

Grand Bay-Westfield's Corporate GHG & Energy Action Plan



Realised with the



Climate Change and Energy Initiative

June 2018

Consulting team



Financed by



© 2018, Union of Municipalities of New Brunswick. All Rights Reserved.

The preparation of this plan was carried out with assistance from the Green Municipal Fund, a Fund financed by the Government of Canada and administered by the Federation of Canadian Municipalities. Notwithstanding this support, the views expressed are the personal views of the authors, and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.



Corporate GHG Inventory & Action Plan

I. Introduction

II. Strategy

III. Town profile

IV. Inventory

V. Action Plan

VI. Appendix



I. INTRODUCTION

A. CONTEXT

The simple fact of having asked for a greenhouse gas inventory and an action plan to reduce it already demonstrates the willingness of Grand Bay-Westfield's elected officials and municipal leaders to do their part in the protection of air quality and the environment !

Communities across Canada are facing the effects of climate change. Some have to deal with greater droughts, others with more violent storms. For example, shorter and warmer winters accentuate coastal erosion and damage to infrastructure, which is less well protected due to loss of coastal ice. Such repercussions will cost municipalities and their communities millions of dollars and the implementation of adaptation and mitigation measures in and for communities seems inevitable today. Municipal governments have a leading role to play in climate protection. They have direct or indirect control over nearly half of Canada's greenhouse gas (GHG) emissions (350 million tons).

Canada's goal is to reduce its GHG emissions by 30% below 2005 levels under the Paris Agreement.



I. INTRODUCTION

B. UMNb CCEI & PPC

CLIMATE CHANGE AND ENERGY INITIATIVE (CCEI) - Municipalities in New Brunswick are increasingly aware of environmental challenges they face, and are particularly concerned with actual and future impacts of climate change. The Town of Grand Bay-Westfield joined the Climate Change and Energy Initiative of the Union of Municipalities of New Brunswick, to reinforce its efforts to advance in the Partners for Climate Protection program (PCP). The UMNb initiative fits perfectly in the global and national context of addressing climate change, following the Paris Agreement (COP 21).

The UMNb CCEI aims to offer support to members to realize their corporate and community GHG inventories and Local Action Plan, as well as integrate the QUEST Community Energy Planning approach.

THE PARTNERS FOR CLIMATE PROTECTION (PCP) PROGRAM is a network of Canadian municipal governments that have committed to reducing greenhouse gases (GHG) and to acting on climate change. Since the program's inception in 1994, over 300 municipalities have joined PCP, making a public commitment to reduce emissions. PCP membership covers all provinces and territories and accounts for more than 65 per cent of the Canadian population. PCP is the Canadian component of ICLEI's Cities for Climate Protection (CCP) network, which involves more than 1,100 communities worldwide. PCP is a partnership between the **Federation of Canadian Municipalities (FCM) and ICLEI** — Local Governments for Sustainability.

As a member of UMNb, the Town of Grand Bay-Westfield has agreed to participate in CCEI.

[Link to: ACTION-GHG Grand Bay-Westfield](#)



I. INTRODUCTION

C. PARTNERS FOR CLIMATE PROTECTION PROGRAM (PCP) - METHOD

UMNB CCEI allows participating municipalities to complete the first 3 steps of the Partners for Climate Protection (PCP) program. Steps 4 and 5 consist of the implementation of action plans and the monitoring and reporting of results.



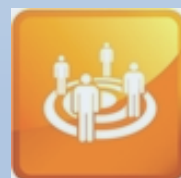
MILESTONE 1 CREATING A GREENHOUSE GAS EMISSIONS INVENTORY AND FORECAST

A greenhouse gas inventory brings together data on community and municipal energy use and solid waste generation in order to estimate greenhouse gas (GHG) emissions in a given year. The forecast projects future emissions based on assumptions about population, economic growth and fuel mix.



MILESTONE 2 SETTING AN EMISSIONS REDUCTIONS TARGET

An emissions reduction target can be established at any time. The target is normally set, however, following the development of an emissions inventory and forecast or after the quantification of existing emissions reduction measures.



MILESTONE 3 DEVELOPING A LOCAL ACTION PLAN

A Local Action Plan (LAP) is a strategic document that outlines how your municipality will achieve its greenhouse gas (GHG) emissions reduction target. The LAP covers municipal operations and the community.



II. STRATEGY

A. UMNb - CCEI OBJECTIVE AND STRATEGY

UMNB CCEI aims to design and implement projects:

- ✓ Which will be examples and role models for New Brunswick and other communities in Canada;
- ✓ Which will improve the quality of life of communities and can guarantee a better environment and economic benefits (energy savings, income, job creation);
- ✓ Which will develop expertise for UMNb members and for New Brunswick.

