



Climate
Action
Together

Technical Report

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Executive Summary

To our community,

Climate change is a global emergency that affects us all. None of us are immune to its effects, and we all have a responsibility to contribute to its solutions. Even a community like the Northern Bruce Peninsula – small, rural, and removed from the areas we often associate with the most significant impacts of climate change – will be profoundly impacted in the coming decades. It is time to do our part and prepare.

This Climate Action Plan is our community's response to the many challenges posed by climate change. It is the culmination of many months of work which began with the appointment of the Municipal Climate Action Committee in 2020. Through the generous support of the Bruce Peninsula Biosphere Association, funding from Environment and Climate Change Canada, as well as several other community organizations, the project team engaged all corners of our community – nearly one thousand voices in all – to develop an ambitious but practical plan that Northern Bruce Peninsula can be proud of.

The Plan includes more than thirty initiatives spanning across all aspects of life on the Peninsula: where we live, how we move, what waste we produce, and what natural areas we enjoy. As the name suggests, this plan is action-oriented: each initiative has specific steps, milestones, and owners. However, these details are intended to serve as a guide, as the implementation of each will depend on the availability of funding and resources throughout the life of the Plan. Overall, the Plan is designed to be flexible: it provides a roadmap for action until 2030, though one we hope establishes a foundation for change that spans much longer than that.

The Climate Action Plan will significantly reduce Northern Bruce Peninsula's contribution to climate change. In conjunction with policies from other levels of government and new technologies that are expected to arrive in the coming years, we believe the Plan will result in a 20% reduction of greenhouse gas emissions from 2020 to 2030. The Plan will also increase the community's resilience to growing climate threats from wildfire, rising temperatures, and more intense storms. At the same time, the Plan will also reinforce many of the features of the Peninsula that already make it so cherished by so many – including its natural beauty and our connectedness to nature.

This plan is not enough on its own: addressing climate change requires more than individual actions by our community. Political action, transformation of industries, and a host of other societal changes are outside of the scope of this plan but no less important. Yet this plan is a crucial step to get our own house in order. It will set us on a path to reduce our contribution to climate change and prepare for the consequences of climate change. Ultimately, it is a strong start to a journey with much further to go.

This Technical Report provides a detailed breakdown of the key components of Northern Bruce Peninsula's Climate Action Plan. It offers readers more information on the rationale for climate action, details on the approach and methodologies used to develop the plan, and specific steps to be taken in the coming years. Given the uncertainties surrounding climate change, this document is best interpreted as a toolkit for climate action - though the specific details or timing of initiatives may evolve, the ideas expressed in this report will remain relevant for years to come.

We are grateful for the community's support throughout this project and look forward to continuing this work in the many months ahead.

Sincerely,

Northern Bruce Peninsula Climate Action Committee

Acknowledgements

Territory Acknowledgement

Saugeen (Bruce) Peninsula is within the traditional territories of the Anishinabek Nation: The People of the Three Fires known as Ojibway, Odawa, and Pottawatomi Nations. The Climate Action Committee gives thanks to the Chippewas of Saugeen, and the Chippewas of Nawash, known collectively as the Saugeen Ojibway Nation, as the traditional keepers of this land, and for their important contributions to this project.

Contributors

Several individuals and organizations were crucial to the development of Northern Bruce Peninsula's first ever Climate Action Plan. We express our thanks to each of them for their enormous contributions - as well as to the nearly the 1,000 members of the public who provided their input to the Plan.

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Partnering Organizations



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For more information, please see:

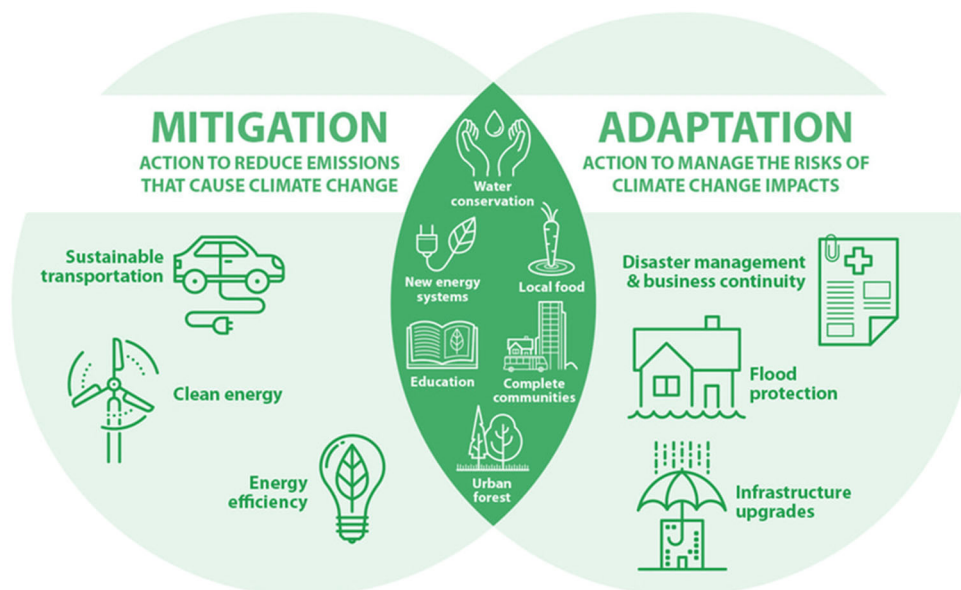
<https://www.canada.ca/en/environment-climate-change.html>

Why a Climate Action Plan?

Climate Action Planning is a crucial early step to address the impacts of climate change. It provides communities with a structured way of understanding climate change - e.g., the science behind climate change, its expected local impacts, the community's own contributions to it - as well as a tool for prioritizing, organizing, and mobilizing to act.

Climate Action Plans typically outline strategies in two areas: emissions reduction (mitigation) and risk reduction (adaptation). Several examples of the types of initiatives included in each area are shown in Figure 1 below. While the goals of mitigation and adaptation actions may be climate-focused, they frequently have other benefits as well in terms of job creation, reduced pollution, or other improvements in community wellbeing.

Figure 1 – Climate Actions: Mitigation & Adaptation



How was the Plan developed?

Although efforts to address climate change have a longstanding history in Northern Bruce Peninsula, efforts to formally develop a Climate Action Plan began in late 2019. Through the advocacy of local environmental organizations, concerned citizens, and engaged students from the local Bruce Peninsula District School, council adopted a resolution acknowledging the science of climate change and supporting the formation of a volunteer-led Municipal Climate Action Committee.¹

The Committee officially launched in 2020 with the mandate of developing the first ever Climate Action Plan for Northern Bruce Peninsula. The Federation of Canadian Municipalities' Partners for Climate Protection Milestone Framework - a commonly used methodology by municipalities across Canada - was selected as the overall approach that would be used to guide the development of the plan. It breaks down into the five milestones shown in Figure 2 below – of which the first three are the focus of this plan.

¹ See *Municipality of Northern Bruce Peninsula*, Council Meeting Minutes for December 9, 2019

Figure 2 - Partners for Climate Protection Milestone Framework



Several principles guided this work:

1. **BE AMBITIOUS.** Climate change is a daunting challenge and requires significant action in order to be properly addressed. While still recognizing the limitations facing a smaller community like Northern Bruce Peninsula, the Plan was intended from the outset to set bold - but still achievable - objectives.
2. **ENSURE INCLUSIVITY.** The Peninsula has a long history of working together to solve difficult problems. The Climate Action Plan was developed in a way that ensures there is a role for everyone to play - regardless of their skills, living situation, or financial means.
3. **AVOID SHORTCUTS.** There are many climate actions that might temporarily reduce emissions or offer protection from climate change, only to cause more issues in the future. The Climate Action Plan only includes actions that are “future-proof” and long-term solutions to climate change.
4. **IMPROVE WELLBEING.** Climate change is just one of the many challenges facing the Peninsula in the coming years. Wherever possible, the Climate Action Plan was intended to support other community objectives as well - such as affordability and accessibility.

As shown in Figure 3, there were four phases to the project. Thanks to the generous support of the Bruce Peninsula Biosphere Association and funding from Environment and Climate Change Canada, from Phase 2 onwards the Committee was supported in their work by Canvas Strategy Consulting Group.

Figure 3 – Climate Action Plan Project Approach



Public consultation was a crucial component of the development of the plan. Although the public health restrictions caused by the ongoing COVID-19 pandemic severely limited the available methods for engagement throughout the project, nearly 1,000 residents, businesses, and other groups were heard from throughout the process. Their input was critical to the initial scoping and eventual design of the plan. For more details on public consultation results, please see Appendix D.

Figure 4 – Public Consultation Key Statistics



Part 1

A Call to Action

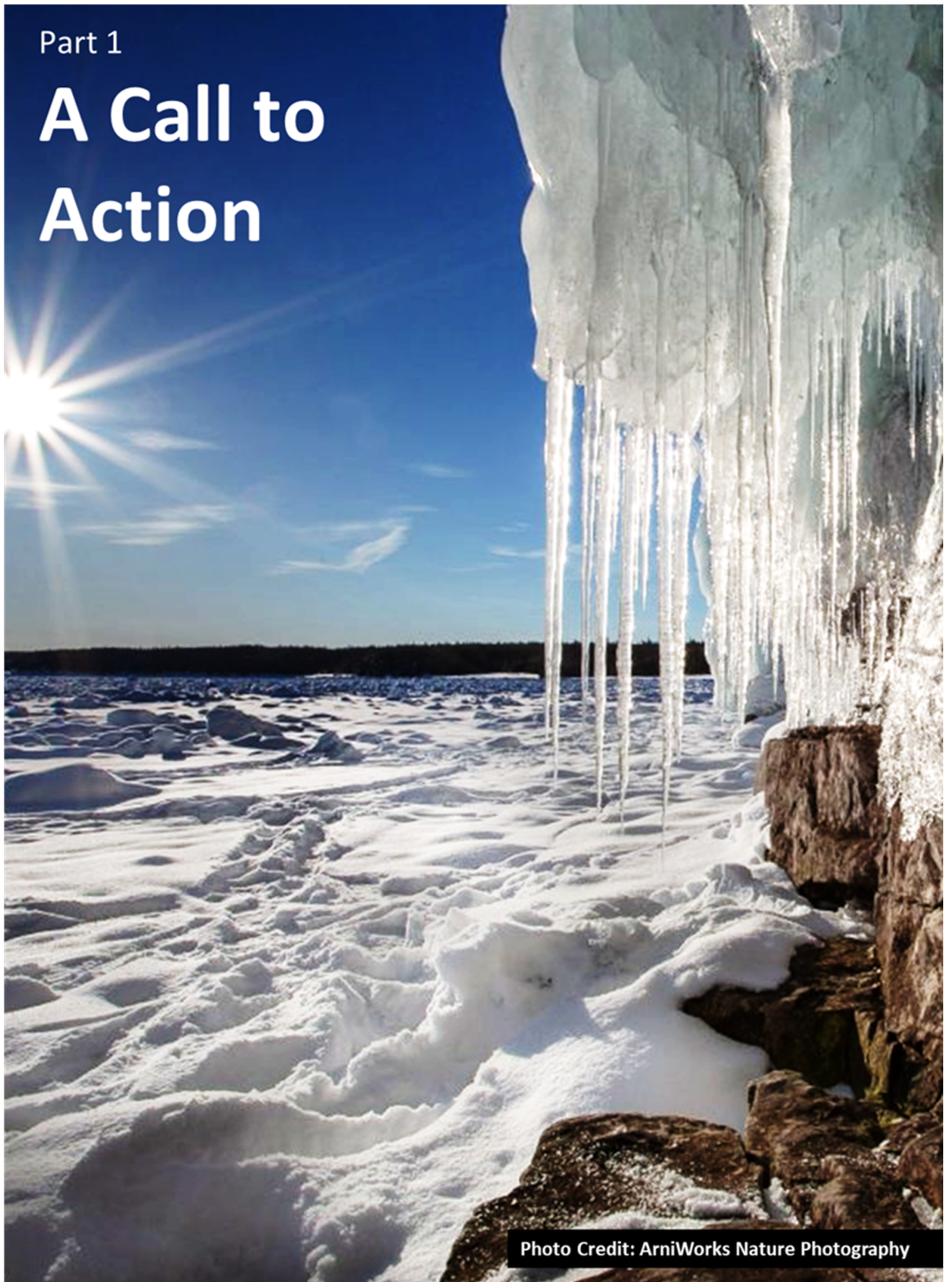
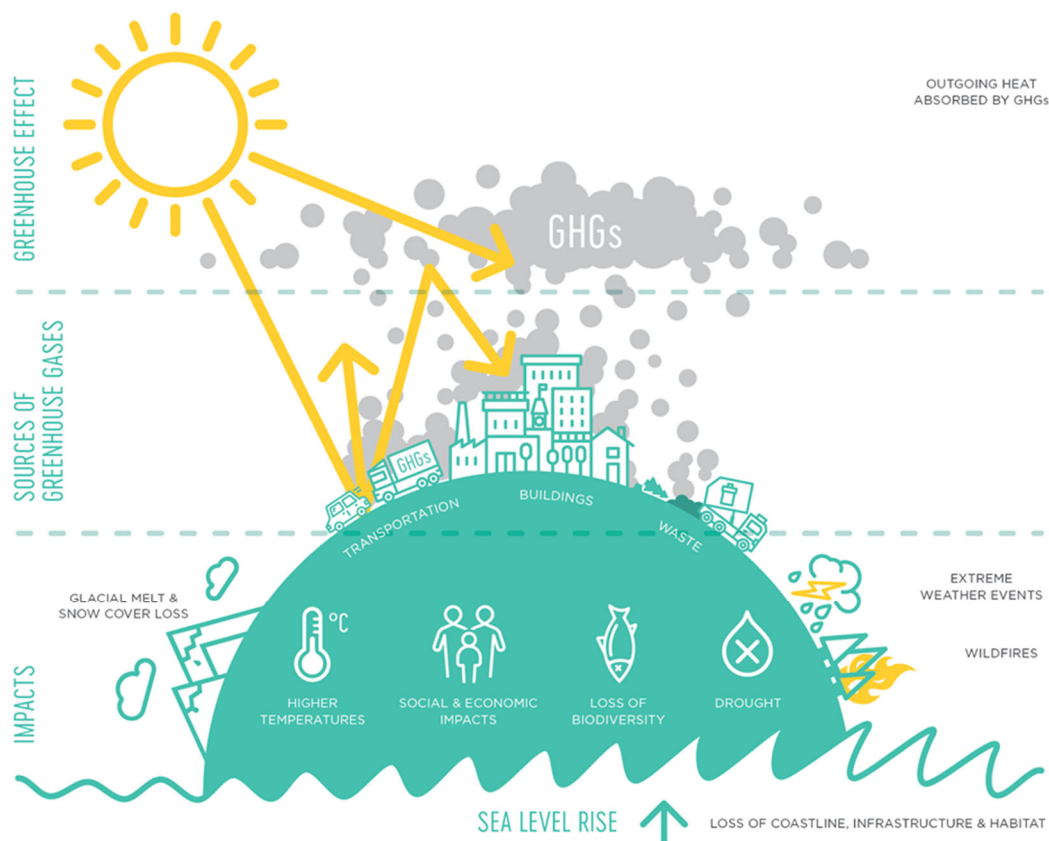


Photo Credit: ArniWorks Nature Photography

The Science of a Changing Climate

Greenhouse gases are a critical, naturally occurring part of the proper functioning of the earth's environment. Many occur naturally in the atmosphere and help the planet absorb sufficient heat to make it hospitable for life. In recent centuries, however, human activity – particularly since the dawn of the industrial age – has dramatically increased the quantity of greenhouse gases. This has resulted in a gradual warming of the planet. While the amounts of this warming may appear small – 0.8°C since the end of the 19th century, with more than 2°C expected by the end of the 21st century – the impacts are profound.

Figure 5 – The Process of Climate Change

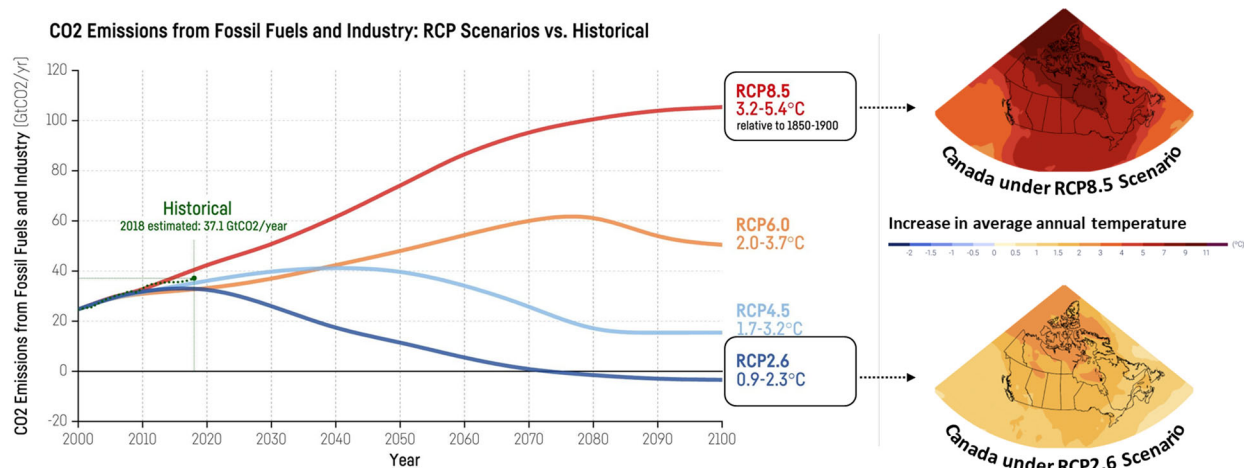


Source: City of Victoria (used with permission)

As with any scientific projection, there is uncertainty about how GHG emissions and climate change may evolve in the decades ahead. As a result, climate scientists frequently evaluate the potential impact of climate change in terms of different scenarios – each with different estimates for total emissions, temperature increases, and other climate impacts.

Figure 3 shows several examples of commonly used climate change scenarios and their impact on Canada. Each one varies in terms of the extent of climate change that is present based on the amount of action society has taken to prevent it. Regardless of scenario, however, the consequences are significant.

Figure 6 – Climate Scenarios and Impact on Canada²



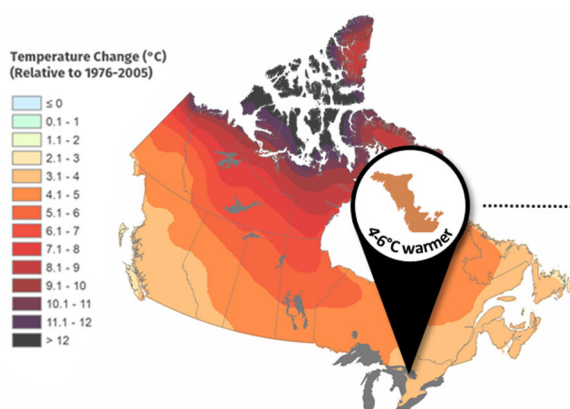
The following sections provides a summary of the key local impacts as a result of climate change. The data presented assumes a “high carbon” scenario (i.e., RCP 8.5 from Figure 6 above) – thus reflecting a “worse case scenario” for climate change, though one we are already dangerously close to experiencing.

Climate Change and the Bruce Peninsula

Though many of Northern Bruce Peninsula’s unique features make it less susceptible to climate change – for example, its in-land location or mild climate – the community is not immune to its consequences. As shown in Figure 7 there are still significant local impacts expected from climate change.

Figure 7 – Project Local Impacts of Climate Change

Average Annual Temperature Increase by 2080



Impacts for Northern Bruce Peninsula

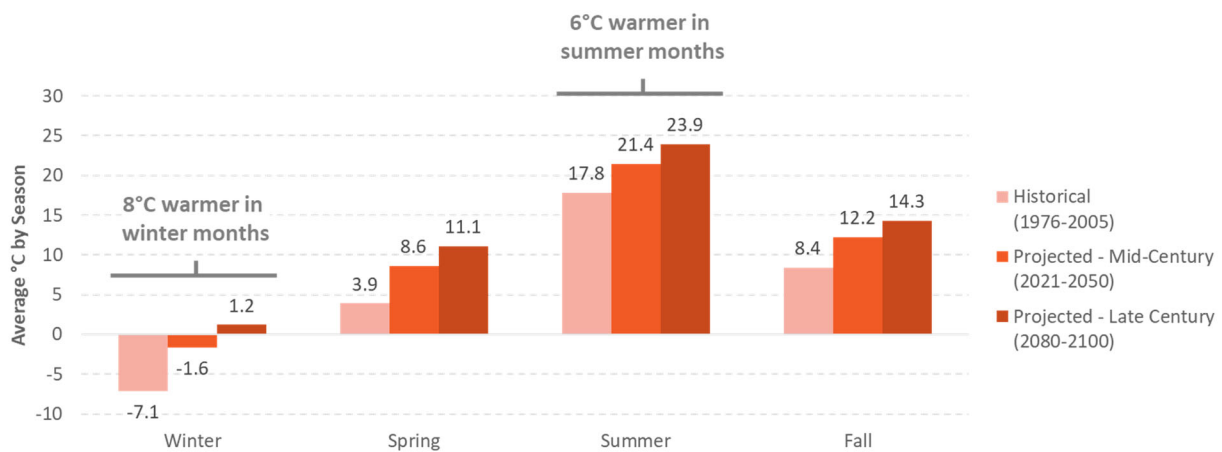
- Changing Seasons**
In winter, nearly 20% more snow despite a month later frost; in summer, 7 weeks of 30°C days and 20°C evenings
- Rising Water Levels**
1.5m increase in the high water mark on Lake Huron; greater frequency of flooding due to rapid rainfall
- Intensifying Storms**
25-year storms now hit every 5-years; gale force winds substantially more common
- Increasing Fire Risk**
Month longer fire season, with increased potential for large scale events
- Weakening Ecosystems**
50% of tree species and 20% of bird species at risk; frequent disruption to aquatic life due to warming of lakes

Source: Prairie Climate Centre, Climate Atlas of Canada (2019)

² Representative Concentration Pathways (RCP) refer to different scenarios for greenhouse gas emissions.

At the core of climate change is the expected **increase in temperatures** as a result of the build-up of greenhouse gases, which trap more heat in the earth's atmosphere. Per Figure 8, if current trends continue, Northern Bruce Peninsula could expect to see a 6°C increase in average temperatures – with increases being particularly pronounced in the winter months.

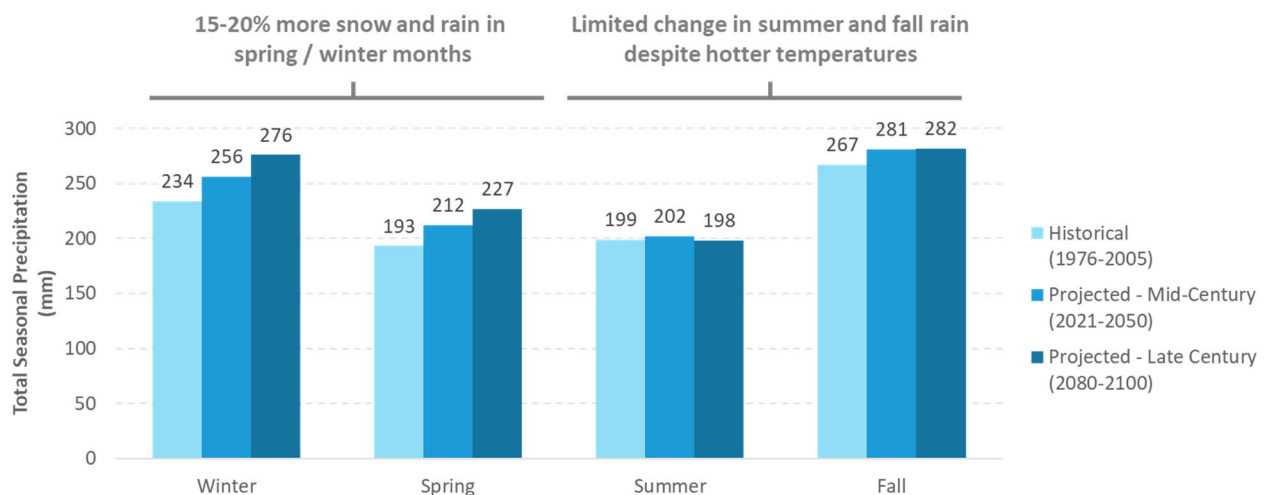
Figure 8 – Projected Changes in Seasonal Temperatures



Notes: Values shown for Tobermory Region, but are representative for entire community`
Source: *Prairie Climate Centre, Climate Atlas of Canada (2019)*

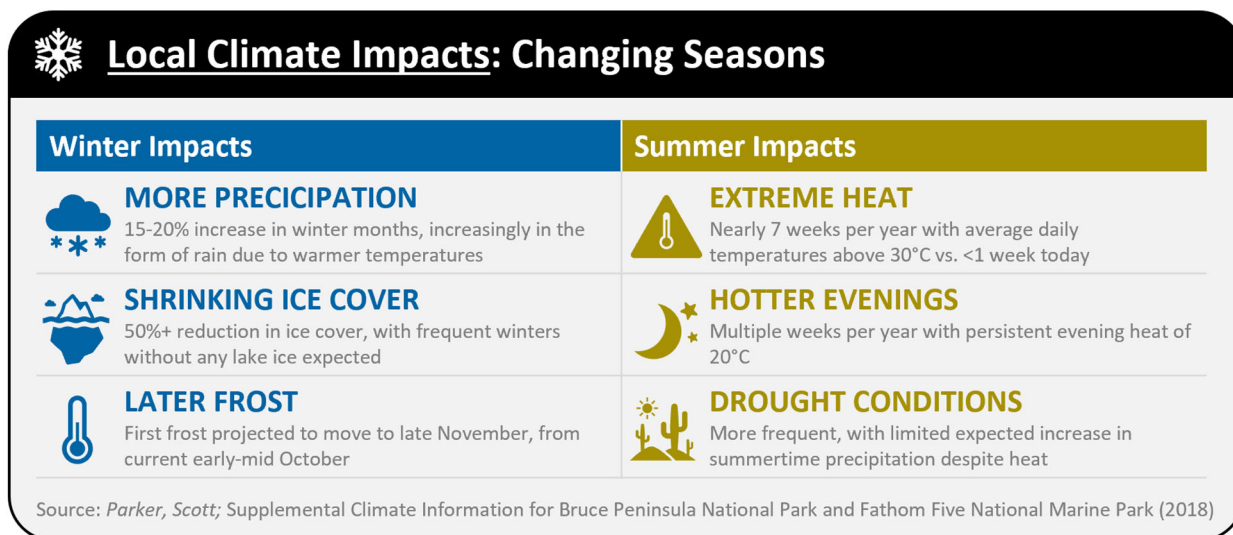
In addition to getting hotter, the Northern Bruce Peninsula can also expect to get wetter as well, with a significant expected **increase in seasonal precipitation**. Overall, the community can expect to see an increase of 10-20% of annual precipitation – with the impact most pronounced in winter months.

