# Sussex's Community GHG & Energy Action Plan

Sussex
NEW BRUNSWICK
Gateway to the Fundy Experience

*Realised with the*

UMNB
Union of the Municipalities of New Brunswick

## Climate Change and Energy Initiative

July 2018

*Consulting team*

YHC ENVIRONNEMENT

*Financed by*

FCM

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## Acknowledgements

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- We also want to present special thanks to all stakeholders and municipal employees who have contributed to achieve the UMNB CCEI.

Union of the Municipalities of New Brunswick

Spatial Quest

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# I. Introduction

***Communities across Canada*** are facing the effects of climate change. Some have to deal with greater droughts, others with more violent storms.

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.**

## *The 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 Sussex** 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 PARTNERS FOR CLIMATE PROTECTION (PCP) PROGRAM*

***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.

**Sussex is engaged:**

- ✓ **Climate Change and Energy Initiative (CCEI) of the Union of Municipalities of New Brunswick, 2017**
- ✓ **Member – Partners for Climate Protection program, FCM, 2016**
- ✓ **The Greater Sussex –Hampton Region Economic Development Strategy, 2017**

# I. Introduction

***In addition to the Corporate GHG Action Plan, the Community GHG & Energy Plan is the UMNB CCEI second foundation stone. The Plan brings a powerful and dynamic tool to help communities for smart and sustainable development allowing to reduce its carbon print.***

## *What is a Community GHG & Energy Plan?*

***The Plan** is a long-term plan that identifies ways to reduce GHG emissions and to support the Municipality's local economy by increasing its competitiveness, helping to create local or regional jobs in the energy sector, improving energy efficiency, and improving energy security.*

*In 2018, planning and coordinating energy use and GHG emission reduction at the community level remains innovative especially for smaller size communities outside metropolitan areas. However, in cities or communities where it has been done, it has resulted in some of the most efficient, and from an energy standpoint, most cost-competitive cities in the world, with resulting reductions in associated environmental impacts.*

*The communities that are leaders have taken an integrated energy systems approach looking at the potential for innovation in how energy is sourced, generated, consumed, re-captured, conserved, stored, and delivered.* ***The UMNB CCEI's Community GHG & Energy Plan** will be a "living document", in that the actions taken by the Municipality and community stakeholders are expected to grow and change over time.*

## *Why a Community & GHG Energy Action Plan?*

***The Plan** is great tool to face community transformation challenges encountered in New Brunswick: Climate change impacts, population growth or decline, development growth and economic transformation.*

*Those challenges push municipalities and communities to examine ways to reduce its cost of services while continuing to maintain and enhance the quality of life. And how energy is used, and the cost of that energy to residents as well as to the municipality, is an important factor. Smart solutions also reduce environmental impacts associated with the consumption of energy. A good strategy and planning can enhance prosperity by making the municipality more economically competitive.*

*Enhancing access to energy efficiency, conservation and demand-management opportunities can also have a positive effect on the local retail and service industry. Businesses that increase the energy efficiency of their facilities and operations can improve their competitiveness in the marketplace.*

# II. The Plan's Strategy

## Vision

The vision of the Plan is to achieve a low carbon and smart energy community in an economically viable way:

Reducing its carbon footprint by increasing energy conservation, using energy efficiently through new development and retrofits, transportation planning, producing renewable or clean energy, helping to improve local energy security.

## Goals

The vision is supported by a series of goals that bring focus to mitigating climate change, improving energy performance within the community and creating economic advantage:

1. **Foster a shift towards low carbon technologies.**
2. **Increase energy efficiency for new and existing buildings.**
3. **Foster a shift towards low carbon transportation that integrates EV infrastructure, promotes alternative fuel vehicles, low carbon fuel options, as well as public transit and active transportation as mechanisms to reduce the number of vehicles on the road.**
4. **Create or help adaptive, sustainable, affordable, and reliable local renewable and clean energy supply.**
5. **Design, build, and revitalize neighbourhoods as complete communities that offer multi-modal transportation options.**
6. **Create new market opportunities for innovative energy solutions that are attractive for local and new businesses, and through high quality, affordable, clean energy services foster retention and growth of existing businesses and industries.**
7. **Build awareness about energy investment and create a culture of energy conservation amongst residents, business, institutions, and industries.**
8. **Build knowledge, skills, and technical capacity through partnerships that deliver innovative energy solutions at the local scale.**

# II. The Plan's Strategy

***The principles*** provide direction for the development of the projects and initiatives presented in the Plan. To build and implement an action plan and portfolio of environmentally and economically successful projects all proposed solutions, projects, or initiatives should consider these principles:

1. **Advocate for urgent action to address climate change**
2. **Set achievable reduction targets**
3. **Maximize benefits for the municipality and the community**
4. **Ensure and enhance a sustainable energy system**
5. **Maximize efficient use of energy**
6. **Design model and innovative projects**
7. **Build on existing programs and funds: for example, FCM and GMF programs, Environmental Trust Fund, NB Power programs, etc.**
8. **Create a competitive and economic advantage for the Community**
9. **Demonstrate global leadership**

## *GHG Emission Reduction Target* *10% for 2025 and 30% for 2035*

For the Community Plan, GHG emission reduction target is 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 is -6% over the base year, within 10 years.**
- ✓ **The objectives of the Government of New Brunswick.***
- ✓ **The GHG reduction potential of the municipality and its community.**

**** 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.*

# II. The Plan's Strategy

***Timeline*** For efficiency, the choice of a pertinent timeline is essential. Because the scope of the Community Plan is important and imply major technological and behavioral changes, we recommend a 20 years timeline. However, for reviewing and monitoring process the Community Plan propose a 10 year step in 2025 concordance with the **Corporate GHG Action Plan**.

## *Approach and developing the Plan*

Background data was collected via energy distributors in New Brunswick and from various other provincial and federal sources. Electricity data was provided by NB Power, Saint John Energy and Perth Andover Electric and Light Commission.

For all participant, a workshop was held to do a mapping exercise through a community GHG & energy planning process. The workshop allowed the team, the municipality and its stakeholders to identify areas or sectors where GHG reduction projects, conservation and efficiency measures could be focused, to assess the potential for local generation, particularly renewable energy, and look at the energy implications of future growth and prosperity. Webinars were held with each participants to finalize the Corporate GHG & Energy Action Plan as well as to prepare the final workshop to complete the Community GHG & Energy Action Plan. Each municipality CCEI manager invited to workshops and webinars, stakeholders they considered important to assist, councillors and municipal employees.

**Each Community Plan include a presentation document and more importantly is also build with a series of tool joined in annexes:**

- Annexe A: Project's description with implementation procedures
- Annexe B: Excel Projects Sheets with GHG and energy data calculation
- Annexe C: Mapping document for Workshop (Spatial Quest)

As final step, the Community and the Corporate plan are submitted to the Participant Municipality to be adopted by resolution.

YHC Environnement, an energy planning and environment consultant, was retained by UMNB to provide services to produce inventories, action plans and the various tool needed. Spatial Quest was hired to do the GHG and energy mapping related to workshop's organisation and as liaison agent with the concerned stakeholders in New Brunswick.

