Local Emissions Reduction Action Plan in Sackville, NB

Milestone 3 of the Partners for Climate Protection Program

Endorsed by the Sackville Town Council February 8, 2016

Prepared by EOS Eco-Energy Inc.

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Sackville
NEW BRUNSWICK

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Introduction

Sackville has been a member of the national Partners for Climate Protection (PCP) program since 2003. The PCP program, administered by the Federation of Canadian Municipalities, is a 5-step process to save energy and reduce carbon emissions at the municipal level. In 2011, the community undertook Milestone 1, which involved a baseline emissions study. The study found that municipal operations released 1,860 metric tonnes of carbon dioxide into the atmosphere that year, while the community released 74,818 metric tonnes. During the winter of 2013-2014, the Sackville Town Council agreed to reduce their municipal emissions by 10% and community emissions by 10% by 2021 (Milestone 2). This report outlines the local action plan to reduce energy and carbon emissions, which was designed by the Town during 2014/2015 (Milestone 3). The action planning process was led by the environmental non-profit EOS Eco-Energy Inc. with funding from the New Brunswick Environmental Trust Fund.

Our Community

The town of Sackville is located in South-Eastern New Brunswick, near the Nova Scotia border, 53km from the city of Moncton, NB and is surrounded by the Tantramar Marshes near the Bay of Fundy. Sackville's population of 5,558 is spread across 74.32 $km^{2.}$ The population increases by 2,500 every academic year when students attend classes at Mount Allison University. Mount Allison is also the largest employer in Sackville. This small town has educational opportunities from pre-school to university to seniors' college, weekly farmer's market, a general hospital, banks, seniors housing, RCMP station, fire station, churches, museums, art galleries, parks, as well as a vibrant downtown with restaurants and storefronts. Sackville often has live music shows, and every summer is the host to the annual SappyFest music festival. Sackville is also home to the Sackville Waterfowl Park, a tourist attraction featuring a boardwalk and a wide variety of wildlife, including many types of birds.

Community Vision

Working to reduce emissions and save energy is part of Sackville's long-term sustainability plan. In the Sustainable Sackville plan, adopted in 2010, the Energy Strategy has the following objective:

To meet our community's energy needs in an efficient, affordable, sustainable and reliable way, while managing greenhouse gas

emissions and air quality.

Sackville's Vision Statement for 2040 includes the following:

Sackville embraces sustainability as the foundation for our environmental, social and economic well-being.

Our legacy to future generations is a community that is cleaner, greener, healthier, and more prosperous than ever before. To that end, we work tirelessly to reduce waste, diminish pollution, conserve energy and encourage healthy, active living.

Project Goals and Objectives

The main goal of the project was the design a local action plan to reduce energy and carbon emissions locally in Sackville. In order to accomplish this, the following objectives were set:

1. Use the emissions inventory and emissions reduction targets for municipal operations and the community to guide the municipal action planning process.

2. Engage municipal staff in action planning for emissions reduction from municipal operations.

3. Engage Sackville residents, business owners and representatives from institutions, organizations and local students in action planning for emissions reduction for the community.

4. Compile all information into a useful and feasible local action plan.

Sackville, NB. Photo credit: https://commons.wikimedia.org/wiki/File:Sackville.JPG

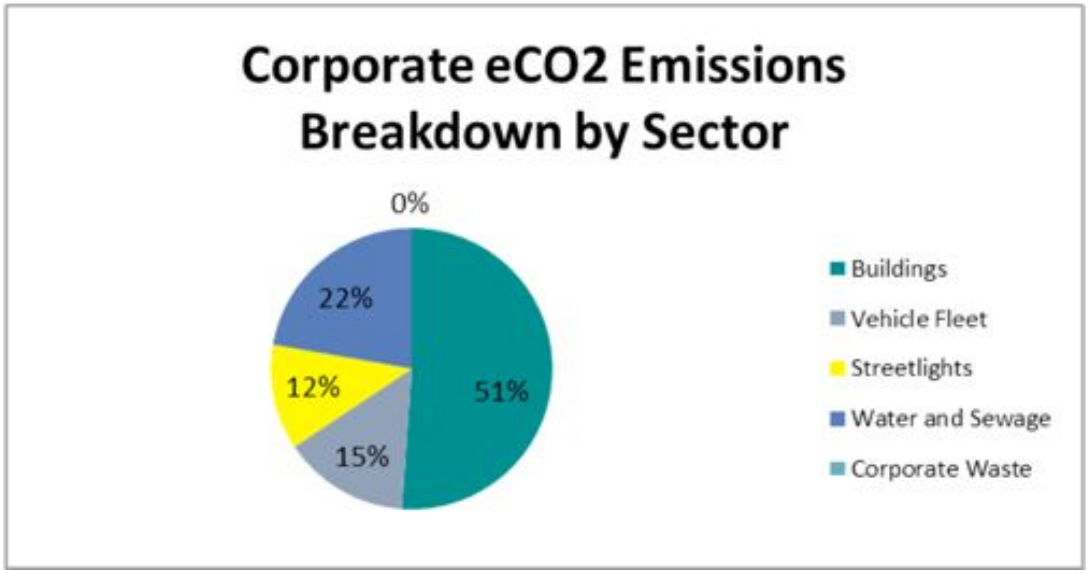
Summary of Emissions Inventory and Forecasts (Milestone 1)

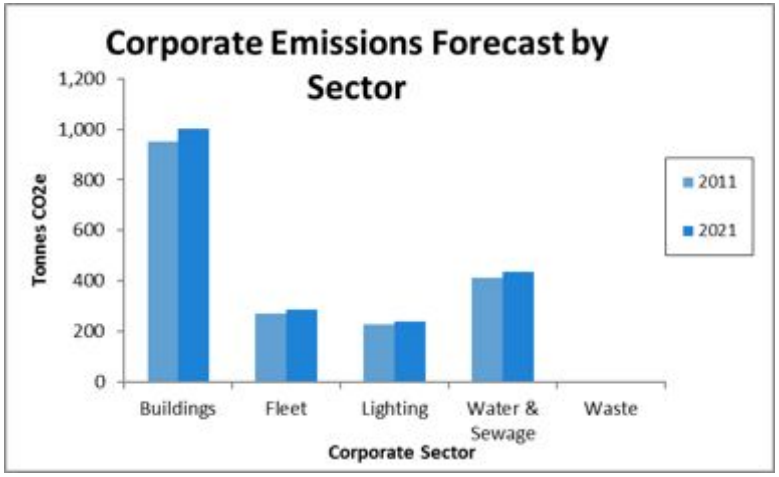
During 2011, emissions inventories and forecasts were completed for municipal operations and the community of Sackville (Milestone 1).

