor and track energy consumption for individual buildings and vehicles. This may include implementing energy management software. By tracking individual buildings, vehicles and the performance of renewable energy installations, the impact of specific emissions reduction actions will be much easier to quantify. As well, significant increases or decreases in energy consumption will be flagged (and addressed if necessary) much more quickly. The additional data will also assist in future action planning.

Appendices

Appendix 1 – Integrated Approach to Reducing Corporate GHG Emissions, Energy Use and Costs

SHIFTING INTO NEUTRAL: an integrated approach to reducing corporate GHG emissions, energy use and costs

2. CURRENT REALITY*

- FSJ has signed the Climate Action Charter and is committed to being carbon neutral by 2012.
- Sustainability is one of three principal goals in 2010-2011 Strategic Plan.
- FSJ has a Community Energy & Emissions Plan, but no specific reduction targets or strategies have been set for corporate operations.
- Main GHG emissions and energy costs are from buildings, fleet, and water pumping.
- Total energy costs: \$1.6M/yr. GHG emissions: 3.6tCO_{2e}/yr. Offset liability: \$90k/yr.
- Community Energy Manager collaborates with a few staff in Facilities and Infrastructure, but generally departments mostly operate in silos.
- Capacity to plan for and implement energy reduction measures are distributed across 6 departments (Facilities, Public Works, Infrastructure, Planning and Eng., Corporate affairs, Finance).
- Many directors and 2iCs of key departments are at capacity.
- Budget is already in process for 2012; new capital expenditures will have to wait to 2013 if they don't fit within current budget plans.

3. NEXT STEPS

- Use carbon neutrality as a test case to improve sustainability implementation.
- Q4-2011:**
 - Form "Shifting to Neutral" interdepartmental team. See suggested membership, structure, and mandate as discussed at Nov 25 meetings in attached document.
- Q1 2012:**
 - Half-day workshop to:
 - o Review GHG/energy reductions projects that are being considered
 - o Identify other win-win opportunities
 - o Generate criteria to decide what projects should move forward in 2012 (using available budget) and 2013 (with possibility for additional capital investment).
 - Evaluate impact of proposed projects (e.g., GHG reduction potential, savings, costs, etc.) and take first cut at ranking.
- Second half-day workshop to:
 - o Review ranking and agree on recommended list of projects for 2012/13
 - o Assign responsibilities and confirm there is capacity
 - o Create process to track and report on progress
 - o Set corporate GHG reduction targets.
- Compile these results into Carbon Neutral Plan and present to Council.
- Q2 2012:**
 - First quarterly meeting of SiN team. Review progress to date and start planning for 2013 budget.

1. DESIRED FUTURE

- FSJ has corporate emission reductions targets, and leads by example in the community by reducing its energy use.
- All planning processes are informed by sustainability principles.
- For all sustainability priorities, targets are set and indicators are tracked to assess progress.
- Progress is reported to Council regularly.
- Staff across departments who hold levers for sustainability actions are engaged.
- Check points are regularly scheduled to reflect on challenges and success and analyze indicator data.
- This learning process is integrated with ongoing planning processes (yearly budget, OCP, etc.).
- Sustainable tasks/goals are included in job descriptions and performance reviews.
- Sustainability is anchored in the structure and culture of the organization.

* Read from 1 to 3 to follow the design approach (i.e., define desired future, clarify current reality, identify next steps, repeat), or from left to right to follow chronological order.

Appendix 2 – Sample Carbon Neutral Dashboard

Appendices

FORT ST JOHN SHIFT INTO NEUTRAL



VISION
Fort St. John – where nature lives, families flourish and businesses prosper.

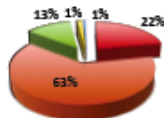
MISSION
To facilitate a vibrant and welcoming community that embraces opportunity and sustainability through the development of innovative strategies that guide the provision of municipal services in order to increase the quality of life of our residents