# III. The Community's Profile

***The Town of Sussex*** *is located in the Kennebecasis River Valley in Kings County, southern New Brunswick. The Town is 81 km southwest of Moncton and 75 km northwest of St. John. The town has a complex territory, bordering the parish of Sussex to the north, Sussex Corner to the east, the parish of Sussex in the south and Studholm in the west.*

*The population of Sussex in 2016 was 4,282 inhabitants spread over an area of 8.95 km$^2$, a density of 478.3 hab./km$^2$. The Municipality had 2,147 private dwellings in 2016, of which 1,988 were occupied by full time residents. 78% of the dwellings were built before 1991.*

*The official languages spoken by the population of Sussex are English at 98%, French at 1.5% and both official languages at 0.5%.*

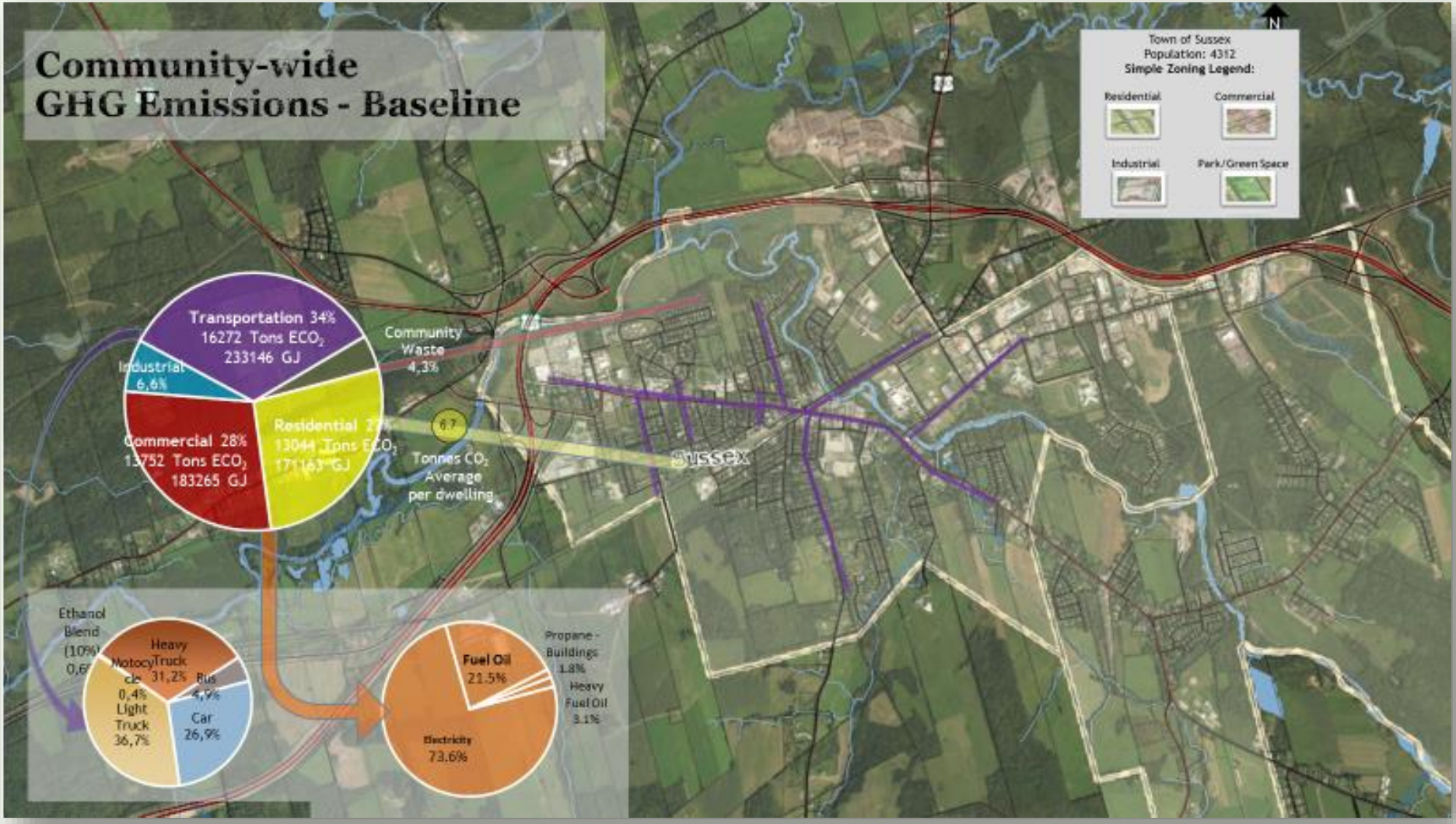
*The town entered economic difficulty during the late 1990s after the Cassidy Lake potash mine flooded, resulting in hundreds of lay-offs.*

*The town developed as a service centre to surrounding communities. Historically a farming community, Sussex has capitalized on its excellent geography to become a leading transportation, manufacturing, distribution and service centre in Atlantic Canada.*

**Picture 1: Sussex's Map**

## III. The Community's Profile

**Picture 2: Sussex's GHG Emissions Map**



# III. The Community's Profile

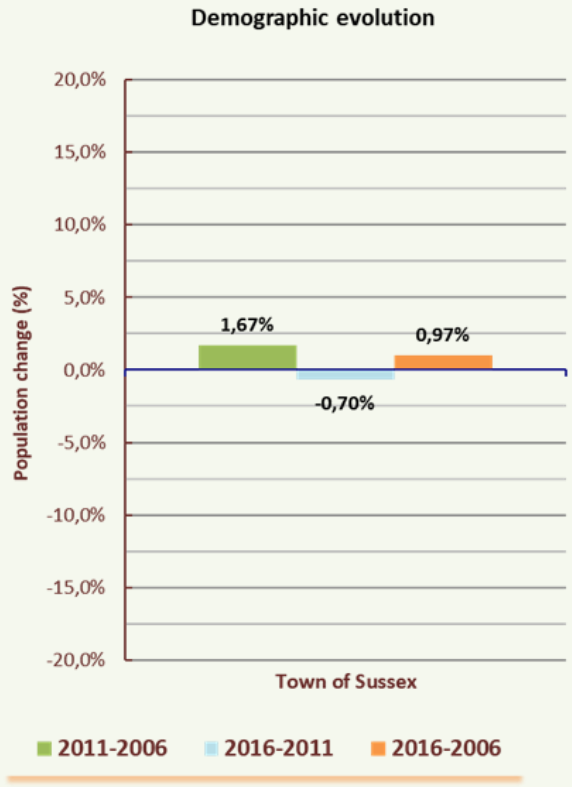
## Challenges

- ✓ The Town's population had increased low rate of 1% between 2006 and 2016.
- ✓ Responsibilities and demand for municipal services may increase in short term and medium term impacting on municipal energy needs.

## Opportunities

- ✓ The community growth of population must be considered an opportunity.
- ✓ The main challenge and opportunity for Sussex, the Town and its Community, are to find solutions to reduce energy use, to produce clean energy and to potentially generate income as well as a good return on investment.
- ✓ Sussex is aiming to promote energy efficiency and clean energy projects and programs in the Community for example by:
  - Promoting electric and clean equipment to remove residential oil furnace;
  - Promoting EV acquisition and use;
  - Negotiating deal with clean tech industries and businesses to develop green and clean projects on its territory.

***Sussex aims to be a New Brunswick leader in renewable energy production***



# IV. The Plan's Summary

## A. The Plan

**The Plan aims to help Sussex and its Community to face main challenges.**

- **Reduce dependency on fossil energies:**
  - Reduce by at least 25% residential heating oil use
- **Curb down energy use, expenses and reduce GHG emissions**
  - Promote individual and collective energy efficient habits:
    a. Implement an ongoing anti-idling campaign & fuel efficient driving all across the community
    b. Increase by at least 25% clothes line usage
  - Promote energy efficient technologies:
    a. LED lighting to replace 60% all lights in the community
    b. At least half of residential and commercial to improve their energy efficiency
  - Promote energy wise decision-making : smaller vehicles are in average 20% more fuel efficient
- **Foster a shift towards low carbon transportation solutions integrating EV infrastructure, promotes alternative fuel vehicles**
  - Use existing programs and incentives to increase the number of Electric and Hybrid Cars and to install more Charging Stations
- **Generate income with local renewable energy production:**
  A. Geothermal District Energy (Short term)
  B. Solar Farms – PV (Medium or long term Project)
- **Expand transportation alternatives by setting up a community van service**

# IV. The Plan's Summary

## B. The Strategy

### Strategy's Summary

### Implementation and monitoring Procedures

#### General Procedures

| | | |
|---|---|---|
| 1 | Annual sectorial review meeting | |
| 2 | Annual Community GHG & Energy Action Plan Update | Reaching PCP Milestone 4 |
| 3 | Annual or biennial inventory update (Community & Corporate) | Reaching PCP Milestone 5 |
| 4 | Project Portfolio Revision: New & Retrieved Project | |