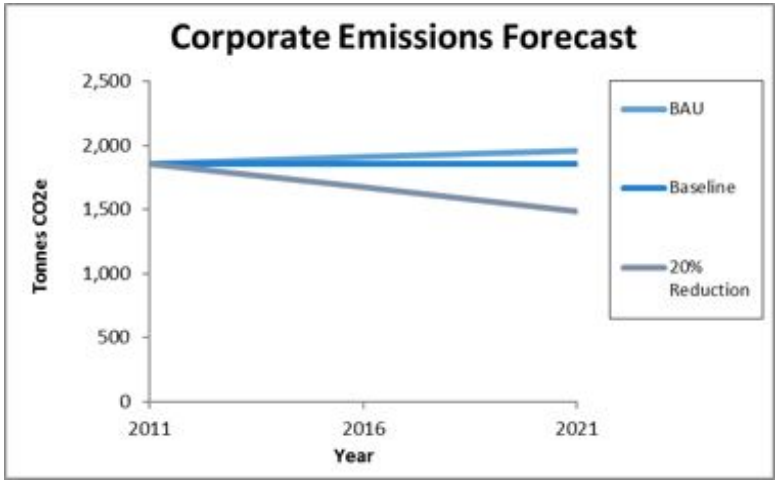
Municipal Operations

Emissions from all municipal emissions were found to be 1,860 metric tonnes of carbon dioxide equivalent (t C02e) in 2011. This calculation included emissions from all municipally-owned buildings, vehicle fleet, streetlights, water and sewage and corporate waste. Emissions from corporate waste were found to be negligible are thus shown to be 0% in the graph. The largest percentage of emissions comes from buildings (51%).

Emissions from municipal operations were then forecasted for the next ten years (until 2021). Sackville is committed to taking additional actions to reduce emissions and live more sustainably.



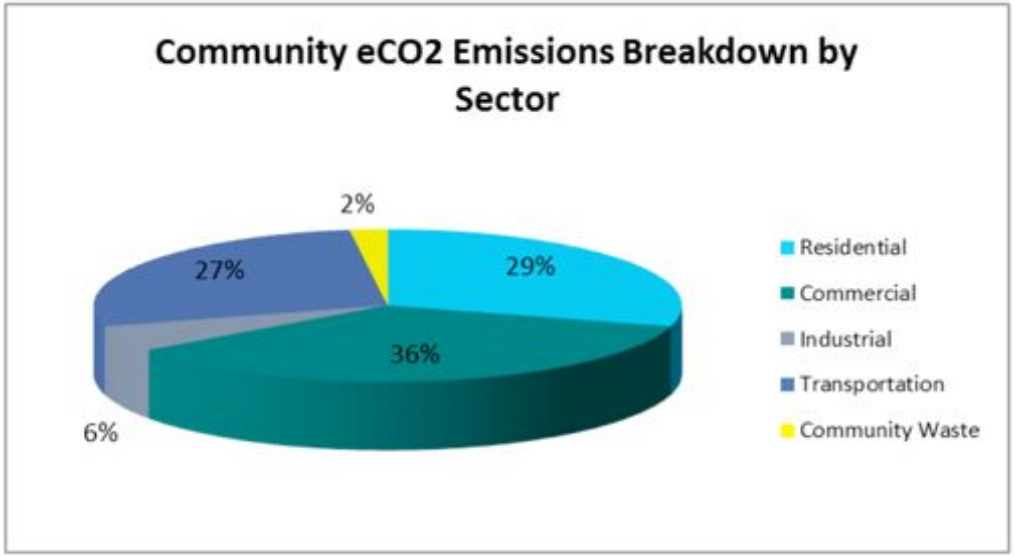


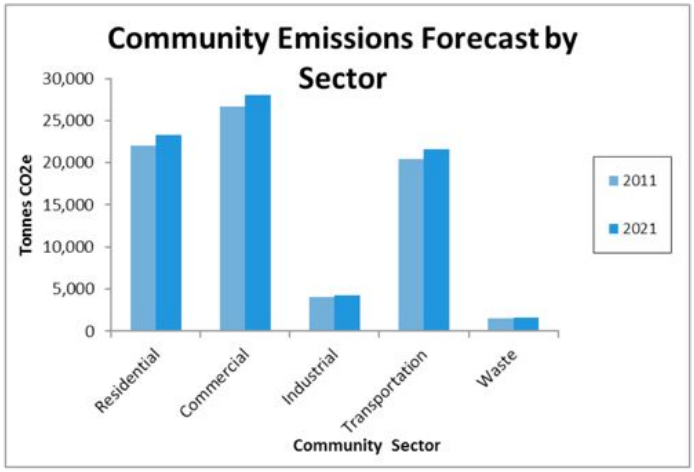


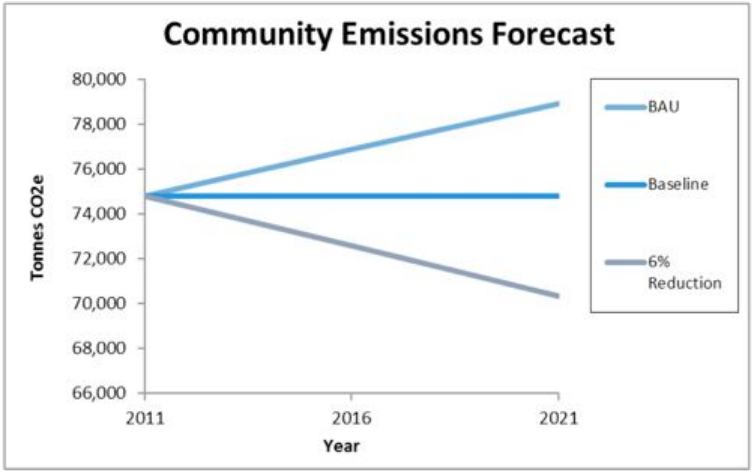
Community

Emissions from the rest of the community of Sackville were found to be 74,818 metric tonnes of carbon dioxide equivalent (t C02e) in 2011. This calculation included emissions from residential buildings, businesses and institutions (commercial), industry, transportation and community waste. The largest percentage of emissions comes from commercial buildings (36%).

Emissions from community sources were then forecasted for the next ten years (until 2021). Local resident are committed to taking actions to reduce their emissions and live more sustainably.







Emissions Reduction Targets (Milestone 2)

Municipal Operations

During winter 2013-2014, the Town Council agreed to reduce emissions from municipal operations by 10% by 2021. Ten percent equals 186 t CO2e.

Community

During winter 2013-2014, the Town Staff worked with EOS to gauge public acceptance to reduce community emissions by at least 10% by 2021. This equals a reduction of 7,482 t CO2e. Participants in a community meeting supported the reduction target and EOS received positive feedback from community outreach.

