



Town of St. Stephen Partners for Climate Protection: Milestone 1



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REPORT TO

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April 4, 2017**

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Executive Summary

The Town of St. Stephen began participating in the Federation of Canadian Municipalities' (FCM) Partners for Climate Protection (PCP) program in July of 2004. The PCP program consists of a five milestone approach that begins by developing a greenhouse gas (GHG) emission inventory for both the municipality (corporation), and the homes and businesses therein (community).

Eastern Charlotte Waterways Inc. received funding from the New Brunswick Environmental Trust Fund (ETF) to commence work on behalf of the Town of St. Stephen under the PCP program by developing the Town's GHG emissions inventory, a forecast of GHG emissions, emissions reduction targets, and to initiate the development of a Local Action Plan for both the corporation and the community.

The corporate GHG inventory was developed by gathering various datasets for buildings, streetlights, vehicle fleet, water and sewage, and solid waste. In total, these five sectors produced 1,768 tonnes of CO₂e in 2015 (Figure A). The buildings, and waste & water sector generated the greatest volume of greenhouse gas emissions.

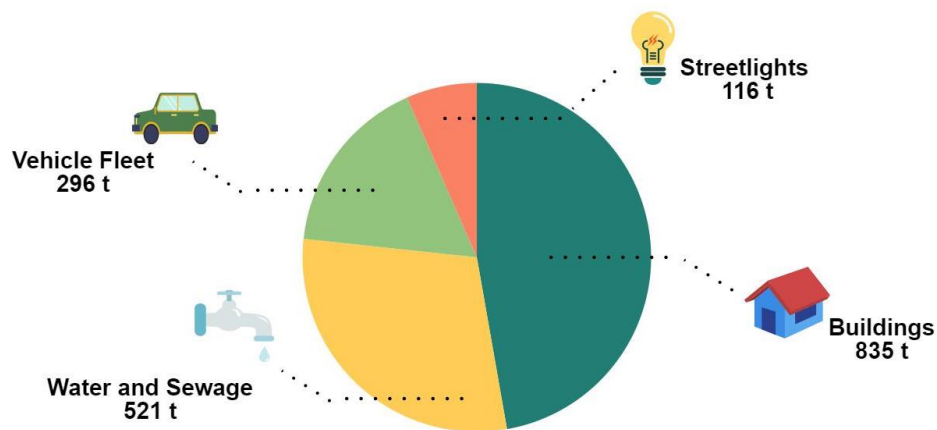


Figure A Corporate CO₂e Greenhouse Gas Emissions by Sector (2015)

The community GHG inventory was developed by gathering various datasets for the residential, commercial, industrial, transportation and waste sectors within the Town of St. Stephen. These emissions are under the direct control of community stakeholders, however the Town can influence these sectors by providing education and outreach, and program and policy support for reduction measures in each sector. In total, these five sectors produced 45,955 tonnes of CO₂e in 2015 (Figure B). The transportation, and residential sectors contributed to the greatest proportion of total emissions.

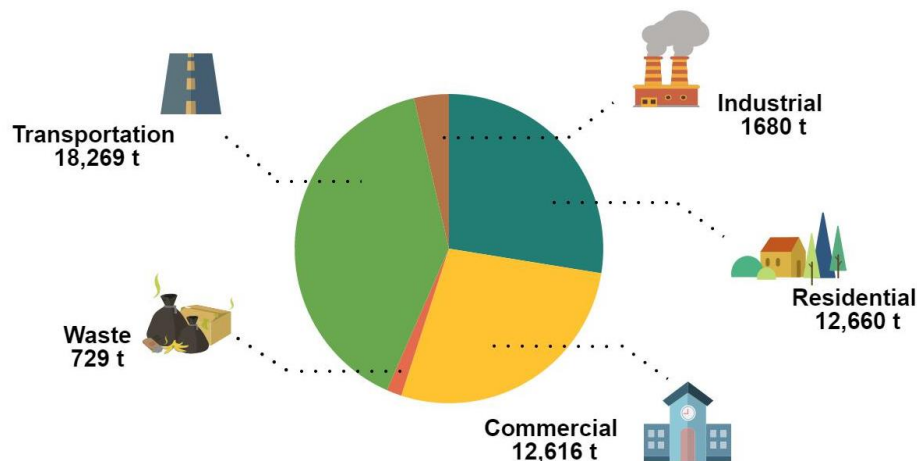


Figure B Community CO₂e Greenhouse Gas Emissions by Sector (2015)