#### Project Portfolio Procedures

| | | |
|---|---|---|
| | **Residential** | |
| ***R 1*** | **LED lighting** | |
| 1 | Annual activity review report | Status, project implementation development |
| ***R 2*** | **Clean Energy Conversion (Oil to Electricity)** | |
| 1 | Annual activity review report | Status, project implementation development |
| 2 | Monitoring activities | GHG & GJ reduction evaluation |
| ***R 3*** | **Energy efficiency (Residential buildings)** | |
| 1 | Annual activity review report | Status, project implementation development |
| 2 | Monitoring activities | GHG & GJ reduction evaluation |
| ***R 4*** | **Energy efficiency - Residential - Clothes Line Program** | |
| 1 | Annual activity review report | Status, project implementation development |
| | **ICI (Institutional, Commercial & Industrial)** | |
| ***ICI 1*** | **LED lighting** | |
| 1 | Annual activity review report: Status, project implementation development | |
| ***ICI 2*** | **Energy efficiency (commercial buildings)** | |
| 1 | Annual activity review report | Status, project implementation development |
| 2 | Monitoring activities | GHG & GJ reduction evaluation |

# IV. The Plan's Summary

## B. The Strategy (continued)

### Project Portfolio Procedures

| | | |
|---|---|---|
| | **Transportation** | |
| ***T 1*** | **Electric Vehicle Community Program** | |
| 1 | Annual activity review report | Status, project implementation development |
| 2 | Monitoring activities | kWh credit, EV purchase information |
| ***T 2*** | **Idle-free Policy** | |
| 1 | Annual activity review report | Status, project implementation development |
| ***T 3*** | **Fuel-efficient driving** | |
| 1 | Annual activity review report | Status, project implementation development |
| ***T 4*** | **Compact vehicles** | |
| 1 | Annual activity review report | Status, project implementation development |
| ***T 5*** | **Community Van** | |
| 1 | Annual activity review report | Status, project implementation development |
| 2 | Monitoring activities | EV purchase information |
| | **Local Renewable Energy Production** | |
| ***RE 1*** | **Geothermal Energy System** | |
| 1 | Annual activity review report | Status, project implementation development |
| 2 | Monitoring activities | GHG & GJ reduction evaluation |
| 3 | According to potential volume - Carbon Credit Registration process: Year status, registered credits, etc. | |
| ***RE 4*** | **Solar Photovoltaic** | |
| 1 | Annual activity review report | Status, project implementation development |
| 2 | Monitoring activities | GHG & GJ reduction evaluation |
| 3 | According to potential volume - Carbon Credit Registration process: Year status, registered credits, etc. | |

# COMMUNITY GHG INVENTORY

# V. The Inventory

The Town of Sussex has joined the Climate Change and Energy Initiatives Program by commissioning UMNB 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.

Sussex'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 Community Component of the Town of Sussex. The relevant additional elements are detailed in the appendices.

# V. The Inventory

## A. Summary

The community component consists of five emission sectors. For Sussex, the total emissions of the community is approximately 46 748 tons of $CO_2$ equivalent. Most of these came from transportation that is 34.8%. Commercial sector generated 29.4% of emissions, residences 27.9%, industries 6.8% and finally 1.1% of emissions are attributed to the community waste.

The Community, with its 4 282 inhabitants has a per capita emission rate of 10.9 tons of $CO_2$ equivalent

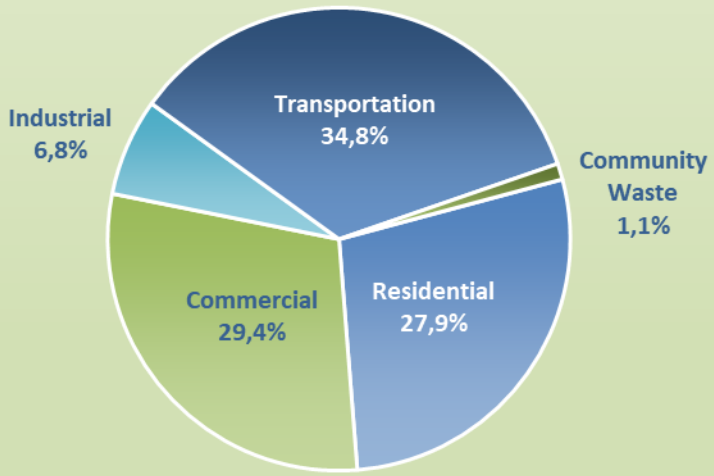
**Table 1 :**

**Community GHG Emissions for the base year**

| GHG (tons $eCO_2$) | 2015 |
|---|---|
| Residential | 13 044 |
| Commercial | 13 752 |
| Industrial | 3 183 |
| Transportation | 16 247 |
| Community Waste | 522 |
| **Total** | **46 748** |
| Population | 4 282 |
| GHG per capita (teCO2) | 10,9 |

**Graph 1 :**

**Community GHG Emissions Breakdown by Sector ($teCO_2$)**



# V. The Inventory

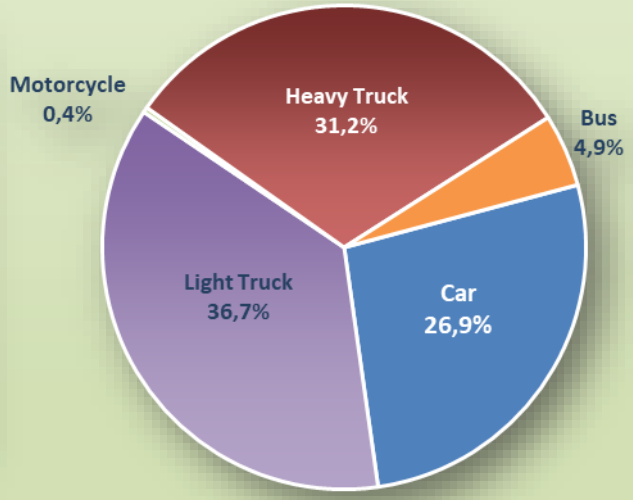
## B. Transportation

For the year 2015, the Sussex community had 3 599 vehicles numbered on its territory. With 16 247 tons of eq. $CO_2$, the transportation sector is responsible for a large part (34.8%) of greenhouse gas emissions of the community (see Graph 1). Emissions from the sector come from five (5) subclasses; light truck because of their large number, form the category that generates the most emissions from GHG, with 36.7% of the total sector. Heavy Truck is in second place with 31.2%, follow car 26.9%, bus 4.9%, and finally motorcycle with 0.4%.

**Table 2 :**
**Transportation GHG Emissions Breakdown by Vehicle Type ($teCO_2$)**

| Vehicle Type | 2015 | | | |
|---|---|---|---|---|
| | Number | % | ($teCO_2$) | % |
| Car | 1 735 | 48,2% | 4 373 | 26,9% |
| Light Truck | 1 520 | 42,2% | 5 963 | 36,7% |
| Motorcycle | 121 | 3,4% | 57 | 0,4% |
| Heavy Truck | 209 | 5,8% | 5 064 | 31,2% |
| Bus | 14 | 0,4% | 789 | 4,9% |
| **Total** | **3 599** | | **16 247** | |

**Graph 2 :**
**Transportation GHG Emissions Breakdown by Vehicle Type ($teCO_2$)**



## C. Industrial, Commercial and Institutional Buildings (ICI)

In 2015, an estimated 29 979.2 tons of eq. $CO_2$, greenhouse gas emissions come from Sussex's residential and industrial, commercial and institutional (ICI) sectors. Electricity gets noticed as first source of GHG emissions with 22 064.8 tons of eq. $CO_2$. Fuel oil and heavy fuel oil assume 6 433.6 and 927.6 tons and propane - building use emits 553.2 tons eq. $CO_2$.