Methodology for Milestone 3

The methodology for developing this action plan had five parts:

1. Background Research
2. Meeting with municipal staff and council
3. Community engagement
4. Youth engagement
5. Presentation of local action plan for council and public

Background Research

The emissions inventory and reduction targets for Sackville were reviewed. Local action plans from other rural communities across Canada were accessed from the Partners for Climate Protection website and reviewed as well.

Meeting with Municipal Staff

EOS Eco-Energy staff began by meeting with representatives from the Town of Sackville, including the Treasurer, Town Engineer, CAO, Manager of Corporate Projects, Tourism and Business Development Manager, Recreation Programs and Events Manager, in January 2015. They provided input, brainstormed, and agreed on actions to reach their municipal reduction target of 10% below 2011 levels. The municipal action plan is outlined at the end of this report. It was important to begin with the municipal plan in order for the municipal government to lead the community by example.

Community Engagement

Community engagement for the local action plan was sought in a number of ways. EOS took part in the popular community event called the Annual Fall Fair, where EOS set up an information booth and set up a station where visitors could write their ideas for reducing emissions and making Sackville more sustainable. EOS conducted an online survey that included questions regarding reducing emissions in Sackville. EOS solicited feedback from the Greater Sackville Chamber of Commerce as a way to get input from the business community. EOS also accessed a list of sustainability projects that Mount Allison has undertaken since 2011.

EOS also publicized PCP events and brought attention to the PCP program through the quarterly EOS Newsletter, and through press releases that were sent to local newspapers and radio stations. The articles that were printed in the Sackville Tribune Post invited residents to attend events or contact EOS via phone or email. EOS also asked for feedback using social media (Facebook and Twitter). EOS hosted multiple events at which input was solicited from the community. The first was held on September 11, 2015 in coordination with QUEST NB to help the community learn about Smart Energy Community Planning. Eddie Oldfield, of QUEST NB, presented the framework for Smart Energy Planning. Twenty community members were then asked to take maps of Sackville and identify current and potential challenges and opportunities for energy waste or efficiency.

Smart Energy Community Planning discussion groups in Sackville on September 11, 2015. Photo credit: A. Marlin

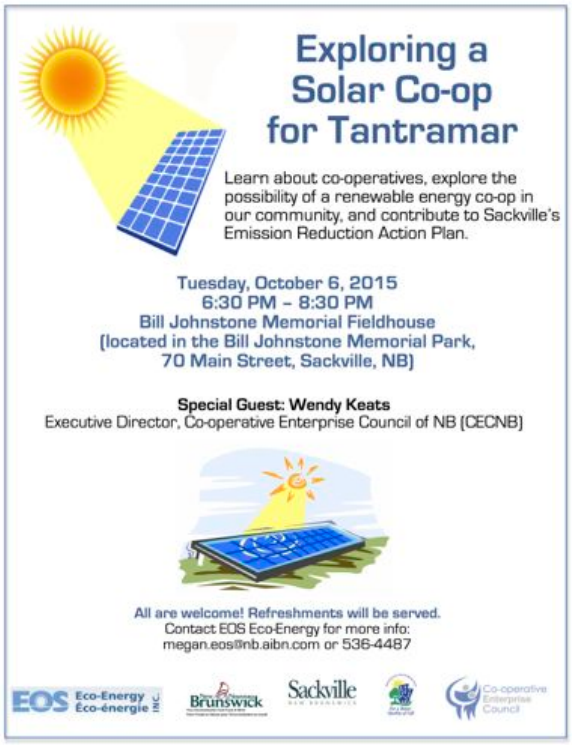
On September 29, 2015, the community of Sackville was invited to the Sackville Energy Saving Dessert Party. Eleven residents attended the event where they ate delicious, locally made desserts, and listened to a presentation by Robert Robichaud, the residential energy advisor with NB Power. His informative presentation included basic information about how electricity works, how to save energy and increase efficiency.

He stressed the importance of adequate insulation before the addition of new technologies such as heat pumps or solar panels. He gave each participant a new energy-saving LED light bulb as well. After the presentation, participants discussed ways for the community to save energy and reduce emission.

On October 6, 2015, twenty community members gathered to discuss the possibility of creating a renewable energy co-operative in the Sackville area and how this potential project would contribute to reducing emissions and reduce energy use.

Sackville Energy-Saving Party on September 29, 2015. Photo credit: M. Mitton

Solar Co-op Event in Sackville on October 6, 2015. Photo credit: M. Mitton



Youth Engagement

Marshview Middle School

EOS Eco-Energy staff visited Marshview Middle School and brought hands on activities so the students could learn about climate change impacts and sustainable energy solutions. 109 students in grades 5 to 8 took part in activities. The students then brainstormed ideas for how to save energy at their school and cross the town of Sackville. They wrote letters to their mayor and council. Some of their ideas included:

- **Use less energy** by making buildings more energy efficient, using clotheslines to dry clothes, and unplugging appliances when not in use.

- **Buy local food** and have a farmer's market more than once a week so that people can buy more local produce.

- **Solar power.** There should be more solar power in town, on residences, businesses, and the university. Students would also like to see solar panels on their school.

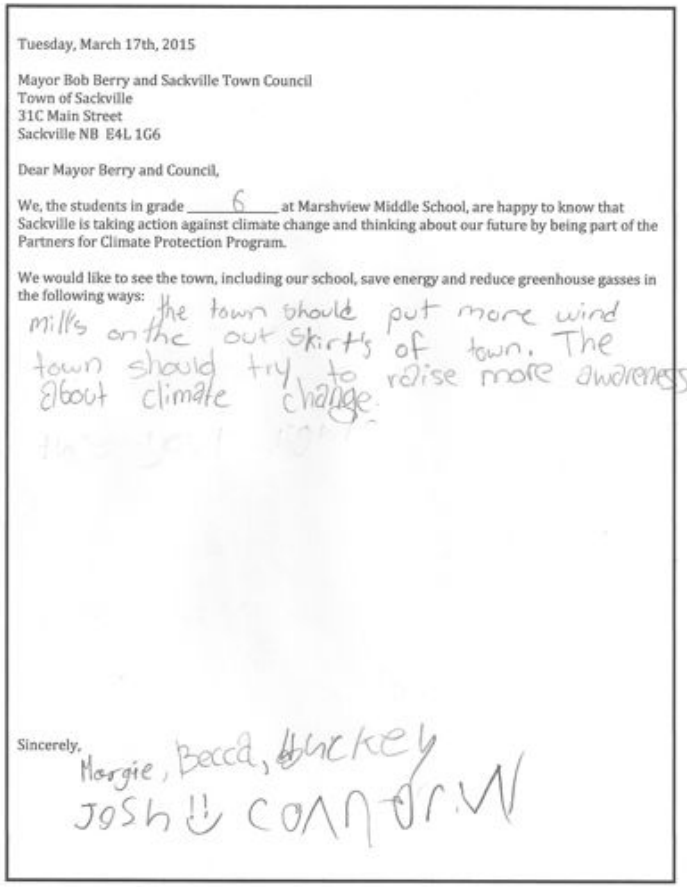
- **Wind power and "water wheels"** are renewable energy options the help meet energy needs.