GHG TARGETS
Carbon Neutral municipal operations by 2012
Community targets Corporate targets
12% below 2007 by 2030 33% below 2008 by 2020
1% below 2007 by 2020 21% below 2008 by 2017
3% above 2007 by 2015 14% below 2008 by 2014

| INFRASTRUCTURE & LAND USE | FLEET & TRANSPORTATION | ALTERNATIVE ENERGY | BUILDINGS | PLANNING & MONITORING |
|---|---|--|--|---|
| <p>Key Message Community lighting and water treatment & delivery account for more than half of FSJ's electricity use, providing unique opportunity for cost and electricity savings. Land use is probably the most important factor in long term reductions at the community and corporate level. Creating more compact and complete communities reduces infrastructure costs, makes alternative energy and district energy technologies more viable, encourages more walking and cycling, improves transit options, and preserves land for agricultural, commercial and industrial uses, parks, and habitat protection.</p> <p>Indicators <i>baseline</i></p> <p>PROJECT 1 – Water System Master Plan E.T.A. lead: Victor Skjoldal Expand business water reduction program Review water pricing</p> <p>PROJECT 2 – Implement dark sky policy E.T.A. lead: Kevin Brooks Next step /Milestones...</p> <p>PROJECT 3 – Reduce snow removal costs E.T.A. lead: Don Demers support: Kevin Brooks Next step /Milestones...</p> <p>PROJECT 4 E.T.A. lead: Next step /Milestones...</p> | <p>Key Message Fleet and machinery account for 13% of FSJ's GHG emissions. Reducing km travelled, using low-carbon fuels, and improving vehicle efficiency through vehicle sizing, maintenance, and driving practices are key strategies to reduce overall cost and GHG footprint of the fleet. At the community level, a transportation system focused on addressing local mobility needs can decrease GHG emissions, improve community health and safety, and allow access for all.</p> <p>Indicators <i>baseline</i></p> <p>PROJECT 1 – Alternative fuel for fleet E.T.A. lead: Marty Paradis support: Joanne Walsh Next step /Milestones...</p> <p>PROJECT 2 – Create right-sizing policy for new fleet purchases E.T.A. lead: Don Demers support: Jeremy Gasser, Joanne Walsh Next step /Milestones...</p> <p>PROJECT 3 – Reduce fleet use E.T.A. lead: Don Demers support: Marty Paradis, Diane Burke, Jeremy Gasser, Joanne Walsh Car co-op mode for staff vehicles Idle reduction procedure for city facilities Replace garbage bins to reduce collection frequency</p> <p>PROJECT 4 E.T.A. lead: Next step /Milestones...</p> <p>PROJECT 5 E.T.A.</p> | <p>Key Message By promoting clean and renewable energies, we can reduce our GHG footprint, increase our energy self-sufficiency, and situate FSJ as a leader in a growing clean tech sector. Wind power, solar power, solar water heaters, geothermal heat, biomass heat, and the development of district energy systems are some of the alternatives available in the region, which we can develop to create jobs and a sustainable energy base.</p> <p>Indicators <i>baseline</i></p> <p>PROJECT 1 – District heating system in Centennial Park area E.T.A. lead: Marty Paradis support: Steve McLain Next step /Milestones...</p> <p>PROJECT 2 – Renewables at the pumping stations E.T.A. lead: Marty Paradis Next step /Milestones...</p> <p>PROJECT 3 – Micro-hydro (south lagoon) E.T.A. lead: Marty Paradis support: Victor Skjoldal Next step /Milestones...</p> <p>PROJECT 4 – Wind/PV streetlight pilot E.T.A. lead: Marty Paradis Next step /Milestones...</p> <p>PROJECT 5 – Wind farms in FSJ are pre-feasibility E.T.A. lead: Marty Paradis Next step /Milestones...</p> | <p>Key Message Buildings are the main source of energy use and emissions, accounting for 85% of our corporate carbon footprint. Green building practices increase the efficiency of buildings and their use of energy, water, and materials, and reduce building impacts on human health and the environment, through better siting, design, construction, operation, maintenance, and removal. To meet our long-term targets, we will need to retrofit most of our buildings and ensure that new buildings—which will contribute to our footprint the next 50 to 80 years—are built at the highest environmental standards.</p> <p>Indicators <i>baseline</i></p> <p>PROJECT 1 – Retrofit buildings E.T.A. lead: Ian Rogers support: Steve McLain Fire hall built to shadow LEED silver-gold standard New audits of civic facilities</p> <p>PROJECT 2 – Recommissioning of civic facilities E.T.A. lead: Ian Rogers support: Steve McLain Next step /Milestones...</p> <p>PROJECT 3 – Lighting retrofit E.T.A. lead: Steve McLain Next step /Milestones...</p> <p>PROJECT 4 – Benchmarking of civic facilities E.T.A. lead: Ian Rogers Next step /Milestones...</p> | <p>Key Message The ultimate goal is for sustainability best practices to become business as usual. This is enabled by the adoption of green policies at the municipal level, and by working with allies to encourage supportive provincial and federal policies. It also requires that system be put in place to track indicators, monitor progress towards set targets, and assess the effectiveness of actions taken.</p> <p>PROJECT 1 – Corporate Energy and Emissions Plan E.T.A. lead: Marty Paradis support: Diane Burke Set standards for reporting contracted services.</p> <p>PROJECT 2 – Carbon Fund Policy E.T.A. lead: Marty Paradis support: Diane Burke Next step /Milestones...</p> <p>PROJECT 3 – Green Procurement Policy E.T.A. lead: Marty Paradis support: Diane Burke, Joanne Walsh, Grace Rie Next step /Milestones...</p> <p>PROJECT 4 – Comprehensive "Asset Management" program E.T.A. lead: Marty Paradis support: Mike Roy, Victor Skjoldal Next step /Milestones...</p> <p>PROJECT 5 – Building monitoring software E.T.A. lead: Ian Rogers support: Marty Paradis Next step /Milestones...</p> |