**Table 3 :**

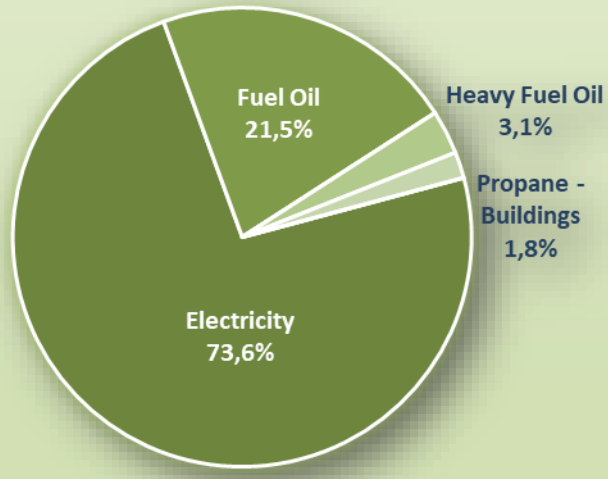
**Community GHG Emissions and Energy Consumption by Type**

| Energy | 2015 | | | | | |
|---|---|---|---|---|---|---|
| | Volume | Unit | ($teCO_2$) | % | (Gj) | % |
| Electricity | 78 802 988 | kWh | 22 064,8 | 73,6% | 283 691 | 71,5% |
| Fuel Oil | 2 352 201 | Liters | 6 433,6 | 21,5% | 91 265 | 23,0% |
| Natural Gas | 0 | m3 | 0,0 | 0,0% | 0 | 0,0% |
| Diesel - Buildings | 0 | Liters | 0,0 | 0,0% | 0 | 0,0% |
| Heavy Fuel Oil | 294 926 | Liters | 927,6 | 3,1% | 12 534 | 3,2% |
| Propane - Buildings | 358 275 | Liters | 553,2 | 1,8% | 9 068 | 2,3% |
| District Energy | 0 | | 0,0 | 0,0% | 0 | 0,0% |
| **Total** | | | **29 979,2** | | **396 558** | |

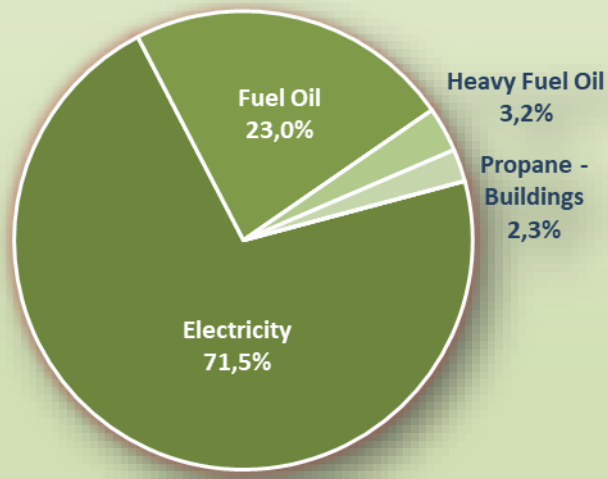
## C. Industrial, Commercial and Institutional Buildings (ICI) (continued)

Electricity produces 73.6% of the sector's emissions and meets 71.5% of the Sussex Territory's energy needs for the residential sector and ICI. Fuel oil, heavy fuel oil and propane – building accounted for 21.5%, 3.1% and 1.8% of greenhouse gases, respectively, and together they contributed 23.0%, 3.2% and 2.3% of their energy demand in their sectors for the Sussex community.

**Graph 3 :**
**Residential and ICI GHG Emissions Breakdown by Energy Type ($teCO_2$)**




**Graph 4 :**
**Residential and ICI Energy Consumption Breakdown by Energy Type (GJ)**



## D. Community Waste

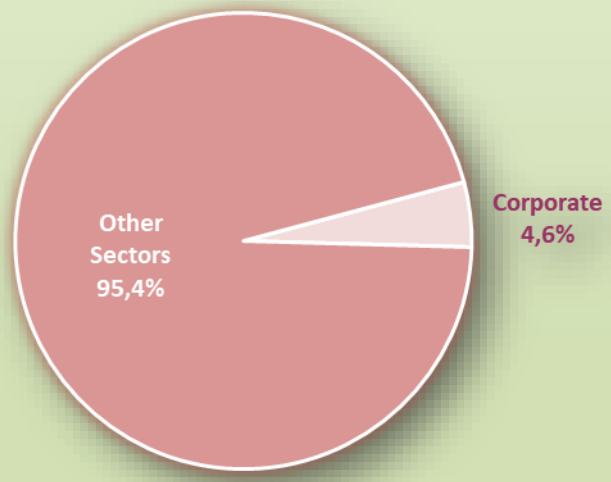
In 2015, the 1 503 tons of Sussex's solid waste produced 522.5 tons of eq. $CO_2$ greenhouse gas. They are responsible for 1.1% of the total emissions of the Community (see Graph 1).

The estimated share of corporate emissions is 24.1 tons of eq. $CO_2$ (4.6% of the total) which would correspond to nearly 59 tons of waste.

**Table 4 :**
**Community Landfill waste by Category**

| Waste Category | 2015 | | | |
|---|---|---|---|---|
| | Tons | % | (teq. $CO_2$) | % |
| Corporate | 59 | 3,9% | 24,1 | 4,6% |
| Other Sectors | 1 444 | 96,1% | 498,4 | 95,4% |
| **Total** | **1 503** | | **522,5** | |

**Graph 5 :**
**Community Landfill Waste GHG Emissions by Category (te$CO_2$)**



## E. Community Emissions Forecast

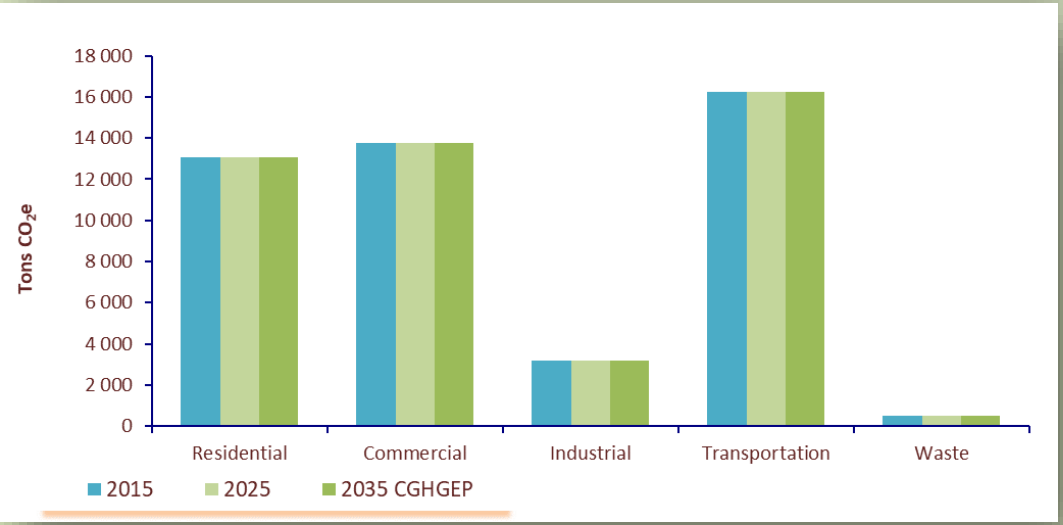
Community emissions forecast present how the inventory emissions may evolve at the end of the action plan (2025), based on a business as usual scenario (BAU), i.e. without any direct intervention of the decision-makers. Factors such as demographic change or economic conditions are taken into account in determining future levels of current emissions.

For Sussex, the business as usual scenario anticipates that, apart from the present action plan reduction, the level of the community GHG emissions will remain stable.

**TABLE 5 :**

**COMMUNITY EMISSIONS FORECAST BY SECTOR**

| | Current emissions | % Change Expected** | Emissions in Forecast year | Emissions in CEP Forecast year |
|---|---|---|---|---|
| Residential | 13 044,3 | 0,0% | 13 044,3 | 13 044,3 |
| Commercial | 13 751,7 | 0,0% | 13 751,7 | 13 751,7 |
| Industrial | 3 183,2 | 0,0% | 3 183,2 | 3 183,2 |
| Transportation | 16 246,7 | 0,0% | 16 246,7 | 16 246,7 |
| Waste | 522,5 | 0,0% | 522,5 | 522,5 |
| **Total Emissions (t CO2e)** | **46 748,4** | | **46 748,4** | **46 748,4** |



## E. Community Emissions Forecast (continued)

The projected emissions, seek to present how inventory emissions will evolve at the end of the action plan, based on a business as usual scenario, ie 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 Sussex, the business as usual scenario anticipates that, apart from the present action plan reduction, the level of the community GHG emissions will remain stable. This action plan is expected to bring them down by 10% in 2025 and by 30% in 2035.