- **Turning off lights** to save energy, replacing light bulbs with more efficient ones, use natural light, and have a day of learning with the lights out at school. On a larger scale, students suggested having solar-powered street lights or having street lights on for less time.

- **Walking, biking, and carpooling** are healthier transportation options that use less energy. Students suggested driving less, in order to reduce pollution. Walking or taking the bus was an action that everyone, including students could take. Students would also like to see solar-powered or electric cars, and public transportation.

- **Reduce, Reuse, Recycle!** Students would like to see recycling bins around the community and their school.

- **Use less water** by turning off the tap when not in use and taking shorter showers.



Tuesday, March 17th, 2015

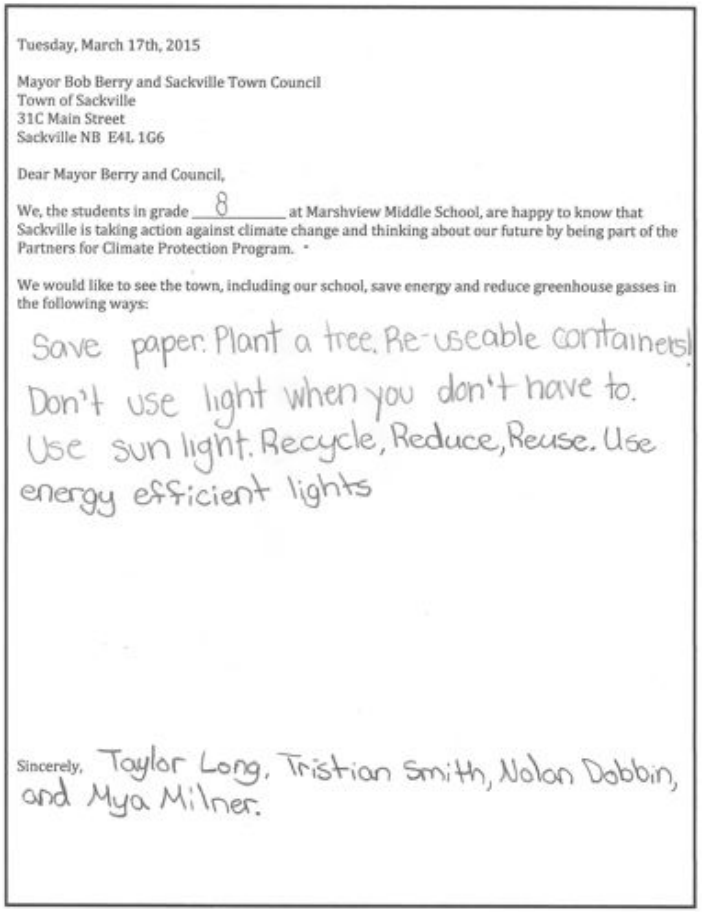
Mayor Bob Berry and Sackville Town Council
Town of Sackville
31C Main Street
Sackville NB E4L 1G6

Dear Mayor Berry and Council,

We, the students in grade 6 at Marshview Middle School, are happy to know that Sackville is taking action against climate change and thinking about our future by being part of the Partners for Climate Protection Program.

We would like to see the town, including our school, save energy and reduce greenhouse gasses in the following ways: the town should put more wind mills on the out skirts of town. The town should try to raise more awareness about climate change.

Sincerely,
Morgie, Becca, Hockey
Josh !! conor W



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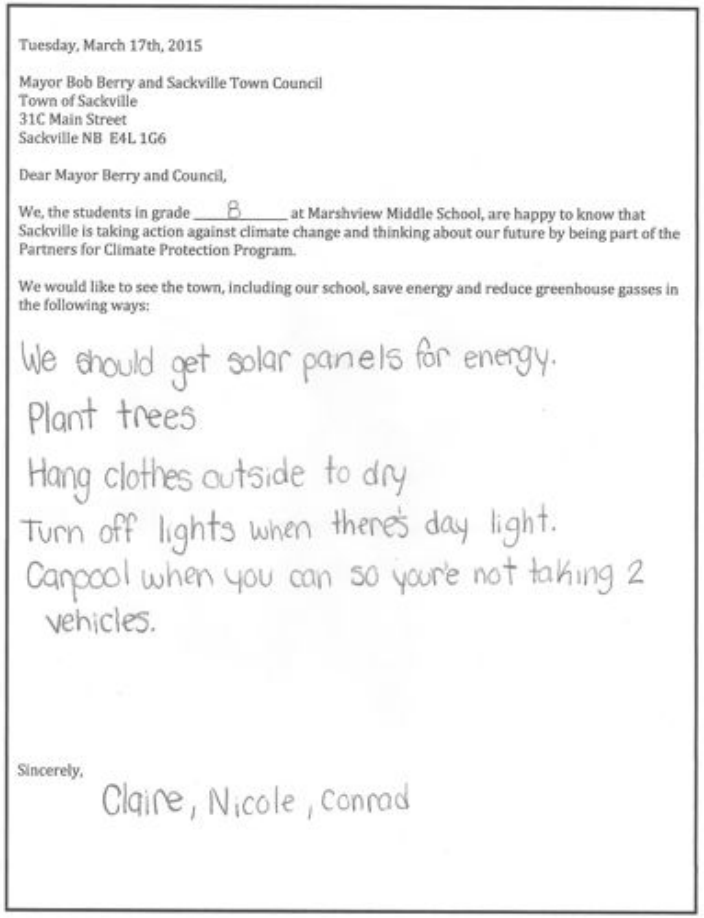
Dear Mayor Berry and Council,

We, the students in grade 8 at Marshview Middle School, are happy to know that Sackville is taking action against climate change and thinking about our future by being part of the Partners for Climate Protection Program.

We would like to see the town, including our school, save energy and reduce greenhouse gasses in the following ways:

Save paper. Plant a tree. Re-useable containers!
Don't use light when you don't have to.
Use sun light. Recycle, Reduce, Reuse. Use energy efficient lights

Sincerely, Taylor Long, Tristian Smith, Nolan Dobbin, and Mya Milner.



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Dear Mayor Berry and Council,

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We would like to see the town, including our school, save energy and reduce greenhouse gasses in the following ways:

We should get solar panels for energy.
Plant trees
Hang clothes outside to dry
Turn off lights when there's day light.
Carpool when you can so you're not taking 2 vehicles.