1.0 Introduction

Human activity has dramatically increased emissions of greenhouse gases (GHGs) in the atmosphere. The build-up of GHGs in the atmosphere has led to an enhancement of the natural greenhouse effect and ongoing emissions of GHGs have the potential to warm the planet to levels that have never been experienced in the history of human civilization. Such climate change could have far-reaching and/or unpredictable environmental, social, and economic consequences. These consequences have motivated governments to reduce greenhouse gas emissions and act on climate change.

In 2016, more than 190 countries, including Canada, signed the Paris Agreement. Under the agreement, countries set their own targets for reducing emissions, with a goal to limit the global temperature increase to below 2°C and to pursue efforts to limit this increase to 1.5°C, in order to avoid the most severe climate change impacts.

The Government of Canada has set a GHG emission reduction target of 523 Mt by 2030, and the Government of New Brunswick has set a target of 10.7 Mt by 2030. These targets represent a reduction of 30% below 2005 levels by 2030. New Brunswick has also set a GHG emission target of 5 Mt by 2050.

Local governments will play a crucial role in helping to reach these targets as up to half of Canada's GHG emissions are under the direct or indirect control or influence of municipal governments. In response, the Federation of Canadian Municipalities (FCM) designed its Partners for Climate Protection (PCP) program to encourage and assist municipalities to manage their contributions to climate change and encourage their communities to participate in local reduction initiatives. At the same time, it was recognized that municipalities are on the front line of this issue; and that they have an opportunity to save money while leading the development of much more sustainable communities. Local governments can drive systemic low-carbon practices, including: building high-efficiency buildings, undertaking building retrofits and developing district heating; building active transit, electric vehicle infrastructure and

electrified public transit; implementing near-zero GHG waste plans; and delivering high-efficiency water and wastewater services.

Investments in these types of measures also reduce operating costs, help municipalities maintain and plan for future community services, protect public health, support sustainable community development, increase community resilience and reduce a community's vulnerability to environmental, economic and social stresses.

The PCP program commits members to adopt a community GHG reduction target of 30 per cent below 2005 levels by 2030, in line with the Government of Canada's target, and to adopt a corporate GHG reduction target that is similar or more ambitious, and to consider adopting a deeper community and corporate emissions reduction target of 80 per cent by 2050.

2.0 Community Profile

St. Stephen is located at the estuary of the St. Croix River and the coast of Passamaquoddy Bay. It covers an area of approximately 13.45km². The Town of St. Stephen was officially incorporated in 1871. In 1973 the municipalities of Milltown and St. Stephen were amalgamated and designated as the Town of St. Stephen (Province of New Brunswick, 2015). The St. Croix River acts as the International Boundary, separating the towns of St. Stephen, New Brunswick and Calais, Maine. The two communities are connected at three international border crossings, Ferry Point International Bridge, the Milltown International Bridge, and the International Avenue Bridge (Town of St. Stephen, 2010). St. Stephen is also home to Canada's oldest candy company, Ganong Bros. and has been deemed "Canada's Chocolate Town" (Town of St. Stephen, 2010). The population of St. Stephen was 4817 in 2011 and dropped to 4415 in 2016. An annual population decline of 0.14% (Statistics Canada, 2017).

2.1 Joining the Partners for Climate Protection Program

In 2016, Eastern Charlotte Waterways Inc. (ECW), a local not-for-profit environmental resource and research centre, was granted funding from the New Brunswick Environmental Trust Fund (ETF) to quantify the Town of St. Stephen's GHG emissions, set a reduction target, and develop a local action plan following PCP program framework. In July, ECW presented the details of the PCP Program to the Town of St. Stephen council, highlighting the benefits, and requested that council begin the program.

