Implementing Emissions Reduction Plans in Tantramar: Community Draft-Proofing Work Parties Year Two

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Introduction Year 2

EOS applied to Environment and Climate Change Canada's Eco Action program to conduct a community-wide draft-proofing project in the Tantramar region of southeast New Brunswick. This report is for year two of three of the project. At draft-proofing work parties, a homeowner or building owner invites friends and neighbours to help them draft-proof their home or building. Everyone learns how to seal leaks from a certified energy advisor and then works together to draft-proof the building. Guests learn the skills to then draft-proof their own homes and help others. This innovative project is reducing emissions, building skills and capacity while also building community and a sense of inclusion in finding viable solutions to help fight climate change. The project gives priority to low-income residents, those with non-electric heat sources, and non-profits.

This report provides results from year two of the draft-proofing work parties.

Background

EOS Eco-Energy helps communities in the Tantramar region of NB implement their emissions reduction action plans to help combat climate change. A large proportion of emissions comes from residential buildings. Draft-proofing, or sealing air leaks, is a cost effective and simple way to reduce home energy needs thereby reducing emissions and improving energy efficiency.

Emissions inventories done in Sackville, Port Elgin and Dorchester in 2011 by EOS showed that emissions from residential buildings were 29%, 27% and 42% of total community emissions, respectively. These amounts represent the largest proportions of emissions in Port Elgin and Dorchester and the second highest in Sackville (after commercial/institutional emissions). These communities are members of the Partners for Climate Protection program that seeks to reduce local emissions in 5 steps. These Tantramar communities set reduction targets between 6 and 10% for community sources and between 10 and 20% for municipal operations (all below 2011 levels by 2021).

Draft-proofing a house to reduce air leakage is often the least expensive way of achieving significant savings on heating bills. Approximately 60% of our annual residential energy use goes towards heating our homes. Much of that energy can be saved though. According to Enercheck Solutions (home energy advisors), air leakage can account for 30% or even 50% of a heating/cooling bill. Even minor gaps can add up and have a major cost over time. Draft-proofing should happen before any other home reno projects, like adding insulation, upgrading heating system, or installing renewable energy. It is also one of the least expensive ways to begin reducing a building's emissions and helping to fight climate change.

Goals

The draft-proofing project goals for year 2 were:

1) Increase public awareness and understanding of energy efficiency and draft-proofing in the face of climate change.
2) Increase energy efficiency of 9 homes in Tantramar.
3) Draft proof 1 community buildings.
4) Build community and increase inclusion of a wider segment of our local population in taking actions to fight climate change.
5) Help low-income homeowners and renters, as well as non-profits save money on energy costs.
6) Reduce emissions.

Methodology

In year two we continued to follow the same methodology as year one by promoting the program, accepting and reviewing applications, coordinating parties, recording results, and following up with homeowners. The bilingual application form can be found at (https://eosecoenergy.com/en/party/ and https://eosecoenergy.com/fr/parties/). We promoted the parties in local newspapers and community newsletters, at community events like the Sackville Fall Fair and on social media sites including Facebook, Twitter and Instagram. We also placed posters throughout our region and visited local area food banks to promote the program to lower income homeowners. Our project partners promoted the program as well in their venues and on their social media sites.

Year 2 Party Results

About the Buildings

Ten draft-proofing parties were completed in year 2 including nine residential parties and one non-profit party. Parties took place in Port Elgin, Sackville, Westcock, Frosty Hollow, Midgic, Memramcook and Dorchester this year. The houses ranged in size from 600 sq ft to 3000 sq ft and the non-profit building was 3000 sq ft. The residential participants all fit our priority criteria of either being low income and/or having non-electric heat sources such as oil and/or electric heating. People listed a variety of reasons why they felt they needed a draft-proofing work party in their applications including:

- *To help us help our environment, pocket book and comfort level in the house. So we can share tips and tricks with others.*
- *Want to live more sustainably.*
- *We can do the work, we just need to know where the leaks are and how to fix them.*
- *There are a lot of drafts in my house and I'd like to see how they can be fixed.*
- *To save money and conserve energy.*
- *I'd like to make the house as efficient as possible before looking into alternative heat sources.*
- *To help with costs and to use less heating oil.*
- *My home needs a lot of work. It's like heating a basket. I can't afford to pay for both heat and renovations. I am sure I can learn from you.*

Work Completed and Results

We performed a variety of types of work during the parties including:

- Spray foamed floor joists, around doors, larger cracks in basement foundations, around pipes, etc.
- Foam gaskets installed behind switches and sockets
- Sealed drafts around old, unused chimneys, fireplaces, fans, etc.
- Used rigid foam board to seal up large holes in foundations
- Caulking of smaller cracks like around windows
- Weather stripping installed on external doors, basement doors and attic hatches
- Removed old ductwork and sealed hole

Homeowners were also given a list of additional work to do outside the scope of the parties. For the most part this involved the need to fully insulated basements, upgrade stone foundations, replace old windows, better seal and insulate attics, etc.