Sincerely,
Claire, Nicole, Conrad

Mount Allison Summer Camp

EOS Eco-Energy facilitated activities for Mount Allison Summer Camp participants. Campers learned about solar energy, used the sun to bake cookies and make sun tea, and shared their ideas about how to save energy in Sackville.

- **Use renewable energy**, including solar, tidal, micro-hydro, and wind power.
- **Play outside more** instead of playing with video games indoors.
- **Use bicycles instead of driving cars**, and use electric and solar-powered cars.
- **Plant trees**, because trees provide oxygen and absorb carbon dioxide.

Sackville Skate Park Event

EOS Eco-Energy staff attended an event at the Sackville Skate Park and youth had the chance to share their ideas for using less energy and making Sackville more sustainable at the EOS information booth.

- **Solar-powered and electric cars** instead of gas- and diesel- powered cars.
- **Use bicycles and scooters** as a mode of transportation and recreation, and install a water fountain at the skate park.
- **Sort garbage** (blue and green) and reduce waste.
- **Save potable water** by using rain water to wash things.

It is clear that there are ideas that many of the youth in Sackville share, such as using renewable energy, having public or car-free transportation, and saving water. Many of the ideas from the students, summer campers, and youth were incorporated into the community action plans represented on the next pages.

Presentation and Review of Local Action Plan with Council and Public

The local action plan was presented to the Sackville Sustainability Committee on January 25th, 2016 and feedback was provided. The completed local action plan was presented at the Special Meeting of Town Council on February 1st, 2016. At the regular Sackville Town Council meeting on February 8th, 2016, Town Council passed a motion to endorse Milestone 3 of the PCP plan.

Municipal Action Plan 2011-2021

Total emissions saved from the proposed activities in the Municipal action plan below could save more than 217 tonnes of green house gas emissions (or carbon dioxide equivalent). This will allow the municipality to reach (and surpass) its reduction target of 186 t CO2e.

Priority Areas

The Sackville Town Council has prioritized the following areas for energy savings and emissions reduction:

- Upgrade Street Lighting to LED
- Upgrades to Municipal Fleet
- Transportation Infrastructure and Culture
- Buildings
- Increase the amount of natural landscape (planting trees) on municipal properties

Activity	Lead/ Partners	Resources Acquired/ Needed	Timeline	Estimated Emissions Reduction
1.Street Lighting				
Installed 910 new LED street lights throughout Sackville. 879 were 100 Watt HPS Equivalent, 1 was a 150 Watt HPS Equivalent and 30 were 200 Watt Equivalent. They use 50-60% less energy.	NB Power	The Town pays NB Power on a per light basis. Cost: N/A We rent them from NB Power, but overall, we estimated saving 8%.	2014 (completed)	910 new LED Lights. We estimated saving 8% on NB Power Bill ($12-13,000/month or 135K/year). 910 LED lights x 0.225 t CO2e/annually = 204.75 t CO2e saved per year. (Savings of 0.225 t CO2e based on NB Power's estimates)

Activity	Lead/ Partners	Resources Acquired/ Needed	Timeline	Estimated Emissions Reduction
2. Municipal Vehicle Fleet				
New Bulldozer Replaced a 1976 Caterpillar D-9 Dozer with a new 2014 Case D-6 dozer.	Public Works Department, Treasurer	Funded via Capital out of Revenue Budget Cost: $140,000	2014 (completed)	A litre of gasoline is generally accepted to emit 2.38kg of carbon dioxide. A more fuel-efficient bulldozer will reduce emissions. According to CAT, a heavy equipment manufacturer, there is a 10-15 percent improvement in fuel efficiency with a Tier 4 engine (http://www.cat.com/en_US/products/new/equipment/dozers/medium-dozers/1000004501.html). Total savings will depend on how much it is used.
Sidewalk Snow Plow Replacing a 1981 Bombardier with a new modern 2015 Sidewalk Plow, equipped with a Tier 4 engine.	Public Works Department Finance Treasurer	This purchase will be funded via the 2015 Capital out of Revenue Budget. A tender process will be required. Cost: $140,000	2015 (completed)	A litre of gasoline is generally accepted to emit 2.38kg of carbon dioxide. A more fuel-efficient bulldozer will reduce emissions. According to CAT, a heavy equipment manufacturer, there is a 10-15 percent improvement in fuel efficiency with a Tier 4 engine (http://www.cat.com/en_US/products/new/equipment/dozers/medium-dozers/1000004501.html). Total savings will depend on how much it is used.
New, more fuel-efficient, fire trucks will be purchased	Sackville Fire Department	Town of Sackville Budget	2017 and 2021	A litre of gasoline is generally accepted to emit 2.38kg of carbon dioxide. More fuel-efficient fire trucks will reduce emissions.

Activity	Lead/ Partners	Resources Acquired/ Needed	Timeline	Estimated Emissions Reduction
New, more fuel-efficient truck will be purchased	Town of Sackville	Town of Sackville Budget	2016	A litre of gasoline is generally accepted to emit 2.38kg of carbon dioxide. A more fuel-efficient truck will reduce emissions.
New, more fuel-efficient loader will be purchased	Town of Sackville	Town of Sackville Budget	2018	A litre of gasoline is generally accepted to emit 2.38kg of carbon dioxide. A more fuel-efficient loader will reduce emissions.
Hybrid Vehicle for Bylaw Officer We replaced a 2003 Chevy Cavalier 2014 Ford C Max	Bylaw officer, Treasurer	Funding, research into hybrid vehicle options. Cost: $29,045	2013 (completed)	Saving of roughly 3300kg of C02 based on 20,000kms/annually.
3. Improve transportation infrastructure and culture				
Electric Vehicle Charging Station installed at the Sackville Visitor Information Centre at 34 Mallard Drive. Is a Sun Country 100amp level 2 charger. The installation of this infrastructure allows the Town to purchase electric vehicles (EVs) or plug in hybrid vehicles, as well as local residents.	Manager of Corporate Projects, EOS Eco-Energy Inc. and Sun Country Highway	Funding (was partially provided from EOS through the Mount Allison University Students' Union Green Investment Fund). Town of Sackville will also cover ongoing cost of charges for the public.	September 2014 (completed)	NB Power estimates that the average midsize vehicle emits 4,613kg of CO2 annually (based on 20,000km) compared to 725kg for a BEV (all battery) and 1,352kg for a PHEV (plug in hybrid).