Figure 9 – Project Changes in Seasonal Precipitations

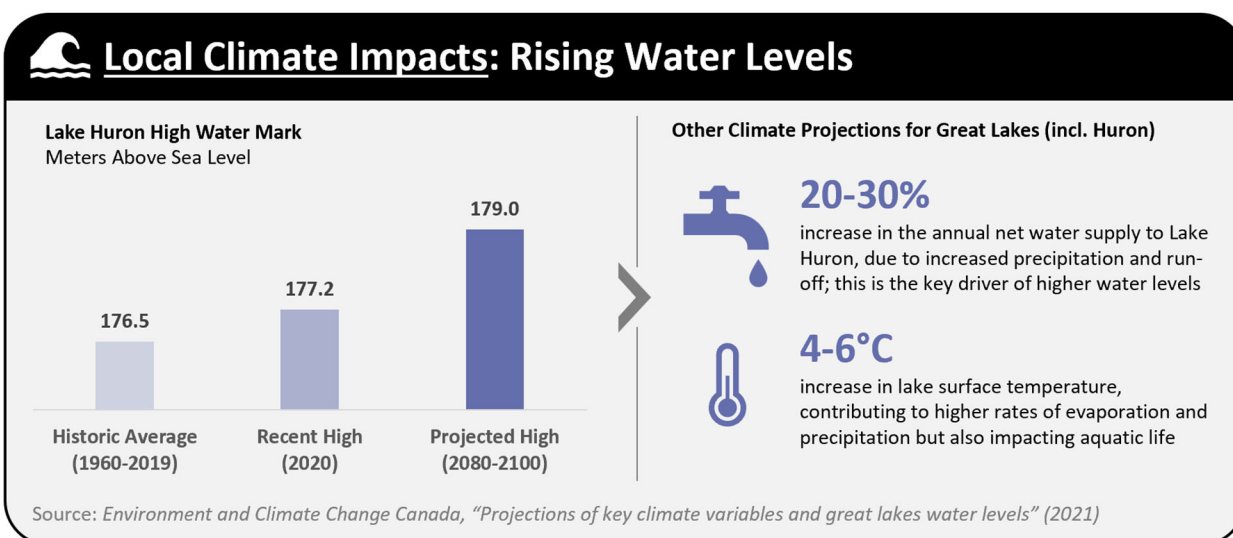


Notes: Values shown for Tobermory Region, but are representative for entire community`
Source: *Prairie Climate Centre, Climate Atlas of Canada (2019)*

The results of these trends will be significant. First, Northern Bruce Peninsula can expect to see **changes in the length of its seasons**. Winters will become warmer, shorter, and involve more precipitation but less ice. By contrast, summers will be longer with high levels of heat that are more likely to persist into the evenings – posing a threat to our community’s most vulnerable as well as several economic sectors.

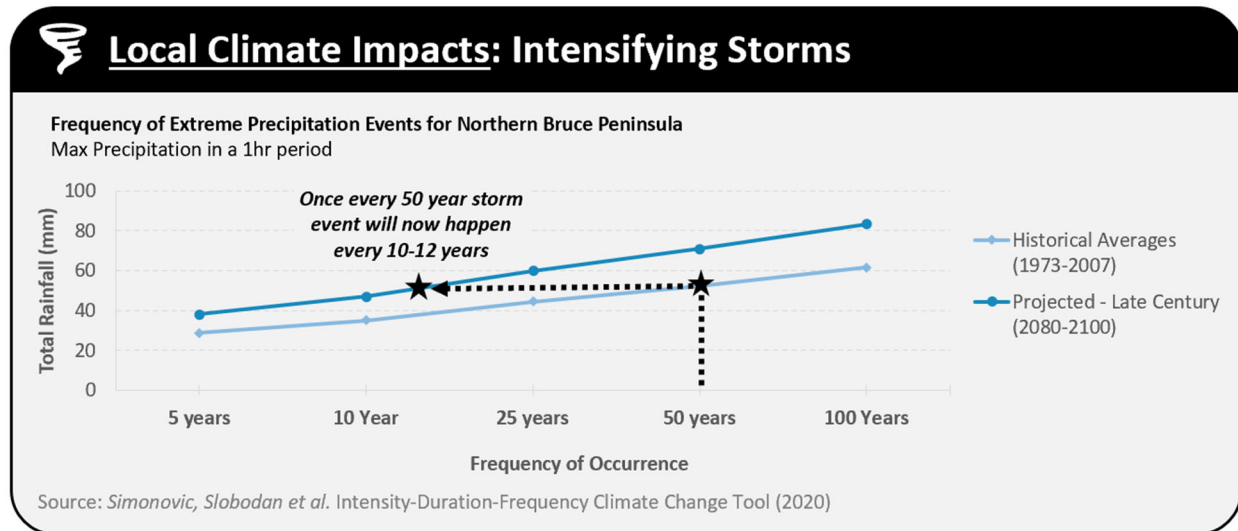


Climate change will also impact **increased water levels** along the community’s shorelines. While much of the global concern is regarding coastal areas, communities along the Great Lakes such as Northern Bruce Peninsula are susceptible to increased precipitation, erosion and run-off. For example, by the end of the century Lake Huron could see an increase in its high-water mark by nearly 1.5 metres as a result of climate change – resulting in greater flooding and higher potential for contamination of lake water due to run-off.

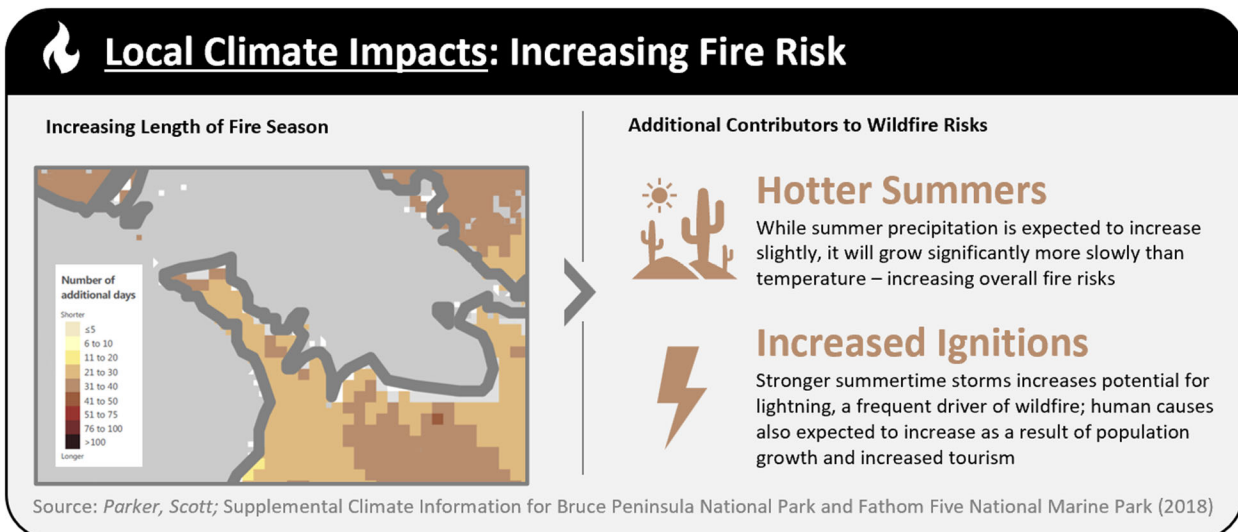


Climate change will also **intensify major storms**, as the warming of the planet adds additional moisture and energy to storms. Extreme events will become more common – with greater potential for high winds, storm surges, and rapid

rainfall. As a result, the major once-in-50-year-storms that most would expect to experience once or twice in their lifetimes will eventually occur nearly every decade.



The higher temperatures will also bring with them a **greater potential for wildfire**. The fire season on the peninsula will grow by nearly a month per year – with the increasingly hot conditions in the summer and struggling plant species raising the potential for a major fire event.



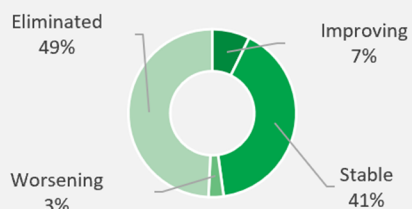
All this climatic change will have **dramatic consequences for the local ecosystem**. For wildlife, a portion of existing species will migrate north to find more hospitable climates – replaced by wildlife currently residing further south. Aquatic species will increasingly find the warming lakes unsuitable for breeding and also be forced to migrate elsewhere in the Great Lakes system. Tree species will see a similar gradual replacement – with as many as half of existing tree species no longer finding the Bruce Peninsula’s climate suitable by the end of this century.



Local Climate Impacts: Weakening Ecosystems

Vegetation Impacts

Bruce Peninsula Tree Species Status by 2080-2100



Examples of At-Risk Species



American Beech



Jack Pine



Mountain Ash



Black Spruce

Wildlife Impacts



Bird species lost

20% of bird species will be different, due to changed range and migratory patterns



Warming lake waters

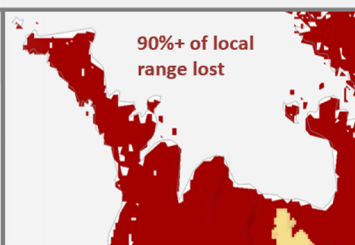
May make climate inhospitable to certain species such as walleye and brook trout



New invasive species

Expected increases in insect-borne diseases such as West Nile and Lyme Disease

Examples Impacted Species: Yellow Warbler



Source: Parker, Scott; Supplemental Climate Information for Bruce Peninsula National Park and Fathom Five National Marine Park (2018)

Our Contribution to Climate Change

Like every community, Northern Bruce Peninsula is contributing to this climate crisis by generating its own emissions locally. Quantifying exact volumes and sources of these emissions is a challenging, data-intensive process – but a crucial step in the climate action planning process in order to provide direction on where the eventual plan must focus.

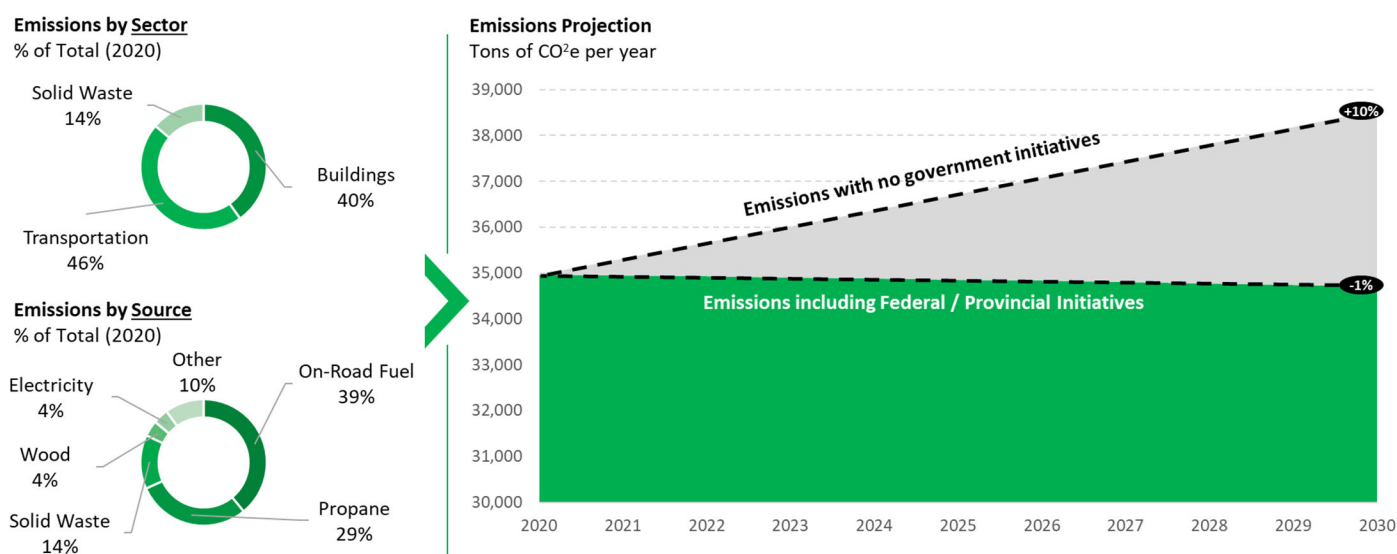
Using the methodology described in Appendix A, we estimate that in 2020 Northern Bruce Peninsula generated an estimated 35,000 tCO₂e – representing approximately 9 tCO₂e per full-time or seasonal resident per year. Though emissions estimation methodologies vary between communities, these estimates for Northern Bruce Peninsula appear to be higher than many surrounding communities – further reinforcing the need for local action.

Transportation and Building emissions are the largest contributors to emissions – an unsurprising finding given Northern Bruce Peninsula’s rural, residential nature. Solid waste emissions represent a smaller – though still meaningful – portion of the overall total. Municipal emissions are embedded in each of these sectors but represent just 1% of the total.

While this inventory represents the majority of local emissions, there are some known and potentially material omissions that should still be considered as part of the plan. For example, agricultural emissions have been excluded due to the lack of available data. Similarly, limited data was available to estimate emissions from visitor trips to the Peninsula. In both cases, the sectors have been excluded from our inventory – though work will continue after the launch of the climate action plan to gather the data required for an estimate. (See Appendix A for more details on this work).

Regardless, the sectors quantified provide clear direction on where the Climate Action Plan must focus. Crucially, as well – these emissions will not remain static. As a result of population growth, GHG emissions are anticipated to grow by 10% through 2030 – though this growth will largely be offset by the expected impact of initiatives from higher levels of government, such as new standards for vehicle efficiency, targets for adoption of electric vehicles, and changes to Canada’s building codes. Additional details on the assumptions used for the project growth are provided in in Appendix B.

Figure 10 – Northern Bruce Peninsula Greenhouse Gas Inventory (2020)

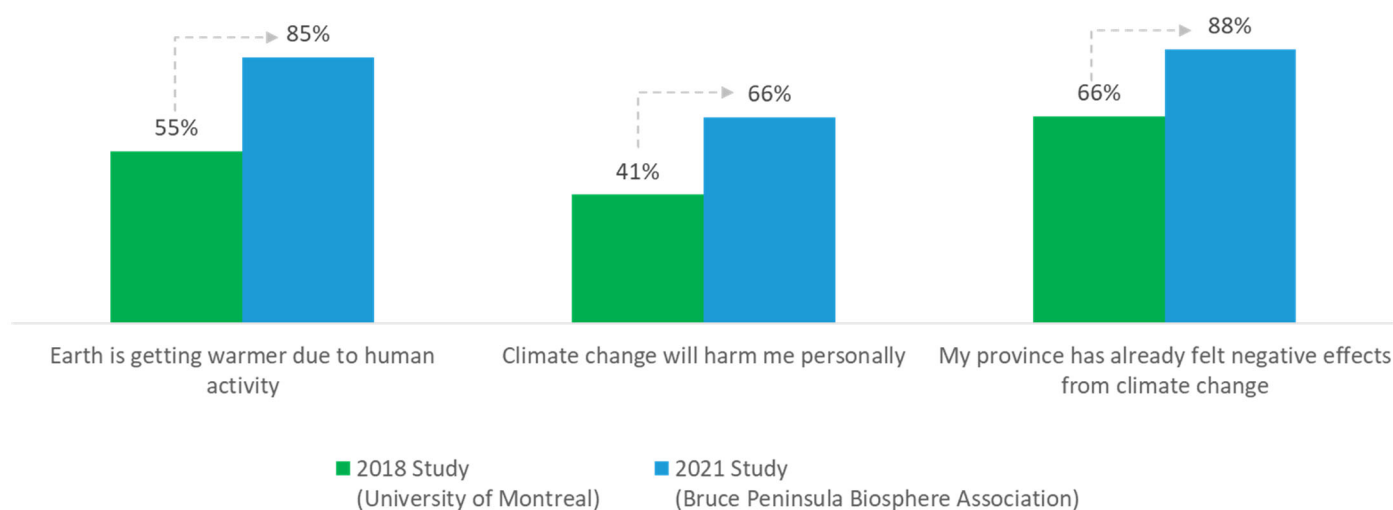


Our Readiness to Act

While these facts on their own create a strong case to address climate change locally, the evolving views in the community regarding climate change only reinforce the need for action.

A study [conducted by University of Montreal and partners in 2018](#) that evaluated Canadian perspectives on climate change found that only slightly more than half of adults in Bruce-Grey-Owen Sound believed human activity was driving climate change. Less than half believed that there were potential impacts to them personally. When the Bruce Peninsula Biosphere Association recreated the study in 2021 with a focus on Northern Bruce Peninsula, it found that views had shifted considerably – with significantly more individuals acknowledging the causes and potential impacts of climate change.

Figure 11 – Local Climate Views (% of total respondents agreeing with the statement)



Similar data collected during the development of the Climate Action Plan reinforce these findings. Surveys conducted by the Climate Action Committee in March 2022 as part of the finalization of this plan found a large proportion of the community were “Alarmed” or “Concerned” about climate change – and relatively few who were indifferent or unconcerned.³ That same survey indicated that knowledge of the causes, consequences, and potential actions to address climate change had also grown significantly in recent months – suggesting a strong and increasing interest in the topic.

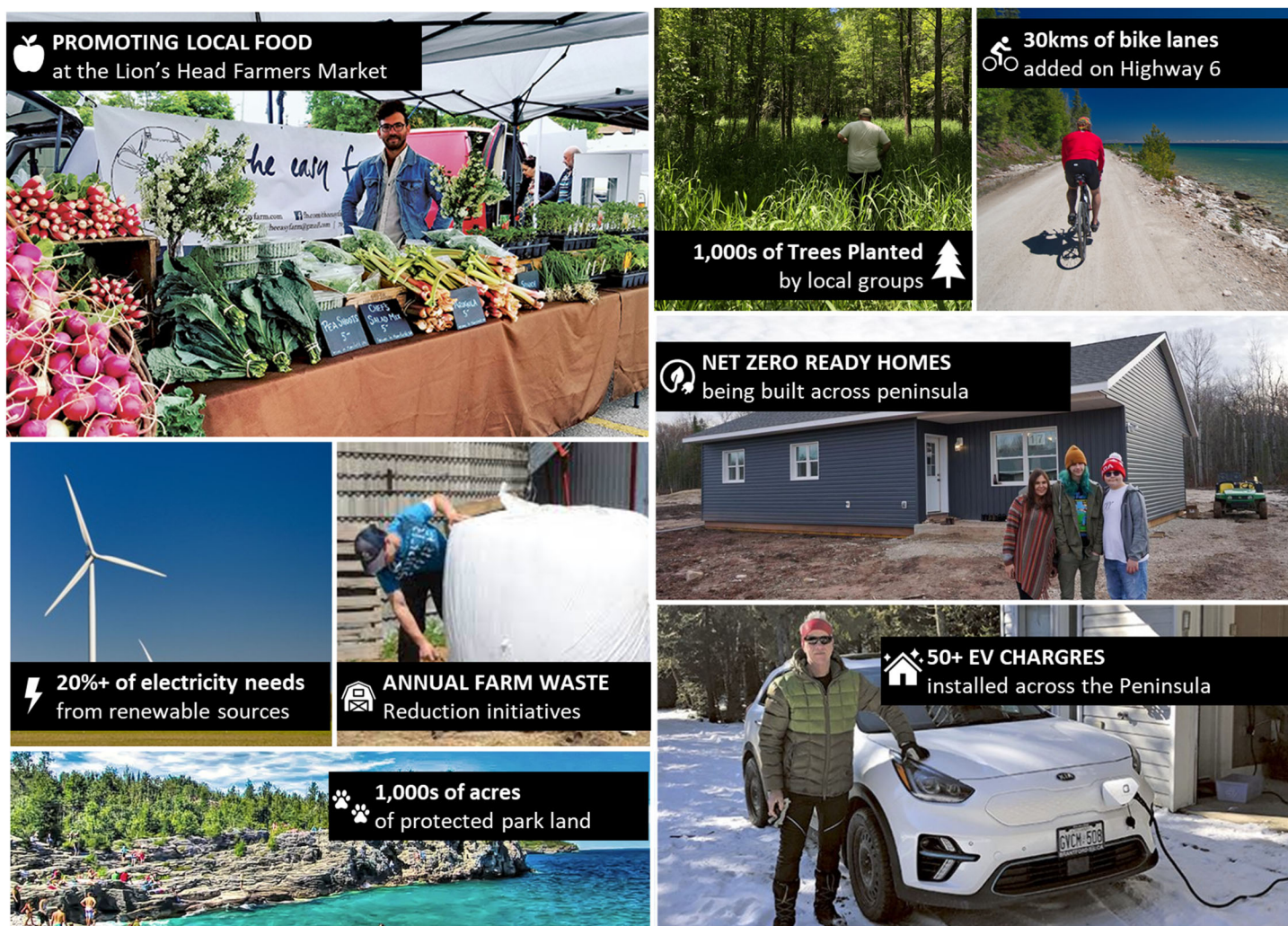
Comparing results between studies and avoiding sample biases is always challenging in such public opinion polling. Clearly, further study of local views on climate change is warranted to develop a statistically significant view of how local perspectives on climate change are evolving over time. However, at minimum, the results to date suggest a strong and growing interest in climate change on Northern Bruce Peninsula. When this interest is coupled with the projections around

³ This survey classified respondents based on their views on climate change using the methodology developed by Yale University. For more information, see *Leiserowitz, Anthony et al, Global Warming’s Six Americas: a review and recommendations for climate change communication* (2021).

the dire consequences of inaction and the relatively high local contributions to climate change's causes, the need for immediate action is clear.

For these reasons, it is no surprise that in recent years the community has already begun to take climate action. Figure 12 highlights just a few examples of work led by local governments, non-profits, or even individual community members that help address climate change in some way. This work demonstrates the appetite for a broader and more ambitious set of climate goals – and provide the foundation upon which this Climate Action Plan is built.

Figure 12 – Previous Climate Actions on Northern Bruce Peninsula



Part 2

Our Climate Action Plan

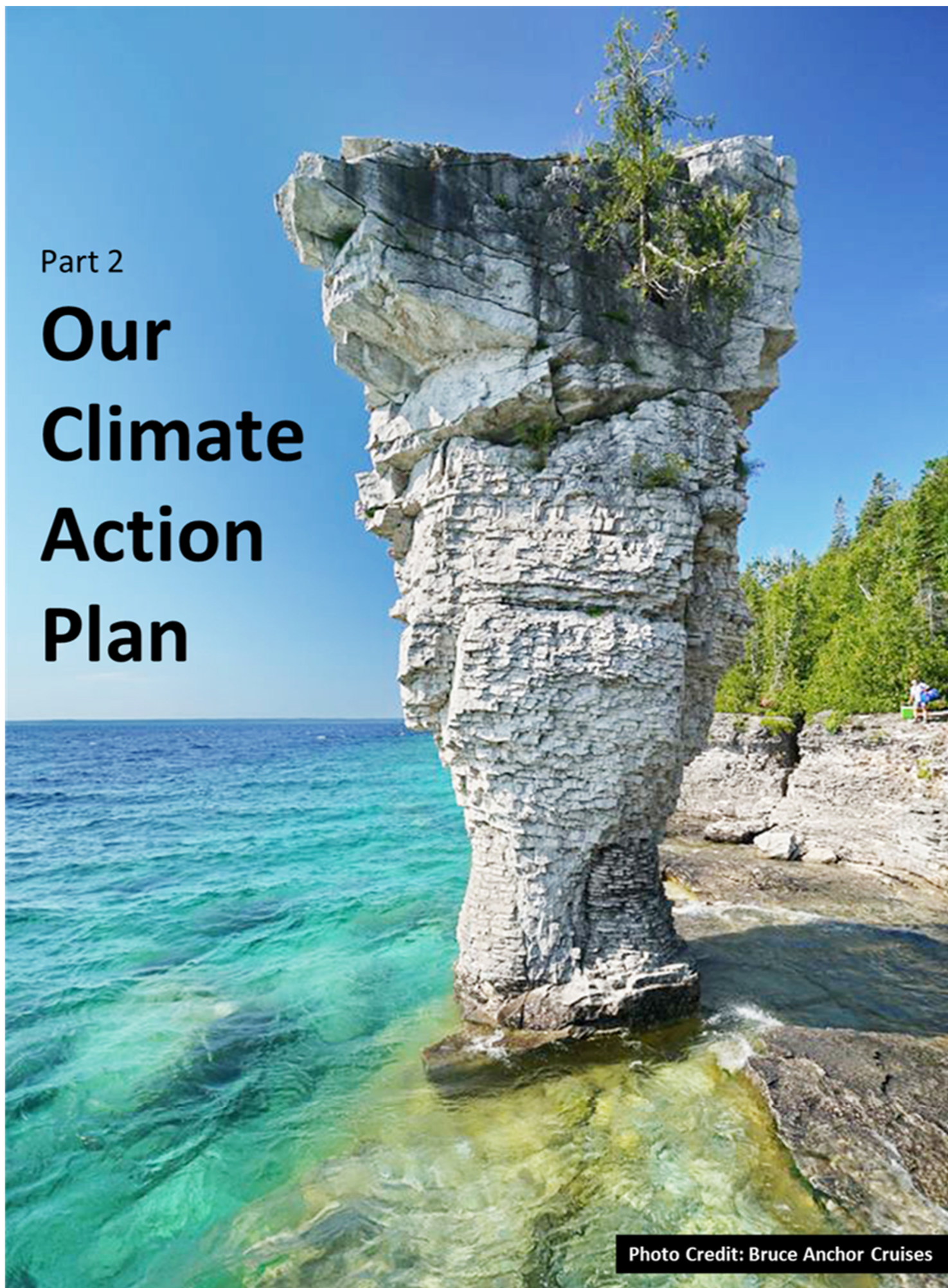


Photo Credit: Bruce Anchor Cruises

Where we must go

Climate change is an emergency that warrants an emergency-worthy response. Climate science suggests that time is of the essence – with significant action required in the next decade in order to avoid the worst repercussions of climate change. As a result, many jurisdictions have set ambitious emission reductions targets by 2030.

Through this Climate Action Plan, Northern Bruce Peninsula will be similarly ambitious. We believe that a 20% reduction in local greenhouse gas emissions from 2020 to 2030 is not only achievable but imperative. Such a level is comparable to other similarly ambitious neighbouring municipalities and aligns with the overall federal emissions reduction targets, after accounting for the different mixes of industries and estimation starting points. More details on this target and how it compares can be found in Appendix B.

Northern Bruce Peninsula will reduce its total greenhouse gas emissions by 20% from 2020 levels by 2030

How we will get there

Achieving this target will be no small feat. It will require years of effort across multiple sectors spanning all corners of the Peninsula. But as the latter sections of this report will describe, this target is achievable. Changes in technology, policy, and attitudes have given us most – if not all – of the tools we already need to achieve this target. We expect developments over the coming years will only further support our efforts.

Transportation represents the greatest opportunity. It is the largest portion of our community's emissions and the one where behavioural change – such as driving less and cycling more – can have an immediate impact. While zero-emission alternatives remain out-of-reach for many in our community, technology and public policy are evolving and rapidly making them more viable. We will tap into this momentum – raising awareness of the technology as it improves and knocking down barriers that prevent its adoption – in order to reduce transportation emissions by 35% over the coming decade.

Buildings are a smaller but nearly-as-important opportunity to reduce our emissions. Embedding best practices for energy efficiency in construction on the Peninsula is an obvious opportunity to avoid new buildings adding to our emissions problem – and one that can be achieved through good local planning policy. However, the vast majority of our buildings in 2030 will be those that exist today – and for them completing emissions reduction upgrades will take time. While the tools we need are available – such as electric heat pumps – awareness of the benefits, incentives to replace existing technologies, and availability of trained local contractors remains low. Yet each of these influences will strengthen over time – further accelerated by the efforts of the Climate Action Plan. Overall, we believe a 10% decrease in buildings emissions is practical while still sufficiently ambitious for a community such as ours.