Newly built homes are required to have less than air changes an hour. Our most drafty house this year had 48.4 air changes an hour! We were able to decrease drafts during the parties up to nearly 23%. We also saved a total of 6.24 metric tonnes (annual reduction). Some houses are saving 2 tonnes of emissions annually but some have negligible savings due the need for large draft-proofing work outside the scope of the project or due to the style of the house or lack of safe accessibility to the drafts. We had a total of 54 volunteers at the draft-proofing parties. See Appendix for full results for each party.

Evaluations

Evaluations received continue to be all extremely positive with everyone who filled out an evaluation form rating the overall experience of each party as 4/5 or 5/5. Participants said they learned more about draft-proofing because of participating in the parties and many were now more likely to engage in air sealing work. In year 2 we also asked people how participating in a party impacted their climate-related stress levels. Some said they felt more at ease because they now knew where their air leaks were and how to fix them. Some said they felt more stressed through because their homes were very leaky. Some of the additional general comments received on the evaluation forms were:

- *Learned a lot and would like to learn more home improvement skills*
- *We were very impressed with the knowledge and suggestions offered but extremely impressed with the friendly volunteers and Amanda and Joe. It was all so easy!!*
- *Information from an expert without an agenda to sell us something was important!*
- *Would like to learn more home improvement skills.*
- *It was really neat seeing how much the bit we did today made on the air flow readings.*
- *Liked the easy, clear sharing of information. Could this program be brought to the high schools? Could students draft-proof something and learn more about energy?*
- *I didn't know how to use caulking or do weather stripping before and now I do. I'd like to see EOS offer more of these parties.*
- *Love this program. I will definitely talk about it and try to volunteer in the future. I feel less stress. I know how to do some of the work and I know where the leaks are.*

Photos

Selected photos from the year depict air sealing work such as weather stripping, caulking, spray foaming and enjoying party food.

Selected Photos from 2018-19 Draft-Proofing Work Parties
All photos credit to A. Marlin

Energy advisor Joe Waugh explains the blower door to home owner and volunteers.

Volunteer seals a large air leak in basement with rigid foam board.

Party people have a morning coffee break.

Installing weather stripping on the attic hatch in the Port Elgin Masonic Lodge.

Energy advisor teaches homeowner how to install weather stripping on basement door.

Homeowner and guests enjoy a break and some refreshments.

Volunteer seals air leak around old chimney.

Sealing air leaks in a basement.

Year 2 Follow Up

Follow ups have been completed and we continue to stay in touch with previous homeowners. Some have gone on to do more air sealing and/or insulation, some have signed up for NB Power's whole home energy audit program in order to do more efficiency upgrades. Many say they are more comfortable in their homes. Some plan to volunteer at parties in the new year as they want to "pay it forward." One person plans to seal a chimney up more this summer. The Masonic Lodge in Port Elgin told us that after their party they had to turn the heat down for the first time in living memory. They

are also looking into solar energy for their building now. Another homeowner plans to insulate her kitchen, back and front porches and basement stairs. She is also looking into a heat pump. Another homeowner plans to insulate her basement this summer

Year 2 Outreach and Education

YouTube Video

We were fortunate to be contacted by a Mount Allison University Student who wanted to do a video about our draft-proofing work parties for a class project. The video was created in November 2018 and is now available on our YouTube channel: https://www.youtube.com/watch?v=HfGgw6_6NTY. We can now use it to help promote the program and we plan to show it at presentations and workshops. It is a great way to show all the positive benefits and impacts of the parties and what is involved.

How-To Guide

This year we produced a how-to guide on organizing a draft-proofing party program for other environmental non-profit organizations. It is available in the resource section of our website: https://eosecoenergy.com/en/wp-content/uploads/2018/05/How-to-Guide-for-Draft-Proofing-Parties.pdf. The how-to guide makes it easier for other groups to learn from our experiences. We hope that many other groups will start draft-proofing.

Conference and Workshop Presentations

We also spread the word about how great draft-proofing parties are and encouraged other community groups and non-profits to organize them in their own communities. In particular, we did a presentation at the national Econous Conference in Moncton in October 2018. People from as far away as Manitoba were interested in copying our process and offering parties in their region. We also presented at the New Brunswick Environmental Network's annual general meeting in November 2018 and encouraged other environmental groups to offer draft-proofing work parties in their corner of the province.