Activity	Lead/ Partners	Resources Acquired/ Needed	Timeline	Estimated Emissions Reduction
Active Transportation Plan for Municipal Staff (this includes Walk to Work Day or Week)	Department of Recreation Programs and Events	Promotion, incentives/rewards, publicity	Ongoing	A litre of gasoline is generally accepted to emit 2.38kg of carbon dioxide. If one staff member walks to work instead of driving, and would normally travel 10km/day, then they can save 1.02L of fuel and 2.38 kg of CO2 per day (based on average fuel efficiency in 2010 of 10.2L/100km). Total savings will depend on how many people participate and how often it is done.
4. Buildings				
Storage facility that uses in-floor heating that is very efficient, and uses excess heat from the electric boiler at the Tantramar Veterans Memorial Civic Centre	Town of Sackville	Town of Sackville Budget		This storage facility uses excess heat in an efficient way to heat the storage building. This will use energy that would have been wasted, as well as saving on energy for the building and therefore reducing CO2 emissions.

Activity	Lead/ Partners	Resources Acquired/ Needed	Timeline	Estimated Emissions Reduction
Development of Municipal Energy Efficiency Policy. The plan will formalize internal plans and goals including use of the vehicle fleet, building use (lights, temperature) etc. Use sustainability lens to evaluate projects. One example is the Idling Policy for municipal vehicles. Another example is the use of LED holiday lights.	Manager of Corporate Projects, Town Engineer, Treasurer	Staff time for plan development and implementation and monitoring	Short- and long-term	Depending on the specific policies implemented, significant emissions could be reduced. A specific example would be the Idling Policy. If the average midsize car were to idle for an hour it would use 0.76L of gas. This translates to 1.8 KG of CO2 for every hour a car idles. In addition, for every two minutes a car idles, it uses enough gas to travel about 1.5 km. Therefore significant emissions could be reduced. The town is using LED holiday lights, which can reduce CO2e per two strings of lights, similar to each light installation; with approximately 50 installations in town, 3.42 t CO2e is saved.
5. Other				
Replace lights at baseball field on Lorne Street with LED lights as part of the Lighting Replacement Program.	Town of Sackville	Town of Sackville has applied to the NB Environmental Trust Fund to pay for this project. If not, the project will take place from 2016-2021 with the Town of Sackville and other funding.	2016-2017	If 20 exterior lights are upgraded to LED: 20 LED lights x 0.225 t CO2e/annually = 4.5 t CO2e saved per year. (Savings of 0.225 t CO2e based on NB Power's estimates)

Activity	Lead/ Partners	Resources Acquired/ Needed	Timeline	Estimated Emissions Reduction
<u>Trailblazer youth education programs</u> Trailblazers Wilderness Survival Camp (summer) for 35 children ages 5-11. Activities include plant identification, water purifying, environmental related activities, nature artwork, etc. at Beech Hill Park. Trailblazers Afterschool Program (fall and winter programs) for at least 20 grade 3 and 4 students per session (2 sessions/week). Grades 5-7 are 2 days per week. Activities include building snow trenches, identifying plants, animals, tracks, etc.	Manager of Recreation Program and Events, Town of Sackville	Town of Sackville Budget	2015 - present	Educating youth about the outdoors and fostering respect for the environment can encourage them to make choices that save energy and can help contribute to emissions reductions.

Activity	Lead/ Partners	Resources Acquired/ Needed	Timeline	Estimated Emissions Reduction
Planting trees in Sackville (10-12 trees per year, at least 60 – 120 trees in various locations)	Public Works, Corporate Projects	Town of Sackville will fund planting trees to improve tree canopy. Town has also applied for CN EcoConnexions grant to plant 120 trees in 2016.	2015 – ongoing until desired tree canopy is achieved. 12 trees were planted in 2015.	According to the Arbor Environmental Alliance, a single tree can absorb CO2 at a rate of 21.8 kg per year - http://www.arborenvironmentalalliance.com/carbon-tree-facts.asp). So, if Sackville plants 12 trees each year over the next 6 years, this would give 72 trees. By 2021, the trees would be reducing CO2 emissions by at least 1570 kg/year. If Sackville is awarded the CN EcoConnexions grant, 130 trees will be planted by 2016, and these trees will absorb 2834 kg of CO2 emissions per year, every year.
Presentation by Tourism staff of a short play on energy efficiency at the Sackville Visitor Information Centre and other places in Sackville during summer 2015. The play will encourage local people to find ways to conserve energy and to live in a more environmentally responsible way. People will be inspired to find ways to improve their efforts, including setting a 10% target for themselves (echoing the Town's target).	Department of Tourism and Business Development	Develop scripts, costumes and props	Summer 2015 (completed)	If local residents make changes and choose more environmentally friendly energy and lifestyle options, significant emissions can be reduced.

Community Action Plan 2011-2021

It is expected that the community action plan will result in a 10% reduction in greenhouse has emissions or 7,482 tonnes of CO2e. The plan focuses on educating the local public to make sustainable choices in their everyday lives.

Priority Areas

The priorities for saving energy and reducing emissions across the community of Sackville include:

- Community Anti-Idling Policy
- Public Education Campaign
- Saving Water
- Buy and Eat Local
- Mount Allison University Energy Upgrades
- Youth and Schools
- Solar Energy

Activity	Lead/ Partners	Resources Acquired/ Needed	Timeline	Estimated Emissions Reduction
1. Anti-Idling Policy				
Implementation of Anti-idling policy (developed around 2006) including education campaign and signage	Town of Sackville staff and council	Staff time to develop, implement, and enforce this policy was undertaken in 2010. Permanent signage paid for by town. Fines for idling could help cover the cost.	2011	If the average midsize car were to idle for an hour it would use 0.76L of gas. This translates to 1.8 KG of CO2 for every hour a car idles. In addition, for every two minutes a car idles, it uses enough gas to travel about 1.5 km.
2. Public Education and Energy Efficiency Campaign				
Draft-proofing parties will bring together community members with EnerGreen builders to improve the efficiency of a drafty home, and everyone who attends the party will learn how to upgrade the efficiency of their own home	EOS Eco-Energy, EnerGreen Builders Co-operative, NB Power	EOS Eco-Energy has applied to the NB Environmental Trust Fund and will partner with EnerGreen Builders Co-op for the draft- proofing parties, and with NB Power to distribute their products	2016-2017	For the 6 parties, plus 12 guests that draft proof their homes too = 10,584kwh and 2667kg/yr or emissions
Direct installations of energy saving items (high-efficiency shower heads, insulation pipe wrap and 20 LEDs per home) in 60 households in the Tantramar Region	EOS Eco-Energy, NB Power	EOS Eco-Energy has applied to the NB Environmental Trust Fund and will partner with NB Power to distribute their products	2016-2017	For 60 homes to get the direct install materials (an average of 20 led lights, 3 ft of wrap and 1 shower head) = 95.790 kWh and 24.139 kg/yr of emissions