The Mayor and Council of the Town of St. Stephen resolved, on September 26, 2016, that Town of St. Stephen proceed with Milestones 1-3 of the PCP program.

The PCP program allows flexibility in the progression through it, but recommends that GHG inventories be developed as a first step. A GHG inventory is an audit of activities that contribute to the release of emissions. The program requires that a baseline GHG emission inventory be developed, and that a 10 year forecast of the Town's GHG emissions from the baseline be estimated for both the municipality and for the community as a whole. Based on the availability of accurate data, the Town, in consultation with Eastern Charlotte Waterways Inc., selected a base year of 2015.

2.2 Partners for Climate Protection Process

The PCP program is administered through the FCM, and prescribes a five milestone framework used to assist local governments and municipalities in a process intended to reduce greenhouse gas emissions.

Over 300 municipal governments across Canada representing more than 65 per cent of the population have already committed to reducing corporate and community GHG emissions through the PCP program since its inception in 1994. To date, 44 municipal governments in New Brunswick have joined the program.

This project will enable the Town to complete Milestones #1 and #2. In addition, the outcome of this project serves as the foundation for the development of the Local Action Plan (LAP) required to fulfill Milestone #3. The five program milestones include:

- Milestone 1: Creating a greenhouse gas emissions inventory and forecast;
- Milestone 2: Set an emissions reductions target;
- Milestone 3: Develop a LAP to reduce GHG emissions;
- Milestone 4: Implement the local action plan or a set of activities; and
- Milestone 5: Monitor progress and report results.

3.0 Methodology

The following guidance and standards documentation was considered when developing the GHG emission inventory:

- Developing Inventories for Greenhouse Gas Emissions and Energy Consumption (Partners for Climate Protection);
- Cities for Climate Protection Guidelines (International Council for Local Environmental Initiatives (ICLEI));
- Canadian Standards Association (CSA) ISO 14064 Standards;

Real energy consumption (RC) data was used as the preferred input for GHG emission calculations. A data set is considered real consumption data when a vendor can provide accounting records that adhere to rigorous, third party scrutiny in accord with standard accounting principles. Where these data sets were not available, activity data (AD) from authoritative, defensible sources were used to estimate the inputs required for GHG emission calculations. A data set is considered activity data when indicators, averages, survey results, or national, provincial, or regional data is employed to estimate consumption.

Table 1 Summary of Data Type Sources - Real Consumption (RC) or Activity Data (AD)

Operational Category or Sector Category	Type of Data Source					
	Electricity	Natural Gas	Fuel Oil	Gasoline /Diesel	Other Fuels	Waste
CORPORATE INVENTORY						
Buildings	RC	RC	RC	-	-	-
Wastewater & Potable Water	RC	-	RC	-	-	-
Fleet	-	-	-	RC	-	-
Solid Waste	-	-	-	-	-	-
Street & Area Lighting	RC	-	-	-	-	-
COMMUNITY INVENTORY						
Residential	RC	AD	AD	-	AD	-
Commercial	RC	AD	AD	-	AD	-
Industrial	RC	AD	AD	-	AD	-
Transportation	-	-	-	AD	AD	-
Solid Waste	-	-	-	-	-	RC

4.0 Corporate Greenhouse Gas Emissions Inventory - Milestone 1

The Corporate GHG emission inventory includes energy consumption and contributions from:

- Buildings;
- Vehicle Fleet;
- Street, Traffic and Area Lights;
- Water and Waste Water Systems (e.g., lift stations, water pumps); and
- Corporate Solid Waste.

The energy consumption data was converted into a GHG emissions inventory using the web-based PCP Milestone Tool. The Milestone Tool includes the ability to input energy and emissions data for multiple inventory years, and track progress over time.

Overall, the Town of St. Stephen operations consumed 24,286 GJ of energy and produced 1,678 tonnes of CO₂e in 2015 (Table 2). Approximately 72% of the emissions were produced by electricity consumption, and the remainder by diesel, natural gas, gasoline and fuel oil consumption. A more detailed look into emissions can be found in the following sections.