The strategy is based on the following principles:

1. Build an action plan and portfolio of environmentally and economically successful projects;
2. Design model and innovative projects;
3. Set ambitious and achievable reduction targets;
4. Build on existing programs and funds: for example, FCM and GMF programs, Environmental Trust Fund, NB Power programs, etc. ;
5. Maximize benefits for participating municipalities, their region.



II. STRATEGY

B. GHG EMISSION REDUCTION TARGET

For PCP and GMF, the GHG emission reduction targets of participating municipalities are set on a voluntary and non-binding basis. It is important that the targets are ambitious while being realistic both in their importance (projected reductions) and in their duration (year of maturity).

Before setting the reduction targets and the action plan timeline, we took into account:

- PCP and GMF recommendations.
- The objectives of the Government of New Brunswick.
- The GHG reduction potential of the municipality and its community.

The PCP and GMF make the following recommendations:

- For **the Corporate component**, that is, the municipality itself, the recommended target is -20% over the reference year, within 10 years. Thus, if the reference year is 2015, the year of maturity will be 2025.
- For the **Community component**, that is to say citizens, businesses, etc., the recommended target is -6% over the base year, within 10 years.

*** The New Brunswick's Climate Change Action Plan "Transitioning to a Low-Carbon Economy" (2017) - The provincial government will:** 31 - Establish specific GHG emission targets for 2020, 2030 and 2050 that reflect a total output of:
a - 14.8 Mt by 2020;
b - 10.7 Mt by 2030; and
c - 5 Mt by 2050.



III. TOWN PROFILE

Profile of the municipality and its geographical context

The Town of Grand Bay-Westfield is located in King's County, southern New Brunswick on the right (west) bank of the Saint John River, directly north of the City of Saint John. Grand Bay-Westfield borders Saint John to the south, Musquash Parish to the southwest, and Westfield Parish to the west and north.

Municipal composition

- 1 mayor and 5 general councillors
- 14 full time employees and seasonal staff

Municipal infrastructures

- 31 buildings, lighting, water and sewage
- 18 vehicles and motorized equipment

Profile of the community

The population of Grand Bay-Westfield in 2016 was 4,964 inhabitants spread over an area of 59.78 km², a density of 83 inhabitants / km². It experienced a 3,0% decrease from 2011 to 2016. The Municipality had 2 029 private dwellings in 2016, of which 1 933 were occupied by full time residents. 77% of dwellings were built before 1991.

The official languages spoken by the population of Grand Bay-Westfield are English at 96% and French at 4%.

In Grand Bay-Westfield:

- Post Office
- 3 Elementary Schools
- Middle School
- Fire Station
- Ambulance
- Golf
- Parks and Tennis Court
- Ferry
- Boat Docking



III. TOWN PROFILE

CLIMATE CHANGE AND ENERGY INITIATIVE (CCEI)

Municipalities in New Brunswick are increasingly aware of environmental challenges they face, and are particularly concerned with actual and future impacts of climate change. The Town of Grand Bay-Westfield joined the Climate Change and Energy Initiative of the Union of Municipalities of New Brunswick, to reinforce its efforts to advance in the Partners for Climate Protection Program (PCP).

The UMNb initiative fits perfectly in the global and national context of addressing climate change, following the Paris Agreement (COP 21).

The UMNb CCEI aims to offer support to members to realize their corporate and community GHG inventories and Local Action Plan, as well as integrate the QUEST Community Energy Planning approach.

The Town of Grand Bay-Westfield has one public electric charging station* on its territory.

*Listed by PlugShare (May 2018)

- Climate Change and Energy Initiative (CCEI) of the Union of Municipalities of New Brunswick, 2017
- Member – Partners for Climate Protection program, FCM, 2016
- Assessment and Test Application of the Community Vulnerability Assessment Tool (CVAT) in Grand Bay-Westfield, NB



IV. INVENTORY

CORPORATE GHG INVENTORY



IV. INVENTORY

The Town of Grand Bay-Westfield has joined the Climate Change and Energy Initiatives Program by commissioning UMN and YHC Environnement to develop an inventory of its GHG emissions that will be used to develop an action plan that includes a suite of measures to control and reduce GHG emissions from their sources.

Grand Bay-Westfield's emissions inventory consists of two separate components. The first is emissions from the activities of the municipal administration (the Corporate) and the second covers the entire territory of the Municipality (the Community).

This document covers the Greenhouse Gas Emission Inventory for the 2015 reference year of the Corporate Component of the Town of Grand Bay-Westfield. The relevant additional elements are detailed in the appendices.



IV. INVENTORY

A. SUMMARY

The corporate component consists of five emission sectors which, in Grand Bay-Westfield's case, are responsible for approximately 417 tons of CO₂ equivalent. The two largest corporate GHG emission sectors are buildings and vehicle fleet. The former produce 37.0% of corporate GHGs, the latter generate 28.6%. Water and sewage is responsible for 21.9% of the Municipality's emissions, streetlights 10.3% and finally 2.2% of emissions are attributed to municipal waste.