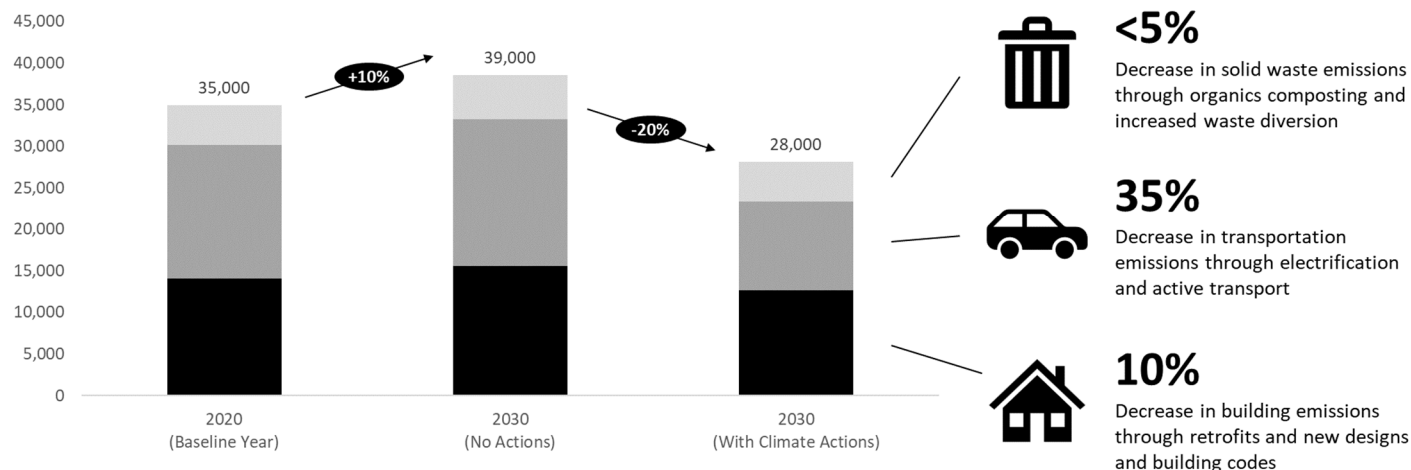
Waste has the smallest potential for emissions reductions in our plan but by requiring limited individual investment to participate, this has the potential to be the most participatory. Although we believe only small emissions reductions from waste are possible – less than 5% of those generated in 2020 by 2030 – by involving a wide audience, the sector has a key role as a uniter within the plan.

Figure 13 summarizes these sector-specific targets and their contribution to our overall goal.

Figure 13 – Emissions Reduction Target by Sector

Northern Bruce Peninsula Emissions Projection

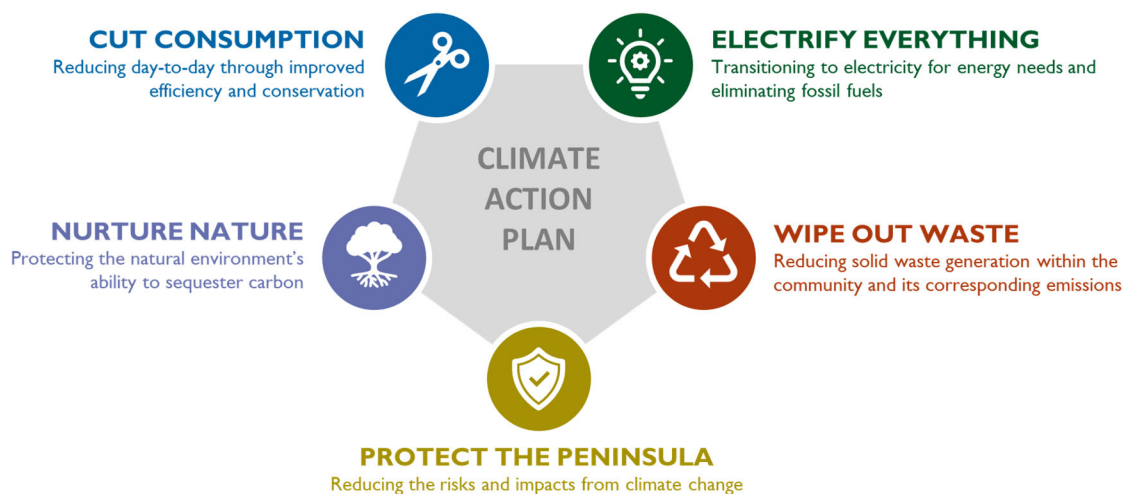
Tons of CO₂e per year



Our Climate Action Plan

To achieve this target, we have developed a Climate Action Plan comprised of the five pillars shown in Figure 14 below. The first three pillars – *Electrify Everything*, *Cut Consumption*, *Wipe-out Waste* – are expected to directly result in emissions reductions. The fourth – *Nurture Nature* – is anticipated to indirectly reduce emissions, primarily through additional carbon sequestration in the Peninsula’s natural environment. The fifth – *Protect the Peninsula* – will not have an impact on emissions but is necessary to prepare for the inevitable impacts of climate change on the local community.

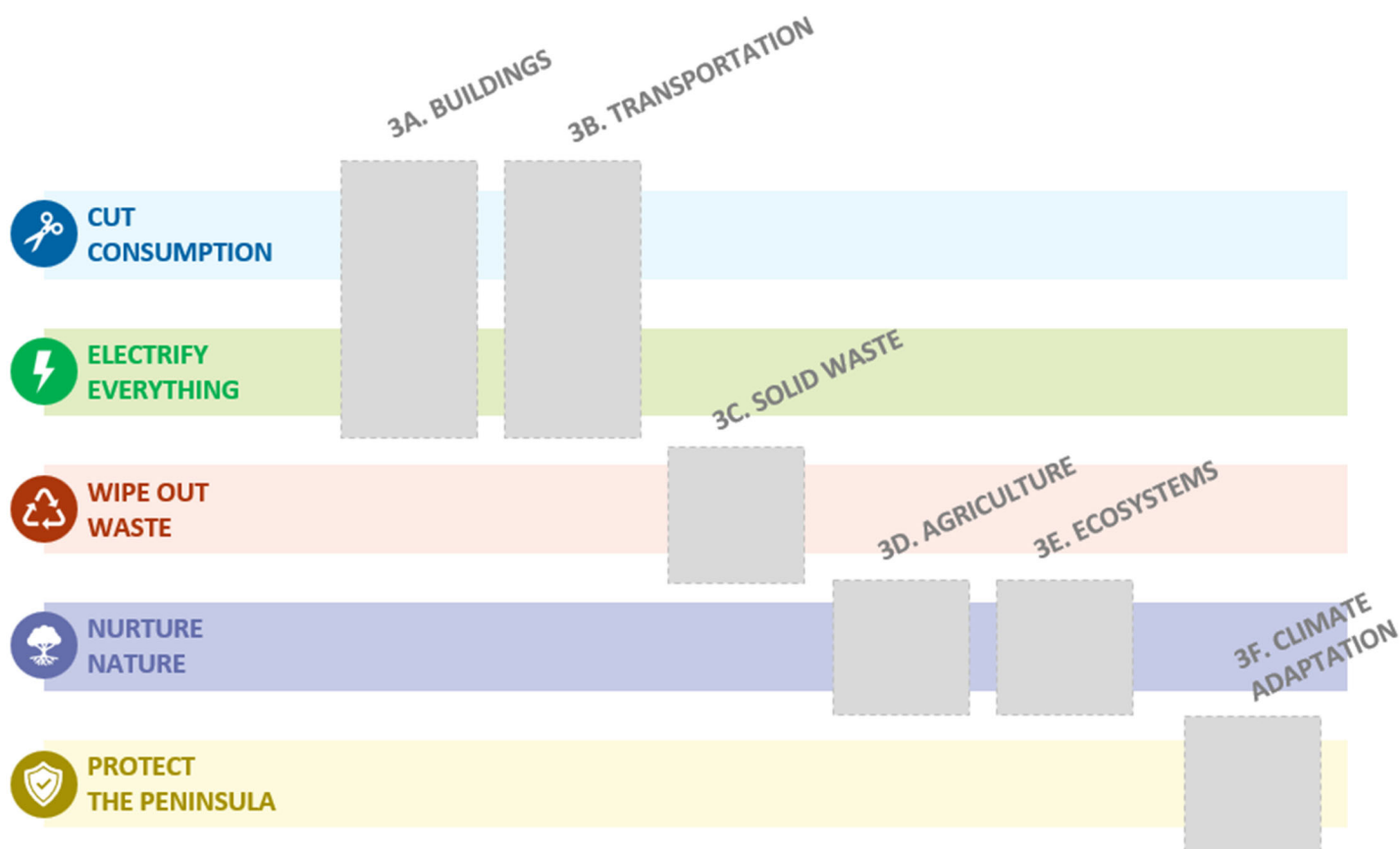
Figure 14 – Climate Action Plan Pillars



It is important to note that several of these pillars span across multiple sectors. This choice was a deliberate one in order to ease future communications regarding the plan and make it more accessible and inclusive. Our consultations indicated that common themes – such as *Electrify Everything* – were easier for the public to immediately interpret and rally behind rather than plans for individual sectors. It also afforded us the opportunity to create pillars that were more inclusive – such as *Cutting Consumption* – whereas sector specific plans were perceived as more expensive and exclusive. More details on these findings and others from the public consultation process are shown in Appendix D.

While this creates some complexity within this report, we ultimately deemed the communications benefits to be worth it. For ease of access, we have included both views of the plan. The following pages include brief summaries of the Climate Action Plan by pillar. From there, we provide additional detail on each initiative organized by sector. The overlap between the two is shown in Figure 15 below.

Figure 15 – Mapping Climate Action Plan Pillars to Sectors





Climate Action #1

CUT CONSUMPTION

WHAT IT MEANS

These actions will look to reduce the energy that we consume at home, at work, or on the road.

It involves energy efficiency investments, policy changes, and new behaviors all aiming to reduce energy demand.

WHY IT IS IMPORTANT

Cutting consumption is an inclusive action: there are many low or no cost steps that everyone can take.

While the emissions reduced may be modest, it will play a critical role in creating the movement for climate action.

WHERE WE MUST GO

50%

of residents and businesses report that they have taken at least one action to reduce their energy consumption by 2030

HOW DO WE GET THERE

REDUCE OUR ENERGY CONSUMPTION AT HOME

Higher density homes in Lion's Head



1.1 LAUNCH LOCAL ENERGY CONSERVATION CAMPAIGN

The community has shown keen interest in energy conservation, but it is often unclear on the best ways to do so. We will run annual energy efficiency campaigns to promote conservation at home and work.

1.2 IMPLEMENT PRO-CLIMATE PLANNING POLICIES

Current local planning policies prevent new buildings from being as energy efficient as possible. We will explore new policies to permit smaller, denser, and more efficient homes on the Peninsula.

1.3 BUILD LOCAL ENERGY EFFICIENCY INDUSTRY

The Peninsula lacks trained energy auditors, heat-pump installers and other contractors needed to support energy efficiency. We will recruit and train new skilled tradespeople to help develop this new industry.

New low-energy home in Neyaashiinigmiing (Cape Croker)



PROMOTE ALTERNATIVE FORMS OF TRANSPORTATION

1.4 EXPAND CYCLING ROUTES & INFRASTRUCTURE

Cycling is an increasingly popular alternative to vehicles. Working with the local, county, & provincial governments we will expand our bike lanes, safety signage and other amenities to promote cycling

1.5 IMPROVE PEDESTRIAN MOBILITY

It is often unsafe or impractical for pedestrians to get around Tobermory and Lion's Head. We will expand sidewalks, snow clearing, and road markings to make walking a safer and more viable alternative to driving.

1.6 REDUCE EMISSIONS FROM OFF-PENINSULA TRIPS

Travel on-and-off the Peninsula is a large source of emissions. We will look to reduce these impacts by expanding shuttle / rideshare options while partnering with other tourism destinations on a Visitor Emissions Strategy.



New cycling routes along Highway 6



Summer pedestrian issues in Tobermory





Climate Action #2 **ELECTRIFY EVERYTHING**

WHAT IT MEANS

Electrification focuses on reducing local consumption of fossil fuels for heating and transportation.

It will involve education on new electric options and eliminating the barriers to their eventual adoption.

WHY IT IS IMPORTANT

Ontario's electrical grid is low emitting, making it a far superior alternative to gas, propane, & other fossil fuels.

Electric options are already growing in popularity, but adoption can be accelerated with focused climate action.

WHERE WE MUST GO

40%

of vehicles on the Peninsula are electric by 2030.

25%

of propane or oil buildings are converted by 2030.

HOW DO WE GET THERE

ELECTRIFY OUR BUILDINGS



New electric heat pump on the Peninsula



Photo Credit: Rod Layman

View from the soon-to-be redeveloped Lion's Head Arena

2.1 SUPPORT HOME ELECTRIFICATION

Many buildings on the Peninsula rely on fossil fuels for heat and appliances. We will support homeowners and businesses converting to electricity & look for ways to power more local buildings with solar energy.

2.2 DEVELOP FUNDING PROGRAM FOR RETROFITS

For some of our older and larger buildings, converting to electric heat will be expensive. Partnering with other levels of government, we will explore potential funding programs for retrofits by homeowners & businesses.

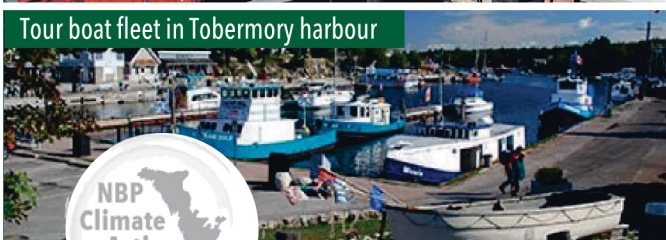
2.3 UPGRADE MUNICIPAL FACILITIES

Municipal buildings are amongst the largest emitters on the Peninsula. As part of planned maintenance or redevelopment, we will implement energy saving upgrades – starting with the Lion's Head arena.

ELECTRIFY OUR TRANSPORTATION



New EV chargers in Lion's Head



Tour boat fleet in Tobermory harbour

2.4 CHAMPION ADOPTION OF ELECTRIC VEHICLES

Electric vehicle technology and affordability is steadily improving - and so too is local interest. We will continue our EV promotion campaign to help residents test drive, research, and choose the right EV for them.

2.5 EXPAND CHARGING INFRASTRUCTURE

The number of EV chargers has grown significantly on the Peninsula. We will complete the charging network by adding chargers at public buildings and encourage installs at private residences & businesses.

2.6 PURSUE ZERO-EMISSIONS HEAVY-DUTY VEHICLES

While larger vehicles and equipment are key emitters, few electric alternatives exist today. We will work with local businesses to promote adoption of low emissions technologies as they become viable.





Climate Action #3

WIPE OUT WASTE

WHAT IT MEANS

These actions build on the community's strong history of reducing waste and promoting recycling.

Actions will also introduce new programs, and use municipal policies to encourage waste diversion.

WHY IT IS IMPORTANT

Waste reduction is yet another climate action that is accessible to anyone.

The actions focus on the largest sources of emissions from waste: organics, paper, and cardboard.

WHERE WE MUST GO

50%

Reduction in household organic waste entering the landfill by 2030.

HOW DO WE GET THERE

REDUCE ORGANIC WASTE



Bear-safe composters in Bruce Peninsula

3.1 EXPAND USE OF BACKYARD COMPOSTING

Composting has been popular on the Peninsula, but participation is still inconsistent. We will expand the promotion and education around composting to ensure it is viewed as practical solution for waste.

3.2 INCREASE OPTIONS FOR ORGANIC COLLECTION & DROP-OFF

While composting is key, we must also create other options for organics that are practical. We will partner with Bruce County and local businesses to explore organic curbside pick-up or drop-off locations.

3.3 EXPLORE LANDFILL ALTERNATIVES FOR YARD WASTE

Current practices of burning yard waste result in rapid release of greenhouse gas emissions. We will test alternative programs for utilizing yard waste that reduce its climate impact.

INCREASE WASTE DIVERSION & PREVENTION



Two-stream waste bins in Lion's Head

3.4 INTRODUCE NEW RECYCLING OPTIONS

Diversion and reuse programs at our landfills have a strong track record of reducing waste. We will identify and implement additional recycling programs - starting with construction waste and other common sources.

3.5 INCREASE ADOPTION OF BLUE BOX PROGRAMS

Though our recycling rate leads Bruce County we can still do better. We will assess the current blue box program and identify modifications to pick-up days, materials, and other features to increase recycling rates.

3.6 EVALUATE OTHER WASTE REDUCTION POLICIES

Our waste fees and limits are less strict than many other communities - which does little to discourage waste. We will assess bag tags, recycling requirements, and other policies that encourage waste reduction





Climate Action #4

NURTURE NATURE

WHAT IT MEANS

These actions focus on improving or maintaining the health of local ecosystems - both agricultural & natural.

The initiatives build on years of conservation work by local farmers, community groups, and all levels of government.

WHY IT IS IMPORTANT

Healthy natural ecosystems remove carbon from the atmosphere and embed it in our trees, plants, and soil.

This process - known as carbon sequestration - helps to slow down and reverse climate change.

WHERE WE MUST GO

75%

of local farms have participated in at least one sustainability or climate-related initiative by 2030

HOW DO WE GET THERE

SUPPORT CLIMATE COMPATIBLE AGRICULTURE



Bale wrap recycling in Bruce County



On-farm renewable energy in Bruce County

4.1 PROMOTE THE CARBON SEQUESTRATION POTENTIAL OF FARMING

Many practices - such as cover crops or low-till farming - can reduce agricultural emissions and even remove atmospheric carbon. We will work with farmers to promote these practices and support their widespread use.

4.2 PILOT INNOVATIVE ON-FARM EMISSIONS INITIATIVES

The Peninsula's farming community has historically shown a strong appetite for innovation & experimentation. We will build on this legacy through annual experiments of new technologies.

4.3 PROTECT FARMLAND, WOODLOTS AND WETLANDS

Agricultural and natural areas frequently face pressures from further development. Through municipal zoning / planning policy, we will protect the status and climate mitigation potential of these areas.

SUPPORT LOCAL ECOSYSTEM HEALTH



Monitoring in Bruce Peninsula National Park



Tree planting in Bruce County

4.4 MEASURE THE CLIMATE IMPACT OF OUR NATURAL AREAS

Our forests, wetlands, and other natural areas have potential to help sequester carbon under the right conditions. We will conduct the first local assessment of the carbon released or sequestered by our ecosystems.

4.5 IMPROVE MONITORING OF ECOSYSTEM HEALTH

There have been numerous initiatives to analyze local ecosystem health. We will implement a regular monitoring program that coordinates these previous efforts to measure climate change impacts

4.6 MAXIMIZE CARBON SEQUESTRATION IN OUR FORESTS & WETLANDS

The amount of carbon sequestered in our natural areas has grown over time. Partnering with Federal & Provincial agencies, we will implement leading ecosystem management practices to ensure this trend continues.





Climate Action #5

PROTECT THE PENINSULA

WHAT IT MEANS

These actions focus on increasing the Peninsula's resilience to the eventual impact of climate change. They prioritize the two greatest risks for the community identified by climate science: fire & storms.

WHY IT IS IMPORTANT

Some amount of climate change is now inevitable; these actions will help prepare for its impacts.

Many of these actions require years of preparation to be effective and so are critical to launch well in advance.

WHERE WE MUST GO

100%

Inclusion of climate change projections in municipal emergency planning, design standards and operation plans by 2030.

HOW DO WE GET THERE

REDUCE RISKS DUE TO WILDFIRE



NBP Volunteer firefighter exercise in 2019

5.1 PREVENT WILDFIRE IGNITION AND SPREAD

Climate change, increased tourism, and more development are increasing the local risk of fire. We will implement new community programs designed to educate and prepare residents & visitors for fire.

5.2 SUPPORT VOLUNTEER FIREFIGHTER FORCE

While traditional focus of our volunteer firefighters has been on urban fire, the requirements to fight wildfire are different. We will acquire new equipment and training to prepare for this growing risk.

5.3 EXPAND PREPARATIONS FOR EVACUATIONS

Northern Bruce Peninsula has greatly expanded its emergency planning in recent years. We will incorporate and run exercises to prepare for the highest risk climate-related events.

REDUCE RISKS DUE TO MAJOR STORMS



Strong Fall Storm at Lion's Head Lighthouse



Snow Squalls & Low Visibility on Highway 6

5.4 UPDATE EMERGENCY COMMUNICATIONS PROTOCOLS

The Peninsula's demographics mean it has a higher proportion of vulnerable persons. We will revitalize the municipality's persons-at-risk registry and implement a "Check-in-on-your Neighbour" program.

5.5 REDUCE RISKS FOR ISOLATED COMMUNITIES

Several parts of the Peninsula are at-risk of being physically cut-off during storms. We will conduct regular education outreach to these communities and implement windbreaks to reduce the risks of isolation.

5.6 INCREASE RESILIENCE OF OUR INFRASTRUCTURE

The Peninsula's roads, bridges, and other infrastructure were built for climate conditions that will soon change. We will update our design standards, map specific risks, and conduct upgrades to prepare.



Part 3a

Plan Details: Buildings

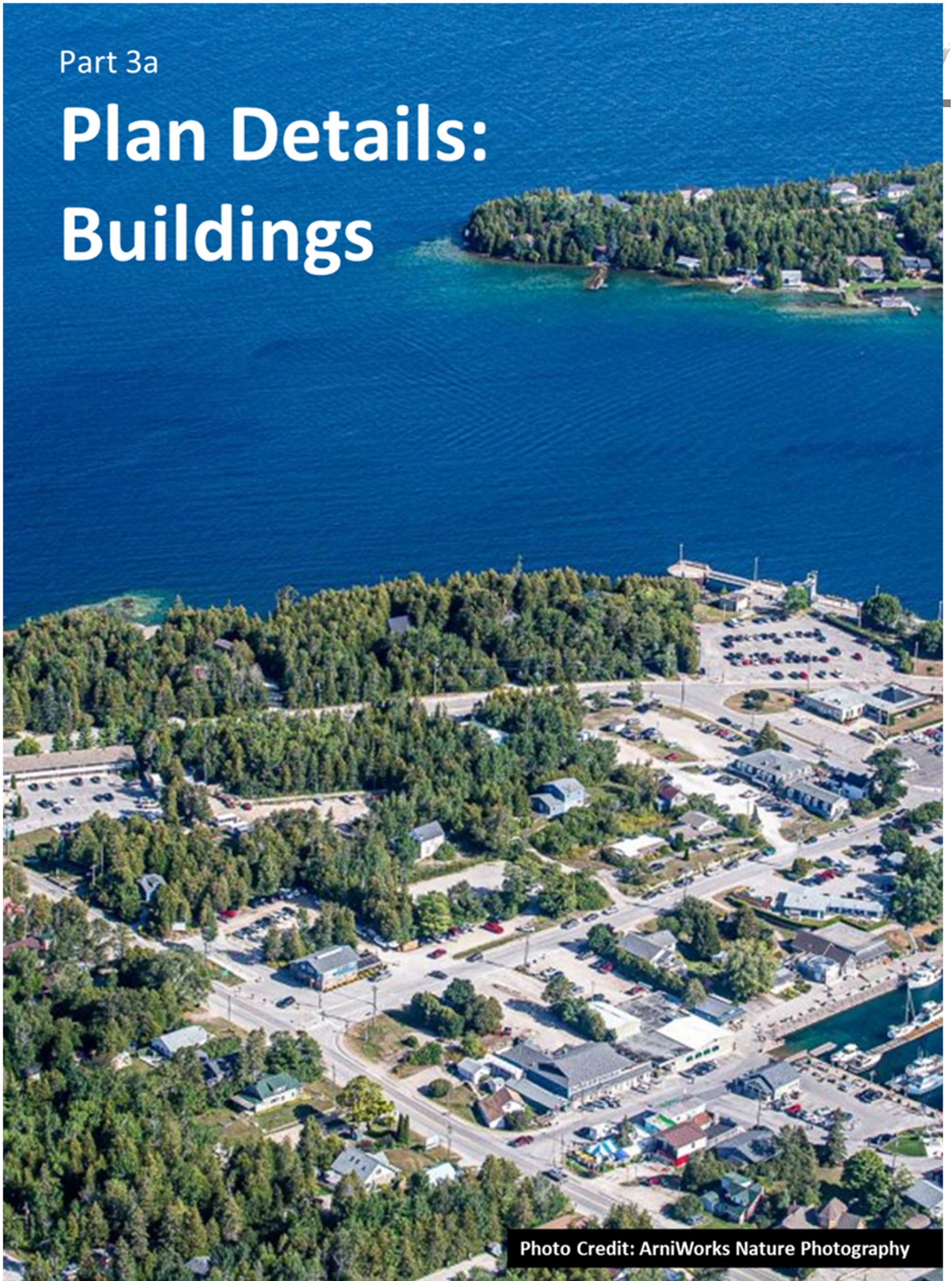


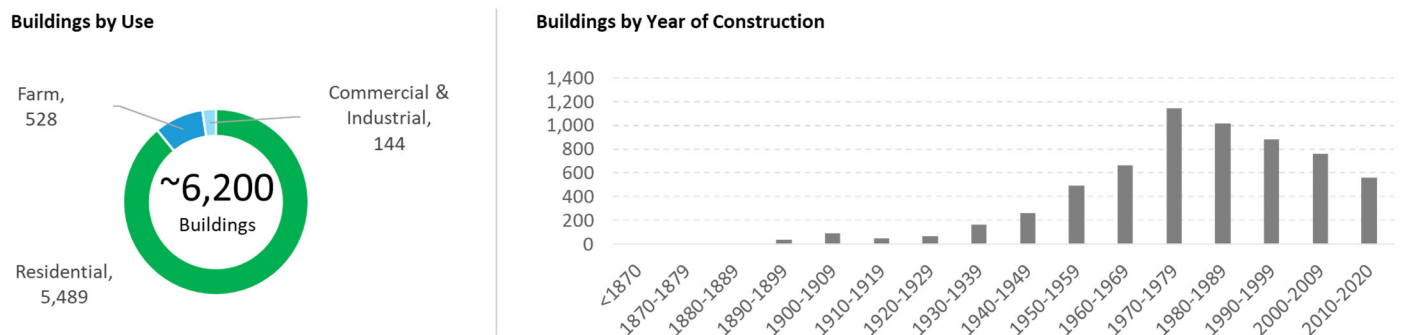
Photo Credit: ArniWorks Nature Photography

Section Details: Buildings

Background

In Northern Bruce Peninsula, there are approximately 6,000 inhabited structures, the vast majority being detached single-family homes or farm buildings.⁴ Also included are a smaller number of municipal, commercial, and institutional facilities.

Figure 16 – Buildings in Northern Bruce Peninsula



Buildings contribute to climate change through their consumption of different forms of energy – such as electricity, propane, oil, or wood – for heat, lighting, and a variety of other home energy uses. There are several factors that contribute to the intensity of energy consumption in a building, including: type of usage (e.g., residential, commercial, industrial), occupancy (e.g., full-time, seasonal), and various property features (e.g., size, age, heating type).