**Table 6 :**
**Community Information**

| Base Year | 2015 | |
|---|---|---|
| Forecast Year* | 2025 | 2035 CGHGEP |
| Reduction Target by Forecast Year* (%) | 10,0% | 30,0% |

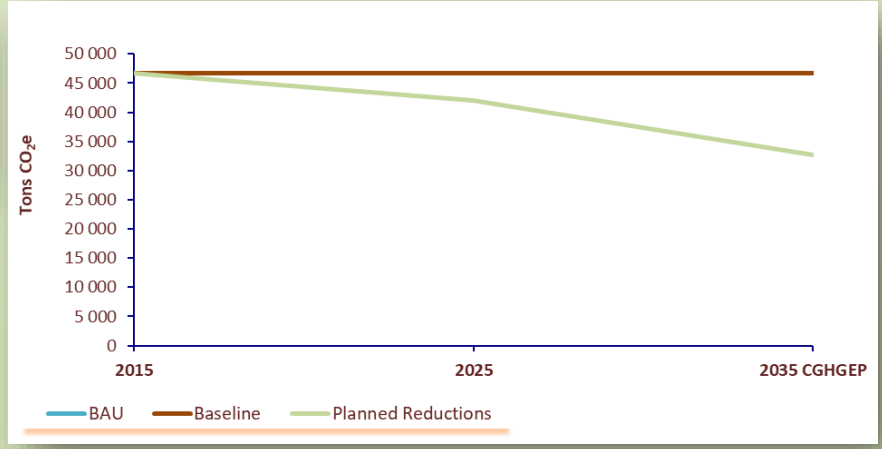
Baseline: 2015 (Base year)

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

2025: Action Plan deadline

CGHGEP or CEP: Community Greenhouse Gases Energy Planning. Long term projects requiring a longer horizon than the current action plan.

**Graph 6 :**
**Community Emissions Forecast**



# THE PLAN

# VI. The Plan

## A. Strategy for GHG Reduction and Project Selection

### Community 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 community plan proposes the achievement of a target of 10% reductions in GHG emissions for 2025 and 30% reductions in GHG emissions for 2035 according to the reference year 2015.

**Table 7 :**
**Community Information**

| Objectives and year set by Sussex: | | |
|---|---|---|
| **Community Action plan :** | | |
| | | • **Reduction Target : 10% and 30%** |
| | | • **Base year : 2015** |
| | | • **Forecast year : 2025 and 2035** |

# VI. The Plan

## A. Strategy for GHG Reduction and Project Selection

### Guiding Principles

The approach behind the development of the Town of Sussex's Action Plan as part of UMNB'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 UMNB 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 UMNB 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.

# VI. The Plan

## A. Strategy for GHG Reduction and Project Selection

### Global Approach

#### «Good practice» projects

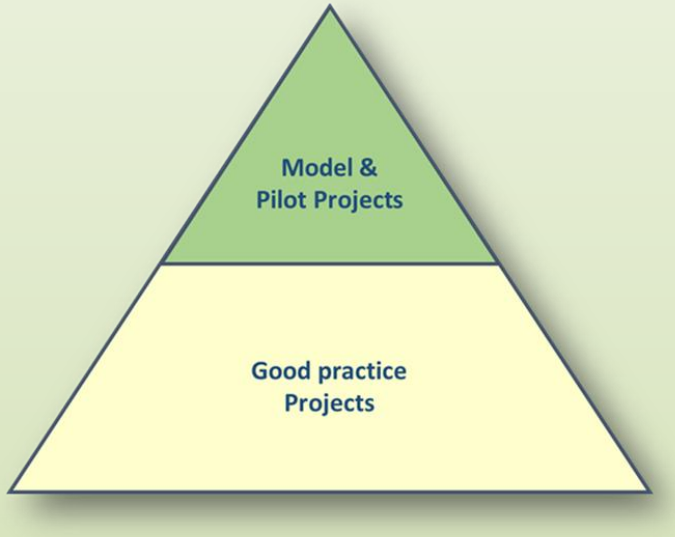
The action plan prioritises projects considered as "good practices". These projects correspond to the application of, for example, measures and technologies supported by the programs of New Brunswick Power, the Government of New Brunswick or Canada.

✓ 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 – SAUVéR * (Group Project)**




* SAUVéR 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.

# VI. The Plan

## B. Reference level and target

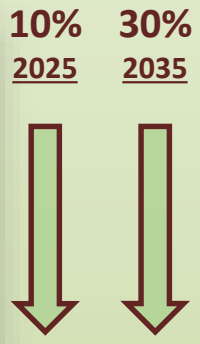
The goal of the Town of Sussex's Community Action Plan is to reduce greenhouse gas emissions by 10% by 2025 and 30% by 2035 from their 2015 baseline.

For Sussex, the emissions calculated for the year 2015 allow us to estimate the reductions required to reach the target set by the Community's action plan to approximately 4 674.8 tons or 10% by 2025 and 14 024.5 tons or 30% by 2035.

**Table 8 :**

**Baseline and Target**

| | Tonnes of $CO_2$ equivalent | Base Year 2015 | Forecast 2025 | Forecast CGHGEP 2035 |
|---|---|---|---|---|
| 1 | Current Emissions | 46 748 | | |
| 2 | Community Emissions Forecast (BAU Scenario) | | ***46 748*** | ***46 748*** |
| 3 | Reduction Target | | 10,0% | 30,0% |
| 4 | Forecast emissions (target) (line 1 - line 5) | | 42 074 | 32 724 |
| **5** | **Total reductions to be achieved (line 1 - line 4)** | | **4 674,8** | **14 024,5** |
| 6 | **Total reductions to be achieved (Including BAU Scenario)** | | **4 674,8** | **14 024,5** |



# VI. The Plan

## C. Analysis of the projected results of the action plan

Achieving the objective of Sussex's Action Plan would mean that the level of community GHG emissions for the year 2025 be at 41 786 tons of eq. $CO_2$. This is a decrease of 4 962 tons from the 2015 emissions level of 46 748 tons of eq. $CO_2$. This represents a potential reduction of 10.6%, which is 0.6 percentage point above the target of 10% and 287.6 tons more than the targeted reduction of 4 674.8 tons (see Table 8).

**Table 9 :**

**Analysis of the Outcome of the Action Plan**

| | | Total reductions | | Forecast CGHGEP 2025 |
|---|---|---|---|---|
| | | $eCO_2(t)$ | % | |
| 1 | Current Emissions (Base year) | 46 748 | 100,0% | |
| 2 | Early action results | 0,0 | 0,0% | |
| 3 | Expected reductions in the Action Plan | 4 962 | 10,6% | |
| 4 | **Total Reductions (line 2 + line 3)** | **4 962** | **10,6%** | |
| 5 | **Level of anticipated emissions (forecast year) (line 1 - line 4)** | **41 786** | **89,4%** | |
| 6 | **Gap with the target ( Action Plan 2025)** | **287,6** | **0,6%** | |
| 7 | **Considering BAU Scenario (2025)** | **287,6** | **0,0%** | **10,6%** |

# VI. The Plan

## D. Project Portfolio

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 Community of Sussex, the development of the Project Portfolio was completed.

The action plan contains twelve (14) projects whose potential reductions are estimated at 4 962.5 tons of $CO_2$ equivalent (see Table 10).

# VI. The Plan

## D. Project Portfolio

### Project Portfolio Summary

Table 10 : Community Project portfolio

| | Projects (Measures, Actions, Technologies) | | | | Total GHG reductions (tons) |
|---|---|---|---|---|---|
| | **Residential** | | | | 822,5 |
| 1 | *R 1* | LED lighting | | | 159,9 |
| 2 | *R 2* | Clean Energy Conversion (Oil to Electricity) | | **Rate: 25%** | 144,2 |
| 3 | *R3* | Energy efficiency (Residential buildings) | | | 442,0 |
| 4 | *R4* | Energy efficiency - Residential - Clothes Line Program | | **Rate: 25%** | 76,4 |
| | **ICI** | | | | 968,0 |
| 5 | *ICI 1* | LED lighting | | | 543,6 |
| 6 | *ICI 2* | Energy efficiency (commercial buildings) | | | 424,4 |
| | **Transportation** | | | | 1 497,9 |
| 7 | *T 1* | Electric Vehicle Community Program | | | 62,1 |
| 8 | *T 2* | Idle-free Policy | | | 1 014,9 |
| 9 | *T 3* | Fuel-efficient driving | | | 308,1 |
| 10 | *T 4* | Compact vehicles | | | 103,5 |
| 11 | *T 5* | Community Van | | | 9,3 |
| | **Local Renewable Energy Production** | | | | 1 674,1 |
| 12 | *RE 1* | Geothermal Energy System | Scenario 2 | **Short term (2025)** | 1 576 |
| 13 | *RE 2* | Solar Photovoltaic | | | 98,1 |
| | **Community Waste** | | | | - |
| 14 | *W1* | Domestic composting | | | - |
| | **TOTAL** | | | | **4 962,5** |