Table 2 Corporate Greenhouse Gas Emission Summary for 2015

GHG Emissions (Tonnes of CO₂e)	2015
Buildings	835
Vehicle Fleet	296
Streetlights	116
Water and Wastewater	521
Solid Waste	-
Total GHG	1,768

4.1 Buildings

The building sector traditionally accounts for a significant proportion of local government operations emissions. Corporate building electricity consumption data was retrieved from monthly NB Power bills provided by the Town. Natural gas consumption data was retrieved from monthly Irving Ltd. invoices provided by the Town. Furnace oil consumption data was retrieved from monthly invoices provided by the Town.

Table 3 Energy Consumption and GHG Emissions for Town Buildings in 2015

Building	Electricity (kWh)	Natural Gas (GJ)	Furnace Oil (L)	Total Emissions (t of CO₂e)
Garcelon Civic Centre	1,669,320	2847		606.54
Public Works/Fire Hall	142,480		18,825	91.38
Clark Building	155,862			43.64
Library	147,040			41.17
RCMP	101,430			28.4
Milltown Pool	63,650			17.82

Airport	14,272			4.00
Band Stand	2,125			0.6
Court	2,202			0.62
Total	2,298,381	2847	18,825	834.17

In total, the GHG emission's associated with operating the Town's buildings were 835 tonnes of CO₂e. This represents 47% of all corporate sector emissions.

4.2 Vehicle Fleet

The vehicle fleet includes all motorized vehicles operated by the Town of St. Stephen. Vehicle fleet fuel consumption data was retrieved from monthly fuel purchase records provided by the Town (Table 4). The information did not provide an indication of how many vehicles the Town of St. Stephen possessed, or used in 2015. Further, it did not provide a breakdown of fuel type or volume used by each vehicle.

Table 4 Volume of Fuel Consumed and GHG Emissions for Town Owned Vehicles

Fuel	Litres	Total Emissions (t of CO ₂ e)
Gasoline	40,848	93.91
Diesel	74,008	202.26
Total	-	296.17

In total, the GHG emission's associated fuel combustion in the Town's vehicle fleet were 296 tonnes of CO₂e. This represents 17% of all corporate sector emissions.

4.3 Street, Traffic and Area Lights

Street light electricity consumption data was retrieved from monthly NB Power bills provided by the Town which detailed traffic lights, area lighting, streetlights and unmetered services in the Town. For the first five groups, which consists of traffic signals and park lighting, kWh consumption was metered and billed separately. The following five area lighting groups were billed on the basis of monthly estimates of electricity used. To determine total kWh used, it was assumed that the Town of St. Stephen was charged 0.1295\$/kWh from January to September, and 0.1316\$/kWh as indicated on the bill. Based on the total monthly cost, kWh used were determined.

The remaining light groups were billed at yearly rates. To determine kWh, a conversion factor of 438 kWh/year/100W-light was applied. This was found by assuming each light was on for an average of 12 hours per day over the 365 days in the year.

Table 5 Energy Consumption and GHG Emissions for Town Streetlights

Streetlight Group Name	Total Use (kWh)	#of Streetlights	Total Emissions (t of CO₂e)
King St. / Union St.	1536	-	0.43
King St. / Superstore	3335	-	0.93
Waterfront	8879	-	2.49
King St. / Queen St.	1672	-	0.47
Parks	5714	-	1.6
100 W/HPS Light	24,070	19	6.74
100 W/HPS Light with wood pole	8287	5	2.32
200 W/HPS Light with wood pole	2382	1	0.67
1000 W/MH Floodlight	5318	1	1.49
400 W/MH Floodlight	6145	2	1.72
100 W/LED Light	223,380	510	62.55
100 W/LED Light with aluminum pole	1314	3	0.37
100 W/LED Light with concrete pole	7008	16	1.96
100 W/LED Light with wood pole	13,140	30	3.68
150 W/LED Light	10,512	16	2.94
150 W/LED Light with concrete pole	4599	7	1.29
200 W/LED Light only	14,016	13	3.92
100 W/HPS	5694	13	1.59
100 W/HPS Light with concrete pole	438	1	0.12

100 W/HPS Light with wood pole	438	1	0.12
100 W/HPS Photo-Controlled	7008	16	1.96
70 W/HPS Photo-Controlled	18,396	60	5.15
175 W/MV Photo-Controlled	19,929	26	5.58
Flashing Light	7510	7	2.10
Self-Contained Sign Lighting	1226	1	0.34
Traffic Control Light	12,092	2	3.39
Total	414,038	750	115.92

In total, the GHG emissions associated with operating the Town's streetlights were 116 tonnes of CO₂e. This represents 6.5% of all corporate sector emissions.