Buildings represent approximately one-third of all emissions in Northern Bruce Peninsula.⁵ As shown in Figure 17, the majority of these emissions come from the residential sector (~90%) for home heating. While population growth is expected to be the primary driver of building emissions in future years, policy changes – in particular, the expected new federal and provincial building code standards for Net-Zero Energy buildings – will, once implemented, mitigate some emissions growth.⁶

Compared to other neighbouring municipalities shown in Figure 18, Northern Bruce Peninsula's emissions from buildings are higher on a per capita basis. This is due to several factors, including the above average size and age of buildings, frequency of fossil fuel-based heating systems, and lower residential density in Northern Bruce Peninsula. Mitigating these factors is the higher degree of seasonality and smaller proportion of higher energy consuming commercial or industrial uses in other communities.

⁴ Based on data provided by the Municipal Property Assessment Corporation (MPAC) accessed November 2021.

⁵ Emissions estimates are based on HydroOne electricity consumption data and survey data developed by the Bruce Peninsula Biosphere Association (BPBA). See Appendix A for details on the methodology and data used.

⁶ See Appendix B for additional details on the expected impact of policies from other levels of government.

Section Details: Buildings

Figure 17 – Total Buildings Emissions

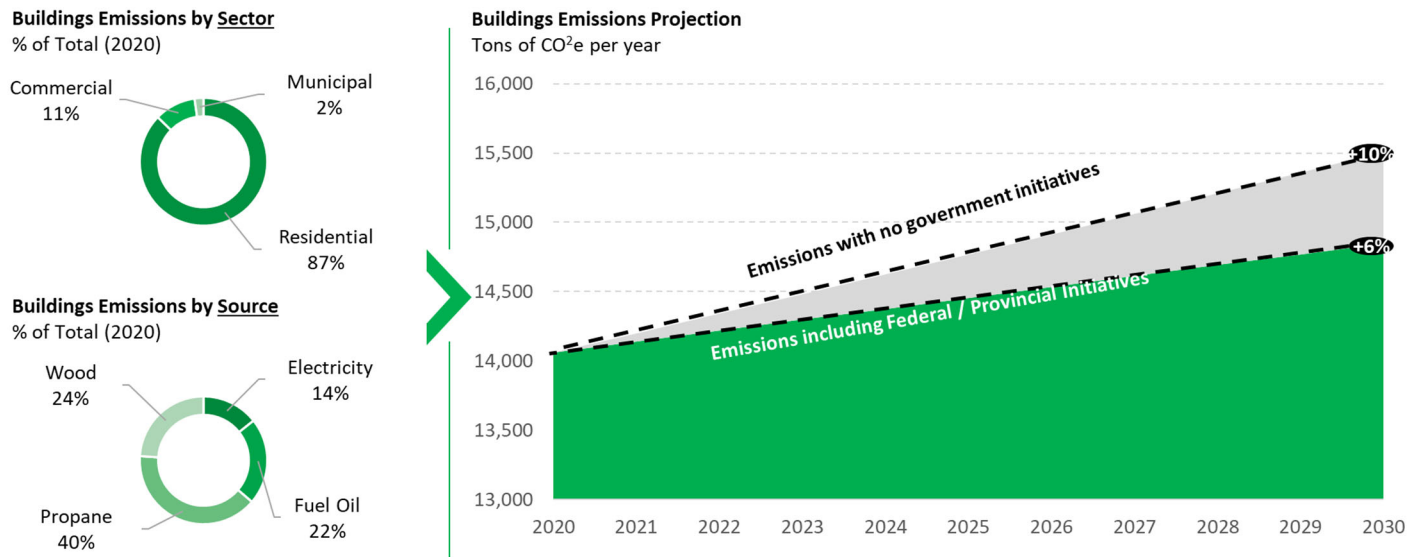
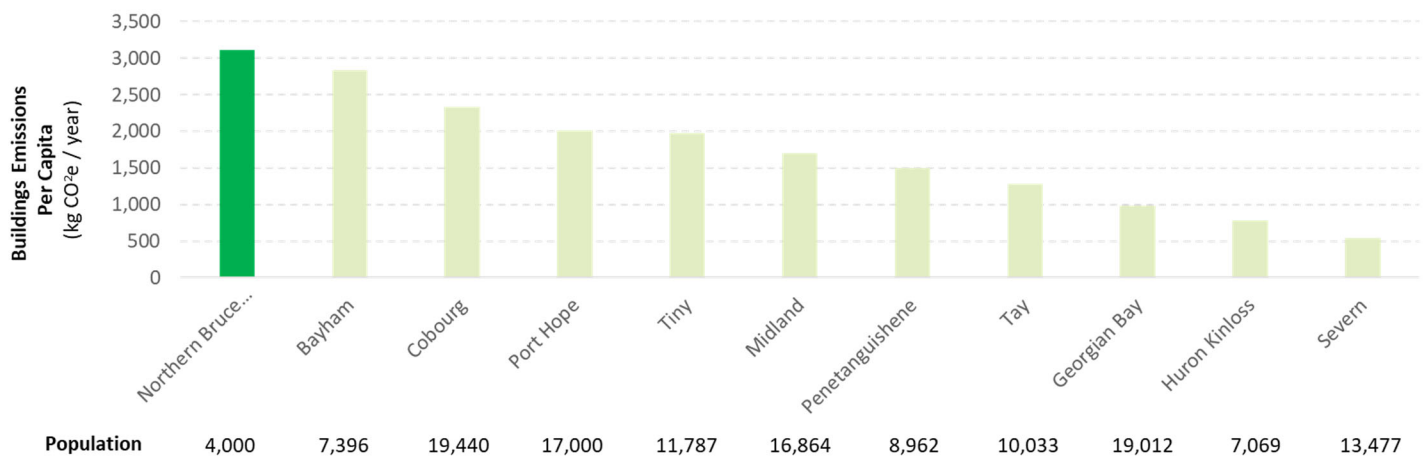


Figure 18 – Buildings Emissions Per Capita vs. Other Small Municipalities⁷



Climate Action Plan

There are typically four methods for reducing the climate change impact of buildings⁸:

1. Retrofits of existing buildings
2. Energy-efficient new development
3. Promoting energy conservation and behavioral changes
4. Switching to on-site renewable sources of heat and electricity

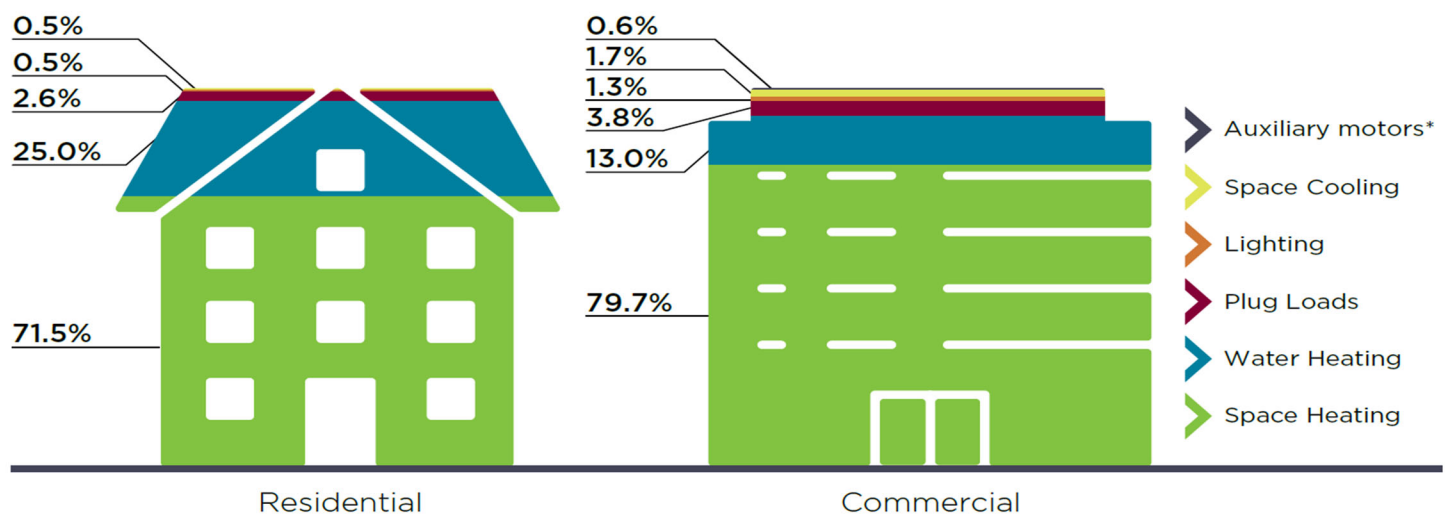
⁷ Federation of Canadian Municipalities, PCP Milestone Tool Public Dashboard (2021)

⁸ Federation of Canadian Municipalities, Small and rural communities climate action guidebook (2021) p. 14

Section Details: Buildings

For Northern Bruce Peninsula, Method #1 (building retrofits) is the most relevant given the energy inefficiency and average age of its existing buildings (i.e., 70% were constructed prior to 2000). This method is often viewed as the most important for most communities because the majority of buildings in 2030 will be those that have already been built today. The primary focus will be on eliminating fossil fuel use for home heat and other appliances. Instead, buildings will be transitioned to electricity for all their energy needs – which, thanks to Ontario’s use of nuclear and renewables, will result in significantly lower emissions.

Figure 19 – Average GHG Emissions by End User for Provinces with Low-Carbon Grids⁹



* Auxiliary motors are devices used to transform electric power into mechanical energy, such as pumps, ventilators, compressors and conveyors.

Due to anticipated population growth, Method #2 – ensuring the energy efficient new development – is another important component of the Climate Action Plan.

For most communities, Method #3 – energy conservation and behavioural changes – typically have smaller potential for delivering emissions reductions as it typically involves reducing electricity use, which is relatively low carbon emitting in Ontario. However, community consultation has demonstrated that there is a keen interest in including such strategies within the plan,¹⁰ largely as a low-barrier way to engage individuals who may be more skeptical of the need for substantial climate actions or do not have the resources to do so.

The NBP Climate Action Plan places less emphasis on Method #4 – on-site renewable energy –again due to the relatively “clean” electrical grid in Ontario. Community consultation also indicated only modest interest in many of the on-site renewable energy sources currently available.¹¹ As the technologies continue to evolve, this may be a more relevant future opportunity for the community in future iterations of the Climate Action Plan. For now, they will only be opportunistically pursued and promoted.

⁹ Federation of Canadian Municipalities, GMF Municipal Energy: Roadmap (2020) p. 20

¹⁰ Based on community feedback received by the BPBA during their public consultation sessions in October 2021. See Appendix D for details on other public comments received.

¹¹ Ibid



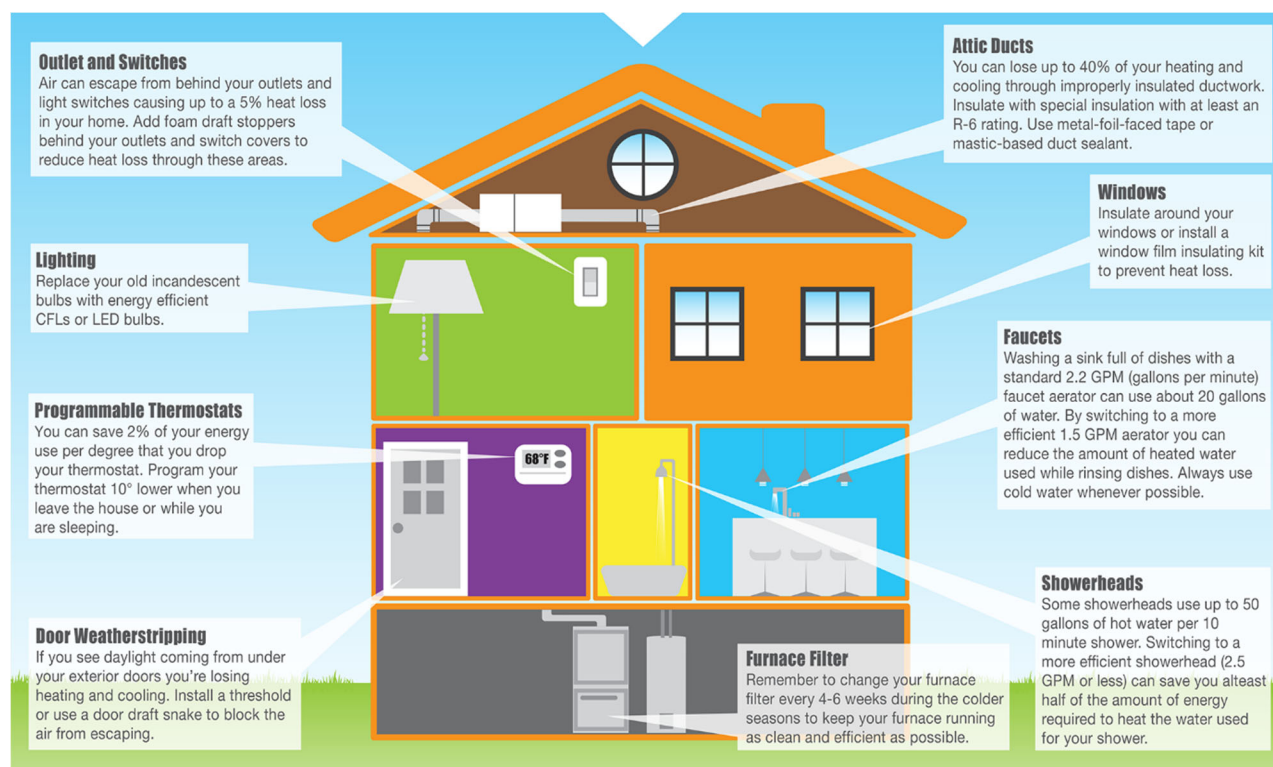
Climate Action 1.1

Launch local energy conservation campaign

As part of the Climate Action Plan, we will conduct a multi-year energy efficiency awareness campaign. The objective of this campaign is not necessarily to drive large emissions reductions on its own but to raise awareness. While the campaign will evolve over time, initially it will focus on two areas.

The first area of focus will be the promotion of energy audits. In Northern Bruce Peninsula, less than 10% of homeowners have undertaken an energy audit - less than half the provincial and national averages.¹² In part this low result is due to the limited number of trained contractors in the area – an issue we are addressing as part of initiative 1.3 *Build local energy efficiency industry*. However, it is also due to a lack of awareness on the process for conducting an audit – a problem which past projects have overcome with targeted promotions.¹³ Conducting such audits is often a critical step in identifying and justifying much bigger investments in building energy efficiency, some examples of which are shown in Figure 20.

Figure 20 – Potential Residential Energy Efficiency Upgrades¹⁴



¹² Source: Bruce Peninsula Biosphere Association, Home Energy Use Survey (2021). See Appendix D for details.

¹³ For example, in 2021 the Bruce Peninsula Biosphere ran a brief energy audit campaign concurrent with the development of this plan. Operating on a part-time basis, the campaign was able to schedule 50 energy audits across the peninsula – approximately 1% of total homes on the peninsula.

¹⁴ Source: *Simply Conserve*

Section Details: Buildings

This campaign would be a powerful enabler of our push to electrify heat in the ~50% of homes on the peninsula that rely on propane, wood or fuel oil (see initiative 2.1 *Support Home Electrification* for more details). Furthermore, energy audits are often a prerequisite in order to qualify for various subsidy and grant programs related to home electrification.¹⁵

While home energy audits often point to investments that occupants can make to improve building energy efficiency, they are not the only tool that is available. There are also a variety of energy-saving techniques that only require behavioral changes to implement – such as those listed in Figure 21. **The second area of focus will be on raising awareness of these low-cost energy efficiency opportunities** in the community. These efforts will help build a culture of energy awareness and efficiency that everyone can participate in.

Figure 21 – Example Behavioural Changes to Reduce Home Energy Consumption¹⁶



The energy consumption campaign will run throughout the length of the plan and is envisioned to be low cost, requiring either part-time or volunteer support to manage the campaigns led by the community sector. Success will be measured based on the percentage of buildings that have completed energy audits – targeting the national average for residential buildings and complete coverage for businesses and farms.

1.1. Launch local energy conservation campaign	
Initiative Summary	
Objective	The community has shown keen interest in energy conservation, but it is often unclear on the best ways to do so. We will run annual energy efficiency campaigns to educate and promote conservation at home.
Initial Focus Areas	- Run annual educational seminars and promotions on home energy efficiency - Facilitate the scheduling of energy audits for homeowners and businesses

¹⁵ Examples include the Greener Homes program

¹⁶ Source: *Victory Electric Cooperative*

Section Details: Buildings

Organizational Lead	Community Organizations	Aligns well with existing community groups' mandates and experience running similar programs in 2021
Resources Requirements	Low (~\$10K / year)	- Requires part-time staff in order to effectively administer the program - Other incidentals costs (e.g., to run events) are expected to be small
Proposed Targets	Energy Audit Completion Rate	<u>Residents</u>: 15% by 2026 <u>Businesses</u>: 100% by 2026
Timeline	Ongoing	2022 - Secure ongoing funding for the initiative - Hiring of part-time coordinator for the role - Develop & launch promotion campaign schedule 2023+ - Ongoing execution and refinements to the program



Climate Action 1.2 Implement pro-climate planning policies

Residential and commercial development on the Peninsula has historically resulted in low energy efficiency due to its lack of density, large average unit sizes, and reliance on non-renewable sources of heat. Due to the significant population growth expected in the coming years¹⁷, changing these development patterns is crucial to ensure that the number of buildings in Northern Bruce Peninsula requiring retrofits for energy efficiency does not grow. Enhancing planning policies – that is, the regulations specifying what, where, and how development happens – is one of the most effective tools to address this challenge.

Planning policies follow the hierarchy shown in Figure 22 – with the provincial policies providing guidance on the overall objectives and scope of planning policies, and municipal or county policies providing guidance on their specific rules and implementation for Northern Bruce Peninsula. Although provincial policies instruct municipalities to incorporate climate change into their local planning¹⁸, specific consideration of climate change is generally absent in for Bruce County and Northern Bruce Peninsula's policies today.

¹⁷ Current estimates suggest that the full-time population of Northern Bruce Peninsula will grow by 10% from 2020-2030. This estimate may be low if recent migration patterns from urban to rural communities as a result of COVID-19 and rising house prices continue. See Appendix B for more details.

¹⁸ Specifically, Section 1.1.3.2. of the Provincial Policy Statement (2020) requires that "land use patterns within settlement areas shall be based on densities and a mix of land uses which...minimize negative impacts to air quality and climate change and promote energy efficiency."

Figure 22 – Municipal Planning Policy Hierarchy



There are several high priority areas listed below in which climate change and energy efficiency considerations can be incorporated into Northern Bruce Peninsula's planning policies. As part of the Climate Action Plan, we will work with Municipal and County staff to explore these policies and recommend them for adoption where appropriate, including:

1. **Climate Targets** – including reference within the County or Local Official Plans to the importance of addressing climate change as well as the targets and objectives outlined in this Climate Action Plan. This is consistent with best practices for municipal climate action¹⁹ and will help ensure future policy decisions are consistent with the goals of this Climate Action Plan.
2. **Dwelling Size** – reducing the minimum unit sizes to allow for smaller, more energy efficient homes. This would also include other policy changes to increase the feasibility and availability of such homes (e.g., smaller lot area requirements).
3. **Energy Efficiency** – within the Comprehensive Zoning Bylaw, requiring developers to include an assessment of their building energy efficiency within their site plans to ensure it is a greater consideration in construction.

Beyond the examples above, we expect additional opportunities to adapt policies to encourage energy efficiency will emerge over time. For example, several jurisdictions, including neighbouring Grey County are in the process of developing their own Green Building Standards. These standards outline additional requirements for energy efficiency beyond those in the existing provincial building code. While it is not yet clear that similar policies will be necessary for Northern Bruce Peninsula (since the upcoming revisions to the provincial code may be sufficient) as part of the Climate Action Plan, we will continue to monitor similar emerging best practices from other communities throughout the duration of this plan.

¹⁹ Source: *Clean Air Partnership*, Bringing Climate Change into Official Plans Primer (2020)

1.2 Implement pro-climate planning policies

Initiative Summary

Objective	Planning policy on the Peninsula has historically prevented new development from being energy efficient. We will explore policy changes to permit smaller, higher density, and more efficient homes.	
Initial Focus Areas	1 Recommending official plan amendments to allow for smaller dwellings, mixed-use developments, and greater density in Lions Head and Tobermory (where servicing is available) 2 Monitoring efforts by the province and neighbouring municipalities to enhance energy efficiency requirements in local building codes 3 Encouraging developers at the time of application to incorporate energy efficiency labeling on their projects for consumers	
Organizational Lead	Municipality	• Requires policy changes • Potentially some support from Climate Action Committee in order to research best practices
Resources Requirements	Low	• Requires municipal staff time for corresponding reports, limited financial impact • May eventually require some consultant resources to support the municipality
Proposed Targets	Energy Efficiency of New Homes	• 20% below community average (2022-2026) • 50% below community average (2026-2030)
Timeline	Near-Term (2022-2023)	2022 • Prepare submission to Bruce County recommending climate-related additions to the Official Plan as part of the ongoing review 2023 • Evaluate high-priority policy initiatives for inclusion in Local Official Plan / Comprehensive Zoning Bylaw • Provide recommendation to council



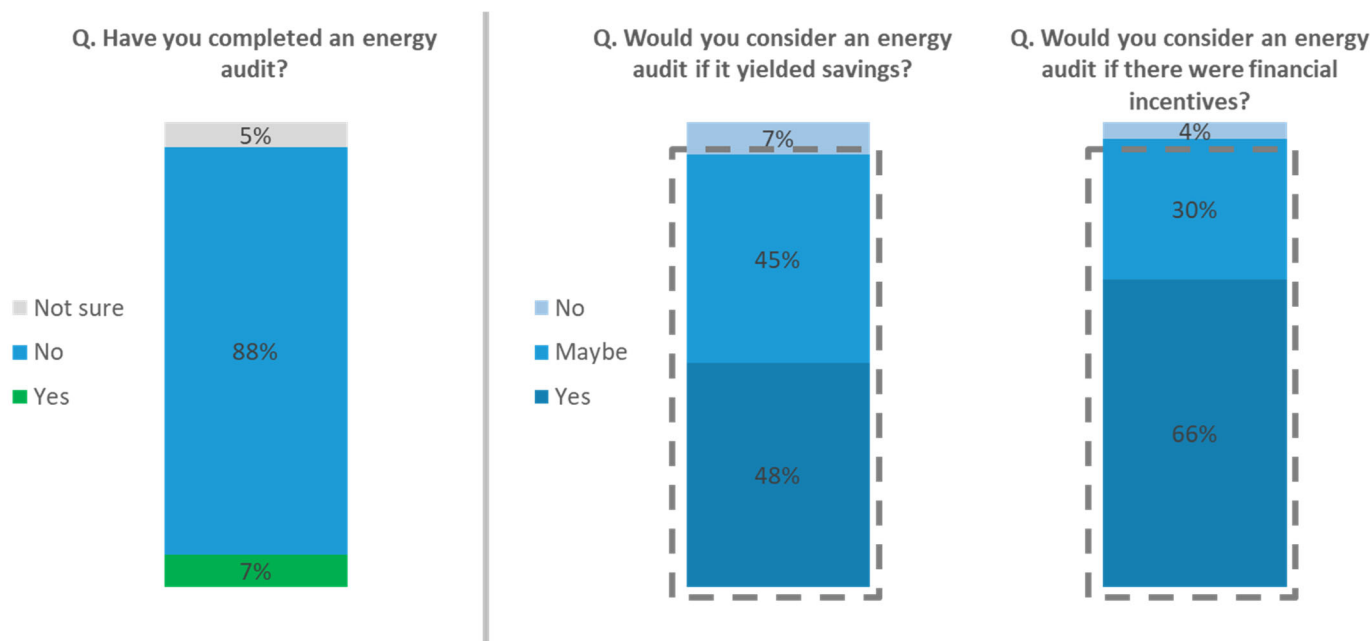
Climate Action 1.3

Build local energy efficiency industry

A key constraint on Northern Bruce Peninsula's ability to pursue greater energy efficiency is the lack of local expertise and capacity. The lack of local energy audits provides one example of this challenge: as the survey data shown in Figure 23 indicates homeowners have a keen interest in conducting an audit (90%+ of homeowners would consider them, under

the right circumstances) but there is a low completion rate (<10%), largely due to the lack of qualified auditors. Skilled tradespeople supporting other energy efficiency work are in similarly short supply.

Figure 23 – Community Energy Audit Sentiment



As part of the Climate Action Plan, we will support the development of the local energy efficiency industry by training, attracting, and supporting the skilled tradespeople that the community needs. Crucially, energy auditors are not the only skills required. HVAC installers, net-zero home builders, and qualified architects / designers are all required as well. Over time, we expect the list of skills to grow further as new techniques and technologies emerge.

A crucial first step is to provide training to Northern Bruce Peninsula’s existing construction / trades workforce. While there are many existing certifications and training programs available, the cost is often prohibitive. To lessen this burden, we will explore grants and group discounts to help fund training programs and then actively recruit participants from the local community. Consultations with Saugeen Ojibway Nation indicated they are an eager to partner in such a program as way of creating potential local job opportunities for members of their community.

Beyond the existing workforce, we must also build a pipeline of new skilled trades in these areas. To do so, we will work with the local post-secondary institutions to provide work opportunities for graduates, potentially through pairing them with existing contractors or businesses.

Importantly, we recognize that getting permanent, full-time, and locally based skilled tradespeople in these areas will be challenging, just as it has been for many other sectors in Northern Bruce Peninsula. To address this issue, we will look to develop a program that recruits skilled tradespeople for a short period of time to complete a high volume of successive projects – such as a week-long “energy audit blitz”. We believe such a program will require relatively little resources to coordinate and address concerns about the lack of consistent demand that prevent trades from relocating to the Peninsula permanently.

1.3 Build local energy efficiency industry

Initiative Summary

Objective	The Peninsula lacks trained energy auditors and contractors needed to support building energy efficiency. We will recruit and train new skilled tradespeople to help develop this critical new industry.	
Initial Focus Areas	1 Pursuing grant funding for training program for local interested contractors – including the Saugeen Ojibway Nation community - for energy audit certifications and / or other programs 2 Exploring partnership opportunities with local colleges to create student opportunities for heat pump installers, energy auditors, or other skilled trades related to energy efficiency 3 Conducting an annual, week-long energy audit blitz by recruiting certified auditors from neighbouring communities in order to expand capacity	
Organizational Lead	Community Organizations	• Aligns well with existing community groups' mandates and experience running similar programs in 2021
Resources Requirements	Low (~\$10K / year)	• Requires part-time staff in order to effectively administer the program • Other incidentals costs (e.g., to run events) are expected to be small • Potential for this to be grant funded
Proposed Targets	Number of Local Energy Auditors	• 5x certified auditors, heat-pump installers, and net-zero certified contractors by 2026 • 10x certified auditors, heat-pump installers, and net-zero certified contractors by 2026
Timeline	Near-Term (2022-2023)	2022 • Recruit auditors for week-long “blitz” program • Support promotion and scheduling for program 2023+ • Identify auditor certification programs • Initiate partnership exploration with local colleges with relevant programs • Apply for grant funding to support training and / or internship program

Section Details: Buildings



Climate Action 2.1 Support home electrification

In the Northern Bruce Peninsula community there is significant interest in home retrofits. Surveys of the local community demonstrated not only are a significant portion of owners planning home upgrades in the coming years (~30% of respondents), but a majority are willing to conduct energy audits or consider technologies such as heat pumps to make these upgrades energy efficient (~50%). For the vast majority, installation costs, incentives, and the potential for long-term savings were the primary drivers of future decisions.²⁰

For many homes, solutions such as heat pumps are already highly economical – but awareness of the technology and its benefits remains low. There also exist numerous incentives such as the federal government’s Greener Homes, HydroOne’s SaveOnEnergy programs, and various other initiatives, although many homeowners are unaware of or are unable to navigate the programs.