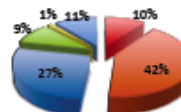
FORT ST JOHN'S SHIFT INTO NEUTRAL

Corporate GHG Emissions
(2010 total: 3400 tCO2e)



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

Corporate Energy Cost
(2010 total: \$1.6M)



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

| | | |
|--------------------------------------|--------|--------------------------|
| INFRASTRUCTURE & LAND USE | Lead | |
| FUTURE OPPORTUNITIES | E.T.D. | Next step /Milestones... |
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| ACHIEVED OUTCOMES/MILESTONES | When? | |
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| KEY LEARNINGS | | |
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|-------------------------------------|--------|--------------------------|
| | Lead | |
| | | Next step /Milestones... |
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| | | |
| FLEET & TRANSPORTATION | | |
| FUTURE OPPORTUNITIES | E.T.D. | |
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| ACHIEVED OUTCOMES/MILESTONES | When? | |
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| KEY LEARNINGS | | |
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| ALTERNATIVE ENERGY | | |
| FUTURE OPPORTUNITIES | E.T.D. | |
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| ACHIEVED OUTCOMES/MILESTONES | When? | |
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| KEY LEARNINGS | | |
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| PROJECT 5 - Behavioural campaign | E.T.A. | |
| Lead: Green Hub | | |
| Support: Diana Barton, Ross | | |
| Next step /Milestones... | | |
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| BUILDINGS | | |
| FUTURE OPPORTUNITIES | E.T.D. | |
| Snow cooling | | |
| Centralize work areas and city infrastructure | | |
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| ACHIEVED OUTCOMES/MILESTONES | When? | |
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| KEY LEARNINGS | | |
| | | |

LEGEND

Action items:
 ● on track
 ◊ Delayed
 ■ Impeded
 ○ not started
 ✓ completed

Indicators:
 ▲ upward trend, on track
 ▼ downward trend, on track
 ▲ upward trend, off track
 ▼ downward trend, off track
 N/A non available

Tom-Pierre Frappé-Sénéclauze and Claire Beckstead
The Pembina Institute, 2012



| | |
|-------------------------------------|--------|
| PLANNING AND MONITORING | |
| FUTURE OPPORTUNITIES | E.T.D. |
| Bylaw review - Diana (Grace) | |
| | |
| | |
| | |
| ACHIEVED OUTCOMES/MILESTONES | When? |
| | |
| | |
| KEY LEARNINGS | |
| | |