4.4 Water and Wastewater Systems

The emissions associated with water and wastewater management systems can be highly variable in local government operations inventories. A number of factors influence this variability, including any sanitary sewer and potable water treatment plants in the system, and the local topography which affects the pumping and movement of water. Water and wastewater system real consumption data sets were retrieved from monthly NB Power bills provided by the Town. Monthly records for each facility were provided, which were compiled into yearly consumption totals.

Table 6 Energy Consumption and Emissions for Operation of Town's Water and Wastewater System

Facility	Electricity (kWh)	Fuel Oil (L)	Total Emissions (t of CO ₂ e)
Waste Treatment Plant	950,760		266.21
Lift Stations	424,340		118.82
Pumps	327,700		91.76
Maxwell Crossing Building	91,140	3078	33.94
Reservoirs	27,796		7.78
Dechlorination Chamber	6,387		1.79
Total	1,828,123	3078	520.3

In total, the GHG emissions associated with operating the Town's Water and Waste Water Systems were 521 tonnes of CO₂e. This represents 30% of all corporate sector emissions.

4.5 Corporate Solid Waste

Emissions from solid waste, mostly in the form of methane, enter the air directly as waste decomposes. The corporate solid waste sector is often a small portion (> 3%) of total corporate sector emissions. Nonetheless, cost-savings and emission reduction opportunities are present within this sector. The data for this sector was deemed inconclusive, or not statistically significant. The overall admissions for this section are ad minimus.

4.6 Business-As-Usual (BAU) Forecast

The PCP Program requires municipalities to develop a simple forecast reflecting a business-as-usual scenario 10 years into the future. Generally, forecasts for municipal operations for most sectors will mirror the population projections for a community. For the Town of St. Stephen, this is challenging, as the permanent resident population has been in decline over recent years as it is a small, rural community. The population of St. Stephen was 4817 in 2011 and dropped to 4415 in 2016. An annual population decline of 0.14% (Statistics Canada, 2017) which would indicate a potential for limited or no increase in emissions over the next 10 years.

4.7 Reduction Target – Milestone 2

As of 2016, the PCP program commits members to adopt a corporate GHG reduction target of 30 per cent below 2005 levels by 2030, in line with the Government of Canada's target. In the past, the PCP program committed members to adopt a corporate GHG reduction target of 20 per cent below 2000 levels within 10 years of joining the PCP program.

With recent population decline, an increase in federal and provincial funding for GHG emission reduction projects (see Section 6.0 for further details), and the fact GHG emissions associated with electricity generation in New Brunswick is likely to decrease in the upcoming years, it is recommended that the Town of St. Stephen set a reduction target of 30% below 2015 levels by 2030. This is a reduction of 530 tonnes of CO₂e.

5.0 Community Greenhouse Gas Emissions Inventory – Milestone 1

The Community GHG emission inventory includes energy consumption and contributions from the:

- Residential Sector;
- Commercial and Institutional Sector;
- Industrial Sector;
- Transportation; and
- Solid Waste.

Overall, the community of St. Stephen consumed 626,984 GJ of energy and produced 45,955 tonnes of CO₂e in 2015 (Table 7). Approximately 39% of the emissions were produced by

electricity consumption, 27% by gasoline consumption, and 13% by fuel oil consumption. A more detailed look into emissions can be found in the following sections.