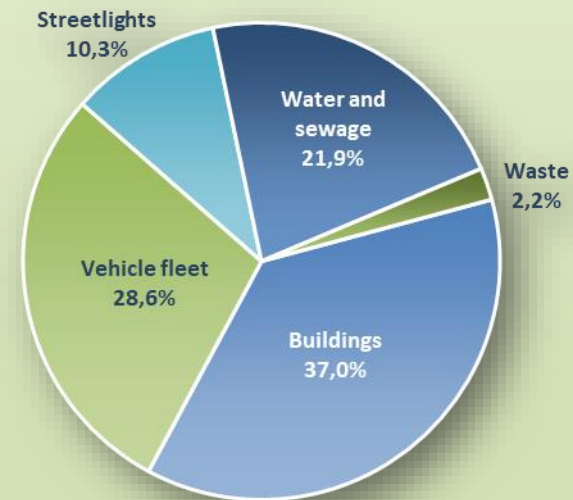
TABLE 1 :

CORPORATE GHG EMISSIONS FOR THE BASE YEAR

GHG (tons eCO ₂)	2015
Buildings	155
Vehicle fleet	119
Streetlights	43
Water and sewage	92
Waste	9
Total	417
Population	4 964
GHG per capita (teCO ₂)	0,1

GRAPH 1 :

CORPORATE GHG EMISSIONS BREAKDOWN BY SECTOR (teCO₂)



IV. INVENTORY

A. SUMMARY (continued)

In 2015, the energy consumption of the various corporate activities of the Municipality was the source of 408.2 tons of emissions (CO₂ equivalent). For its energy needs, Grand Bay-Westfield uses electricity and propane for heating and two types of fuels for vehicles. Electricity and propane are devoted to the energy demand of buildings and other infrastructure. Gasoline, diesel and propane are used by the fleet of vehicles and various equipment and tools of the municipal administration.

TABLE 2 : CORPORATE GHG EMISSIONS AND ENERGY CONSUMPTION BY TYPE

Energy	2015		(teCO ₂)	%	(Gj)	%
	Volume	Units				
Electricity	960 083	kWh	268,8	65,9%	3 456,3	62,9%
Natural Gas	0	m ³	0,0	0,0%	0,0	0,0%
CNG	0	Liters	0,0	0,0%	0,0	0,0%
Diesel	18 751	Liters	50,3	12,3%	718,2	13,1%
Gasoline	28 292	Liters	69,0	16,9%	990,2	18,0%
District Energy	0	Gj	0,0	0,0%	0,0	0,0%
Ethanol Blend (10%)	0	Liters	0,0	0,0%	0,0	0,0%
Biodiesel	0	Liters	0,0	0,0%	0,0	0,0%
Fuel Oil	0	Liters	0,0	0,0%	0,0	0,0%
Propane	12 996	Liters	20,1	4,9%	328,9	6,0%
Waste	-	-	-	-	-	-
Total			408,2		5 493,6	



IV. INVENTORY

B. CORPORATE EMISSIONS FORECAST

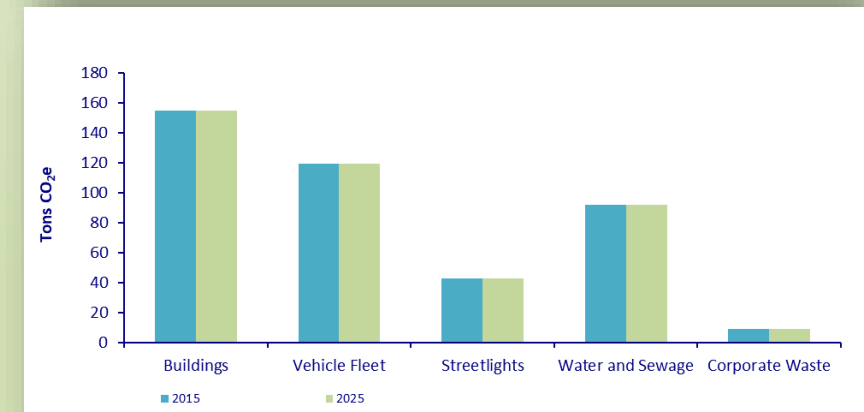
The corporate inventory of GHG emissions is only valid for the reference year. The forecast emissions seek to show how inventory emissions will evolve at the end of the action plan (2025), based on a business as usual scenario (BAU), i.e. without any direct intervention from the decision makers. Factors such as demographic change or economic conditions are taken into account in determining future levels of current emissions.

For Grand Bay-Westfield the business as usual scenario anticipates that, apart from the present action plan reduction, the level of the corporate GHG emissions will remain stable.