This initiative intends to solve the information gaps around current retrofit options with an ongoing **Retrofit Promotion & Awareness Campaign**. This will build on the successes of the pilot program conducted in 2021 by the Bruce Peninsula Biosphere Association.

While electrifying heat will be a key focus for this campaign – given its status as the primary source of residential emissions – it will not be the only area targeted. There are a wide variety of other fossil fuel-powered activities in the home such as propane stoves and gas-powered yard appliances. In each instance, practical electric options are available – and may be more financially viable for individuals than a larger retrofit of their home’s heat. As part of the campaign, we will promote these alternatives as well, thereby broadening the proportion of the community who can participate in climate action.

2.1 Support home electrification

Initiative Summary

Objective	Buildings on the Peninsula rely on high emitting fossil fuels for heat and appliances. We will promote and support businesses and homeowners converting to new, efficient, electric alternatives.	
Initial Focus Areas	N/A – ongoing promotion of heat pumps	
Organizational Lead	Community Organizations	Aligns well with existing community groups’ mandates and experience running similar programs in 2021
Resources Requirements	Low (~\$10K / year)	- Requires part-time staff in order to effectively administer the program - Other incidentals costs (e.g., to run events) are expected to be small - Potential for this to be grant funded

²⁰ See Appendix D for additional details on the *BPBA Home Energy Use Survey (2021)*.

Section Details: Buildings

Proposed Targets	Number of Heating Conversations	• 200+ of homes by 2026 • 800+ of homes by 2030
Timeline	Ongoing	• Expected to be a recurring action within the Climate Action Plan • Note that program could wind-down as critical mass is achieved (e.g., 20%+ of homes with heat pumps)



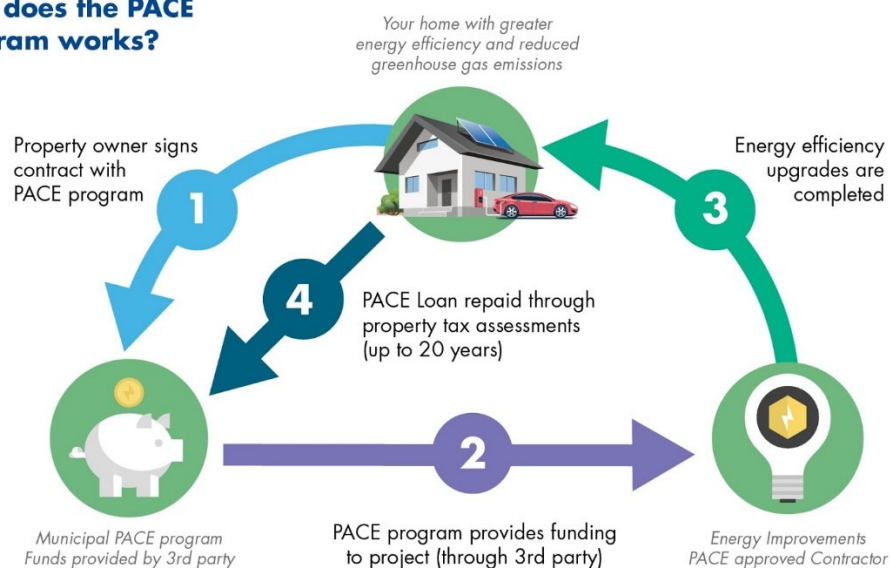
Climate Action 2.2 Develop funding program for retrofits

As previously mentioned, financial feasibility is the primary concern / barrier for homeowners considering potential retrofit options. The characteristics of some homes will make retrofits economical, whereas others will require financial incentives. While there are a range of incentives already available are often insufficient to cover the full cost of changes.

To bridge this financial gap and accelerate the pace of retrofits, municipalities are increasingly experimenting with their own incremental **Retrofit Financing Programs**.²¹ These use a variety of financing models, typically revolving around loans to homeowners repaid through incremental property tax assessments known as Property Assessed Clean Energy (PACE) loans or local improvement charges (as shown in the example below). The model has been used successfully to fund local infrastructure improvements for decades but due to regulatory changes in Ontario in 2012 they could now be used to fund individual household improvements as well, particularly those related to home energy efficiency.²²

Figure 24 – Property Assessed Clean Energy Program Example

How does the PACE program works?



²¹ Federation of Canadian Municipalities, Small and rural communities climate action guidebook (2021) p. 25

²² Dunskey Consulting, Local Improvement Charge Financing Pilot Program Design (2013). p. 14

Section Details: Buildings

To date, the majority of programs have been developed by medium-to-large sized cities, such as Toronto, London, Guelph, Halton Hills, and Vaughan. However, this is an increasing aspiration within county / municipal climate action plans, including communities neighbouring Northern Bruce Peninsula, such as Grey County and Huron Kinloss.

Given the sophistication of these programs and complexities that go into their design, the Climate Action Plan envisions conducting a feasibility study to assess whether such a program is practical for Northern Bruce Peninsula. It is expected that this work would only be conducted in partnership with neighbouring municipalities given these programs' need for greater scale to be successful.

2.2 Develop funding program for retrofits

Initiative Summary

Objective	For some buildings, converting to electric heat will often be expensive. Working with other levels of government, we will explore potential for a municipal-led loan program financed through tax charges to fund home and business retrofits.	
Initial Focus Areas	1 Promote financing options for retrofits; work with nearby municipalities to develop Bruce County-specific program	
Organizational Lead	Municipality	Requires policy changes and liaising with other municipalities
Resources Requirements	Low (Evaluation only)	- Likely to be professional fees associated with project, unclear until partnership opportunities clear - Implementation would clearly have financial implications, but this is also unclear at this stage
Proposed Targets	N/A	Dependent on conclusion of feasibility study
Timeline	Mid-term (2024-2025)	2022 - Initial outreach with neighbouring communities to explore partnerships - Application to FCM through Green Municipal Fund to fund feasibility study 2023 (note: only if successful) - Recruitment of consultant to conduct study - Completion of feasibility study - Evaluation of results and decision by local municipal councils

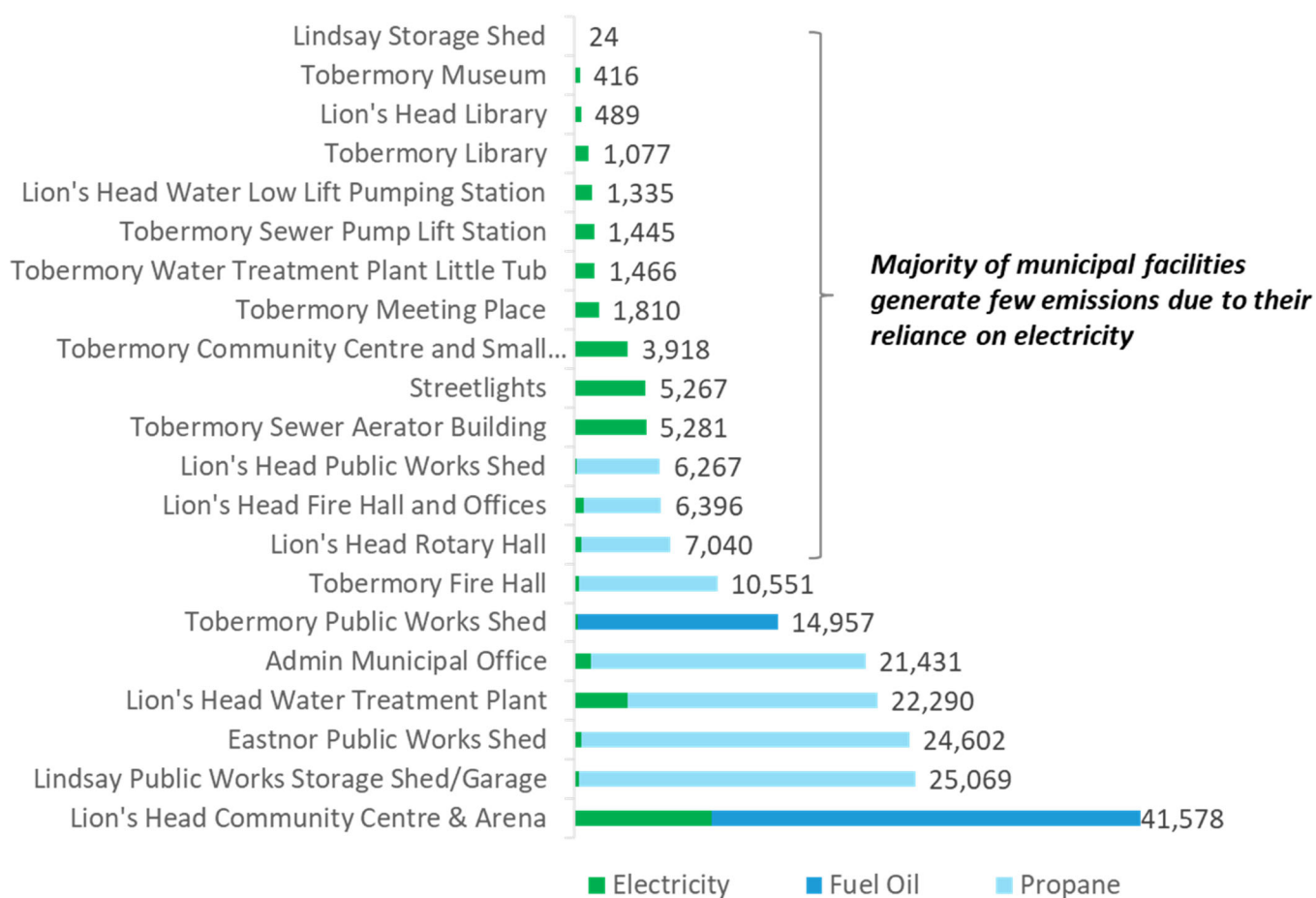


Climate Action 2.3

Upgrade Municipal facilities

Municipal buildings are a relatively small proportion of total building emissions within the community – representing just 1% of the projected total in 2030. However, municipal leadership in retrofits has been shown to be an effective way to demonstrate climate leadership and change the desired behaviors in the rest of the community.

Figure 25 – Municipal Facility Energy Consumption (Annual Average 2017-2019)



This is particularly true with the forthcoming redevelopment of the Lion's Head Arena, the largest single emitter in Northern Bruce Peninsula. Community ice rinks are regularly cited as one of the best ways to reduce emissions in small communities given their high energy use and public visibility.²³ As shown in Figure 26, there are a variety of proven methods to reduce arena energy consumption.

²³ Federation of Canadian Municipalities, GMF Municipal Energy: Roadmap (2020) p. 161

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Figure 26 – Ice Rink Energy Conservation Strategies²⁴

Energy conservation and GHG reduction measures for ice rinks	Level of complexity ^a		
	Low	Med	High
System upgrades: refrigeration^{b, c}			
Install a building automation system (BAS) to accurately control ice temperature		✓	
Install a low-emissivity ceiling sheet to reduce the amount of heat radiated onto the ice and reflect more light back down to the ice surface		✓	
Convert the brine distribution piping under the ice from a two-pass to a four-pass arrangement to reduce pumping power		✓	
Use floating head pressure control to be able to vary the pressure drop across the compressor, thereby improving compressor efficiency			✓
System upgrades: lighting, pumping, hot water^{b, c}			
Install low-flow showerheads and faucet aerators to reduce hot water use	✓		
Vary the speed of the brine pump using a variable frequency drive (VFD) based on how much refrigeration is needed (VFDs can also be installed in cooling tower fans or condensate pumps)		✓	
Install energy-efficient bulbs (high bay LEDs) to reduce both the heating of the ice by the lights and the energy use of the lighting itself		✓	
Recover heat that has been produced by the refrigeration system and use it to pre-heat water for the showers and for the Zamboni		✓	

Energy conservation and GHG reduction measures for ice rinks	Level of complexity ^a		
	Low	Med	High
System upgrades: space heating^d			
Install occupancy sensors to control heating/ventilation/lighting		✓	
Install condensing boilers and water heaters		✓	
Install radiant heating for stands not heavily in use and maintain lower air temperatures (control radiant heating using occupancy sensors)		✓	
Use electric desiccant dehumidifiers for year-round ice rinks		✓	
Use air source heat pumps for rooms that are too far from the refrigeration room to be able to use waste heat		✓	
Recover heat that has been produced by the refrigeration system and use it for space heating and sub-floor heating (this can be done directly or by using a water-source heat pump to achieve higher air temperatures)			✓

The first step in this energy upgrade program is the completion of the municipal energy audits – scheduled for Q2 2022. Based on the results of that study, individual reduction targets and a prioritization schedule can be developed for all facilities. The timeline for this initiative will likely be aligned with the overall municipal capital plan in order that large-scale retrofits can happen concurrent with the planned asset repair / replacement cycle to avoid duplicate costs.

2.3 Upgrade municipal facilities

Initiative Summary

Objective	Municipal facilities are amongst the highest emitting buildings on the peninsula. As part of planned maintenance or redevelopment, we will implement energy saving upgrades starting with the Lions Head arena.
Initial Focus Areas	1. Identify "low hanging fruit" from the energy audits that can be implemented through routine maintenance (e.g., streetlight replacement) or as part of annual improvements via the capital budget 2. Incorporate the results of the energy audits into the forthcoming redevelopment of the Lions Head arena - with a specific emphasis on electrification of heat 3. Require energy audit information to inform the regular asset management planning process for the municipality where it makes long-term capital investment decisions 4. Incorporate lifecycle costing as part of municipal purchasing decisions - i.e., the total cost of the good or services throughout its existence, from production and manufacturing,

²⁴ *Ibid.*

Section Details: Buildings

	distribution, usage to end of life (see Appendix E for more details on lifecycle costing and its application in the proposed <i>Green Purchasing Policy</i>)	
Organizational Lead	Municipality	• Municipality to incorporate as part of their regular asset management planning • Climate Action Committee can serve as advisors / reviewers of specific initiatives
Resources Requirements	High (Exact amounts are to be determined)	• Will depend on the results of the energy audits
Proposed Targets	Municipal Facilities Energy Reduction	• Will depend on the results of the energy audits
Timeline	Ongoing	2022 • Complete municipal energy audits and analysis of results • Incorporate efficiency designs into arena redevelopment plan (planning underway in 2022) • Identify other efficiency improvements for inclusion in 2022 budget 2023+ • Annual inclusion of efficiency opportunities within budget cycle; sequenced to align with facility maintenance 2026+ • Incorporate energy audits / improvements as part of next version of Municipal Asset Management Plan (timing is TBD)

Overall Impact

The Climate Action Plan is targeting a ~10% reduction of emissions from buildings by 2030 relative to the business-as-usual scenario. This will be achieved by:

- 1. Converting 20% of buildings heated by propane and fuel oil to electricity**
- 2. Reducing by 20% total emissions from municipal buildings through efficiency improvements**
- 3. Introducing 5% energy efficiency improvement through non-heating retrofits**

Achieving the first target implies a total of ~800 homes with heating systems replaced – at a pace of ~100 per year from 2022 – 2030. Achieving the second target can be achieved in a variety of ways, for example, pursuing relatively minor retrofits on all ~5,000 homes on the Peninsula, or more significant retrofits on a smaller proportion.

Section Details: Buildings

Figure 27 – Summary of Buildings Emissions & Targets

Buildings Targets



~20%

reduction in home heating emissions from propane and fuel oil



~20%

reduction in total buildings emissions from municipal facilities as a result of retrofits

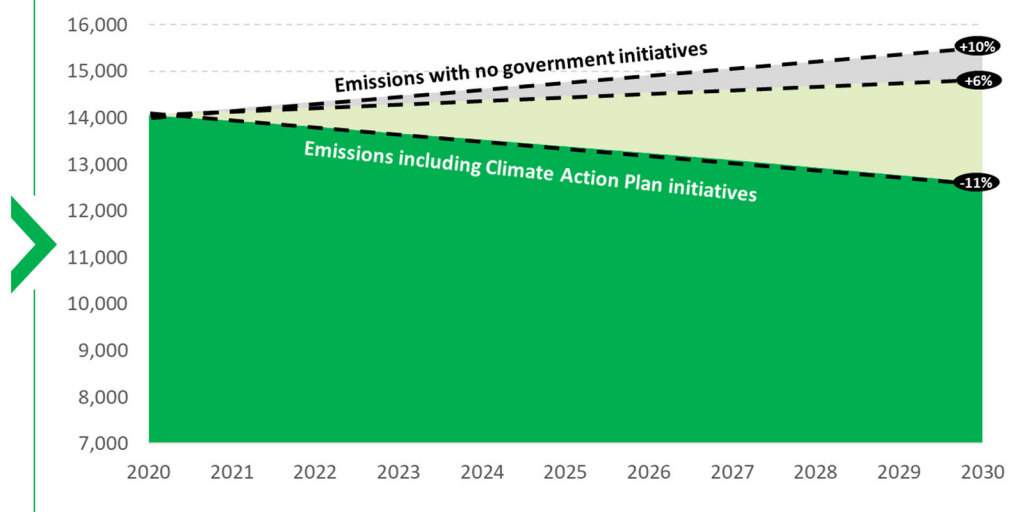


~5%

reduction in per capita community energy use through efficiency improvements and retrofits

Buildings Emissions Projection

Tons of CO₂e per year



Part 3b

Plan Details: Transportation



Photo Credit: CyclingMagazine.ca

Sector Details: Transportation

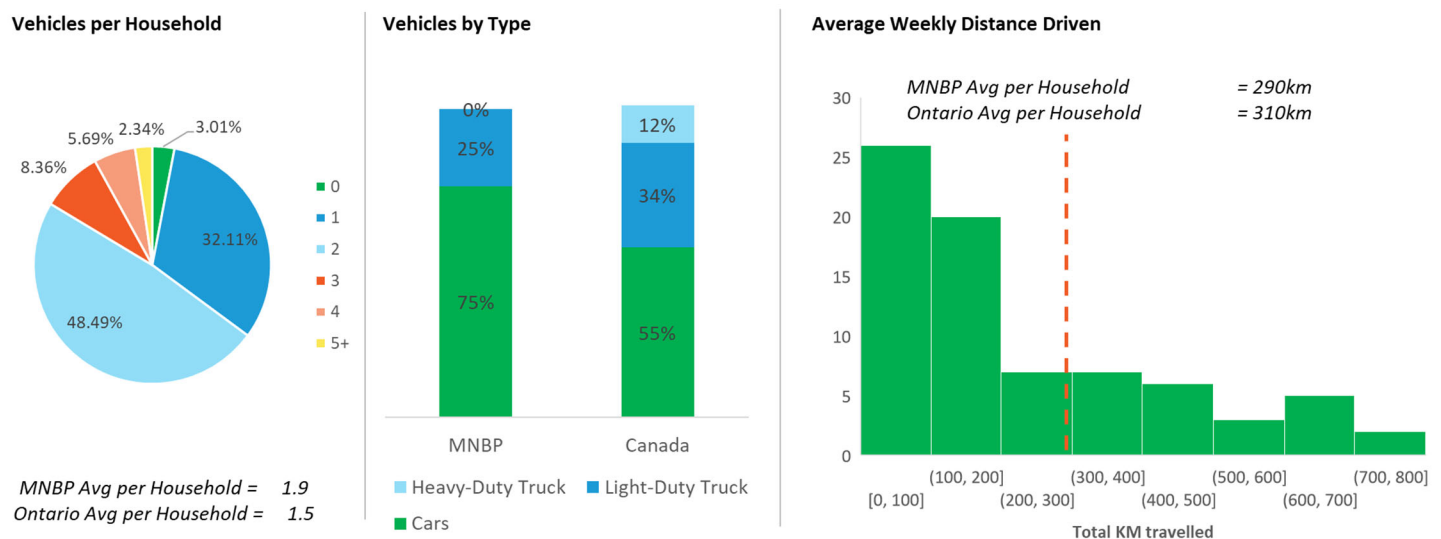
Background

Transportation emissions primarily originate from the use of fossil fuels by internal combustion engine (ICE) vehicles. For a community, there are a variety of factors that contribute to fuel usage, including:

- Vehicle characteristics (e.g., age, type, efficiency)
- Transportation habits (e.g., number of trips, average length of trips)
- Alternative modes (e.g., proportion of travel by driving, biking, or walking)

For Northern Bruce Peninsula, per Figure 28, community surveys demonstrate some key differences relative to the rest of the province. For example, in Northern Bruce Peninsula there is a higher proportion of vehicles per household, likely reflecting the lack of other transportation options relative to other communities. Light-duty vehicles make up a larger proportion of the total, potentially due to the more limited local commercial and industrial activity. The average weekly distances travelled are similar to those of the province overall reflecting the larger number of trips required in Northern Bruce Peninsula, but shorter distances traveled for recurring trips such as commuting to work.

Figure 28 – Transportation Characteristics for Northern Bruce Peninsula²⁵



Calculating transportation emissions is often one of the most computationally complex factors within climate change planning. Not only does it rely on key assumptions around travel habits for residents but also upon jurisdictional decisions around which vehicles or trips to include. For Northern Bruce Peninsula, the focus is on vehicle emissions made by full-time and seasonal residents. Trips by visitors – a material source of emissions, but one that isn't measurable with current data – has been excluded from this analysis, though further study is underway. (See Appendix A for more details).

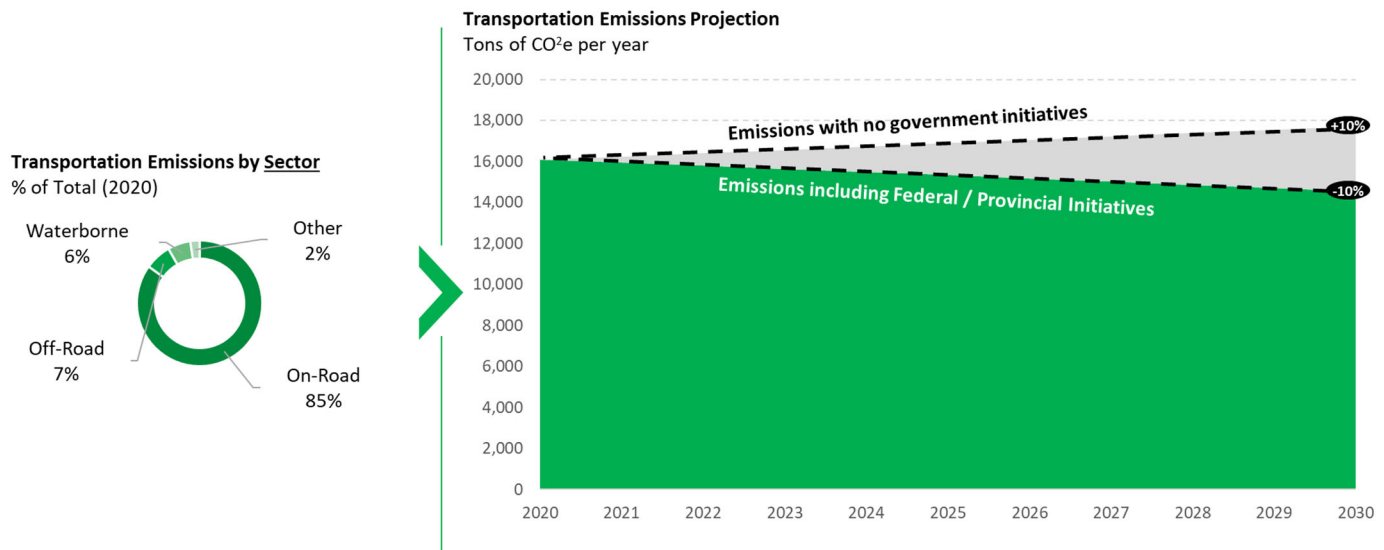
Per Figure 29, transportation represents approximately half of all emissions in Northern Bruce Peninsula. While population growth is expected to be the primary driver of transportation emissions in future years, policy changes - in particular,

²⁵ Bruce Peninsula Biosphere Association, Transportation Energy Use Survey (2021). See Appendix D for details.

Sector Details: Transportation

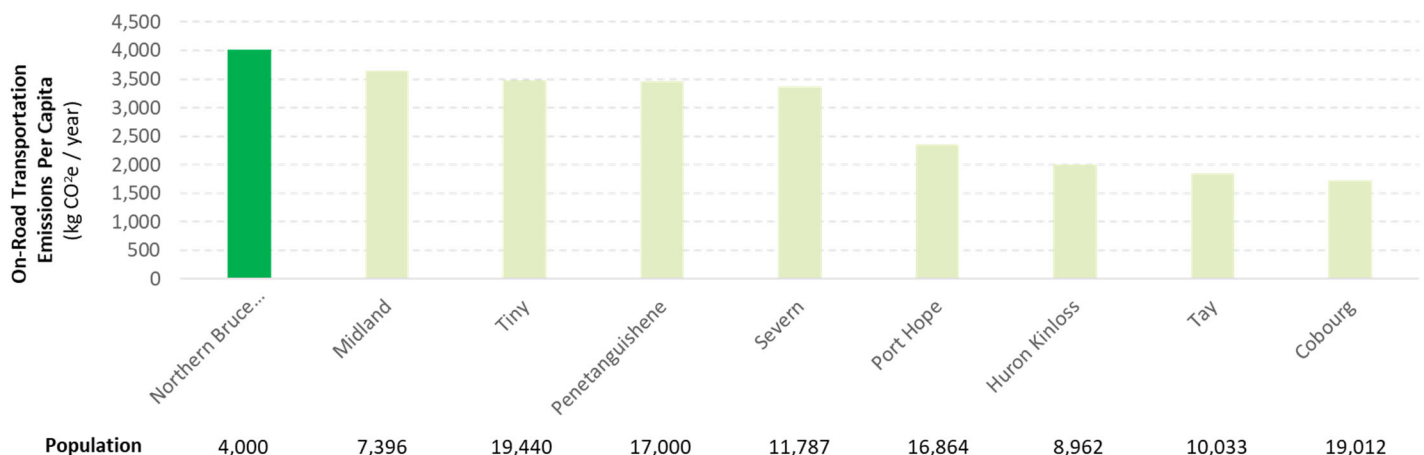
future fuel efficiency standards and the federal electric vehicle mandate - will reduce some emissions growth once implemented.²⁶

Figure 29 – Transportation Emissions for Northern Bruce Peninsula



Compared to other neighbouring municipalities, Northern Bruce Peninsula's emissions from transportation are higher on a per capita basis. While differing estimation methodologies will account for some of the difference, this may also be the result of several factors – such as Northern Bruce Peninsula's larger proportion of long-distance traveling seasonal residents.

Figure 30 – Transportation Emissions Per Capita vs. Other Small Municipalities²⁷



²⁶ See Appendix B for additional details on the expected impact of policies from other levels of government.