# VI. The Plan

## D. Project Portfolio

### 1. Infrastructure (lighting) - LED lighting

LED technology is more reliable with a much longer life span compared to other types of lighting. According to Hydro-Quebec : "Most LED bulbs last about 25,000 hours, while incandescent lightbulbs last only 1,000." So if they're on 8 hours a day, 365 days a year, LED bulbs could last more than 8 years". In the community, voluntary conversions and those made through information, awareness and incentive campaigns reduce electricity consumption.
It is assumed that 60% of the incandescent bulbs will be replaced by LED bulbs at the end of this action plan.

| | LED lighting | Base year : 2015 GJ | kWh | Ratio |
|---|---|---|---|---|
| 1 | Total residential energy consumption | 171 163 | 47 545 174 | |
| 2 | Estimated residential lighting power consumption | 6 230 | 1 730 644 | 3,64% |
| 3 | Total CI sector energy consumption | 183 265 | 50 906 846 | |
| 4 | Estimated commercial lighting power consumption | 19 646 | 5 457 214 | 10,72% |
| 5 | Total industrial energy consumption | 42 131 | 11 703 101 | |
| 6 | Estimated industrial lighting power consumption | 1 534 | 425 993 | 3,64% |
| | | | | |
| 7 | Efficiency gains due to conversion | | 55% | |
| 8 | Conversion rate for 2025 | | 60% | |
| 9 | Annual energy conversion reduction (Residential) | | 571 113 | kWh |
| 10 | Annual Energy Conversion Reduction (Commercial and Institutional) | | 1 800 881 | kWh |
| 11 | Annual Energy Reduction in Conversion (Industrial) | | 140 578 | kWh |
| 12 | Reduction of GHG emissions from conversion (Residential) | | 160 | t. eq. $CO_2$ |
| 13 | Conversion GHG emission reduction (Commercial and Institutional) | | 504 | t. eq. $CO_2$ |
| 14 | Reduction in Conversion GHG Emissions (Industrial) | | 39 | t. eq. $CO_2$ |
| **15** | **Reduction of GHG emissions from conversion (all sectors)** | | **704** | **t. eq. $CO_2$** |

**Note**:
Line 12- Table 10, Project 1 R 1
Lines 13 & 14- Table 10, Project 5 ICI 1

## D. PROJECT PORTFOLIO

### 2. Infrastructure (heating, cooling) - Clean Energy Conversion (Oil to Electricity)

Sussex wishes to reduce heating oil consumption in the community in favor of electricity. The municipality plans to run a survey on heating oil users for a better understanding of their number, needs and demands. The survey will allow to adjust the project's target and timeline.

According to the community inventory, almost 28% of the community's GHG emissions come from the residential sector. Fuel furnaces are less efficient that electric heater.

| | Clean Energy Conversion (Oil to Electricity) | | Base year : 2015 | |
|---|---|---|---|---|
| 1 | Energy conversion | | 25,0% | |
| 2 | Participating households (number and %) * | | 498 | 25,0% |
| 3 | Energy saved per (Gj) | | 2 695 | |
| **4** | **Reduction of GHG emissions (tonnes and %)** | | **144,2** | **5,7%** |
| | * Rough estimation | | | |
| | **Estimation details** | | | |
| 5 | Heating oil consumption | 35 930 | Gj | |
| 6 | Heating oil GHG emissions | 2 533 | $eCO_2$ (t) | |
| **7** | **Projects' rate of implementation To Set** | **25%** | **Target** | |
| 8 | Number of Dwellings in the community | 1 990 | | |
| 9 | Participating households | 498 | Rough estimation | |
| 10 | Electricity needs (result of conversion) | 6 288 | Gj | |
| 11 | Electricity GHG Emissions (result of conversion) | 489 | $eCO_2$ (t) | |
| 12 | Residual Heating Oil consumption | 26 948 | Gj | |
| 13 | Residual Heating GHG Emissions | 1 900 | $eCO_2$ (t) | |
| **14** | **GHG reduction** | **144,2** | $eCO_2$ (t) | |

# VI. The Plan

## D. Project Portfolio

### 3. Infrastructure (heating, cooling & envelope) - Energy efficiency (Residential buildings)

According to the community inventory, almost 28% of the community's GHG emissions come from the residential sector. Improving energy efficiency is therefore a key means of reducing overall community emissions. NB Power has developed a series of financial incentive programs such as waterproofing, insulation or replacement of home heating systems. The average implementation rate of these measures is set at 50%. The average efficiency of all these measures is set at 10%.

| | Energy efficiency (Residential buildings) | | Base year : 2015 | |
|---|---|---|---|---|
| 1 | Energy saving (estimated) | | 10,0% | |
| 2 | Participating households (number and %) * | | 995 | 50,0% |
| 3 | Energy saved per year (Mj) | | 5 812 712 | |
| 4 | **Reduction of GHG emissions (tons and %)** | | **441,95** | **5,0%** |
| | * Rough estimation | | | |
| | **Estimation details** | | | |
| 5 | Total electricity Consumption | 134 838 | Gj | |
| 6 | Energy use for heating purposes | 65,94% | | |
| 7 | Electric Consumption - heating | 88 912 | Gj | |
| 8 | Fuel consumption - heating | 26 948 | Gj | see below |
| 9 | Propane consumption - heating | 394 | Gj | |
| 10 | Electricity consumption GHG emissions | 6 915 | $eCO_2$ (t) | |
| 11 | **Fuel consumption GHG emissions** | **1 900** | **$eCO_2$** (t) | |
| 12 | Propane GHG emissions | 24 | $eCO_2$ (t) | |
| 13 | GHG emissions targeted | 8 839 | 18,9% | |
| 14 | Projects' rate of implementation | 50% | To Set | |
| 15 | Total community emissions | 46 748 | $eCO_2$ (t) | |
| 16 | Average energy efficiency gain | 10,0% | To Set | |
| 17 | Number of Dwellings in the community | 1 990 | | |
| 18 | Participating households | 995 | Rough estimation | |

# VI. The Plan

## D. Project Portfolio

### 4. Infrastructure (heating, cooling) - Energy efficiency - Residential - Clothes Line Program

Sussex wishes to promote simple yet efficient measures that will reduce energy costs and carbon footprint of its citizens. According to the community inventory, almost 28% of the community's GHG emissions come from the residential sector. Clothes lines have multiple advantages : Low installation/repair cost, saves money, zero GHG emission, etc.

The average implementation rate of these measures is set at 25%.

| | Infrastructure (heating, cooling & envelope) | Base year : 2015 | | |
|---|---|---|---|---|
| 1 | Energy saving (estimated) | | 12,5% | |
| 2 | Participating households (number and %) | | 455 | 22,9% |
| 3 | Energy saved per year (kWh) | | 272 970 | |
| **4** | **Reduction of GHG emissions (tons and %)** | | **76,4** | **0,2%** |
| | **Estimation details** | | | |
| 5 | Average electric clothes Dryer consumption per household | 100 | kWh / month | |
| 6 | Total power use for clothes drying | 1 200 | kWh / year | |
| 7 | Number of Dwellings in the community | 1 990 | | |
| 8 | Ratio of households with an electric clothes dryer | 91,4% | | |
| 9 | Annual estimated power used by laundry dryers | 2 183 757 | kWh / year | |
| 10 | Total estimated GHG emissions of laundry drying | 611 | $eCO_2$ (t) | |
| **11** | **Clothes lines efficiency** | **100%** | | |
| **12** | **Clothes lines use rate** | **50%** | **6 months / year** | |
| **13** | **Projects' rate of penetration** | **25%** | **To set** | |
| 14 | Participating households | 455 | | |
| 15 | Energy reduction | 272 970 | kWh | |
| 16 | GHG reduction | 76 | | |
| 17 | Energy savings | 28 907 | $ | |
| 18 | Total community emissions | 46 748 | $eCO_2$ (t) | |

# VI. The Plan

## D. Project Portfolio

### 5. Infrastructure (heating, cooling & envelope) - Energy efficiency (Commercial buildings)

According to the community inventory, more than 29% of the community's GHG emissions come from the commercial and institutional sector. Improving energy efficiency is therefore a key means of reducing overall community emissions. NB Power has put in place a program called " Energy Smart Commercial Buildings Retrofit Program" for Commercial Buildings.