TABLE 3 :

CORPORATE EMISSIONS FORECAST BY SECTOR

	Current emissions	% Change Expected**	Emissions in Forecast year
Buildings	154,5	0,0%	154,5
Vehicle Fleet	119,3	0,0%	119,3
Streetlights	42,9	0,0%	42,9
Water and Sewage	91,5	0,0%	91,5
Corporate Waste	9,1	0,0%	9,1
Émissions total (t CO₂e)	417,3		417,3



IV. INVENTORY

B. CORPORATE EMISSIONS FORECAST (continued)

The portrait of the corporate inventory of GHG emissions is only valid for the reference year. The projected emissions, seek to present how inventory emissions will evolve at the end of the action plan (2025), based on a business as usual scenario, i.e. without any direct intervention of the decision-makers. Factors such as demographic change or economic conditions are taken into account in determining future levels of current emissions.

For Grand Bay-Westfield, the business as usual scenario anticipates that, apart from the present action plan reduction, the level of the corporate GHG emissions will remain stable. This action plan, at its end, is expected to bring them down by 9% (Graph 2).

TABLE 4 :
CORPORATE INFORMATION

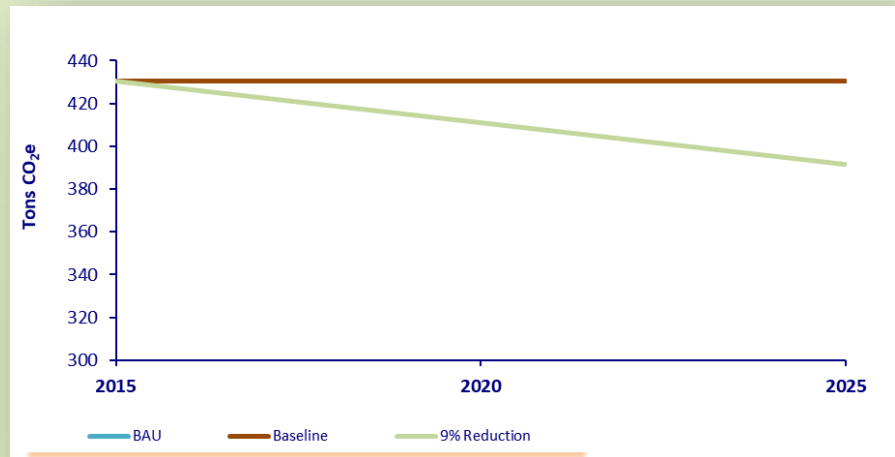
Base Year	2015
Forecast Year*	2025
Reduction Target by Forecast Year* (%)	9,0%

Baseline: 2015 (Base year)

BAU: Business as usual scenario forecast (when BAU scenario predicts no change in GHG emissions, it equals to Baseline)

2025: Action Plan deadline

GRAPH 2 :
FORECAST OF CORPORATE GHG EMISSIONS UNTIL 2025



GHG ACTION PLAN



V. ACTION PLAN

A. STRATEGY FOR GHG REDUCTION AND PROJECT SELECTION

Corporate Action Plan

As noted in Section II - Strategy, for PCP and GMF, the GHG emission reduction targets of participating municipalities are set on a voluntary and non-binding basis.

Taking into account the context of the Municipality, the corporate plan proposes the achievement of a target of 9,0% reductions in GHG emissions for 2025 according to the reference year 2015.

**TABLE 5 :
OBJECTIVES AND YEAR**

Objectives and year set by Grand Bay-Westfield:	
Corporate Action plan :	
	• Reduction Target : 9,0%
	• Base year : 2015
	• Forecast year : 2025



V. ACTION PLAN

A. STRATEGY FOR GHG REDUCTION AND PROJECT SELECTION

Guiding Principles

The approach behind the development of the Town of Grand Bay-Westfield's Action Plan as part of UMN's CCEI is to develop an action plan that includes projects which :

- 1) Improve the quality of life of communities (better environment and savings)**
 - ✓ Improve the quality of life of communities (better environment and savings) ;
 - ✓ Generate GHG emission reductions that meet the goals and needs of the community ;
 - ✓ Allow as much as possible to generate energy savings that guarantee the sustainability of the actions of the Municipality and its community.
- 2) Use community resources to develop the expertise of UMN and New Brunswick members**
 - ✓ Optimize the use of community resources and know-how to maximize socio-economic benefits;
 - ✓ Help develop local and regional expertise to increase the knowledge of communities and New Brunswick..
- 3) Will become examples and models for New Brunswick and other communities in Canada**
 - ✓ The projects must enable UMN member municipalities to stand out / take leadership, to respond to challenges of climate change for New Brunswick communities, to protect the environment, improve the quality of life, and become role models for action and resilience.



V. ACTION PLAN

A. STRATEGY FOR GHG REDUCTION AND PROJECT SELECTION

Global Approach

«GOOD PRACTICE» PROJECTS

The action plan prioritises projects considered as "good practices". These projects correspond to the application of, for example, measures and technologies supported by the programs of New Brunswick Power, the Government of New Brunswick or Canada.