²⁷ Federation of Canadian Municipalities, PCP Milestone Tool Public Dashboard (2021)

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Climate Action Plan

As shown in Figure 31, there are typically three methods for reducing the climate change impact of transportation, each with a wide range of potential tactics that can be used.

Figure 31 – Transportation Emissions Reduction Strategies ²⁸

Vehicle efficiency	Low-carbon fuels	Vehicle demand reduction
- Fuel standards - Fleet management systems - Driver training to improve fuel economy - Preventative maintenance - Anti-idling policies	- Switching to electric, hydrogen and renewable natural gas vehicles - Increased access to EV infrastructure - Access to free charging stations - Preferred parking for low-carbon vehicles	- Carpooling programs - Car sharing programs - Fixed route rural buses - On-demand transportation services (i.e. taxibus, on-demand minibuses) - Increased trail development and connectivity - Improved bicycle infrastructure: bike parking, paved shoulders, bicycle route maps, dedicated bike lanes, improved trail quality to support increased bicycle usage - Complete Streets policies

Method #1 is the least relevant of the three methods for Northern Bruce Peninsula. This is largely due to the fact that fuel efficiency standards are typically set at the federal or provincial level that cannot be influenced by this plan. While some educational tactics and preventative maintenance strategies could reduce fuel consumption, they will be significantly less impactful than other methods.

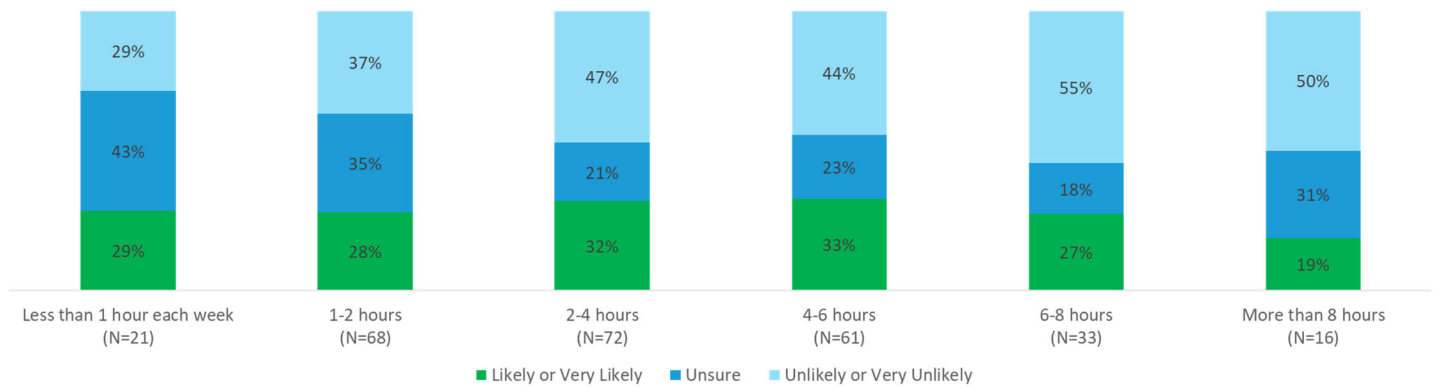
Method #2 is the most important component of the Climate Action Plan for transportation. Given the relatively clean electricity grid in Ontario, the transition of any ICE vehicles to electric will yield significant emissions reduction.²⁹ While only a small proportion of current vehicles in the community are electric, local survey data indicates significant interest in purchasing an electric vehicle for at least 20% of the population – a number that will naturally rise as the technology and economics improve.

²⁸ Federation of Canadian Municipalities, Small and rural communities climate action guidebook (2021) p. 26

²⁹ Federation of Canadian Municipalities, GMF Municipal Energy: Roadmap (2020) p. 15

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Figure 32 – Likelihood to Purchase an Electric Vehicle based on Average Weekly Driving Time³⁰



Method #3 is another important tactic for Northern Bruce Peninsula. While certain strategies are less relevant than in more urban areas, such as encouraging greater use of public transport, many of the other tactics in Figure 31 remain relevant. Furthermore, certain unique diversion strategies may be practical for the Northern Bruce Peninsula – particularly the large number of trips generated by visitors.



Climate Action 1.4 Expand cycling routes & infrastructure

Cycling is becoming increasingly popular on the Peninsula as an affordable, recreational and age-friendly source of exercise and transportation.³¹ Electrically powered bikes (E-Bikes) are only further enhancing this trend by increasing cycling's accessibility and practicality over longer distances. These factors make the promotion of cycling an important addition to the Climate Action Plan.

There have already been significant local investments made to improve the safety and practicality of cycling, most notably, the addition of 30 kilometers of cycling lanes as part of the redevelopment of Highway 6. Bruce County's forthcoming Transportation Master Plan envisions further expansions to this network, notably through the addition of bike lanes from Wiarton to Lions Head, thus completing a single continuous North-South route along the Peninsula. Advocating to the county to ensure that this route is prioritized is a crucial first step in the plan. The Municipality should also opportunistically look for ways to add to the network with additional routes over time as part of regular road repair and redevelopment.

³⁰ Bruce Peninsula Biosphere Association, Transportation Energy Use Survey (2021). See Appendix D for details.

³¹ In a recent survey conducted by the Municipality, improving the cycling system was identified as one of the top 10 priorities for how the municipality should manage

Figure 33 – Existing & Proposed Cycling Routes



In many portions of the community, however, dedicated cycling lanes will be impractical – often due to constraints on road width or design. In lieu of dedicated infrastructure, we will secure the addition of safety signage for cyclists in key areas where there is significant cycling traffic.

Encouraging cycling requires focusing not only on the on-road infrastructure, but also the off-road amenities as well. For example, secure and public bike racks are key to encouraging cycling as an alternative to vehicular travel to and from our urban areas. Municipal facilities and high traffic public spaces are excellent opportunities for these.

1.4 Expand cycling routes & infrastructure

Initiative Summary

Objective	Cycling is an increasingly popular alternative to vehicles. Working with the local, county, & provincial government, we will expand our bike lanes, safety signage and other amenities to promote cycling.
Initial Focus Areas	1 Partner with Bruce County and the Ministry of Transport to complete cycling routes in the community - prioritizing the busy North-South routes 2 Add cycling safety signage and other features on other popular municipal routes where dedicated lanes aren't required / appropriate 3 Incorporate basic cycling infrastructure such as bike racks into municipal facilities or as part of street repair projects

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Organizational Lead	Municipality	Requires infrastructure investments that will be municipal led
Resources Requirements	Medium (Exact amounts are to be determined)	- Will require detailed site / infrastructure planning in order to develop cost estimates - Introduction of cycling lanes will require substantial financial commitments, though would be completed in partnership with other levels of government - Additional signage and other cycling infrastructure will require only modest investment - Investments can be staged over multiple years
Proposed Targets	Local Participation Rate for Cycling	10% by 2026 (<i>to be estimated via survey</i>) 25% by 2030
Timeline	Ongoing	Envision gradual implementation of cycling improvements starting in 2022 with - Evaluate incorporation of cycling infrastructure in arena redesign (e.g., bike racks or storage) - Confirm priority cycling routes (potentially with public consultation input) - Partner with Ministry of Transportation to complete north-south cycling routes



Climate Action 1.5 Improve pedestrian mobility

Improving the “walkability” of Northern Bruce Peninsula has regularly been highlighted as a priority in community well-being surveys.³² While its potential to reduce greenhouse gas emissions is smaller than other initiatives such as cycling, it remains an important strategy for the urban areas of the Peninsula: Lions Head and Tobermory.

The primary action required is to improve pedestrian safety in the busiest parts of Lions Head and Tobermory during the summer tourism season. This involves additional signage, changes to road markings, and potential changes to the streetscape itself (e.g., sidewalk widening) in certain areas. The two priority areas for these improvements are the Lions Head beach and Tobermory Harbourfront, though other opportunities should be continually evaluated over time.

Encouraging walking in the winter months is more challenging given the local climate. However, increased snow-clearing was identified in the public consultation feedback as an impediment, in addition to the challenges it poses for other

³² See *Municipality of Northern Bruce Peninsula, Strategic Plan (2022)* pg 19, 41

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municipal priorities such as accessibility. As part of the Climate Action Plan, we will evaluate the options and investments required to expand snow clearing.

Long-term, we will evaluate areas on the peninsula that require the introduction of sidewalks. This will be most relevant at the edges of the urban areas as development increases.

1.5 Improve pedestrian mobility

Initiative Summary

Objective	It is often unsafe for pedestrians to get around Tobermory and Lions Head. We will expand sidewalk options, snow clearing, and road markings to make walking a safer, more viable alternative to driving.	
Initial Focus Areas	1 Redesigning street signage, markings, and sidewalk routes in the community's busiest areas - particularly downtown Tobermory and the beachfront in Lions Head 2 Improving the frequency and speed of sidewalk snow clearing across the municipality	
Organizational Lead	Municipality	• Requires infrastructure investments that will be municipal led
Resources Requirements	Low (Exact amounts are to be determined)	• Majority of envisioned improvements will involve signage, markings, or other cost-effective solutions in order to improve safety • Largely redesigns of sidewalk networks would require capital investment, but are also likely to be part of other funded plans (e.g., Roads Needs Study)
Proposed Targets	N/A	• Unlikely to be measurable
Timeline	Ongoing	Envision gradual implementation of pedestrian improvements starting in 2022 with • Identification of priority safety improvements for 2022 summer tourism season • Evaluate expanded sidewalk clearing as part of 2023 budget process



Climate Action 1.6

Reduce emissions from off-peninsula trips

While difficult to quantify, transportation on-and-off the Peninsula is undoubtedly a large contributor to the emissions generated in Northern Bruce Peninsula. Unlike trips on-peninsula – where cycling or walking may be an alternative – or

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trips between communities in other parts of the peninsula – where mass transit may be available – getting to or from Northern Bruce Peninsula in 2022 requires the use of a car.

Addressing vehicular emissions by visitors is a high priority for the Climate Action Plan. Studies by Parks Canada have shown an average round-trip driving distance of more than 400KM – suggesting total emissions from such trips may be greater than those of all driving by full-time residents combined.³³ Working with the University of Waterloo to finalize these estimates on visitor emissions is a key first step to this component of our plan, a project that is described in greater detail in Appendix A. Working with Parks Canada and other stakeholder groups, we will also look for opportunities to implement transit options to the Peninsula from high volume points of origin (e.g., Toronto, London, Waterloo).

Another important component to visitor emissions are trips once individuals or families are already on the Peninsula, such as those between their motel or Airbnb and our various beaches, hiking routes, or retail areas. While these are a secondary priority given that they account for fewer emissions, reducing these trips remains important to the overall visitor emissions impact – as well as several non-climate-related, community wellbeing issues such as overcrowding. To address these on-peninsula trips, we will work with private operators from Lion's Head, Tobermory, and Saugeen Ojibway Nation to support the existing shuttle services operating in our urban areas and potentially expand their use.

For full-time and seasonal residents, survey data has shown that trips to large urban areas – such as Owen Sound, the Waterloo Region, or London – are commonplace.³⁴ At present, there are few alternatives to a private vehicle for the majority of these trips. While not a primary focus of the Climate Action Plan, we will encourage carpooling and ridesharing as methods to reduce the frequency of these trips.

1.6 Reduce emissions from off-peninsula trips

Initiative Summary

Objective	Longer trips on-and-off the peninsula – by residents and visitors – is one of our largest sources of emissions. We will look to expand the shuttle and rideshare options to reduce the number of vehicular trips.	
Initial Focus Areas	1 Evaluate the success of current local shuttle programs for potential support in expansion / continuation 2 Partner with other agencies - such as Parks Canada - to explore mass transit options for visitors coming off-peninsula 3 Encourage carpooling and ridesharing as alternatives amongst full-time residents	
Organizational Lead	Climate Action Committee	• Committee will likely have the greatest reach in terms of identifying potential partners • Municipal role may exist for coordination with county / other municipalities and funding (if appropriate)

³³ Based on data provided by Parks Canada that identified the majority of visitors lived 2-3 hours from the park, with 43% stemming from the Greater Toronto Area. For more details, please see *Parks Canada, Visitor Experience Study for Fathom Five National Marine Park* (2021).

³⁴ *Bruce Peninsula Biosphere Association, Transportation Energy Use Survey* (2021). See Appendix D for details.

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Resources Requirements	Low (Evaluation only)	No costs to recruitment / analysis phase
Proposed Targets	N/A	None while being studied
Timeline	Mid-term (2024-2025)	2022-2023 - Evaluate existing shuttle program after completion of first post-COVID season - Work with private operator to assess viability of continuation / expansion - Initiate discussions with Parks Canada to evaluate shuttle options 2024+ - Target implementation, if there are interested operators and a viable business model`



Climate Action 2.4 Champion adoption of electric vehicles

Ultimately, while active transportation and mass transit are important tools to address climate change, for a rural community such as Northern Bruce Peninsula, they are insufficient. The remote, low-density nature of the community means that the majority of trips will continue to be in private vehicles for the foreseeable future – increasing the importance of electric vehicles as a low-emissions alternative.

Due to technological advancements and policies from other levels of government, electric vehicle adoption is expected to grow organically over time – a topic explored in detail in Appendix B. Despite this momentum, there is still a strong need for targeted local promotion of electric vehicles to address the unique challenges preventing adoption in rural areas, many of which are overlooked given the industry’s focus on driving adoption in urban areas. The campaign will also help accelerate adoption of electric vehicles – which would otherwise likely lag behind urban areas – in order to ensure we hit our 2030 objectives.

The electric vehicle promotion campaign will build on the successes of recent promotion programs run by organizations like the Bruce Peninsula Biosphere Association. It will focus initially on the nearly one-third of community members who have indicated in surveys that their next purchase is “likely” or “very likely” to be an electric vehicle. Focusing on these audiences first will help build a critical mass that encourages adoption across the rest of the community – i.e., the more visible electric vehicles are in the community, the more they will be viewed as a realistic, accessible, affordable alternative.

The campaign will focus its messaging, education, and events to address each of the main barriers to adoption (Figure 34 below). Testimonials, savings calculators, and promotion of rebates will be used to addressing concerns around costs.

Marketing the locations of chargers will reduce concerns around infrastructure. Continuation of the Bruce Peninsula Biosphere Association's "EV Champions" program³⁵ will help address concerns about reliability and driving experience.

Figure 34 – Barriers to Purchase an Electric Vehicle by Likelihood to Purchase an Electric Vehicle³⁶

		Barrier Identified					
		Too expensive	Not enough chargers	Low battery life	Not enough models and supply chain issues	Winter weather reliability	Other
Likelihood to buy an Electric Vehicle	Very Unlikely (N = 40)	54%	31%	20%	5%	7%	22%
	Unlikely (N = 60)	52%	23%	25%	2%	7%	15%
	Not sure (N = 74)	62%	30%	15%	4%	4%	14%
	Likely (N = 40)	63%	50%	33%	13%	5%	18%
	Very likely (N = 59)	68%	35%	15%	15%	5%	8%

The electric vehicle campaign is envisioned as an ongoing activity as part of the Climate Action Plan. The intensity of campaign activities is expected to evolve over time – with major pushes being scheduled around key local events or industry developments (e.g., the release of the first electric pick-up truck).

In parallel with this public campaign, the Climate Action Plan will also seek to electrify the Municipality's existing fleet of vehicles. The Municipality's leadership in this regard will help further promote the practicality and awareness of electric vehicles in the community. This conversion to electric will happen gradually over time for the Municipality's fleet as they age out, with the goal of requiring all new vehicle purchases to be electric by 2025.

2.4 Champion adoption of electric vehicles

Initiative Summary

Objective	Electric vehicle technology and affordability is improving rapidly - as well as local interest. We continue our EV promotion campaign to help residents test drive, research, and choose the right EV for them.	
Initial Focus Areas	1. Continue advocacy and test drives by local electric vehicle owners while recruiting dealers for seasonal local auto shows	
Organizational Lead	Community Organizations	Aligns well with existing community groups' mandates and experience running similar programs in 2021

³⁵ The EV Champions program pairs local electric vehicle owners with those interested in purchasing one to conduct test drivers – thereby addressing barriers to access to electric vehicle due to the lack of local dealers.

³⁶ Bruce Peninsula Biosphere Association, Transportation Energy Use Survey (2021). See Appendix D for details.

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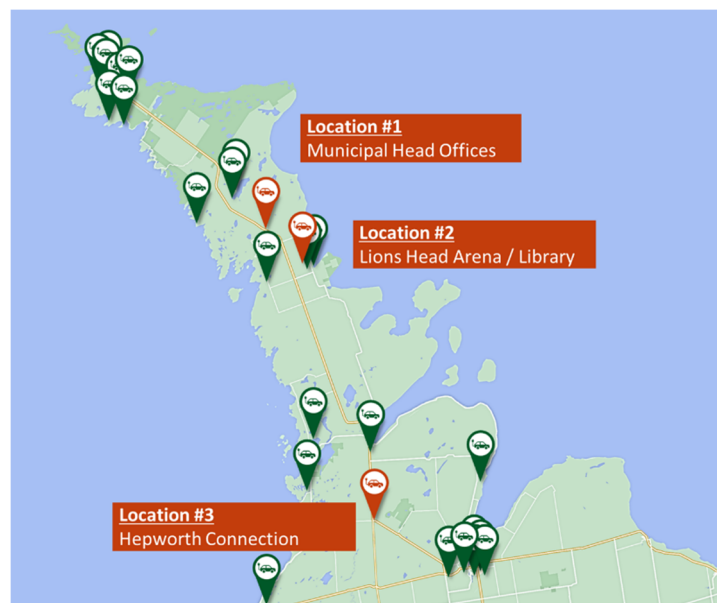
Resources Requirements	Low (~\$10K / year)	- Requires part-time staff in order to effectively administer the program - Other incidental costs (e.g., to run events) are expected to be small - Potential for this to be grant funded
Proposed Targets	Number of Local EV Owners	15% by 2026 40% by 2030
Timeline	Ongoing	- Expected to be a recurring action within the Climate Action Plan - Note that program could wind-down as critical mass is achieved (e.g., 20%+ of homes with heat pumps)



Climate Action 2.5 Expand charging infrastructure

As previously shown, the availability of charging infrastructure is viewed as one of the primary barriers to adoption of electric vehicles. While the envisioned promotion campaign will ensure that there is greater awareness for the charging infrastructure that already exists, there is still a need for expansion in several key areas – highlighted in Figure 35 below.

Figure 35 – Electric vehicle Charging Locations & Needs³⁷



³⁷ Bruce Peninsula Biosphere Association, Transportation Energy Use Survey (2021). See Appendix D for details.

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Tackling “range anxiety” – i.e., the concern over running out of power while driving an electric vehicle – requires additional investments in electric vehicle infrastructure outside of the Peninsula. Ensuring sufficient chargers in frequent destinations like Wiarton or Owen Sound, or at key locations along routes off the Peninsula, such as Hepworth, will be important in addressing this concern. To do so, the Climate Action Plan envisions supporting the work of the Electric Vehicle Network Study – a project being led by several local municipalities and counties to build out the infrastructure in southwestern Ontario.

Notwithstanding the above, in a rural setting such as Northern Bruce Peninsula, the majority of electric vehicle charging will occur at individual homes. The purchase and installation costs of chargers can be significant, ranging from \$500 to \$1,500, depending upon the need for home electrical supply upgrades. To address this additional barrier, as part of the Climate Action Plan, we will continue to monitor grant opportunities or municipal policies to help fund charger installation.

An initial area of focus will be on developing a funding program for additional Short-term Accommodators to install chargers. Such a program may involve working with the municipality to provide financial incentives to owners of these properties through the waiving of fees. This would have a significant impact given that it would help reduce emissions from long-distance trips taken by visitors to the Peninsula.

2.5 Expand charging infrastructure

Initiative Summary

Objective	The number of EV chargers has grown significantly on the peninsula. We will complete the charging network by adding chargers at public buildings and encourage installs at private overnight accommodators.	
Initial Focus Areas	1. Complete public network in Wiarton/Hepworth and all municipal facilities; advocate installs at all motels, campgrounds, and STAs on the peninsula	
Organizational Lead	Climate Action Committee	- Requires close coordination between municipality and community members, which the committee will be well-positioned to do - Committee has a track record of success driving this program from experience in 2021
Resources Requirements	Low (Exact amounts to be determined)	- Some capital costs likely to incorporate chargers in the designs of municipal facilities, though likely to be low if done during routine maintenance / upgrades - No / limited costs support community implementation; may be an opportunity for some grant funding to support (similar to 2021 program)
Proposed Targets	Publicly Accessible Chargers	50 by 2026 100 by 2030
Timeline	Mid-term (2024-2025)	Recent surge in introduction of chargers in 2021 is likely sufficient for EV needs for immediate future.

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	● Focus is on being opportunistic near-term with a more concerted effort to complete the network in the middle years of the plan ● 2022-2023 ○ Ongoing promotion of EV chargers with overnight accommodators / businesses ○ Monitor for new grants for public chargers ○ Participate in county EV charger network study ○ Support implementation of county EV charger study ○ Incorporate EV charging into municipal facilities
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Climate Action 2.6 Pursue zero-emissions heavy-duty vehicles

Car and truck traffic are not the only sources of transportation emissions on the Peninsula. Though difficult to quantify, heavy duty vehicles, boats, and other equipment contribute meaningfully to emissions as well. In general, addressing these emissions is significantly more challenging, given the limited options for low-emitting or electric alternatives that are presently available or the prohibitive cost of transitioning.³⁸

As a result, electrification of these vehicles will be a lower priority in the Climate Action Plan as we instead focus our efforts where the technology is already viable and cost effective. However, we will monitor technology developments in these sectors and share the results of our findings with the local companies, for example, through annual gatherings with the Chamber of Commerce.

When the technologies do eventually reach the point that they are viewed as feasible, we will revise the Climate Action Plan to include specific initiatives to encourage their adoption. Until that time, this will remain solely a research-focused initiative.

2.6 Pursue Zero-Emissions Heavy-Duty Vehicles

Initiative Summary

Objective

While boats and large equipment are key emitters, few alternatives exist today. Working with local businesses, we will monitor the technology's progress and promote new alternatives as they emerge.

³⁸ Northern Bruce Peninsula's tour boats are a useful example of this challenge. Due to their size and safety needs – specifically, the need to be able to navigate on rough water during storms – there are few commercially available electric options that would be viable today

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Initial Focus Areas	1. Monitor zero-emission options for trucks, boats, and other equipment used across the peninsula	
Organizational Lead	Climate Action Committee	Exploratory nature of the initiative is well-suited to the role and expected expertise of the committee
Resources Requirements	N/A	Initiative is envisioned as analysis only at this stage
Proposed Targets	N/A	No targets during analysis stage
Timeline	Ongoing	- Collect information on latest low emission options for each sector (i.e., boating, construction, farm) - Convene sector representatives annually to review findings (where appropriate)

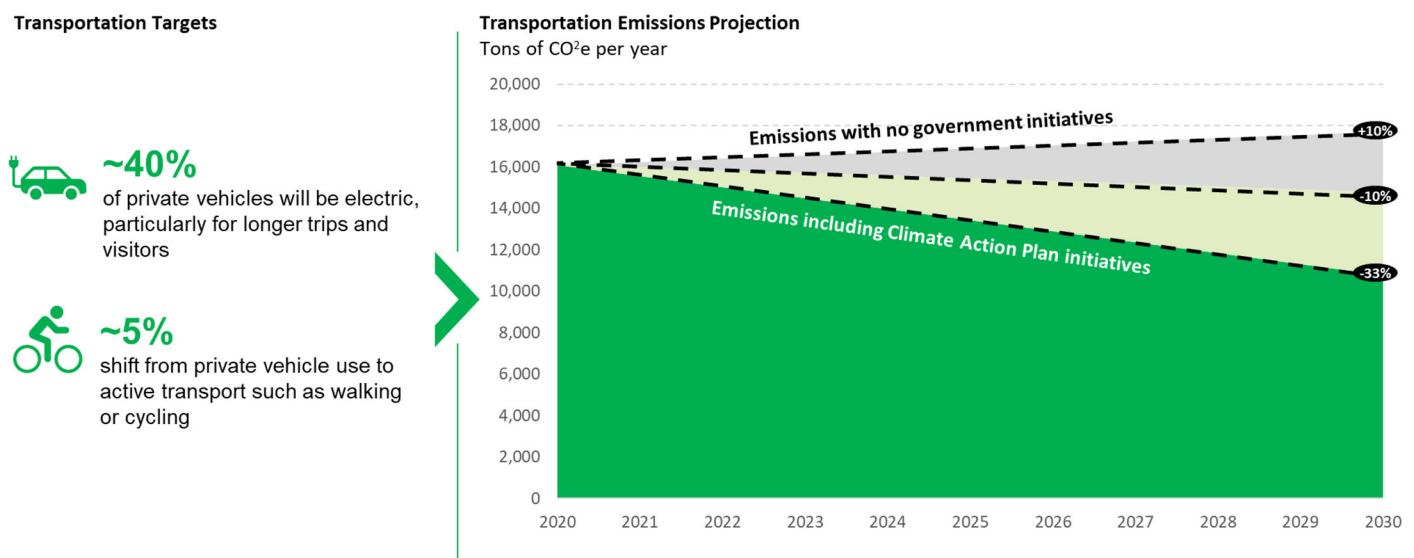
Overall Impact

The Climate Action Plan is targeting a ~45% reduction of emissions from transportation by 2030 relative to the business-as-usual scenario. This will be achieved by:

1. Converting 40% of ICE vehicles to electricity or hybrid options
2. Converting ~5% of vehicular trips taken to zero-emission methods (e.g., walking, cycling)

Additional future emissions reductions may be achieved for heavier duty vehicles depending on technological availability in future years of the plan.

Figure 36 – Summary of Transportation Emissions & Targets



Part 3c

Plan Details: Waste



Photo Credit: Bruce Peninsula Press

Sector Details: Waste

Background

Solid waste emissions originate from the decomposition of biodegradable material into GHGs. Per Figure 37, this is just one of many environmental implications of solid waste.

Figure 37 – Environmental Impacts of Solid Waste



The amount emissions generated from a community's solid waste is influenced by a number of factors beyond quantity:

- Type of waste material and the corresponding degradable carbon component³⁹
- Waste decomposition approach used (e.g., aerobic vs. anaerobic digestion)⁴⁰
- Other landfill management practices (e.g., landfill gas retention)

For Northern Bruce Peninsula, per Figure 38, waste volumes have been growing for several years – driven primarily by an increase in wood and mixed (i.e., household) waste. Note that these figures do not account for waste generated by businesses for which data was not available as it is collected by private firms and this data was unavailable. Despite this, it is expected that their total waste generated would demonstrate a similar pattern of growth over time.⁴¹ This growth is despite the Municipality's success in achieving county-leading diversion rates – where ~35% of waste generated is recycled and thus avoids the landfill.