Table 7 Community Greenhouse Gas Emissions Summary for 2015

GHG Emissions (Tonnes of CO₂e)	2015
Residential	12,660
Commercial	12,616
Industrial	729
Transportation	18,269
Solid Waste	1,680
Total GHG	45,955

5.1 Residential Sector

Similar to the building sector in the municipal inventory, the residential sector is a large producer of GHG emissions. Real consumption data for the residential sector in the form of total electricity consumption was acquired from NB Power. Under NB Power, residential includes domestic use, use in churches and farms. In 2015, NB Power had a total of 2,593 residential contracts. The majority, 2,502, were urban; 3 seasonal; and 88 rural, which resulted in a total of 35,597,149 kWh.

Based on the Natural Resources Canada's (NRCAN) Comprehensive Energy Use Database data for New Brunswick, the 35,597,149 kWh used by the residential sector in the Town of St. Stephen is assumed to account for 61.7 % of the energy consumed in 2015. The remaining energy consumption data was estimated using the consumption breakdown given in the database.

Table 8 New Brunswick Residential Sector Energy Use by Energy Source and Estimated Consumption in the Town of St. Stephen

Energy Source	Consumption Breakdown (%)	Energy Consumed (GJ)
Electricity	61.7	128,149.74
Natural Gas	1.8	3,738.57
Heating Oil	16.9	35,100.98
Other (Propane)	0.2	415.40
Wood	19.4 (N/A)	40,293.44
Total	100	207,698.12

Table 9 Residential Energy Consumption Estimates and GHG Emissions by Energy Type

Fuel Type	Units	Total Use	Total CO ₂ e
Electricity	kWh	35,597,149	9967.2
Natural Gas	M ³	97,282	186.00
Heating Oil	L	907,471	2,481.93
Propane	L	16,412	25.34
Total	-		12,660.47

The total value of all CO₂e produced by the residential sector in St. Stephen is estimated to be approximately 12, 660 tonnes. This represents 27.5% of all community sector emissions.

5.2 Commercial and Institutional Sector

Real consumption data for the commercial sector in the form of total electricity consumption was acquired from NB Power. Under NB Power, the commercial and institutional sector fall under “General Service” which are customers who use electricity for all purposes other than those specifically covered under the residential, industrial, street lighting or unmetered service categories. In 2015, NB Power had a total of 314 commercial contracts. The majority, 271, were “General Service 1” and the remaining 43 were “General Service 2” which resulted in a total of 26,579,172 kWh.

Based on the Natural Resources Canada’s (NRCAN) Comprehensive Energy Use Database data on commercial energy use for Atlantic Provinces, the 26,579,172 kWh used by the commercial sector in the Town of St. Stephen is assumed to account for 54.3% of the energy consumed in 2015. The remaining energy consumption data was estimated using the consumption breakdown given in the database.

Table 10 Atlantic Provinces Commercial Sector Energy Use by Energy Source and Estimated Consumption in the Town of St. Stephen

Energy Source	Consumption Breakdown (%)	Energy Consumed (GJ)
Electricity	54.3	95,685.02
Natural Gas	12.5	22,026.94
Light Fuel Oil	26.3	46,344.68
Heavy Fuel Oil	2.6	4581.60
Other (Propane)	4.3	7577.27
Total	100	176,215.51

Table 11 Commercial Energy Consumption Estimates and GHG Emissions by Energy Type

Fuel Type	Units	Total Use	Total CO ₂ e
Electricity	kWh	26,579,172	7442.17
Natural Gas	M ³	573,170	1095.90
Fuel Oil	L	1,198,156	3276.96
Heavy Fuel Oil	L	107,802	339.04
Propane	L	299,378	462.24
Total	-		12,616.31

The total value of all CO₂e produced by the commercial sector in St. Stephen is estimated to be approximately 12, 616 tonnes. This represents 27.5% of all community sector emissions.

5.3 Industrial Sector

Similar to the commercial and institutional sector, industrial sector energy consumption and GHG emissions can vary across municipalities based on the level of industry present within the municipality. Real consumption data for the residential sector in the form of total electricity consumption was acquired from NB Power. Under NB Power, industrial includes customers who use electricity chiefly for manufacturing, assembly or processing of goods, or the extraction of raw materials. In 2015, NB Power had a total of 13 small industrial contracts (up to 750 kilowatts) which resulted in a total of 978,528 kWh.