Appendix 3 – Provincial Carbon Neutral Inventory Scope

CARBON NEUTRAL LOCAL GOVERNMENT

Scope Document – 2010-5-07

| 1. GREENHOUSE GAS COVERAGE | |
|--|--|
| IN SCOPE | OUT OF SCOPE |
| <p>Six gases:</p> <ul style="list-style-type: none"> • Carbon dioxide – CO₂ • Methane – CH₄ • Nitrous oxide – N₂O • Sulphur Hexafluoride– SF₆ • Per fluorocarbons – PFCs • Hydro fluorocarbons – HFCs | <p>All other gases not considered GHGs</p> |
| 2. GEOGRAPHIC BOUNDARIES | |
| IN SCOPE | OUT OF SCOPE |
| <p>Emissions from Local Government (LG) operations located in British Columbia.</p> | <p>Emissions from LG operations outside of British Columbia.</p> |
| 3. ORGANIZATIONAL BOUNDARIES | |
| IN SCOPE | OUT OF SCOPE |
| <p>a) Traditional Local Government Services</p> <p>Emissions from LGs that:</p> <ul style="list-style-type: none"> • are parties to the Climate Action Charter; and • provide any of the following traditional services: <ul style="list-style-type: none"> ○ Administration and Governance ○ Drinking, Storm and Waste Water ○ Solid Waste Collection, Transportation and Diversion ○ Roads and Traffic Operations/Maintenance ○ Arts, Recreation and Cultural Services ○ Fire Protection | <p>a) Other Local Government Services</p> <p>Emissions from LGs that are not parties to the Climate Action Charter.</p> <p>Emissions from:</p> <ul style="list-style-type: none"> ○ Landfill ○ Transit services ○ Police Services ○ New construction (facilities, roads, etc.) ○ Primary power generation ○ Social housing ○ Tree farms ○ Community Sources (e.g., residential sources) |

2010-5-07

1

| 4. ORGANIZATIONAL BOUNDARIES (cont'd) | |
|--|---|
| IN SCOPE | OUT OF SCOPE |
| <p>b) Subsidiary Organizations and Shared Services:</p> <ul style="list-style-type: none"> • Emissions related to a traditional service provided by a subsidiary organization or through a shared service agreement that is either fully consolidated or consolidated on a modified equity basis, are included in the local government's carbon neutral operations. • For those organizations that are included in the financial statements on a proportional consolidation basis, the local government can include a proportionate share of the emissions related to a traditional service operated by the organization, using the same proportion for emissions as are used for financial statement purposes, or as otherwise agreed to by the parties who share a proportional responsibility for the service. | |
| 5. OPERATIONAL BOUNDARIES | |
| 5.1 STATIONARY SOURCES (buildings, structures, and related equipment/machinery) | |
| IN SCOPE | OUT OF SCOPE |
| <p>a) Direct emissions or indirect energy emissions from stationary sources used to provide traditional services.</p> <ul style="list-style-type: none"> • Direct emissions include those from the use of fossil fuels (e.g., natural gas, heating oil, propane) for heating space and water or producing steam. • Indirect energy emissions include those from electricity, hot water, steam etc. purchased from a third party (e.g., BC Hydro). | <p>a) Direct or indirect energy emissions from stationary sources owned by the Province of BC or a public sector organization who would be required to include the building's emissions as part of its carbon neutral requirement. For example, the Province is responsible for the emissions from the Vancouver Art Gallery and as such the City of Vancouver will not include those emissions in its corporate footprint.</p> |
| <p>b) Direct emissions released unintentionally (fugitive emissions) from stationary sources used to provide traditional services. For example: HFCs from cooling units in arenas.</p> | <p>b) Fugitive emissions from transmission lines.</p> |

| 5.3 MOBILE SOURCES (vehicle, park maintenance equipment, etc.) | |
|--|--|
| IN SCOPE | OUT OF SCOPE |
| <p>c) Direct emissions from:</p> <ul style="list-style-type: none"> • fleet vehicles and other mobile combustion sources used to provide traditional services; and • employee use of personal vehicles in the provision of traditional services (e.g., building inspection). <p>These emissions generally involve the mobile combustion of gasoline, diesel, propane, biofuel blends, etc.</p> | <p>c) Emissions from:</p> <ul style="list-style-type: none"> • transit buses • vehicle air conditioning (i.e., fugitive HFC emissions) • employee use of commercial transport (e.g., intercity air/train/bus; vehicle rentals; taxi). |
| 5.4 CONTRACTED SERVICES | |
| IN SCOPE | OUT OF SCOPE |
| <p>d) Direct emissions from mobile sources which are used by contractors to provide traditional services.</p> | <p>d) Emissions associated with:</p> <ul style="list-style-type: none"> • a contractor's corporate offices • travel to and from the contractor's offices |
| 5.5 PROCUREMENT | |
| IN SCOPE | OUT OF SCOPE |
| | <p>e) Indirect emissions associated with purchased office paper.</p> |