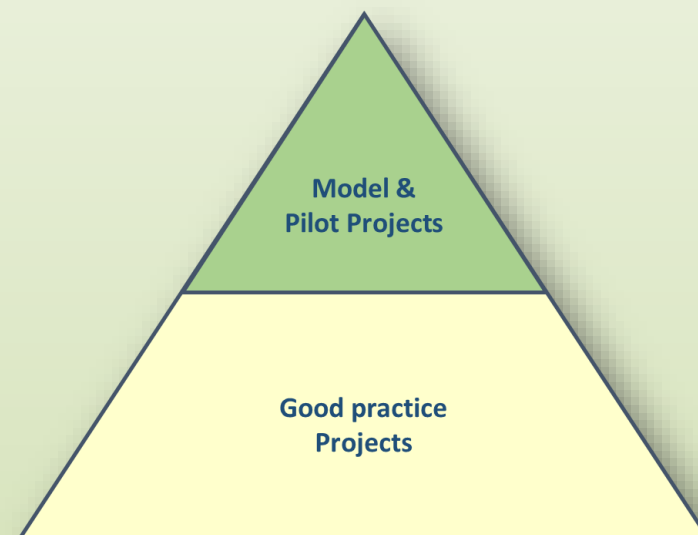
✓ These "Good Practice" projects form the basis of the Action Plan.

MODEL PROJECTS & UMNb PILOT PROJECTS

As part of UMNb's CCEI, the action plan also proposes to municipalities two types of model projects & pilot projects :

1. **Transport electrification & EV integration in the community**
2. **EV & Carsharing – SAUV^{ÉR}* (Group Project)**

* SAUV^{ÉR} concept is a fleet management and carsharing system for municipalities, organizations and companies. Its objectives are both to protect the environment and to create a synergy using regional municipalities to develop innovative technologies and services to create and support local expertise and services and enhance regional development.



V. ACTION PLAN

B. REFERENCE LEVEL AND TARGET

The goal of the Town of Grand Bay-Westfield’s Corporate Action Plan is to reduce greenhouse gas emissions by 9.0% by 2025 from their 2015 baseline.

For Grand Bay-Westfield, the emissions calculated for the year 2015 allow us to estimate the reductions required to reach the target set by the Municipality's action plan to approximately 38.7 tons or 9.0%.

TABLE 6 :
BASELINE AND TARGET

Tons of CO ₂ equivalent	Year	
	Base 2015	forecast 2025
1 Current Emissions	430,5	
2 Reduction Target		9,0%
3 Forecast emissions (target) (line 1- line 4)		391,8
4 Total reductions to be achieved (line 1- line 3)		38,7



V. ACTION PLAN

C. ANALYSIS OF THE PROJECTED RESULTS OF THE ACTION PLAN

Achieving the objective of Grand Bay-Westfield’s Action Plan would mean that the level of corporate GHG emissions for the year 2025 be at 390.6 tons of eq. CO₂. This is a decrease of 39.9 tons from the 2015 emissions level of 430.5 tons of eq. CO₂. This represents a potential reduction of 9.3%, which is 0.3 percentage points above the target of 9.0% and 1.2 tons more than the targeted reduction of 38.7 tons (see Table 6).

TABLE 7 :
ANALYSIS OF THE OUTCOME OF THE ACTION PLAN

		Total reductions	
		eCO ₂ (t)	%
1	Current Emissions (Base year)	430,5	100,0%
2	Early action results	1,1	0,3%
3	Expected reductions in the Action Plan	38,8	9,0%
4	Total Reductions (line 2 + line 3)	39,9	9,3%
5	Level of anticipated emissions (forecast year) (line 1 - line 4)	390,6	90,7%
6	Gap with the target	1,2	0,3%



V. ACTION PLAN

D. PROJECT PORTFOLIO – EARLY ACTION

Some projects have been completed or initiated by the Town of Grand Bay-Westfield between the reference year of the inventory (2015) and the year of adoption of the action plan presented (2018). These early actions have contributed to the municipality's effort to reduce corporate GHG emissions.

The action plan identified the completion of two (2) projects whose estimated reductions were estimated at 1.1 ton of CO₂ equivalent.

TABLE 8 :

PROJECTS COMPLETED PRIOR TO THE ADOPTION OF THE ACTION PLAN (EARLY ACTIONS)

Projects (Measures, Actions, Technologies)		Total GHG reductions (tons)
Buildings		-
Vehicle Fleet		-
1	EA1 Electric Vehicle Charging station Number of units: 1	n/d
Streetlights		1,1
2	SL1 Streetlight replacement Number of units: 13	1,1
Water and Sewage		-
TOTAL		1,1

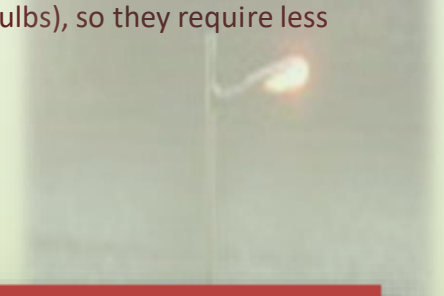


V. ACTION PLAN

D. PROJECT PORTFOLIO – EARLY ACTION

Streetlights - Streetlights replacement (Early Action)

Early Action completed in 2017-2018. Street light conversion is almost completely done in 2013. Very few HPS lights were remained of which 13 are being replaced. LED uses approximately 50-60% less energy compared to HPS street lights. LED technology is more reliable with a much longer life span compared to the current HPS bulbs (20 year design life vs. 6 years for HPS bulbs), so they require less maintenance, making them more economical to operate.