Based on the Natural Resources Canada's (NRCAN) Comprehensive Energy Use Database data on industrial energy use for Atlantic Provinces, the 978,528 kWh used by small industry in the Town of St. Stephen is assumed to account for 24.4% of the energy consumed in 2015. The remaining energy consumption data was estimated using the consumption breakdown given in the database. For Atlantic Provinces, a % was not available for natural gas, so the 34.5% was based on the assumption that the remainder of energy use is natural gas.

Table 12 Atlantic Provinces Industrial Sector Energy Use and Estimated Consumption in the Town of St. Stephen

Energy Source	Consumption Breakdown (%)	Energy Consumed (GJ)
Electricity	24.4	3522.70
Natural Gas	34.5	4980.87
Fuel Oil	9.4	1357.11

Heavy Fuel Oil	10.4	1501.48
Wood Waste and Pulping Liquor	21.3 (N/A)	3075.14
Total	-	14,437.30

Table 13 Industrial Energy Consumption Estimates and Emissions by Energy Type

Fuel Type	Units	Total Use	Total CO ₂ e
Electricity	kWh	978,528	273.99
Natural Gas	M ³	129,609	247.81
Fuel Oil	L	35,085	95.96
Heavy Fuel Oil	L	35,329	111.11
Total	-		728.87

The total value of all CO₂e produced by the industrial sector in St. Stephen is estimated to be approximately 729 tonnes. This represents 1.6% of all community sector emissions.

5.4 Transportation

The Vehicle Kilometers Travelled (VKT) method in the PCP Milestone Tool was used to determine community transportation emissions. This method takes into consideration the number of households in the community, the average number of vehicles per household in New Brunswick, and the average annual distance traveled by vehicles in New Brunswick. Based on the 2011 census, St. Stephen had a total of 2150 households. As provided in the PCP Milestone Tool, the average number of vehicles per household was 1.60, and the average annual distance travelled by vehicles in was 15,864.

The total value of all CO₂e produced by the transportation sector in St. Stephen is estimated to be approximately 18,269 tonnes. This represents 38% of all community sector emissions.

5.5 Solid Waste

Solid waste production information for the residential sector was available directly from the Southwest Solid Waste Commission. The waste category includes emissions produced from waste generated from the residential sector only. Industrial waste, construction waste and demolition waste, including concrete, wood, tires and contaminated soil, are not included in the community emissions inventory. Recyclables have also been excluded from the total, as they are not landfilled.

The 'methane commitment' approach available in the PCP Milestone Tool was used to determine emissions from the decomposition of waste. The Southwest Solid Waste Commission

facility does have containment cells 1-7 equipped with wells that allow for landfill gas (LFG) collection. Over the last two years, the facility has not been flaring methane regularly to convert into CO₂ because of an insufficient volume of gas. In 2015, the facility flared for 28 days. However, an accurate estimate of the landfill gas collected by the system is unavailable at this time (Dan Harrington, Regional Service Commission, Personal Communication, January 31 2017).

The total mass of waste sent to landfill from the Town of St. Stephen was 1269.67 tonnes. The decomposition of this waste is estimated to release 1680 tonnes of CO₂e. This value represents 3.7% of all community sector emissions.

5.6 Business-As-Usual (BAU) Forecast

The PCP Program requires municipalities to develop a simple forecast reflecting a business-as-usual scenario 10 years into the future. Generally, forecasts for municipal operations for most sectors will mirror the population projections for a community. For the Town of St. Stephen, this is challenging, as the permanent resident population has been in decline over recent years. The population of St. Stephen was 4817 in 2011 and dropped to 4415 in 2016. An annual population decline of 0.14% (Statistics Canada, 2017) which would indicate a potential for limited or no increase in emissions over the next 10 years.

5.7 Reduction Target - Milestone 2

As of 2016, the PCP program commits members to adopt a community GHG reduction target of 30 per cent below 2005 levels by 2030, in line with the Government of Canada's target. In the past, the PCP program committed members to adopt a community GHG reduction target of 6 per cent below 2000 levels within 10 years of joining the PCP program.