News Articles

The EOS draft-proofing program and benefits of sealing airl leaks were mentioned numerous times in local papers this past year:

- https://www.sackvilletribunepost.com/community/sackvilles-eos-eco-energy-brings-back-popular-draft-proofing-parties-246667/
- https://www.sackvilletribunepost.com/community/a-time-to-raise-awareness-take-action-in-tantramar-281875/
- https://www.sackvilletribunepost.com/living/top-7-things-you-can-do-at-home-in-your-community-to-reduce-your-impact-on-the-environment-in-2019-276343/

Challenges and Opportunities in Year 2

More people were aware of draft-proofing work parties and we were able to get started earlier. The first party took place in early October with more in the fall compared to year 1. We completed our target of 10 parties including one at a non-profit community building. Some buildings did not reduce emissions by much though because of the type of additional work needed which was outside of the scope of the project (eg. new insulation), or because of the construction type (old stone foundation) or other reasons (too much clutter, etc. in the way of the sources of drafts). There was also a day when it was too windy to get a good final reading on the blower door test. Despite this we still reduced emissions by more than 6 tonnes annually and educated many people on the value of draft-proofing. We also now ask homeowners during a draft-proofing party if they would like to participate in our other home retrofit program where we install free LED light bulbs, pipe wrap and/or shower heads (provided in-kind by NB Power) and many took us up on that offer. We installed 49 LED lightbulbs and 2 feet of pipe wrap. This equalled as savings of 1906.08kwh which equals about 471.27kg[1] of emissions saved annually as well. We also did not get as many volunteers as originally thought but some of the houses were smaller and did not require 10 volunteers each. We are also recruiting new people and some of this past year's homeowners want to help at future parties and "pay it forward".

Summary and Next Steps

In summary, year 2 saw more than 6 tonnes of emission reduced from draft-proofing and more than 50 people volunteered. We educated many more people on the importance of sealing air leaks and the impacts for emissions reduction through workshops and conferences, etc. We look forward to the third and final year of the program and already have people signed up and waiting for their parties to take place. We also look forward to more educational and promotional opportunities to spread the draft-proofing party model to others.

[1] According to NB Power every kwh emits 247.25 g of emissions.