Streetlights		Base year : 2015
1 Total lighting consumption		7 288 kWh
2 Cost of electricity for lighting		2 231 \$
3 GHG emissions from lighting electric consumption		2,04 eCO ₂ (t)
4 Efficiency gains after conversion		55%
5 Annual consumption after conversion		3 280 kWh
6 Annual energy savings due to conversion		4 009 kWh
7 Annual savings due to conversion		n/a \$
8 Reduction of GHG emissions after conversion		1,12 eCO ₂ (t)



V. ACTION PLAN

D. PROJECT PORTFOLIO

Project Portfolio Summary

The most recent measures, technologies and programs have been analyzed and evaluated. They form the basis of the action plans produced by YHC Environnement. Then, based on the 2015 inventory data, as well as the characteristics and needs of the Town of Grand Bay-Westfield, the development of the Project Portfolio was completed.

The action plan contains nine (9) projects whose potential reductions are estimated at 38.8 tons of CO₂ equivalent (see Table 9).



V. ACTION PLAN

D. PROJECT PORTFOLIO

Project Portfolio Summary

TABLE 9 : CORPORATE PROJECT PORTFOLIO

Projects (Measures, Actions, Technologies)	Total GHG reductions (tons)
Buildings	16,8
1 B1 Buildings (Community Centrum & Fire Station No.1) Clean Energy Conversion (Propane to Electricity)	2,2
2 B2 Buildings (Community Centrum & Fire Station No.1) Energy Efficiency (after conversion to electricity)	3,9
3 B3 Buildings (Works Department Garage - Warehouse New Building)	7,8
4 B4 Buildings (Five buildings) Energy Efficiency (Electricity)	3,0
Vehicle Fleet	13,4
5 VF1 Gradual Fleet Renewal Policy Number of vehicles : 13	4,6
6 VF2 Clean Vehicle Purchase Policy Number of vehicles : 2	2,1
7 VF3 Idle-free Policy Number of vehicles : 13	5,0
8 VF4 Electric Vehicle Car Sharing System Number of vehicles : 1	1,8
Streetlights	-
Water and Sewage	8,5
9 WS1 Water & Sewage Energy Efficiency (Electricity)	8,5
Corporate Waste	-
TOTAL	38,8

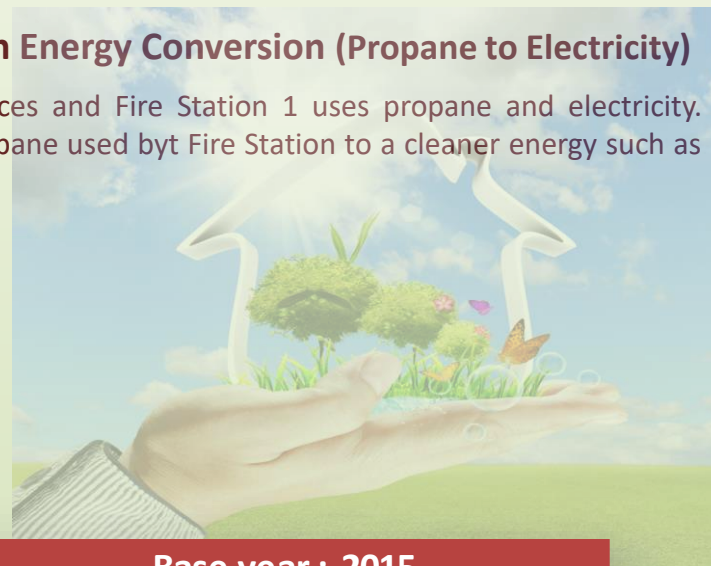


V. ACTION PLAN

D. PROJECT PORTFOLIO

1. Buildings (Community Centrum & Fire Station No.1) - Clean Energy Conversion (Propane to Electricity)

The Community Centrum building includes the Municipal Offices, meeting spaces and Fire Station 1 uses propane and electricity. Propane is used by the Fire Station part. The Project would propose changing Propane used by Fire Station to a cleaner energy such as electricity..