Activity	Lead/ Partners	Resources Acquired/ Needed	Timeline	Estimated Emissions Reduction
Climate Change Week raises awareness in the community of how our actions impact emissions. Community members are encouraged to drive less, buy local, eat seasonal, climate-friendly foods, and to find ways to reduce energy usage.	EOS Eco-Energy, various community organizations	EOS Eco-Energy received funding for climate adaptation that can be used to organize these annual events.	2012 – present (ongoing)	If more residents shop locally and eat locally grown food, it will reduce emissions by reducing the emissions from the individuals driving farther to get items, but also from the emissions created to ship the items. A litre of gasoline emits 2.38 kg of carbon dioxide. Local residents may also insulate their homes, use less water, turn off lights, etc. which would result in significant emissions reductions.
Presentations on Saving Energy (tips such as benefits of clothes lines, importance of insulation, etc.)	EOS Eco-Energy, NB Power	No cost involved. Staff time to coordinate events and speakers, workshop venues.	2015 (ongoing)	If local residents make changes and install clotheslines, insulate their homes, use less water, and turn off lights, etc. significant emissions can be reduced.
Bulk-purchase energy saving items such as LED light bulbs, programmable thermostats, low-flow showerheads, or clotheslines.	EOS Eco-Energy, maybe NB Power	NB Power already offers incentives for some of these items. EOS may be able to coordinate bulk purchases but would need funding for staff time to coordinate.	2016	If local residents make changes and install clotheslines, insulate their homes, use less water, and turn off lights, etc. significant emissions can be reduced. For example, if one household installs a clothesline and uses it twice a week, six months out of the year, they could reduce emissions by 75 kg CO2/year. Total CO2e reduction depends on how many people participate.

Activity	Lead/ Partners	Resources Acquired/ Needed	Timeline	Estimated Emissions Reduction
3. Saving Water				
DIY Rain Barrel workshop for residents of Sackville	EOS Eco-Energy, Eco-Container Co.	Funding may be needed. Participants registration fees help cover expenses such at the rain barrel materials.	2014 (completed)	The average savings from a rain barrel is generally regarded as 4900L annually. Rain barrels have the potential to save Sackville a lot of water and energy.
4. Buy and Eat Local				
Farmer's market growth, including some farms offering community supported agriculture (CSA) shares, which allows people to purchase more local food.	Sackville Farmer's Market	Volunteers, vendors, community members	2011 - ongoing	Driving less saves fuel, which reduces emissions. One litre of gasoline emits 2.38 kg of CO2. Not only is the amount of CO2 emissions from the transportation of the food and goods reduced, but local residents also drive less when they buy local food and goods.
Articles in newspaper could be written by local residents to educate fellow Sackville residents of how shopping local, buying local food and handmade items reduces emissions, in addition to helping the economy and community.	Community members (potentially part of business community)	No funding needed. Need to organize community members to write articles.	2016 (long-term)	If more residents shop locally and eat locally grown food, it will reduce emissions by reducing the emissions from the individuals driving farther to get items, but also from the emissions created to ship the items. A litre of gasoline emits 2.38 kg of carbon dioxide.

Activity	Lead/ Partners	Resources Acquired/ Needed	Timeline	Estimated Emissions Reduction
5. Mount Allison University Energy Upgrades				
Mount Allison is encouraging active transportation by offering staff pedometers to encourage walking	Mount Allison University	Mount Allison is funding project and charging staff a small fee to cover the cost of pedometers.	2015	By encouraging walking and active transportation, staff may reduce their driving and therefore reduce emissions.
Boiler Conversion to Natural Gas	Mount Allison University	Mount Allison Facilities Management did the work and funding was part of Mount Allison budget.	2011-2012	The boiler was converted to be able to use natural gas (instead of Bunker A heavy fuel oil No. 5). Natural gas (consisting primarily of methane) generates 27% fewer CO2 emissions per BTU than heating oil when burned. It was also upgraded to be able to run the boiler feeder water pumps on demand to reduce energy use. These conversions will result in significant savings in terms of CO2 emissions.
Campus Green Projects, including air hand dryers.	Mount Allison University	Mount Allison Facilities Management did the work and funding was part of Mount Allison budget.	2012-2013	The carbon emissions of paper towels are 12.5g per use. Therefore, with thousands of students using the facilities daily, there is potential to reduce emissions significantly.

Activity	Lead/ Partners	Resources Acquired/ Needed	Timeline	Estimated Emissions Reduction
LED Lights upgrades on campus	Mount Allison University	Mount Allison Facilities Management did the work and funding was part of Mount Allison budget.	2015	For example, at least 65 exterior lights were upgraded to LED. 65 LED lights x 0.225 t CO2e/annually = 204.75 t CO2e saved per year. (savings of 0.225 t CO2e based on NB Power's estimates)
6. Youth and Schools				
Students will do their best to tuff off lights, recycle more, walk to school, etc.	Students in grades 5 to 8	Funding not needed. Students could make posters to put up around their school.	Immediately	Saving energy with these simple steps will help contribute to emissions reductions.
Playing outdoors instead of playing video games	Youth (adults could do this too)	No funding needed.	Immediately	According to ca.complex.com, just one hour of gaming time spent on an Xbox 360 will use 0.3kwh of power. This translates into 76g of GHG emissions. Thus, if youth play outdoors instead of gaming, they will not use any energy but their own.

Activity	Lead/ Partners	Resources Acquired/ Needed	Timeline	Estimated Emissions Reduction
Meatless Monday: Marshview Middle School student will work with teacher and cafeteria to offer meatless dishes every Monday.	Students, teachers and cafeteria staff	No funding needed. Meeting time with students and staff, vegetarian and vegan recipe ideas would be needed. Meatless Monday and Meatout Monday non-profits have resources available for free.	2015-2016 school year	According to www.cok.net, eating meatless meals one day a week could save 3.6 kg CO2 per person per year.
7. Solar Energy				
Solar panel bulk purchase: coordinate a bulk purchase of solar panels to help reduce upfront costs.	EOS Eco-Energy	EOS received funding from the NB Environmental Trust Fund to promote solar energy across the Tantramar region.	2015-2016	The average family of 4 in Canada uses 9600 kWh of electricity annually. In New Brunswick, this translated into 2419kg of CO2. Thus, each house that switches to solar in Sackville could save a significant amount of GHG emissions. Approximately 15 kW of solar panels will be installed as a result of the bulk purchase.
Solar Co-operative Explore the potential for forming a solar or renewable energy co-operative. Hold public meeting to gauge interest, and form group of individuals to make plans.	EOS Eco-Energy	EOS received funding from the NB Environmental Trust Fund to promote solar energy across the Tantramar region.	2015-2016	The average family of 4 in Canada uses 9600 kWh of electricity annually. In New Brunswick, this translated into 2419kg of CO2. Thus, each house that purchases solar power or contributes to creating solar power to offset non-renewable energy sources, could save a significant amount of GHG emissions.