Appendix 4 – Complete List of Potential Actions

| PROJECT INFO | | | |
|------------------------|-----------|--|-------------------------------|
| Theme | scope | Project | Project Status |
| _planning & monitoring | corp | Building Monitoring Software (for Pomeroy SC) | Future project |
| _planning & monitoring | corp | Internal carbon fund | Active - on dashboard |
| _planning & monitoring | corp | Comprehensive “Asset Management” program | Active - on a director's desk |
| _planning & monitoring | corp | Corporate Energy and Emissions reduction Plan | Active - on CEM's desk |
| _planning & monitoring | corp | review bylaws to ensure it is simple to make sustainable choice | Future project |
| _planning & monitoring | corp | Set standards for reporting for contracted services | Future project |
| _planning & monitoring | corp | Green procurement policy | Future project |
| Alterative Energy | corp | District heating system in the Centennial Park area and ECM measures (include the new Fire Hall) | Active - on dashboard |
| Alterative Energy | corp | micro-hydro south lagoon | Active - on dashboard |
| Alterative Energy | corp/comm | Wind farms in FSJ area pre-feasibility | Future project |
| Alterative Energy | corp | Anaerobic digestion of city sewage / integrated waste heat recovery pre-feasibility | Future project |
| Alterative Energy | corp | Nexterra bioenergy project | Future project |
| Buildings | corp | snow cooling | Future project |
| Buildings | corp | Solar thermal hot water at City Hall | Completed |
| Buildings | corp | Implement LEED policy for new municipal buildings; geothermal policy; DE ready | Future project |
| Buildings | corp | Internal tax to encourage load shedding and conservation (related to internal carbon fund) | Future project |
| Buildings | corp | behavioral campaign | Future project |
| Buildings | corp/comm | Benchmarking of civic facilities (asset life expectncy and condition) | Future project |

Appendices

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|---------------------------|-----------|---|-------------------------------|
| Buildings | corp | lighting retrofit | Active - on a director's desk |
| Buildings | corp | fire hall built to LEED silver-Gold standard | Active - on dashboard |
| Buildings | corp | Rec Area Lighting | Active - on dashboard |
| Buildings | corp | install solar heating to supplement the gas fired furnaces in the equipment storage bay | Completed |
| Buildings | corp | City LED streetlight retrofit and dimming (or PV) | Future project |
| Buildings | corp | build heated garage to avoid idling | Future project |
| Buildings | corp | recomissioning of civic facilities | Future project |
| Buildings | corp | Public works solar heating installation | Completed |
| Buildings | corp | set heating units running in freeze protect mode in buildings that are not frequented daily | Completed |
| Buildings | corp/comm | Refurb demo | Completed |
| Buildings | corp | Retrofits round 2: new audits of civic facilities | Future project |
| Buildings | corp | Install capacitors at treatment plants to reduce electrical spikes | Active - on a director's desk |
| Buildings | corp | install low-flow toilets in muni buildings | Completed |
| Buildings | corp | Centralize work areas and city infrastructure | Future project |
| Buildings | corp | Peer review lighting specs | Future project |
| Land Use & Infrastructure | corp/comm | Growth boundary (100% infill) | Future project |
| Land Use & Infrastructure | corp | reduce snow removal cost | Future project |
| Land Use & Infrastructure | corp/comm | Review water pricing | Future project |
| Land Use & Infrastructure | corp | Expand business water reduction program | Future project |
| Land Use & Infrastructure | corp | Water System Master Plan | Active - on dashboard |
| Land Use & Infrastructure | corp | Consider on-site renewables for pumping stations | Future project |
| Land Use & Infrastructure | corp/comm | Implement dark sky policy | Future project |

Appendices

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|---------------------------|------|--|------------------------|
| Land Use & Infrastructure | corp | Solar powered compactors (trash cans) | Active - on CEM's desk |
| Land Use & Infrastructure | corp | portable solar powered radar signs | Completed |
| Land Use & Infrastructure | corp | programmed watering system for parks to reduce evaporation losses | Completed |
| Land Use & Infrastructure | corp | rainwater harvesting at enerplex parking lot | Completed |
| Land Use & Infrastructure | corp | solar power bus shelters | Completed |
| Land Use & Infrastructure | corp | Solar powered pedestrian signals | Completed |
| Land Use & Infrastructure | corp | Solar powered compactors (trash cans) | Completed |
| Transportation / Fleet | corp | Fleet management - E3 and Evergreen fleets | Active - on dashboard |
| Transportation / Fleet | corp | Biodiesel for fleet | Future project |
| Transportation / Fleet | corp | right-sizing for new fleet purchases | Active - on dashboard |
| Transportation / Fleet | corp | consider Alternate fuels: EV, NG, Hybrids, recycled oil, biodiesel | Future project |
| Transportation / Fleet | corp | idle reduction procedure for public works | Future project |
| Transportation / Fleet | corp | use water from backwash tank at the water treatment plant to clean streets | Completed |
| Transportation / Fleet | corp | reduce number of new vehicles by using 'car coop' model of vehicle sharing for staff | Active - on dashboard |
| Transportation / Fleet | corp | use crew cab to reduce ground crew travel | Completed |
| Transportation / Fleet | corp | use mulching blades on lawnmowers to reduce hauling and fertilizer use | Completed |
| Transportation / Fleet | corp | Use trenching technology to reduce work needed to install underground infrastructure | Completed |
| Transportation / Fleet | corp | self watering planters and hangers | Now BAU |
| Transportation / Fleet | corp | use bicycle for GPS data collection | Now BAU |
| Transportation / Fleet | corp | use bike patrols for RCMP | Now BAU |
| Transportation / Fleet | corp | increase size of garbage bins in park to reduce collection frequency | Completed |