The average implementation rate of these measures is set at 50%. The average efficiency of all these measures is set at 10%.

| | Energy efficiency (commercial buildings) | | Base year : 2015 | |
|---|---|---|---|---|
| 1 | Energy saving (estimated) | | 0 | |
| 2 | Energy saved per year (Mj) | | 5 767 942 | |
| **3** | **Reduction of GHG emissions (tons and %)** | | **424,39** | **5,0%** |
| | **Estimation details** | | | |
| 4 | Total electricity Consumption | 122 422 | Gj | |
| 5 | Energy use for heating purposes | 48,35% | | |
| 6 | Electric Consumption - heating | 59 191 | Gj | |
| 7 | Fuel consumption - heating | 48 222 | Gj | |
| 8 | Propane consumption - heating | 7 946 | Gj | |
| 9 | Electricity consumption GHG emissions | 4 604 | $eCO_2$ (t) | |
| 10 | Fuel consumption GHG emissions | 3 399 | $eCO_2$ (t) | |
| 11 | Propane GHG emissions | 485 | $eCO_2$ (t) | |
| 12 | GHG emissions targeted | 8 488 | 18,2% | |
| **13** | **Projects' rate of implementation** | **50%** | **To Set** | |
| 14 | Total community emissions | 46 748 | $eCO_2$ (t) | |
| **15** | **Average energy efficiency gain** | **10,0%** | **To Set** | |

## D. PROJECT PORTFOLIO

### 6. 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-liters 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


| Idle-free Policy | Base year : 2015 | | | |
|---|---|---|---|---|
| | Gasoline | | Diesel | |
| 1 Number of units | 3 333 | | 234 | |
| 2 Fuel consumption | 4 347 786 | litres | 2 065 726 | litres |
| 4 GHG emissions | 10 607 | $eCO_2$ (t) | 5 543 | $eCO_2$ (t) |
| 5 Average fuel wasted idling | 358 364 | litres | 52 416 | litres |
| 6 Average fuel economy | 8,2% | | 2,5% | |
| 7 GHG emissions reduction | 874,2 | eCO2 (t) | 140,7 | eCO2 (t) |
| **9 Total GHG Emissions reduction** | **1014,89** | **eCO2 (t)** | | |

## D. PROJECT PORTFOLIO

### 7. Transportation - Fuel-efficient driving

Driving can significantly influence fuel consumption. We assume in this project that community drivers, through incentives, promotional campaigns and economic reasons, will gradually integrate these principles of effective behaviour.

According to Natural resources Canada, Adopting these five fuel-efficient driving techniques can reduce fuel consumption and carbon dioxide emissions by as much as 20 percent (20%):

1. Accelerate gently
2. Maintain a steady speed
3. Anticipate traffic
4. Avoid high speeds
5. Coast to decelerate

| Fuel-efficient driving | Base year : 2015 | |
|---|---|---|
| 1 Community transportation emissions | 16 247 | $eCO_2$ (t) |
| 2 Total community emissions | 46 748 | $eCO_2$ (t) |
| 3 Number of targeted units | 346 | |
| **4 Reduction of GHG emissions (tons and %)** | **308** | **0,66%** |

## D. PROJECT PORTFOLIO

### 8. Transportation - Electric Vehicle Community Program

The EV Community Program is proposed for the Community GHG and Energy Planning timeline. The program is related to the NB Climate Action Plan and will help the community to integrate EV and gradually replace conventional vehicle use.

Information : EV 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. There are two kinds of electric car:

**Fully Electric Cars** are powered 100% by electricity and have zero tailpipe emissions. Fully electric cars can travel 200-400 km on a single charge.

**Plug-in Hybrid Electric Cars** have small battery packs for short all-electric driving distances (20-80 km) before a gasoline engine or generator turns on for longer trips.

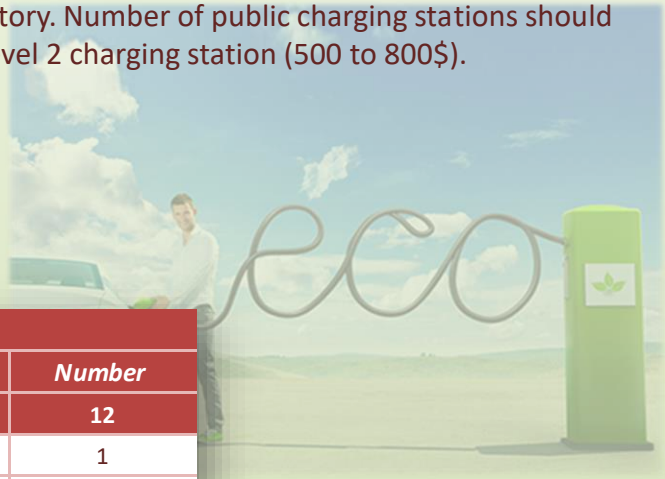
| | | | Base year : | 2015 |
|---|---|---|---|---|
| | | | Target year : | 2025 |
| 1 | GHG Target - $eCO_2$ (t) | | **62** | |
| 2 | Target number of EV units for 2025 | Minimum & maximum | 20 | 56 |
| 3 | *NB CCAP Target for EV units for 2025 (estimated)* | *Total & annually* | *56* | *7* |
| 4 | GHG emissions reduction (tons and %) | Minimum | 62 | 0,1% |
| 5 | | Maximum | 172 | 0,4% |
| 6 | Transport GHG emissions reduction (%) | Maximum & Minimun | 1,1% | 0,4% |
| 7 | Savings per year (Minimum & maximum) | | 22 698 $ | 20 652 $ |
| 8 | Number of car & light Truck | | 3 254 | |
| 9 | | Minimum & maximum | 0,6% | 1,7% |

# VI. The Plan

## D. Project Portfolio

### 9. Transportation - Electric Vehicle Community Program (continued)

Charging Station : In 2018, Sussex counts 12 public N2 charging stations (CS) on its territory. Number of public charging stations should be increased locally and regionally. We estimates that EV owners should have private level 2 charging station (500 to 800$).

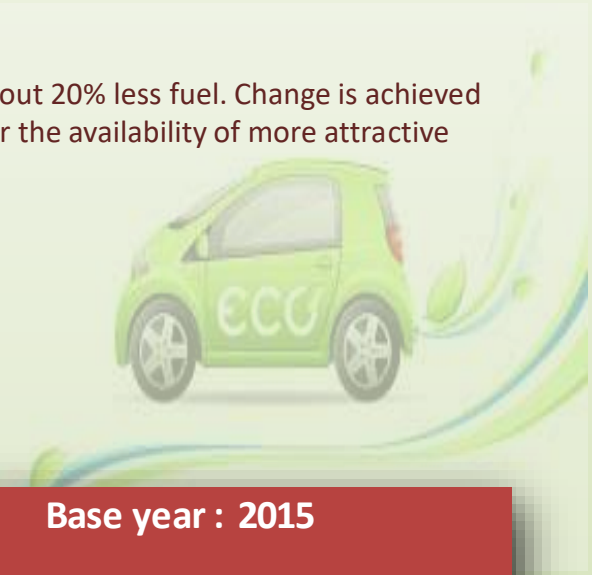


| EV-Charging Station (Installed & planned) | | |
|---|---|---|
| *Location* | *Comment* | *Number* |
| | Total | 12 |
| Amsterdam Inn & Suites 143 Main St, - N2 Sun Country | | 1 |
| · Gatewall Mall | *Proposed W1* | 1 |
| · Arena | *Proposed W1* | 1 |
| · Civic Centre | *Proposed W1* | 1 |
| · Amsterdam Inn | *Proposed W1* | 1 |
| · Downtown Core | *Proposed W1* | 1 |
| · Works Garage | *Proposed W1* | 1 |
| · Library | *Proposed W1* | 1 |
| · Balloon Festival / Fleamart | *Proposed W1* | 1 |
| · Arts & Culture Centre | *Proposed W1* | 1 |
| · Train Station | *Proposed W1* | 1 |
| · Kingswood Chapel | *Proposed W1* | 1 |