With recent population decline, an increase in federal and provincial funding for GHG emission reduction projects (see Section 6.0 for further details), and the fact GHG emissions associated with electricity generation in New Brunswick is likely to decrease in the upcoming years, it is recommended that the Town of St. Stephen set a community reduction target of 30% below 2015 levels by 2030. This is a reduction of 13,787 tonnes of CO₂e.

6.0 Discussion

This report completes Milestone #1 of the PCP program with the development of the corporate GHG emissions inventory and estimates for the community sectors. These may now be reported to the FCM and the Town's PCP status updated on the FCM website. Milestone #2 requires the setting of firm corporate and community GHG emissions reduction targets by the Town which needs to be adopted by council. It is recommended that council adopts the target of 30% below 2015 levels by 2030 as recommended by the PCP program, and set in this report.

In total, the GHG emission's associated with the Town of St. Stephen's operation in 2015 were 1,768 tonnes of CO₂e, and community emissions were 45,955 tonnes of CO₂e. GHG emissions vary for each municipality and energy needs and sources used are also different by community (Table 14).

Table 14 A Comparison of GHG Emissions Between Similar Sized Municipalities in New Brunswick

Municipality	Population	Corporate Emissions (t CO₂e)	Community Emissions (t CO₂e)	Per Capita Emissions
St. Stephen	4415	1,768	45,955	10.4
Hampton	4292	1,124	39,493	9.2
Tracadie	4933	1,953	71,532	14.5

Milestone #3 requires the development of a Local Action Plan (LAP) designed to meet the Corporate and Community emissions targets set in Milestone #2. Achievement of the corporate target will require close attention to each future decision that impacts the Town’s energy consumption. As participants in the PCP program, the Town of St. Stephen is eligible for financial assistance from the FCM Green Municipal Fund and Municipalities for Climate Innovation Program. The Town is also eligible to participate in other funding programs including the NB Power Commercial Buildings Retrofit Program and Locally Owned Renewable Energy Small Scale (LORESS) Program, and the New Brunswick Environmental Trust Fund (ETF). These funding programs can be used reduce energy consumption of municipal operations.

Additional resources will be required to engage the community and develop that portion of the Local Action Plan in a manner whereby the community takes ownership and identifies champions and initiatives that are most appropriate for it.

The setting of a community emission reduction target and the achievement of emission reductions may be much more of a challenge than meeting the corporate target, given the lack of data regarding the growth plans of the institutional, commercial, and small industrial sector. However, there are opportunities to improve the accuracy of the emissions inventory through participation of the community as part of a LAP. Given that most of the community GHG emissions are outside the direct control of the Town, the development of the LAP may best include considerable and effective involvement and interaction with the community, including the residents, businesses, industry and the operators of institutional facilities. The Town and the community may also wish to include their energy suppliers in their consultations.

While 44 other New Brunswick communities have joined the PCP program, St. Stephen has the opportunity to showcase leadership among its peers across the Province. This report provides an opportunity for the Town to complete Milestones #1 and #2 and, with some additional consultation with the corporate staff and community, to complete Milestone #3 in the future.

7.0 References

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Appendix A – Emission and Conversion Factors

Table 15 PCP Tool Emission Factors (Tonnes of CO₂e/Unit)

Energy Source	Emission Factor (Tonnes of CO₂e/Unit)
Electricity	0.000280
Natural Gas	0.001912
Fuel Oil	0.002735
Heavy Fuel Oil	0.003145
Kerosene	0.002544
Propane	0.001544
Diesel Stationary	0.002790

Table 16 PCP Tool Conversion Factors (GJ/Unit)

Energy Source	Conversion Factor (GJ/Unit)
Electricity	0.003600
Natural Gas	0.038430
Fuel Oil	0.038680
Heavy Fuel Oil	0.042500
Propane	0.025310
Gasoline	0.035000
Kerosene	0.037680
Diesel Stationary	0.038300
Ethanol Blend	0.033860
Biodiesel (B5)	0.038170
Biodiesel (B10)	0.038040
Biodiesel (B20)	0.038780