Appendix 5 – Inventory and Reporting Resources

| Resource Title | Link |
|--|---|
| Becoming Carbon Neutral Local Government Workbook | http://www.toolkit.bc.ca/sites/default/files/CarbonNeutralWorkbook.V2_noapdcs_03.12_0.pdf |
| Becoming Carbon Neutral Local Government Guidebook | http://toolkit.bc.ca/sites/default/files/CNLG%20Final%20July%202011_0.pdf |
| Contracted Out Services | http://www.toolkit.bc.ca/sites/default/files/CNLG_Contracted%20Emissions_April%202012%20_FINAL.pdf |
| Tools to Measure Emissions | http://www.toolkit.bc.ca/sites/default/files/Self%20Certification%20Business%20Process%20Checklist_print_0.pdf |
| 2011 Methodology for Reporting B.C. Local Government GHG Emissions | http://www.env.gov.bc.ca/cas/mitigation/pdfs/Methodology_for_Reporting_BC_Local_Government_GHG_Emissions.pdf |
| Moving Forward with Carbon Neutral Government: Engagement | http://www.env.gov.bc.ca/cas/mitigation/carbon_neutral.html#engagement |

About the Authors

Marty Paradine

Marty Paradine is the Corporate Sustainability Manager for the City of Fort St. John. His focus is on community energy planning, policy design, and the implementation of the Community Energy and Emissions Plan – all focused on reducing community-wide greenhouse gases (GHG). Corporate energy management efforts include energy conservation measures, life cycle cost minimization, GHG reductions and renewable energy project implementation. Furthermore, he is tasked with leading the city in achieving carbon neutrality by managing emissions from buildings, fleet, public services and contracted services.

Marty holds a Bachelor of Science in Mechanical Engineering from the University of Manitoba, a Master of Science in Renewable Energy from the University of Oldenburg in Germany, and recently completed a Master in Business and Administration from Blekinge Institute of Technology in Sweden.

For more information on this report, please contact Marty at mparadine@fortstjohn.ca.

Claire Beckstead

Claire Beckstead is a Senior Technical and Policy Advisor with the Pembina Institute's Sustainable Communities Group. She is engaged in community energy planning with municipalities and First Nations communities in British Columbia, and has worked with many small and large communities across the province. Claire has experience in community energy planning (including greenhouse gas inventory analysis), facilitation and stakeholder engagement, and research and policy design. Claire is currently involved in the Pembina Institute's Green Building Leaders project, and is working with more than twelve local governments to design municipal and provincial policies to reduce greenhouse gas emissions from buildings in B.C. Prior to joining the Pembina Institute, Claire worked with Ontario school boards researching the non-technical barriers to installing solar photovoltaic projects on primary and secondary schools. Claire holds a Master of Environmental Studies from the University of Waterloo.

Tom-Pierre Frappé-Sénéclauze

Tom-Pierre Frappé-Sénéclauze is a technical and policy advisor with the Pembina Institute's Sustainable Communities Group. He facilitates the development and implementation of policies to reduce greenhouse gas emissions and energy use from communities and municipal operations across British Columbia. Prior to joining Pembina, Tom-Pierre worked as a facilitation

consultant, building strategic partnerships for energy conservation between local government, community groups, and utilities. Tom-Pierre started his career as a climate scientist, measuring and modeling the dynamic behavior of alpine glaciers in the Yukon and Norwegian Arctic. He has taught the science and policy of climate change at the university level and in the community, and recently developed a continuing education course on climate literacy for professionals. Tom-Pierre holds a physics degree from L'Université Laval, a master's in glaciology from the University of British Columbia, and is a LEED® accredited professional.