## D. PROJECT PORTFOLIO

### 10. Transportation - Compact vehicles

The community vehicle fleet is becoming more fuel-efficient and fuel-efficient, consuming about 20% less fuel. Change is achieved through targeted incentives, public awareness, a gradual change in transportation patterns, or the availability of more attractive business models.




| Fuel-efficient driving | Base year : 2015 | |
|---|---|---|
| 1 Community transportation emissions | 16 247 | $eCO_2$ (t) |
| 2 Total community emissions | 46 748 | $eCO_2$ (t) |
| 3 Number of targeted units | 346 | |
| **4 Reduction of GHG emissions (tons and %)** | **308** | **0,66%** |

## D. PROJECT PORTFOLIO

### 11. Transportation - Community Van

Community Van is a service offered by the municipality which provides the community and its members a shared means of transportation for short or long distance travels. Because the community van is a form of public transportation service, it helps reducing the number of commuting cars.

| | Community Van | Base year : 2015 | |
|---|---|---|---|
| 1 | One-passenger cars removed from the roads | 6 | Units |
| 2 | km travelled | 15 000 | |
| **3** | **Reduction of GHG emissions (tons and %)** | 9,29 | 60,5% |
| | | | |
| 4 | Passenger Van | 1 | Units |
| 5 | passenger capacity | 12 | seats |
| 6 | Fuel efficiency (L/100 KM) | 17 | L/100 km |
| 7 | km travelled | 15 000 | km |
| 8 | Fuel consumption | 2 490 | Liters |
| 9 | GHG emissions (tons) | 6,1 | $eCO_2$ (t) |
| **10** | Occupied seats in average | **50%** | **To Set** |
| 11 | One-passenger cars removed from the roads | 6 | Units |
| 12 | Average Fuel consumption rating of removed cars | 7 | L/100 km |
| 13 | Avoided fuel consumption | 6 300 | Liters |
| 14 | Avoided GHG emissions | 15,4 | $eCO_2$ (t) |
| **15** | **GHG reductions** | **9,3** | **$eCO_2$ (t)** |

## D. PROJECT PORTFOLIO

### 12. Renewable Energy Production – Geothermal Energy System

In 2016, the Potash Corporation of Saskatchewan decommissioned their Potash mine in Penobsquis which is now in the stage of flooding and presents a unique investment opportunity. The Town of Sussex commissioned a Technical feasibility study of the geothermal capability of the Penobsquis mine site. The study assembled background data from local Penobsquis industry partners, PotashCorp and Avon Valley Floral, to enable the modelling of 20 example geothermal applications.

"Currently, the Avon Valley Floral greenhouse, in Penobsquis, employs 12 full time employees. During their growing season, this number rises to 50 to 60 employees. Installation of a district system could provide Avon Valley Floral the economic advantage to operate 12 months of the year. A district system could also provide an economic advantage to prospective proponents who connect to the district system (additional greenhouses, refrigeration warehouse and or data storage centers etc.). This would create more jobs in the region and additional revenue for the utility provider which could prompt expansion of the district system."

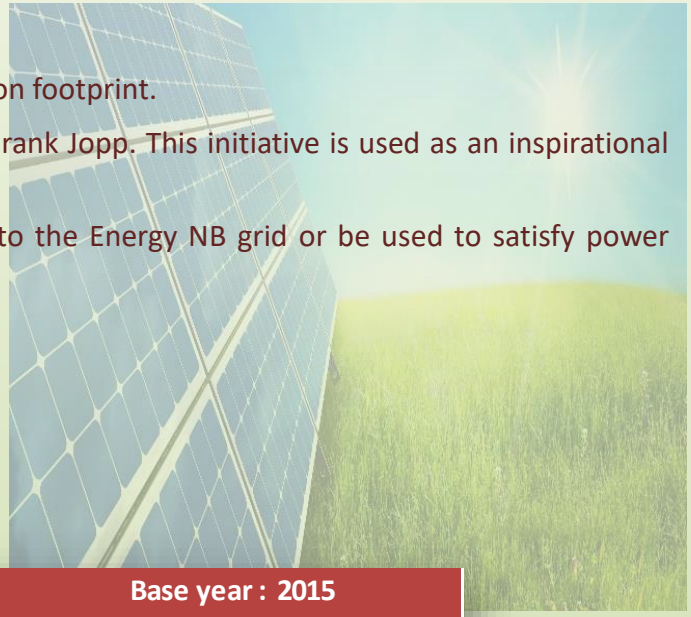
This project considers the scenario 2 which is producing geothermal energy for the current greenhouse operating 12 months per year.

| | Geothermal Energy System | | I 1B C 2025 |
|---|---|---|---|
| 1 | Total Energy saved (Gj) | | 20 263 |
| 2 | **Total GHG reductions (t eCO2)** | | **1 576** |
| 2 | **Geothermal project - scenario 2** | **Short term (2025)** | **(Scenario : i 1B C)** |
| | **Avon Valley Floral greenhouse (12 months/yr)** | **Quantity (GJ)** | **Quantity (kWh)** |
| a | **Electricity (grid)** | 28 903 | 8 028 571 |
| b | **Electricity (geothermal)** | 8 640 | 2 400 000 |
| | Difference | 20 263 | 5 628 571 |

# VI. The Plan

## D. Project Portfolio

### 13. Renewable Energy Production - Solar Photovoltaic



Sussex wishes to produce renewable energy to generate income and reduce its carbon footprint.

The Sussex community already has a solar farm which is a privately owned by Mr. Frank Jopp. This initiative is used as an inspirational model for other members of the community to create other solar farms.

As it is the case for the existing solar farm, the produced energy could be return to the Energy NB grid or be used to satisfy power demand of one or several consumers.

This project assumes that two more solar farms are set up in the future years.

These installations are assumed to be of similar size than the existing solar farm.

The revenues are calculated as if all the power production were for self-consumption

| | Solar Photovoltaic | | Base year : 2015 | |
|---|---|---|---|---|
| 1 | **Energy conversion** | **Target year** **2025** | | |
| 2 | Energy saved per (Gj) | | 1 261 | |
| 3 | **Reduction of GHG emissions (tons and %)** | | **98** | **0,4%** |
| | **Estimation details** | | | |
| 4 | Electricity consumption (all sectors) | 283 691 | Gj | |
| 5 | Electricity consumption (all sectors) GHG emissions | 22 065 | $eCO_2$ (t) | |
| 6 | Renewable Electricity Production | 1 261 | Gj | |
| 7 | Renewable Electricity Production ratio | 0,4 | % | |
| 8 | **GHG reduction** | **98,1** | **$eCO_2$** (t) | |
| 9 | GHG reduction for all sector electricity use (%) | 0,4 | % | |

## D. PROJECT PORTFOLIO

### 14. Solid Waste - Domestic composting

The Town intends to promote and establish a" domestic composting culture "with the population through actions such as training, composting, etc. This project involves the distribution of 200 domestic composters as soon as possible.

| | Solid Waste | Base year : 2015 | |
|---|---|---|---|
| 1 | Compostable materials diverted from landfill | 49 | |
| 2 | GHG emissions reduction (tons & %) | - | 0,0% |
| **3** | **Duration of the project** | **7** | |
| | **Estimation details** | | |
| 4 | Community Waste sector emissions | 522 | $eCO_2$ (t) |
| 5 | Total community emissions | 46 748 | $eCO_2$ (t) |
| 6 | Residential solid waste | 725 | Tons |
| 7 | Number of Dwellings in the community | 1 990 | |
| **8** | **Number of composters to be distributed** | **200** | **Units** |
| 9 | Number of users per composter | 2,24 | |
| 10 | Average organic material per person / year | 0,184 | Tons |
| 11 | Proportion of organic matter actually composted | 60% | |
| 12 | Compostable materials diverted from landfill | 49,46 | Tons |
| 13 | Avoided Emissions | **17** | $eCO_2$ (t) |
| 14 | Emissions from composting | 20 | $eCO_2$ (t) |
| 15 | Net Short-term Reductions | **0** | $eCO_2$ (t) |

# VII. APPENDIX

## Partners for Climate Protection program (PCP) - Method

## 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.