Appendix – Party Results

Party #	Address	Building size (sq ft)	Age /type of House	Heating source(s) (priority for non electric)	Work done	To do List for Homeowners	Air changes per hr before party at 50 pa pressure	After party	% decrease in drafts	Annual emissions before party (annual tonnes)	Annual emissions after party	Annual emissions reduction (annual tonnes)	Number of people at party	Retrofit Installs (LEDs, pipe wrap, shower heads)
1	Port Elgin	~1300	125-150 year old ranch style with various additions	Electic baseboards and heaters, an oil furnace was not in use.	Spray foam in basement at floor joists, around basement door, around wires and pipes, foam gaskets installed on exterior socks and switches.	Seal attic hatches, insulate basement with spray foam, when sealing air leaks seal as close to outside or source of leak as possible, bedroom panelling oculd be caulked, seal hole by chimney in bathroom with riid foam board and spray foam, finish the new bathroom and place foam board on outside walls and vapor barrier, seal inside fire place in master bedroom but it must be at the top of the chimney. REcommend an NB Power whole home energy audit or low income program.	14.37	No measurable reduction achieved	0.00	23.6	No measurable reduction achieved	0	4	Not done
2	Westcock		1970s Bungalow	Oil furnace, wood stove	Partially sealed basement floor headers (where accessible), foam gaskets placed behind sockets nad switches, sealed draft around bathroom fan, sealed leak in upstairs fireplace.	Continue sealing between floor joists in the basement, Sealing around wood stove flue pipe at the attic ceiling penetration, Sealing around fireplace and oil furnace flue at the attic ceiling penetration.	4.4	3.4	23.00	9.1	8.7	0.4	6	9 ft Pipe wrap
3	Sackville	~2000	1880 classical revival story and a half	Oil furnace, fireplaces	10 inch round hole in stone wall at front of house saled, 3 basement window or former window locations, Leakage at corner of wood and stone wall at back of house, Leakage at electrical receptacles and switches on exterior walls all sealed.	1st floor cupboard closets – visible cracks at exterior wall/corner, Leakage around pantry window trim, 2nd floor sunroom – cracks where walls and ceiling meet house wall, Leakage through cracks under window sills, Leakage around 2nd floor bathroom window trim, Cracks in stone foundation walls, Leakage between floor joists in the basement.	11.38	10.4	9.00	18.2	16.9	1.3	7	1 ft of pipe wrap and 9 LEDs installed
4	Port Elgin	~3000	1972 lodge	Oil	Air sealing included the removal of ductwork into the attic and the sealing of holes provided for that ductwork, caulking of all windows with removable caulking, weather-stripping of the front and basement exterior doors and weather stripping of the attic hatch. Foam gaskets were also installed behind electrical plug and switch plates on outside walls.	The attic hatch is warped and even with the new weather-stripping is not well sealed. A new attic hatch of thicker plywood should be installed complete with hold down hook and eye hardware.This building was found to be fairly air tight especially for a building of this era. Major heating energy savings could be realized by increasing the attic insulation to R40-R60 . The current attic insulation is rock wool estimated at about R8-R10. The basement walls and possibly the floor header area are likely uninsulated. A good target insulation level would be in the R20 range. Foam insulation products are probably the best choice for insulation material.	3.14	2.59	17.52	22.4	22.2	0.2	6	6 LED bulbs
5	Midgic	not provided	early 1900s farm house	Wood furnace only	Air sealing included installing weather-stripping to a very leaky basement exterior door, caulking of some windows and installing foam gaskets installed behind electrical plug and switch plates on outside walls.	Other air leakage areas were indentified that the homeowner will work on. A large air leakage area is in the attic door/stairway area. An insulated and weather-stripped hatch should be built and installed to seal off the attic stair access. The homeowner also intends to seal the front door. Major heating energy savings could be realized by insulating the basement walls and floor header area. Foam insulation products are probably the best choice for insulation material. Use of spray foam insulation in the floor header area would also reduce air leakage in that area. The home owner is encouraged to register for a full house evaluation through NB Power's Total Home Energy Savings Program. Participating in this program will give the homeowner a full energy evaluation of the home and access to significant rebates to help pay for the cost of the energy improvements.	8.43	Due to wind it was impossible to get final air readings.	?	9.29	Due to wind it was impossible to get final readings.	?	6	8 LEDs and 4 ft of pipe wrap
6	Frosty Hollow	Not provided	farm house built in 1880s or earlier	Wood furnace, some electric baseboards	Foam gasgets installed, spray foam and rigid foam board in places in stone foundation.	Basement Extensive air leakage was found through the many gaps between the stones of the basement walls. If this area is to be insulated, the use of spay foam insulation will help seal the air leaks in the walls and seal the wood floor joist area where the house sits on the concrete foundation wall. Exterior Wall at basement access stairs Insulate and air seal this wall Attic Hatch Install weather-stripping around the attic hatch. This may also require the replacement of the hatch which appears to be warped and not sitting flat on the stops that hold it in place. Also install hook and eye catches to pull the new hatch tight to the weather-stripping. A full home energy audit through NB Power was recomended.	23	20	13.04	22	20	2	6	6 LEDs
7	Dorchester	1,200	1900 or earlier story and a half	Wood stove, minisplit	Installed weather stripping on doors, spray foam around new patio door and windows, caulking around old windows, foam gaskets behind swiches and sockets.	Basement/Crawlspace - The major air leakage area was found to be through a large hole clearly visible in the spray foam insualted south wall. This hole is accessible for sealing. Seal smoke pipe opening in brick flue. There is most likely also a fair level of air leakage in the crawlspace areas that not accessible. Windows -Replacement of second floor windows will reduce air leakage in these areas. Doors - Install sweep type weather stripping at bottom of exterior door to side porch.	20	Will be retested in 2019 once more work is completed	Coming in 2019	11.3	Will be retested in 2019 once more work is completed	Coming in 2019	5	9 ft pipe wrap
8	Sackville	3200	50 yr old split level	Oil, wood	Windows – joints in trim work were caulked to reduce air leakage Exterior doors – weather-stripping was installed on the basement door and the side entry door Electrical outlets and light switched on exterior walls – foam gaskets were installed.	Air leakage around the fireplace damper was detected. It is recommended that this area be permanently sealed since the fireplace is not used.	3.82	3.52	7.85	13.36	12.92	0.44	5	Already done during EOS retrofit program in previous years
9	Sackville	2500	2 story, built in 1920	Oil	Windows and exterior doors are relatively new and showed almost no air leakage. Gaskets were installed behind switch plates. Put weather stripping on attic hatch.	The major air leakage area was the basement but the basement was not accessible to carry out any air sealing work.	13.34	measurable reduction achieved	0.00	20.11	measurable reduction achieved	0	5	11 LEDs
10	Memramcook	600 sq ft	120 yr farm house	Oil	Attic hatch was weather-stripped, Electrical outlets and light switched on exterior walls – foam gaskets were installed, sealed around chimney, caulking around old windows, weather stripping adjusted around door, spray foamed by front door, etc.	The major air leakage area is the basement. Homeowner plans to replace foundation in the near future. No air sealing was done in this area.	48.4	47.7	2.05	27.8	25.9	1.9	4	9 LEDs
TOTALS												**6.24**	**54**	