Buildings (Community Centrum & Fire Station No.1)		Base year : 2015
1 Annual propane Consumption	329	Gj
2 Annual propane Cost	4 198	\$
3 Annual GHG Emissions	20,07	eCO ₂ (t)
4 Total Reductions in GHG Emissions	2,16	eCO₂ (t)
5 Energy savings	99	Gj



V. ACTION PLAN

D. PROJECT PORTFOLIO

2. Buildings (Community Centrum & Fire Station No.1) - Energy Efficiency (after conversion to electricity)

Once the conversion of propane is completed, Grand Bay-Westfield plans to implement a number of energy conservation measures on the building :

- Upgrade the lighting System to LED
- Upgrade the Energy Management Control System (ECMS)
- Energy Optimization
- Install Heat Pump System
- Increase the building envelop performance

Buildings (Community Centrum & Fire Station No.1)		Base year : 2015
1 Electricity used per year		275 641 kWh
2 Cost of electricity per year		n/a \$
3 GHG emissions from electric consumption		77,18 eCO ₂ (t)
4 Electricity saving (estimated)		5 %
5 Electricity reduction per year (kWh)		13 782 kWh
6 GHG emissions reduction (tons)		3,86 eCO ₂ (t)



V. ACTION PLAN

D. PROJECT PORTFOLIO

3. Buildings (Works Department Garage - Warehouse) - New Building

The building that shelters the Garage and the Warehouse is an old inefficient building. It is planned to replace the building with a clean energy building within the next 8 years. The new design aims maximizing efficiency opportunities. Energy efficiency is generally the most cost-effective strategy with the highest return on investment. The project could be improved by adding a renewable energy plan.

The efficient equipments used may included :

- Energy efficient lighting
- Electric lighting controls
- High-performance HVAC
- Geothermal heat pumps

Buildings (Works Department Garage - Warehouse)		Base year : 2015
1 Energy used per year		53 179
2 Cost of electricity per year		5 632 \$
3 GHG emissions from electric consumption		14,89 eCO ₂ (t)
4 Envelope efficiency (design and materials)		15 %
5 Heating and cooling efficiency (estimated)		70 %
6 Lighting efficiency (estimated)		50 %
7 Oher uses efficiency (unchanged)		- %
8 Total energy reduction per year (%)		52,29 %
9 Total energy reduction per year (kWh)		27 806 kWh
10 GHG emissions reduction (tons)		7,79 eCO ₂ (t)
11 Annual savings		2 945 \$
12 Program length (action plan deadline : 2025)		8 Years
13 Project's lifespan benefit		23 557 \$
14 Annual savings (\$ / ton GHG)		378 \$ / eCO ₂ (t)



V. ACTION PLAN

D. PROJECT PORTFOLIO

4. Buildings (Five buildings) - Energy Efficiency (Electricity)

In addition of what is done in 2013, Grand Bay-Westfield plans to implement a number of energy conservation measures on five buildings :

- Upgrade the lighting System to LED
- Upgrade the Energy Management Control System (ECMS)
- Energy Optimization
- Install Heat Pump System
- Replace existing boilers with high efficiency heating system
- Increase the building envelop performance

Buildings (Five buildings)	Base year : 2015
1 Electricity used per year	215 306 kWh
2 Cost of electricity per year	22 805 \$
3 GHG emissions from electric consumption	60,29 eCO ₂ (t)
4 Electricity saving (estimated)	5 %
5 Electricity reduction per year (kWh)	10 765 kWh
6 GHG emissions reduction (tons)	3,01 eCO ₂ (t)
7 Annual savings	1 140 \$
8 Program length (action plan deadline : 2025)	8 Years
9 Project's lifespan benefit	9 122 \$
10 Annual savings (\$ / ton GHG)	378 \$ / eCO ₂ (t)



V. ACTION PLAN

D. PROJECT PORTFOLIO

5. Transportation - Gradual Fleet Renewal Policy

The vehicle replacement policy of the municipality is as follows:

- Fire trucks: after 25 years
- Heavy machinery: after 12 to 15 years
- Heavy trucks: after 8 to 10 years
- Trucks and light vehicles: after 10 years

Thus, at the end of this action plan (2015-2025), almost all of the corporate fleet will be replaced. In addition, the Town plans to reduce its fleet to make it more efficient.

Note : Cumulative effects of other projects are not considered (ex. Idle free policy).

Gradual Fleet Renewal Policy	Base year : 2015	
	Gasoline	Diesel
1 Number de vehicles	9	9
2 Fuel consumption	28 292 liters	18 751 liters
3 Fuel cost	32 609 \$	20 438 \$
4 GHG emissions	69,02 eCO ₂ (t)	50 eCO ₂ (t)
5 Number of vehicles to be replaced	9	4
6 Average efficiency gains due to renewal of fleet	5,0%	5,0%
7 Reduction of GHG emissions after conversion	3,45 eCO ₂ (t)	1,12 eCO ₂ (t)
8 Total Reductions in GHG Emissions	4,57 eCO₂ (t)	



V. ACTION PLAN

D. PROJECT PORTFOLIO

6. Transportation - Clean Vehicle Purchase Policy

Clean vehicle purchase policy is that when the vehicles are to be replaced, the municipality evaluates the possibility of choosing a model smaller than the vehicle currently used.