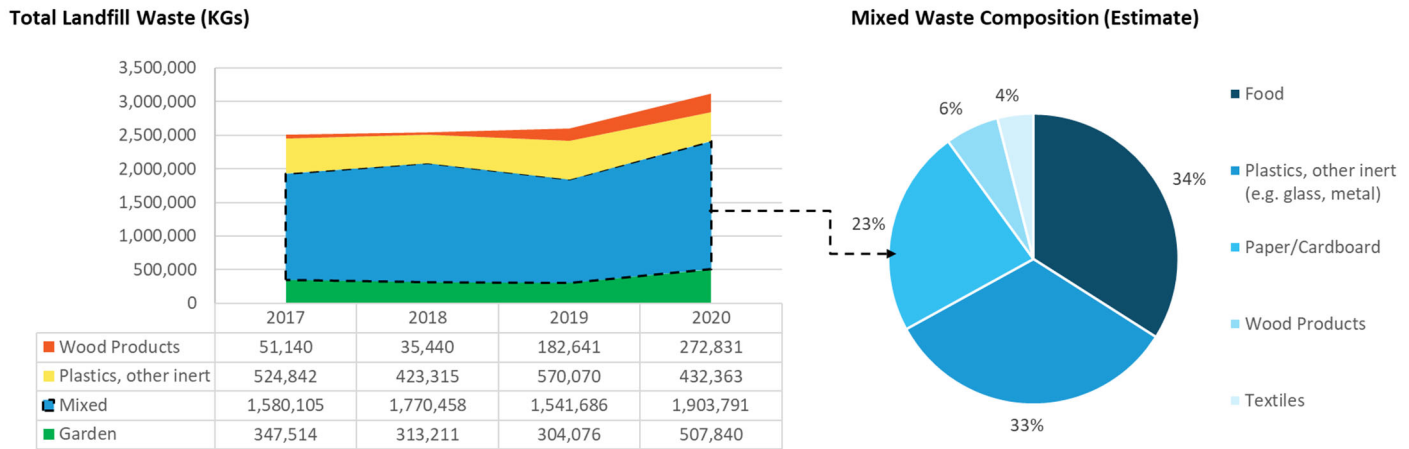
³⁹ Refers to the portion of organic carbon present in such solid waste as paper, food waste, and yard waste that is susceptible to biochemical decomposition and thus convertible into greenhouse gas emissions.

⁴⁰ Aerobic digestion refers to organic waste decomposition that takes place with oxygen present, whereas anaerobic is conducted without. The distinction is critical in the context of climate change as the by-product of anaerobic digestion (methane) has significantly higher warming potential than aerobic digestion (carbon dioxide)

⁴¹ Per expert interviews / workshops with the Municipality's Waste Management Committee.

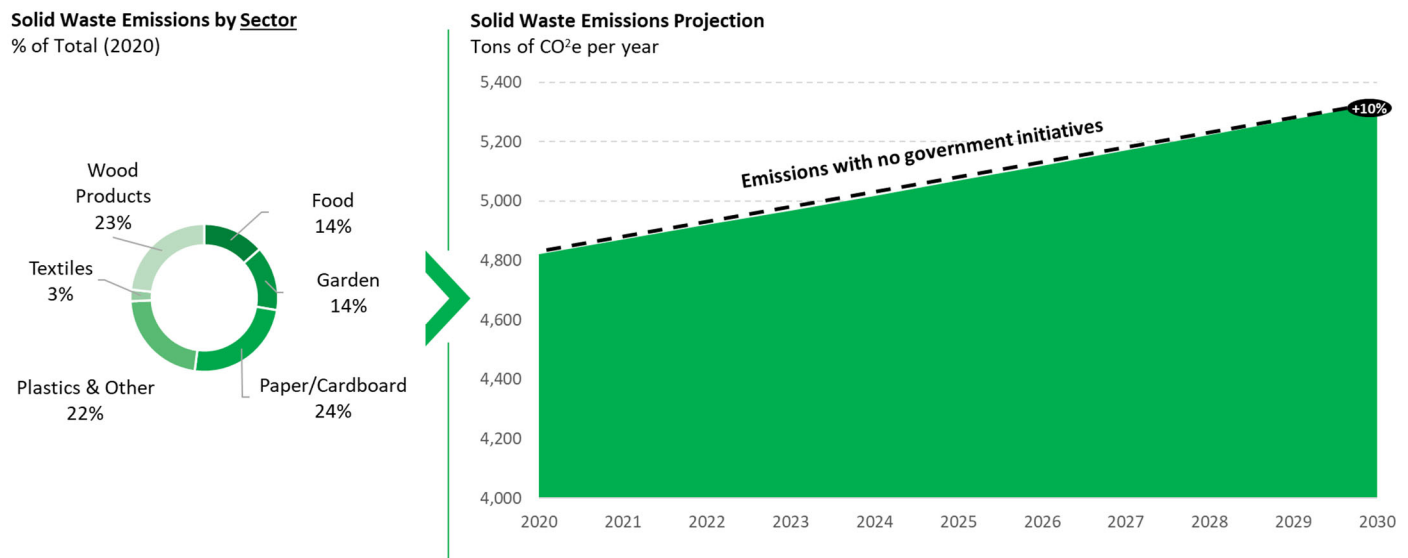
Sector Details: Waste

Figure 38 – Community Solid Waste Characteristics for Northern Bruce Peninsula⁴²



Solid waste represents approximately one fifth of NBP's emissions. Per Figure 39, the majority of solid waste emissions come from paper, wood, and plastics not diverted as part of the Blue Box or reuse programs. Future growth in solid waste and emissions is expected to be in-line with population growth.⁴³ Note that recycled / diverted materials are excluded assuming they have been reprocessed or reused.⁴⁴

Figure 39 – Solid Waste Emissions for Northern Bruce Peninsula



Compared to other smaller municipalities, NBP's solid waste emissions are higher per capita, likely due to seasonal residents and visitors. Both groups contribute to total waste but are not necessarily captured in the per capita

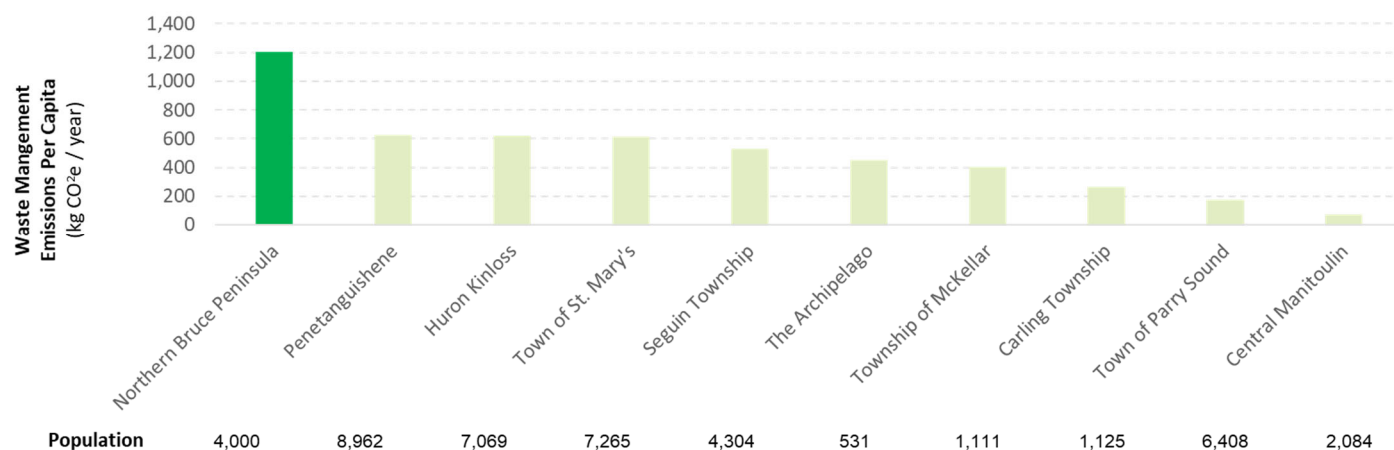
⁴² Source: *Municipality of Northern Bruce Peninsula*, Waste Management Data (2021).

⁴³ See Appendix B for additional details on the expected impact of policies from other levels of government.

⁴⁴ See Appendix A for details on the methodology and data used.

calculations.⁴⁵ Even adjusting for this difference, however, it appears likely that Northern Bruce Peninsula's solid waste emissions would be higher than other similar municipalities.

Figure 40 – Transportation Emissions per Capita vs. Other Small Municipalities⁴⁶



Climate Action Plan

There are typically three methods for reducing the climate change impact of solid waste:

1. Waste diversion (e.g., recycling, reuse, composting)
2. Waste prevention (e.g., composting, purchasing behaviors)
3. Landfill management (e.g., organics stirring, landfill gas retention)

Method #1 is highly relevant for Northern Bruce Peninsula, but for some waste types, such programs are already in effect. Future efforts should strengthen awareness and participation in these programs, and collaborate with other municipalities to increase types of waste accepted and diverted

Method #2 is widely viewed as the most important component of an emissions reduction strategy for solid waste.⁴⁷ While many prevention activities are also underway in NBP, increasing participation and awareness with them – as well as eliminating barriers that prevent adoption – is the top priority for the Climate Action Plan.

Method #3 plays the smallest role within the Climate Action Plan. Many of these initiatives to improve landfills require capital investments that may not be feasible for a small municipality like Northern Bruce Peninsula. Instead, NBP should continue to monitor neighbouring municipalities' experiments with such technologies – such as the proposed biogas

⁴⁵ Due to data limitations, per capita calculations are based solely on full-time residents – whereas landfill data will also capture was from seasonal residents and visitors.

⁴⁶ Federation of Canadian Municipalities, PCP Milestone Tool Public Dashboard (2021)

⁴⁷ Smart Prosperity Institute, Tools to reduce household waste & reduce greenhouse gas emissions (2018).

Sector Details: Waste

retention facility in Owen Sound – and seek opportunities to work together or await future changes in the regulatory environment that will increase the feasibility of such techniques.⁴⁸



Climate Action 3.1 **Expand use of backyard composting**

Increasing backyard composting is a key component of the Climate Action Plan due to its accessibility. It necessitates limited upfront investment, requires minimal municipal coordination, and involves only a modest amount of education for participants. Of all the initiatives in the Climate Action Plan, backyard composting has the potential for the widest adoption.

A crucial first step is better understanding the barriers preventing individuals from composting. While several concerns were voiced during the public consultations for this plan (and described in greater detail below) further study is required. This analysis includes waste audits to better understand the composition of Northern Bruce Peninsula's household waste and thus to better understand the emissions reduction potential from increased backyard composting.

While these studies will identify additional future initiatives to support backyard composting, several are already known based on the feedback to date. In particular, wildlife / bear proofing composting is a known area of concern preventing further composting and will be addressed by:

- Evaluating bear-proof alternatives to the current municipally subsidized compost bins
- Conducting education seminars on wildlife-safe composting best practices

3.1 Expand use of backyard composting

Initiative Summary

Objective	Composting has been popular on the Peninsula, but participation is still inconsistent. We will expand the promotion and education around composting to ensure it is viewed as a practical solution for waste.	
Initial Focus Areas	1 Complete community waste management survey and waste audit 2 Evaluating bear-proof alternatives to the current municipally subsidized compost bins 3 Conducting annual education seminars on wildlife-safe composting best practices	
Organizational Lead	Waste Mgmt. Committee	• Historical lead for community initiatives related to waste
Resources Requirements	N/A	• This would be a volunteer led initiative

⁴⁸ Ontario is investigating requirements for source-separation of organics – a regulation that would substantially increase the organic content available for biodigesters. Municipalities such as Georgian Bluffs and Chatsworth are considering closure of their existing facilities until that regulation is in place as it will make the facilities more economic. See *Owen Sound Sun Times*, Georgian Bluffs, Chatsworth to explore mothballing biodigester (2020).

Sector Details: Waste

		- There are some minor costs associated with providing the municipal composters, but these have been budgeted for separately - Potential for some additional costs if there are specific promotions / incentives required
Proposed Targets	Backyard Composting Participation Rate	>25% by 2026 >40% by 2030 <i>Note: these targets may be revised based on the results of the waste management survey</i>
Timeline	Ongoing	2022 - Complete audits with Waste Management to confirm current organic content in landfill waste - Conduct community survey on waste management habits and barriers to composting 2023+ - Plan for future years should be established based on the results of the survey + audit - Assess feasibility of commercial organic drop-off bins (e.g., expanded Pig Bin from Lion's Head)



Climate Action 3.2

Increase options for organics collection & drop-off

While backyard composting remains the most efficient option for addressing organic waste, it is likely to face adoption challenges amongst portions of the community. In some cases, the barriers will be structural such as short-term rental unit owners who will have limited control around the waste habits of guests. In other cases, it will be behavioral including those unwilling or unable to spend time composting.

Owing to its extreme convenience, curbside pick-up is the tactic most likely to address the largest proportion of organic waste. It is, however, a costly strategy with an expected total cost of \$30-55 per household.⁴⁹ There are also numerous other practical concerns for such a program such as operator interest and ultimate processing capacity for waste collected.

The Climate Action Plan proposes studying curbside collection for its potential implementation in Northern Bruce Peninsula. This study would be conducted in partnership with Bruce County and neighbouring municipalities, all of whom have demonstrated interest in such a program in the past. The study and potential implementation would occur in later

⁴⁹ Municipality of Northern Bruce Peninsula, Long-term Waste Management Plan (2012)

Sector Details: Waste

years of the Climate Action Plan, allowing for an evaluation of other organics-related initiatives in order to better assess the need for curbside pickup.

3.2 Increase options for organic collection & drop-off

Initiative Summary

Objective	While composting is key, we must also create other options for organics that are practical. We will partner with Bruce County and businesses to explore organic curbside pick-up of drop-off locations.	
Initial Focus Areas	1. Explore potential for curbside organics collection program with neighbouring municipalities	
Organizational Lead	Municipality	Will require coordination with other municipalities (due to cost / capacity constraints) meaning staff are best positioned to push initiative forward
Resources Requirements	High (Exact amounts to be determined)	- Existing waste management services already a material component of municipal budget and any programming would be adding to that total - Costs can be mitigated through (a) partnerships with other municipalities and (b) other waste initiatives (e.g., bag tag system)
Proposed Targets	Organic Waste Content in Landfill	<25% by 2026 <10% by 2030 <i>Note: these targets may be revised based on the results of the upcoming waste management audit</i>
Timeline	Long-Term (2026+)	2022-2023 - Outreach to other municipalities in county to confirm interest in assessing organic collection 2024-2025 (If sufficient interest) feasibility study of organics collection program 2026+ - Potential implementation dates



Climate Action 3.3

Explore landfill alternatives for yard waste

Addressing emissions from yard waste is easier than other organic waste as it generally comes pre-sorted (i.e., it is not mixed with inorganic components). However, the bulk and slow biodegradation of certain types of yard waste – in particular, tree branches and stumps – means methods such as backyard composting either aren't practical or appealing.

Sector Details: Waste

The current Municipal practice that involves burning of yard waste has some environmental benefits relative to standard landfilling in that it releases CO₂ instead of methane – a less potent contributor to climate change. However, this approach also has drawbacks – notably that the emissions occur immediately instead of gradually during decomposition. Additionally, through burning, the majority of carbon is released into the atmosphere – where it contributes to climate change – rather than returning to the soil.

Through the Climate Action Plan, we will explore alternatives for addressing yard waste. The initial focus will be re-evaluating the previous practice of mulching yard waste – where waste can decompose aerobically after initial chipping / processing. This will involve outreach to private operators as well as neighbouring municipalities – the latter serving as potential partners to increase the financial feasibility of any eventual program.

3.3 Explore landfill alternatives for yard waste

Initiative Summary

Objective	Current practices of burning yard waste result in rapid release of emissions. We will test alternative programs for utilizing yard waste that are more climate positive.	
Initial Focus Areas	1. Identify potential alternatives for addressing yard waste in Northern Bruce Peninsula's landfills	
Organizational Lead	Municipality	- Oversees waste management operations and will need to be involved in order to assess financial implications - Waste Management Committee likely can support some components of research and analysis - Potential to investigate partnerships with other municipalities, particular if cost is prohibitive
Resources Requirements	Low (Exploration phase only)	- Likely requires only staff time for research & analysis - Any eventual program will have operational costs (i.e., previous mulching was \$30-55 per household per year)
Proposed Targets	N/A	No targets during analysis stage
Timeline	Near-term (2022-2023)	2022 - Reconnect with previous mulching vendors to assess cost of program - Discuss with neighbouring municipalities potential of coordination / partnership in order to improve viability - Evaluate operational procedures to reduce contamination (If appropriate) include as part of Waste Management's 2023 budget requests



Climate Action 3.5

Increase adoption of blue box programs

Northern Bruce Peninsula has a strong track-record of participation in its recycling programs, having diverted on average 35% of waste per year – the highest rate in all of Bruce County. In large part, this is owed to the success of the Municipal blue box program, particularly since the addition of curbside pick-up made it a more convenient and practical option for the community.

Despite this success, there remains an opportunity to push these diversion rates higher. In particular, feedback during the consultation for this plan indicated several features of the current curbside program that prevented full participation, such as the Monday pick-up days being impractical for weekend cottagers / visitors. Interviews with municipal staff also indicated concerns regarding the level of contamination within the blue box program – which poses challenges to its long-term economic viability.

Similar to the organic's initiatives, the crucial first step in the Climate Action Plan for blue box programs is acquiring additional data through the completion of a community waste survey and municipal waste audits. Based on the results of those studies, a detailed list of revisions to the programs will be brought forward to ensure barriers to participation are reduced.

3.4 Increase adoption of blue box programs

Initiative Summary

Objective	Though our recycling rate leads Bruce County we can still do better. We will assess the current blue box program and identify tweaks to pick-up days, materials, and other features to increase recycling rates	
Initial Focus Areas	1 Adjust pickup times to increase use by seasonal residents; explore potential recycling mandate to require participation	
Organizational Lead	Waste Mgmt. Committee	Historical lead for community initiatives related to waste
Resources Requirements	Low	- This would be a volunteer led initiative - There will be some minor costs if recycling rates do increase (as municipality is charged based on volumes) - Potential for some additional costs if there are specific promotions / incentives required
Proposed Targets	Recycling Waste Diversion Rates	45% of annual waste diverted by 2026 (Note: current rates are ~35%) 50% of annual waste diverted by 2030
Timeline	Near-term (2022-2023)	2022

Sector Details: Waste

- Conduct community survey on waste management habits and barriers to further recycling (coordinating with initiative 3.1)
- Identify potential program changes (e.g., days of week collection takes place) and incorporate as part of budget cycle 2023



Climate Action 3.4 Introduce new recycling options

Curbside recycling is not the only diversion program in Northern Bruce Peninsula, but there are variety of other diversion programs available at the landfills. Figure 41 shows there are some material gaps relative to other neighbouring municipalities.

Figure 41 – Comparison of Residential Waste Diversion Programs across Bruce County⁵⁰

	Northern Bruce Peninsula	Arran-Elderslie	Brockton	Huron-Kinloss	Kincardine	Saugeen Shores	South Bruce	South Bruce Peninsula
Electronic Waste								
Scrap Metal								
Leaf & Yard								
Polystyrene								
Mattresses & Box Springs								
Automotive Batteries								
Shingles								
Drywall								
Fluorescent Lights								

Green indicates diversion programs that are in-place

Several of these waste types without diversion programs have a meaningful organic component – such as shingles and drywall. As a result, waste in these categories will generate landfill emissions unless recycled or reused. Exploring diversion options for these categories by working with neighbouring municipalities with programs in place or partnering with the construction industry generating much of this waste will be an immediate priority within the Climate Action Plan.

Other waste types without diversion programs such as polystyrene or fluorescent lights will have little impact on emissions as they either don't biodegrade or do so exceedingly slowly. Waste diversion strategies for these categories are a lower

⁵⁰ Source: *Bruce County, Status of Waste Management Report (2018)*

Sector Details: Waste

priority, but still included within the plan as ways to preserve landfill space and to promote the overall culture of waste reduction and reuse in the community. They will be assessed in the latter years of the Climate Action Plan.

3.5 Introduce new recycling options

Initiative Summary

Objective	Diversion and reuse programs at our landfills have a strong track record of reducing waste. We will identify additional reuse or diversion programs for construction waste and other common sources.	
Initial Focus Areas	1 Explore recycling / reuse options for construction waste – particularly drywall and shingles	
Organizational Lead	Waste Mgmt. Committee	Historical lead for community initiatives related to waste
Resources Requirements	Low (Exploration phase only)	- Likely requires only staff time for research & analysis - Any eventual program(s) will have operational costs
Proposed Targets	N/A	No targets during analysis stage
Timeline	Near-term (2022-2023)	2022-2023 - Inquire regarding opportunity to partner with other municipalities in Bruce County (e.g., Brockton) for shingles and drywall - Conduct interviews / working sessions with construction industry to evaluate potential diversion program setup focused on shingles and drywall 2024+ - Launch similar analysis / study for other, lower climate impact materials (e.g., fluorescent lights, polystyrene)



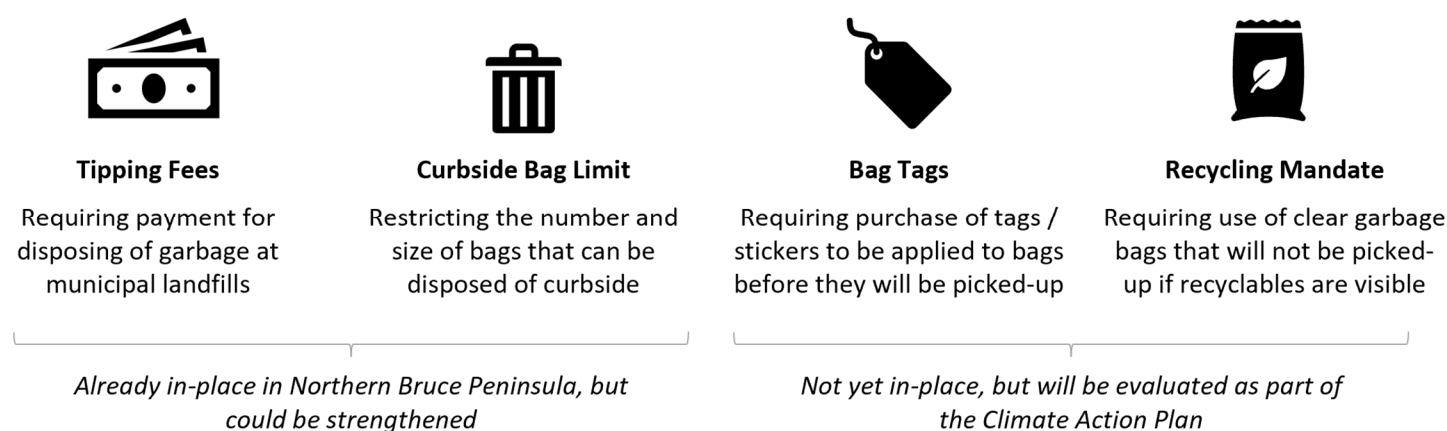
Climate Action 3.6 Evaluate other waste reduction policies

The final component to our Climate Action Plan for waste will seek to implement policies that encourage or, in some instances, mandate waste diversion or prevention. These policies are a critical last step to ensure that all members of the community are working to reduce their waste in addition to the keenest or earliest adopters.

Sector Details: Waste

There are a variety of municipal policies that have proven successful in other communities at driving waste reduction – some examples of which are shown in Figure 42. Some policies – such as landfill tipping fees and garbage bag limits – are already in-place, but could be strengthened (i.e., by further restricting pick-ups or increasing fees). Others will be evaluated for potential implementation as part of this plan.

Figure 42 – Example Waste Diversion / Prevention Policies



The Climate Action Plan would envision implementing these gradually and sequentially. Crucially, the Climate Action Plan envisions completing many of the other early waste emission-related initiatives in this section first, in order to provide the community with the tools it needs to adhere to these requirements. Additionally, each strategy will be evaluated to ensure that its impacts are equitable and don't disadvantage any particular group. These steps in the analysis are necessary to ensure the proposed requirements are viewed as reasonable and fair.

Given the far-reaching implications of certain of these strategies, they should be individually assessed as part of a broader study of the Municipality's waste needs. In certain cases, they may be modified based on public feedback.⁵¹ The Climate Action Plan thus calls for the completion of an updated Municipal Solid Waste Management Master Plan, with these waste reduction policies being assessed and incorporated in the final recommendations.

3.6 Evaluate other waste reduction policies

Initiative Summary

Objective	Garbage limits and fees in Northern Bruce Peninsula are low – which does little to discourage waste. We will assess bag tags, recycling requirements, and other policies that encourage waste reduction	
Initial Focus Areas	1. Update the Municipality's Waste Management Master Plan (from 2021) 2. Assess feasibility and timing of bag tags, recycling mandate, and other waste prevention policies	
Organizational Lead	Municipality	Oversees waste management operations and will need to be involved in order to assess financial implications and define policy statements

⁵¹ For example, during public consultation on this portion of the plan we consistently heard the request to see at least one bag of garbage be free but charging for any excess beyond that

Sector Details: Waste

Resources Requirements	Medium (Evaluation only)	• ~\$50,000 → potential consultant fees in order to complete updated waste management plan • There may be some costs to implementing these policies, though majority require only policy change (and in some cases, they will be revenue-generated)
Proposed Targets	Annual Waste Generation	• 5% decrease in per capita landfill waste generated (2026) • 10% decrease in per capita landfill waste generated (2030)
Timeline	Mid-term (2024-2025)	2022 • Assess currently landfill tipping fees relative to other municipalities for potential revision 2023 • Update municipal Waste Management Plan 2024+ • Implementation of elements of Waste Management Plan (e.g., bag tags, recycling mandate)

Overall Impact

The Climate Action Plan is targeting a ~10% reduction of emissions from solid waste by 2030 relative to the business-as-usual scenario.