Activity	Lead/ Partners	Resources Acquired/ Needed	Timeline	Estimated Emissions Reduction
Solar Potential Mapping Mapping of every rooftop in Sackville will show the potential for solar energy collection. It will help promote solar as a viable energy source.	EOS Eco-Energy, South East Regional Service Commission	EOS has received funding from the NB Environmental Trust Fund to promote solar energy across the Tantramar region.	2015-2016	One solar hot water system could save 500 kg of C02/year and 2000 kWh of electricity per year. Solar PV arrays would save even more. The exact amounts will depend on how many solar systems are installed.
Off-grid classroom at Salem Elementary School Off-grid classroom with six 255 watt solar panels will reduce energy costs and educate youth about renewable energy	RCE Tantramar, Salem Elementary School, EOS Eco-Energy	Funding from the Mount Allison University Green Investment Fund disbursed by EOS Eco-Energy	2015-2016 (installation)	This project has the potential to produce 1.53 kWh of energy when it's sunny. The classroom will be able to power itself and will contribute to significant reductions in CO2 emissions.

Activity	Lead/ Partners	Resources Acquired/ Needed	Timeline	Estimated Emissions Reduction
Workshops on Solar Energy Workshops on a wide range of topics such as solar panels, off-grid living, solar hot water, solar design, smart energy communities, etc. will be provided with a variety of speakers	EOS Eco-Energy will coordinate the workshop series	EOS has received funding from the NB Environmental Trust Fund to promote solar energy across the Tantramar region.	2015 -2016	The average family of 4 in Canada uses 9600 kWh of electricity annually. In New Brunswick, this translated into 2419kg of CO2. Thus, each house that switches to solar in Sackville could save a significant amount of GHG emissions.

Implementation, Monitoring and Reporting (Milestones 4 and 5)

The Town of Sackville council and staff will be responsible for implementing the municipal action plan and meeting their target by 2021. The community groups outlined in the community action will be responsible for implementing their activities outlines in the community plan by 2021. There will be a report once a year and progress will be monitored regularly and an emissions inventory will be performed around the year 2018 to gauge improvement and how close both the municipal government and wider community are to reaching their targets by 2021. Additional inventories will be performed as needed. Once the targets have been reached, a final report will be submitted to the PCP program. Progress throughout the rest of the milestones will also be communicated to the public through a variety of means, such as the local paper, community meetings, and social media.

Appendices

Appendix 1 – Selected Media Coverage

Area residents invited to discuss renewable energy co-ops at upcoming EOS event

Opportunity to learn about energy potential for region

Appendix 2 – Sackville PCP Summary Handout for the Public

Sackville: Partner for Climate Protection (PCP)

What is the PCP Program?
Sackville joined the PCP in 2003. The PCP program is a network of municipal governments that have committed to reducing greenhouse gas emissions (GHG) and acting on climate change. It is a program of the Federation of Canadian Municipalities and part of an international initiative of the ICLEI (International Council for Local Environmental Initiatives).

There are five milestones to complete in order to reduce GHG emissions:

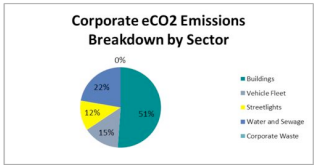
1. Create a GHG emissions inventory and forecast
2. Set an emissions reduction target
3. Develop a local action plan
4. Implement the plan and activities
5. Monitor progress and report results

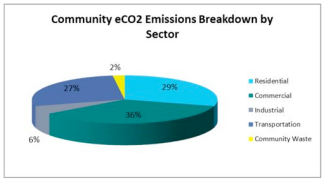
Benefits of the program:

- Reduced emissions
- Cost savings (eg. lighting, heating, hybrid vehicles, etc)
- Job creation and local economic development
- Reduced traffic congestion (eg. new shuttle service, car sharing, etc)
- More environmentally friendly and liveable community

Where is Sackville at now?
Sackville has completed milestones 1 and 2 (emissions inventory and reduction targets). Milestone 1 involved an inventory of GHG emissions from both municipal operations (eg. Buildings, lighting, water treatment, waste water treatment, municipal vehicles, and solid waste) and the community (including institutions, businesses, industry, transportation and residential waste). EOS completed the work for the town with a grant from the ETF (NB Environmental Trust Fund). The PCP work is also part of the Sustainable Sackville and Tantramar 2040 plans.

The result of the inventory was:
Municipal GHG emissions = 1,860 metric tonnes of carbon dioxide equivalent (t C02e)
Community GHG emissions = 74,818 t C02e





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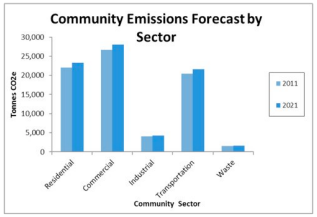
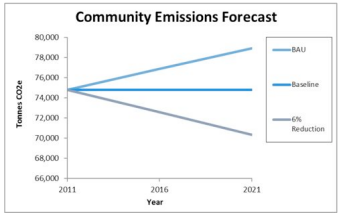
Predicted Community Greenhouse Gas Emissions:





Next step - Milestone 3:
Get in touch with EOS if you'd like to sit on the local committee that will design the emissions reduction plan, or if you'd like to be part of one of the planning sessions. The plan will only be successful if it has a range of input by local people.

Emissions Reduction Targets
During winter 2013-14 Sackville Town Council agreed to reduce emissions from municipal operations by 10% by 2021. EOS worked with senior town staff and conducted some public outreach to gauge the acceptance of the community (residents, businesses, institutions and industry) to also try and reduce their emissions by 10% by 2021. This equals a reduction of 7,482t C02e, or less than 1.5 metric tonnes of C02e per resident (not counting students). One tonne equals 42 propane cylinders for BBQs or 424 L of gas consumed.

Potential ways to reach the target:

- Common transportation (eg. Carshares, etc)
- Solar voltaic technology is decreasing in price, more uptake by homeowners within 10 years
- Solar hot water systems (EOS could coordinate a mass purchase and is currently working on bringing the Solar City model from Halifax to NB)
- Energy efficiency campaigns
- Waste reduction campaigns
- Water conservation campaigns, rain barrels
- Energy efficient retrofits
- Purchase of Energy Star appliances t

For More Information and examples of PCP work from other communities across Canada, go to: http://www.fcm.ca/home/programs/partners-for-climate-protection.htm

To get in touch with EOS: 536-4487 or eos@nb.aibn.com

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