More compact cars		Base year : 2015
1	Number of targeted units	2
2	Fuel type	Gasoline
3	Fuel consumption	4906 liters
4	Fuel savings per year (liters)	854 liters
5	Fuel savings per year (\$)	984 \$
6	GHG emissions reduction (tons)	2,08 eCO ₂ (t)
7	GHG emissions reduction (%)	17,40 %
8	Lifetime	10 years
9	Project's lifespan benefit	9 840 liters
10	Savings (\$ / ton GHG)	472 / t eCO ₂



V. ACTION PLAN

D. PROJECT PORTFOLIO

7. Transportation - Idle-free Policy

Idling refers to running a vehicle's engine when the vehicle is not in motion. Idling occurs when car owner is warming up or cooling down a vehicle, drivers are stopped at a red light, waiting while parked outside a business or residence, or otherwise stationary with the engine running. For the average vehicle with a 3-litre engine, every 10 minutes of idling costs 300 milliliters (over 1 cup) in wasted fuel – and one half of a liter (over 2 cups) if your vehicle has a 5-litre engine.

- For a successful anti-idling campaign includes
- the adoption of a speed reduction regulation
 - carrying out an awareness-raising campaign
 - the acquisition and installation of permanent signs

Since 2006, the Town has an Idle-free policy. The present project is a revised and improved version of current policy.

Idle-free Policy	Base year : 2015	
	Gasoline	Diesel
1 Number of units	9	4
2 Fuel consumption	28 292 liters	10 606 liters
3 Fuel cost	32 609 \$	11 561 \$
4 GHG emissions	69,02 eCO ₂ (t)	28,46 eCO ₂ (t)
5 Average fuel wasted idling	965 liters	998 liters
6 Average fuel economy	3,4%	9,4%
7 GHG emissions reduction	2,35 eCO ₂ (t)	2,68 eCO ₂ (t)
8 Fuel savings (\$)	1 112 \$	394 \$
9 Total GHG Emissions reduction	5,03 eCO ₂ (t)	
10 Total fuel savings (\$)	1 507 \$	
11 Saving per ton of GHG reduced	299 / t eCO ₂	



V. ACTION PLAN

D. PROJECT PORTFOLIO

8. Transportation - Electric Vehicle Car Sharing System

Electric cars use electrical energy to power an electric motor, they also reduce society's dependence on environmentally damaging fossil fuels while lowering greenhouse gas emissions and air pollution. Electric cars are cost effective, good for the environment and deliver great performance.

Car-sharing :
Optimizes vehicle usage and improves fleet administration. Depending on the situation, the best fit vehicle for the task is used regardless of the department the vehicle is assigned to. Sharing EV among all corporate departments increases the use of this car which has zero GHG emissions and less operational and energy costs.

Nissan Leaf (2015) versus Ford - Escape 4x4 (2013)			Base year : 2015	
1	Total kilometers travelled*		10 000	km
2		Internal users		km
3		External users		km
4	Number of targeted units		1	
5	Energy saved per year (Gj and \$)**		25,93	794 \$
6	GHG emissions reduction (tons and %)		1,75	77,3%
7	Economy (cost) of MAT implementation		n/d	
8	Lifetime		10	years
9	Project's lifespan benefit		7 935	\$
10	Savings (\$ / ton GHG)		453	/ t eCO2



V. ACTION PLAN

D. PROJECT PORTFOLIO

9. Water & Sewage - Energy Efficiency (Electricity)

Grand Bay-Westfield plans to implement a number of energy conservation measures to its Water and sewage facilities : the sewage lagoon and L-5 Majestic Drive which are responsible for the majority of the sector's energy use.

- Upgrade the lighting System to LED
- Upgrade the Energy Management Control System (ECMS)
- Energy Optimization
- Install variable-frequency drive (VFD) where applicable
- Install High Efficiency Motors & Pumps where applicable
- Install Energy Meters

Minimum target for overall energy savings: 10%.

Water & Sewage		Base year : 2015
1 Electricity used per year		304 530 kWh
2 Cost of electricity per year		32 879 \$
3 GHG emissions from electric consumption		85,27 eCO ₂ (t)
4 Electricity saving (estimated)		10 %
5 Electricity reduction per year (kWh)		30 453 kWh
6 GHG emissions reduction (tons)		8,53 eCO ₂ (t)
7 Annual savings		3 288 \$
8 Program length (action plan deadline : 2025)		8 Years
9 Project's lifespan benefit		26 303 \$
10 Annual savings (\$ / ton GHG)		386 \$ / eCO ₂ (t)



VI. APPENDIX

The methodology and references are available on request.