Figure 43 – Summary of Waste Emissions & Targets

Solid Waste Targets



~50%

Reduction in total organic waste entering landfills

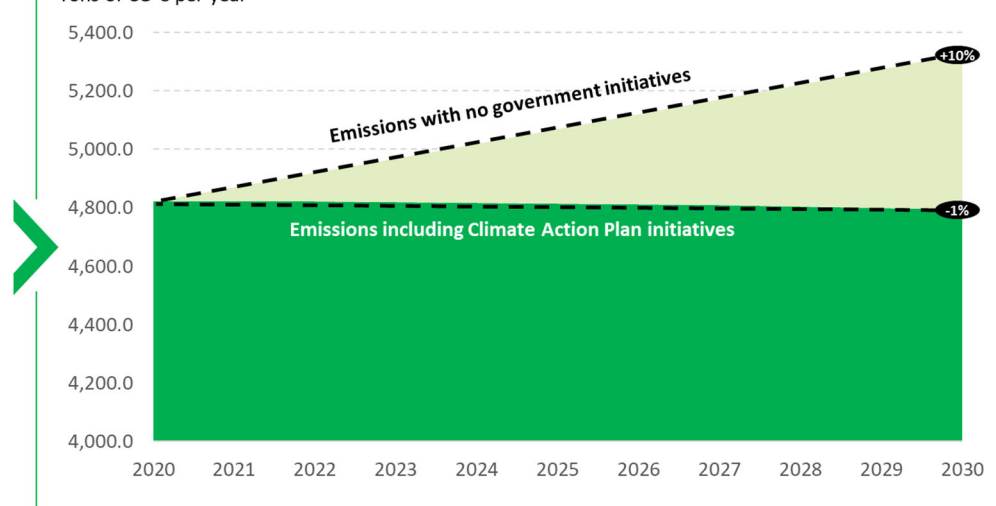


~10%

reduction in total waste per person entering municipal landfills

Solid Waste Emissions Projection

Tons of CO₂e per year



Part 3d

Plan Details: Agriculture



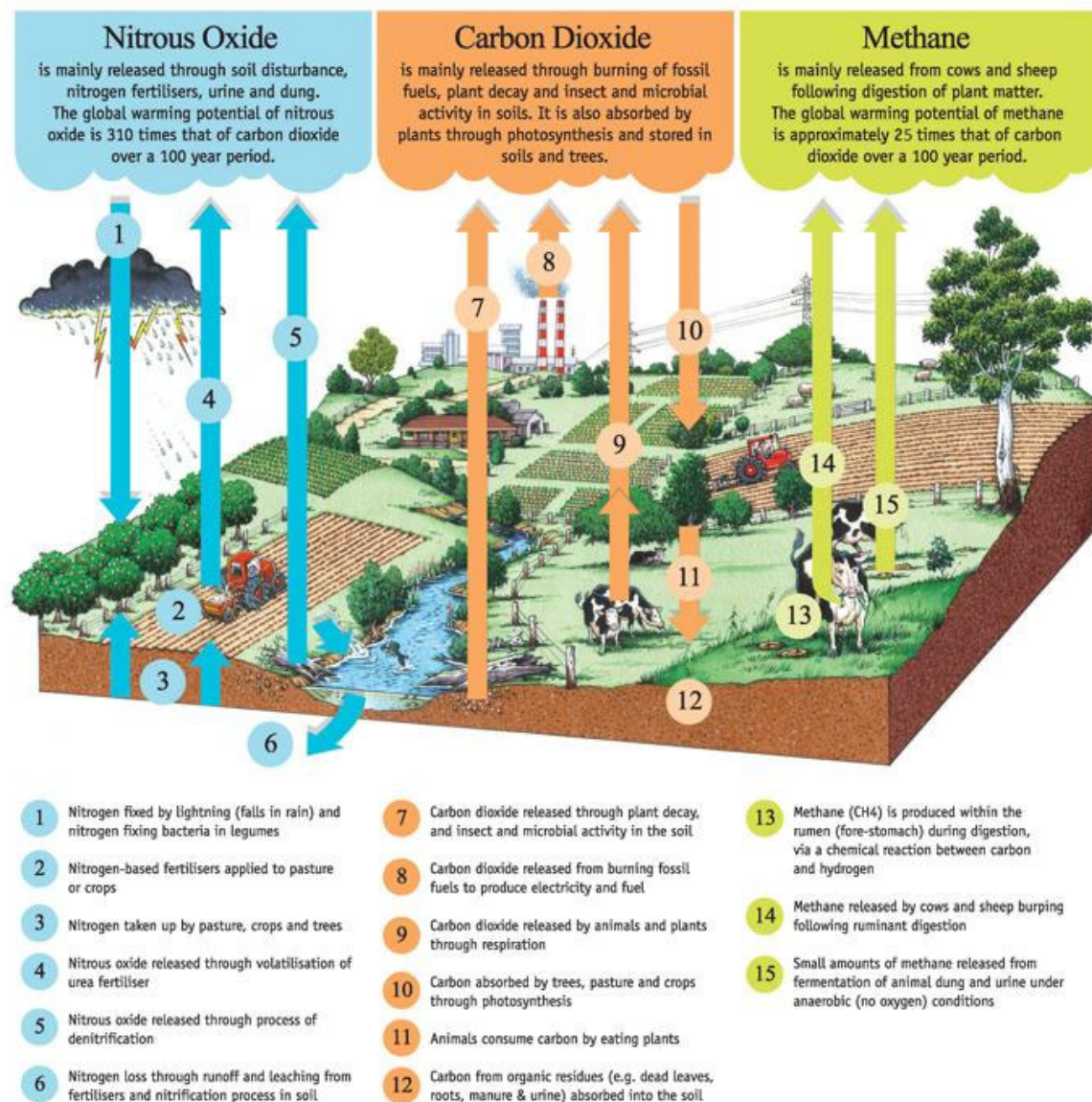
Photo Credit: Blue Lotus (Flickr)

Sector Details: Agriculture

Background

Agricultural systems have the capacity to capture carbon from the atmosphere and store it in soils or plant biomass - a process known as carbon sequestration. However, because of synthetic inputs like pesticides, fertilizers, and fuel, most modern agriculture operations are net emitters of greenhouse gases. These inputs result in “on-farm” emissions, meaning emissions that are a direct result of growing a crop or raising livestock. Examples of these processes and emissions are shown in Figure 44.

Figure 44 – Greenhouse Gas Emissions Sources from Agriculture⁵²



⁵² Source: Agriculture Victoria

Sector Details: Agriculture

Agriculture on the Peninsula contributes to emissions in a variety of ways. Based on the most recent available census data, there are 72 operating farms in the Northern Bruce Peninsula with a combined area of more than 12,000 hectares.⁵³

Nearly 40% of that land is used for crops such as corn, soybeans, canola, and wheat, typically in a 2,3- or 4-year rotation - sequestering carbon in the soil through natural processes, while also generating emissions through fertilizer use and biodegradation. Another 35% is pastureland - primarily for beef, with some sheep and pig farming as well - generating emissions manure and methane. The remaining 25% of farmland on the Peninsula is classified under woodlots, wetlands, or other non-producing uses - generally contributing minimally to emissions.

Estimating agricultural emissions is notoriously challenging due to data limitations, uncertainty regarding scope, and scientific disagreements regarding the appropriate methodologies. As a result, many climate action plans do not include agricultural emissions from their greenhouse gas inventories.⁵⁴ For Northern Bruce Peninsula, although we have developed a preliminary estimate for agricultural emissions, due to these concerns regarding accuracy we have chosen to exclude it from our overall emissions inventory. However, several factors suggest agriculture should remain an important component of our plan:

- Preliminary estimates for greenhouse gases suggest that the emissions contribution may be a significant (see Appendix A for details on our preliminary estimate)
- The current mix of farming practices and crop / livestock types on the Peninsula suggests that the emissions intensity of local agriculture is likely slightly above average relative to other communities across the province
- Recent advances in technology and agricultural practices have created enormous potential to reduce the climate impact from the sector

Climate Action Plan

There are typically three methods for reducing the climate change impact of agriculture:

1. Shifting to lower emitting livestock / crop types
2. Adopting lower emitting farming practices
3. Improving sequestration potential of agricultural land

Method #1 is relevant to Northern Bruce Peninsula as many of the local crop or livestock types are high-emitting relative to other agricultural uses. However, encouraging or incentivizing farmers to change the focus of their farms was deemed inappropriate and outside of the scope of this plan and was therefore not included.

Method #2 is also relevant for Northern Bruce Peninsula but deemed more appropriate for inclusion within the Climate Action Plan given the numerous examples of these practices already being implemented within the community.

Method #3 is also relevant for the Climate Action Plan given the large presence of on-farm naturalized areas (e.g., woodlots and wetlands). The importance of incorporating this method in the Plan is further reinforced by the growing development pressures facing local farmland.

⁵³ Statistics Canada, *National Census (2016)*

⁵⁴ Guidance documents from the Federation of Canadian Municipalities Partners for Climate Protection Program typically recommend they are excluded as well.



Climate Action 4.1

Promote the carbon sequestration potential of farming

The primary focus of our Climate Action Plan within agriculture will be education and promotion of the opportunities to reduce greenhouse gas emissions through new farm management techniques. In many cases, there are relatively limited costs associated with these techniques - they only require changes in crop rotations or cultivation processes. Several examples of potential techniques are shown in Figure 45 below.

Figure 45 – Example Sustainable Farming Practices

Initiative	Description	GHG Impact	Cost / Benefit
Cover and / or catch crops	Sown in Autumn/Winter, acting as a canopy to protect the soil, recycle nutrients, help build soil organic matter content, and to combat weeds, pests and diseases		
Integrating grass leys	Grass leys incorporated into an arable rotation can reduce GHG emissions by reducing losses from artificial fertilizer applications and improving the amount of carbon sequestered.		
Grain legumes	Grain legumes include peas, beans and lupins, and can be grown as part of an arable crop rotation to provide a disease break and reduce the reliance on manufactured nitrogen.		
Optimizing Soil PH	Soil pH can be optimized through liming to increase the effectiveness of fertilizers and manure and reducing the release of nitrous oxide.		
Minimum tillage cultivations	Minimum tillage, non-inversion tillage, and reduced tillage are all terms which refer to cultivation techniques that do not include deep inversion ploughing, reducing fossil fuel use.		
Precision fertiliser applications	There are opportunities to improve the efficiency of chemical fertilizers by more accurate timing of application and by applying nitrogen to match specific plant needs.		

The campaign will involve a variety of strategies over the coming years. Feedback received through the Climate Action Planning process indicated that virtual engagement was less effective with the local agriculture community - suggesting that tactics will need to focus on in-person gathering or one-on-one engagements in future years. The campaign will also integrate with existing efforts by Saugeen Ojibway Nation – who's priorities include minimizing similar environmental impacts from agriculture, such as the excess contamination in streams (e.g., from over-use of fertilizer).

4.1 Promote the carbon sequestration potential of farming

Initiative Summary

Objective	The agricultural sector will be one of the most impacted sectors by climate change. Working with local farmers, we help promote and implement sustainable farming practices to minimize these impacts	
Initial Focus Areas	1. Organizing regular seminars on best management practices for climate-friendly agriculture. Focussing on reducing tillage and use of synthetic fertilizer. 2. Pursuing grant opportunities for low-carbon agricultural systems or projects. 3. Explore partnership opportunities with University and College agricultural programs. 4. Encourage the development of a strong local food economy.	
Organizational Lead	Community Organizations	• Community organizations already have established relationships with the farming community • Can be aligned with other similar marketing / promotional efforts that have historically been pursued with the agricultural community
Resources Requirements	Low (<10K / year)	• May requires part-time staff in order to effectively administer the program, but for now likely to be volunteer led
Proposed Targets	Number of Local Farmers Engaged	• 50% by 2026 • 100% by 2030
Timeline	Ongoing	• Expected to be a recurring action within the Climate Action Plan • Note that program could wind-down as critical mass is achieved (e.g., 20%+ of homes with heat pumps)



Climate Action 4.2

Pilot innovative on-farm emissions initiatives

Modern agricultural systems continue to rely heavily on the use of fossil fuels for heating and on-farm equipment. For certain activities, cleaner, low emitting technologies - such as those for tractors or plows - are only just emerging and becoming economic for farmers. In other cases - such as on-farm solar energy production - the technology is already viable with many adopters within the community already.

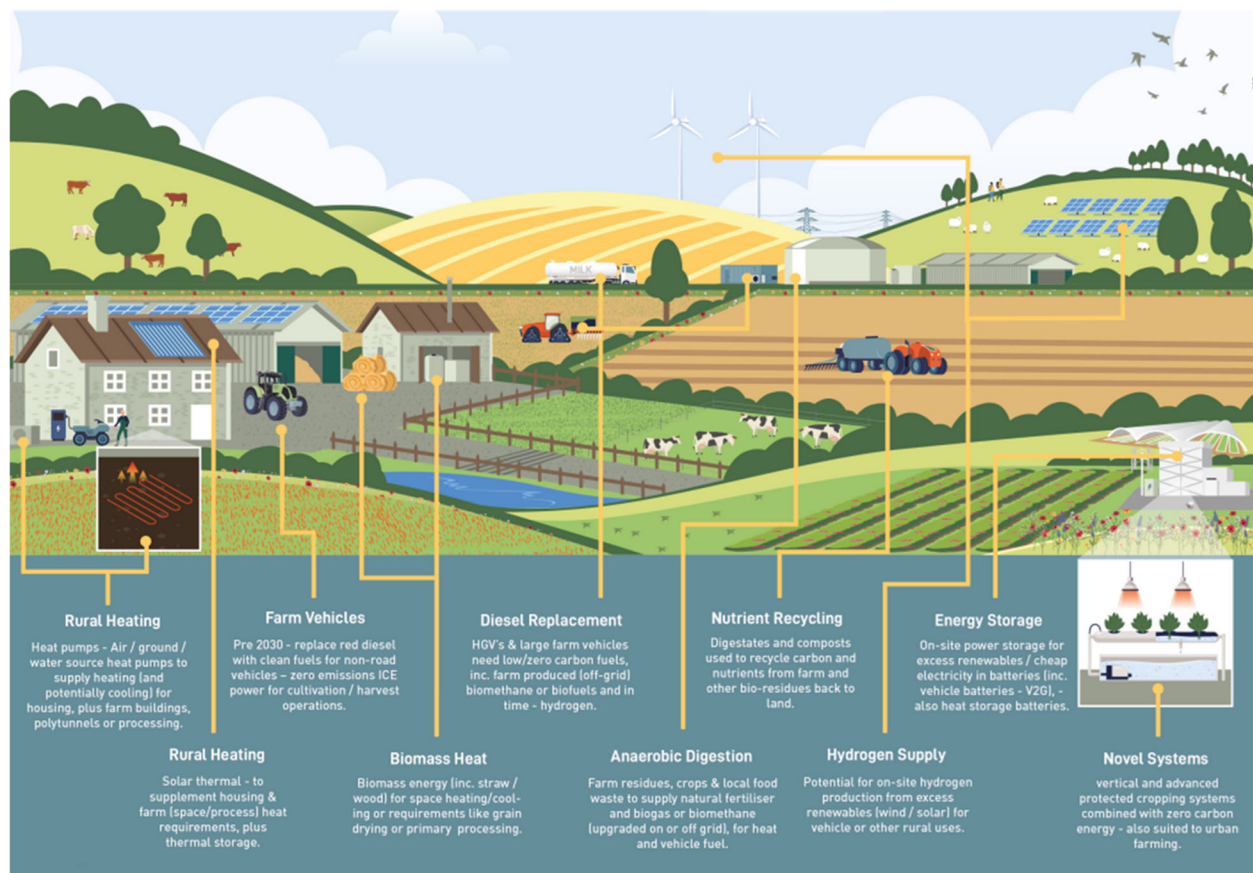
As part of the climate action plan, we will support the piloting and experimentation of new on-farm emissions reduction initiatives. There are a wide range of technologies that could be included in such pilots - some examples for which are

Sector Details: Agriculture

shown in Figure 46 below. We will work directly with the local farming community and Bruce County Federation of Agriculture to identify pilot candidates and potential funding opportunities.

A crucial enabler of this campaign will be conducting energy audits to increase the awareness of on-farm energy use as this will also aid in building business cases and acquiring funding for any eventual pilot initiatives. Throughout the duration of the Climate Action Plan, we will conduct annual promotion of energy audits directly targeting farmers.

Figure 46 – Example On-Farm Emissions Reduction Initiatives



4.2 Pilot innovative on-farm emissions initiatives

Initiative Summary

Objective	The Peninsula's farming community has historically shown a strong appetite for innovation & experimentation. We will build on this legacy through annual tests of new farming emissions reduction technology.
Initial Focus Areas	1. Source funding to conduct on-farm energy audits - Full operations audits to determine where energy is being wasted on-farm and identify intervention points. 2. Facilitate switching from fossil fuel to electric energy where possible - This includes farm machinery and building HVAC systems. Monitor for new technology as it becomes available.

Sector Details: Agriculture

		3. Research and educate on low-emission manure-management strategies. 4. Pilot on-farm energy production projects (i.e., biogas/methane reduction, on-farm solar, etc.)
Organizational Lead	Community Organizations	Community organizations have a long track-record of successfully acquiring funding for similar initiatives
Resources Requirements	Medium (Exact amounts to be determined)	- Each initiative likely to come with an upfront capital cost, though it will depend on which system is chosen - These initiatives will each need to be grant funded and pursued opportunistically
Proposed Targets	N/A	Will be dependent on funding opportunities.
Timeline	Ongoing	2022-2023 - Select priority on-farm innovation pilot technologies - Identify potential funding opportunities; target 1 successful funding acquisition per year 2024+ - Target 1 successful funding acquisition per year



Climate Action 4.3

Protect farmland, woodlots, and wetlands

While the other initiatives will support the reduction of on-farm emissions, additional effort is required to ensure that the carbon sequestration potential of farmland is preserved. As shown in Figure 47, several prime agricultural areas will continue to face development pressures from nearby settlement - particularly those areas surrounding Lions Head and Ferndale. While other community priorities may require the conversion of agricultural land to other uses - in particular, the need to expand local housing options / supply - the Climate Action Plan envisions ensuring that climate objectives are considered as part of any such rezoning or redevelopment.

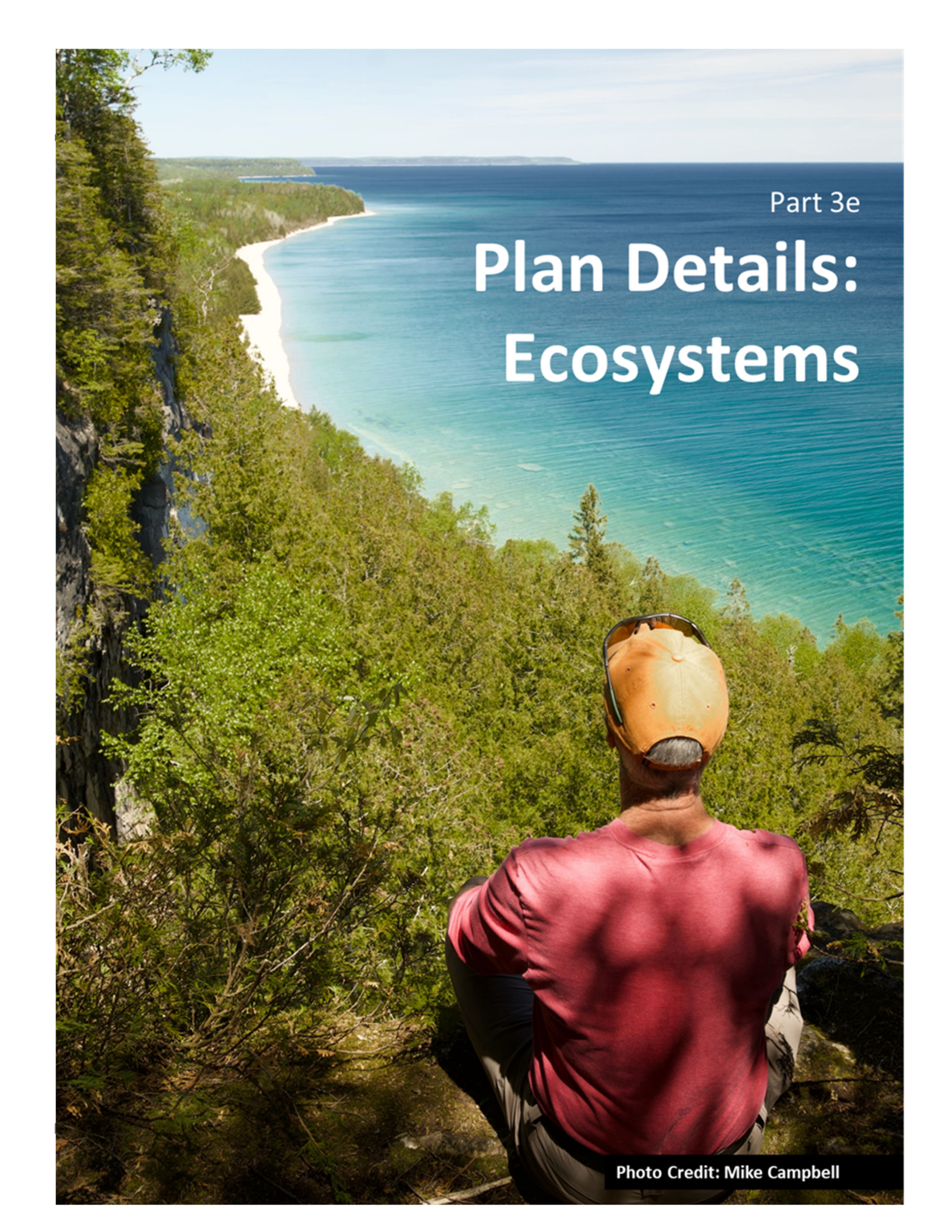
Figure 47 – Northern Bruce Peninsula Agricultural & Residential Land-Uses



4.3 Protect farmland, woodlots, and wetlands

Initiative Summary

Objective	Agricultural and natural areas frequently face pressures from further development. Through municipal zoning / planning policy, we will protect the status and climate mitigation potential of these areas.	
Initial Focus Areas	N/A - ongoing focus	
Organizational Lead	Municipality	Focus of the initiative is on zoning, which is a municipal responsibility
Resources Requirements	N/A	Part of existing day-to-day activities of municipal planning department
Proposed Targets	N/A	90%+ preservation of existing land zoned for agriculture
Timeline	Ongoing	No specific activities; part of day-to-day operations

A person wearing a red long-sleeved shirt and an orange baseball cap is seen from behind, standing on a rocky outcrop. They are looking out over a vast, turquoise lake that stretches to the horizon. The lake's water is exceptionally clear, showing varying shades of blue and green. A narrow, white sandy beach is visible on the left side of the lake, nestled between a dense forest of green trees and the water's edge. The sky is a clear, pale blue. The overall scene is a beautiful natural landscape.

Part 3e

Plan Details: Ecosystems

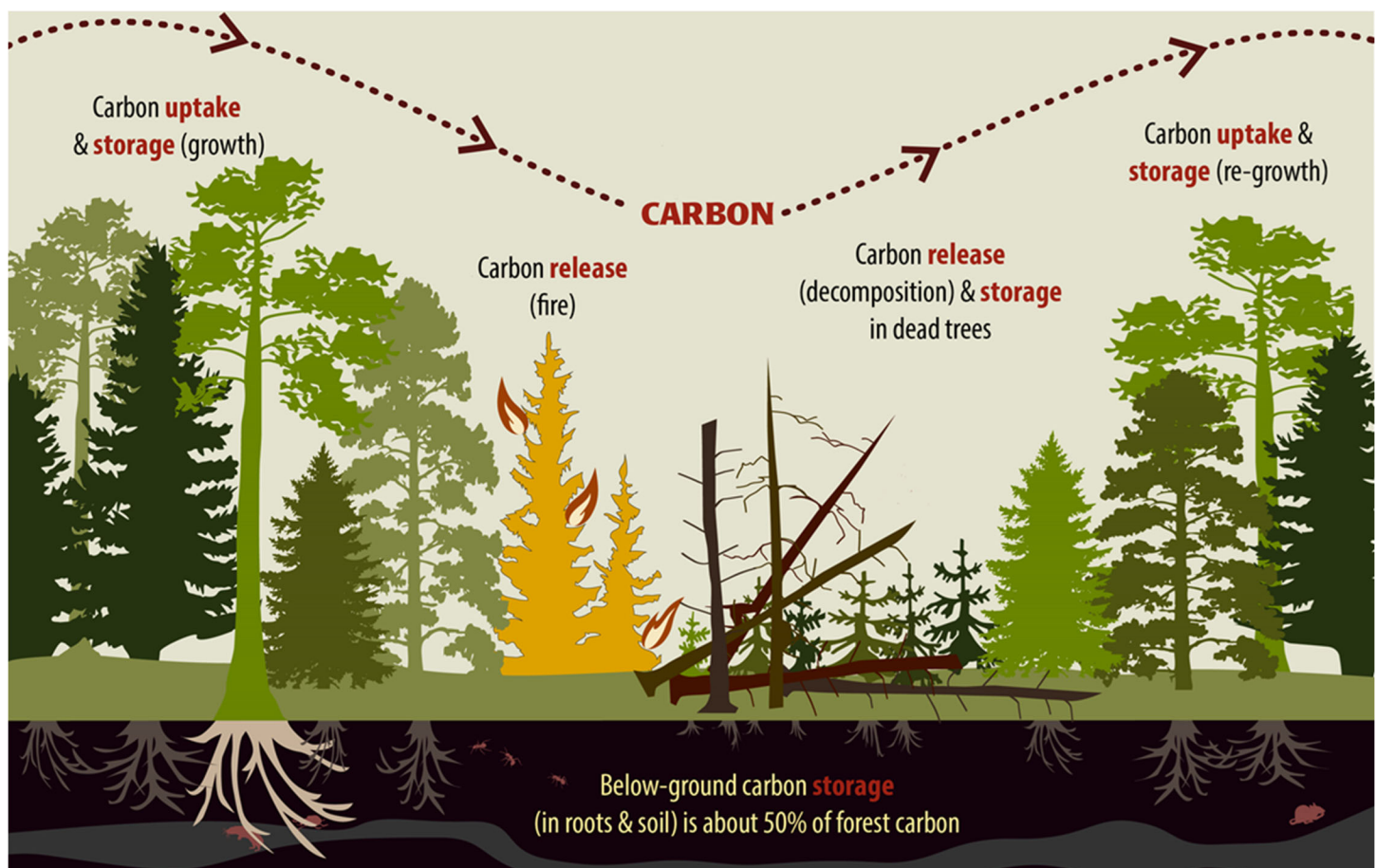
Photo Credit: Mike Campbell

Background

While each of the other sectors covered by this plan address the anthropogenic (i.e., human) drivers of climate change, naturally occurring processes play an important role as well. Of particular importance is the carbon cycle - which covers the natural ebb and flow of carbon embedded or released from forests, wetlands, and other natural areas.

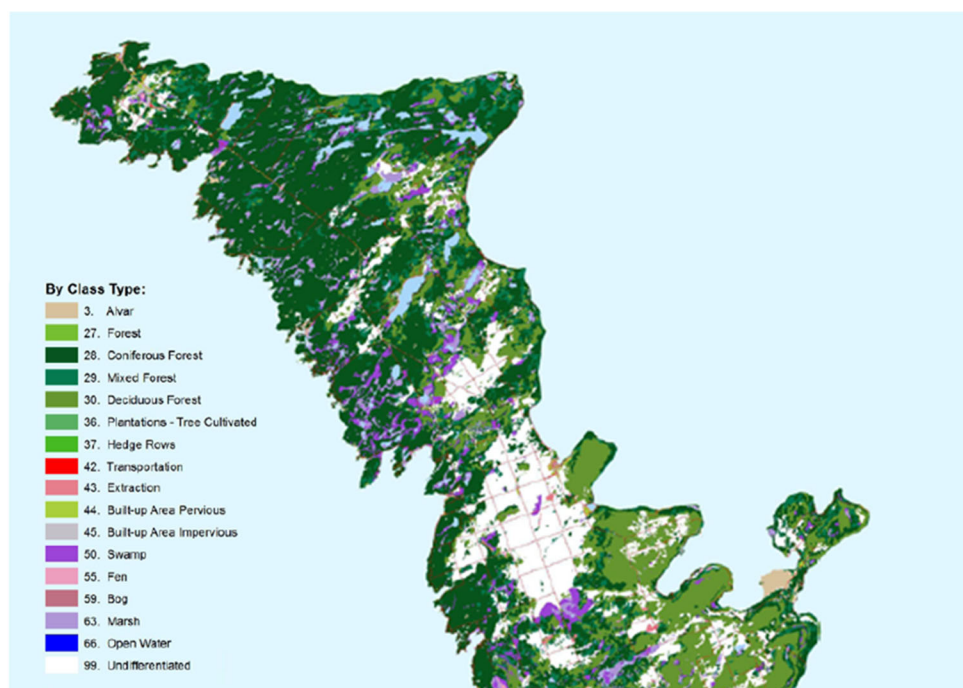
As shown in Figure 48 below, as they grow, trees and other plants will remove carbon from the atmosphere and thus store it – acting as a “carbon sink”. This process also operates in reverse - with trees that die and decompose or succumb to fire releasing their carbon to the atmosphere. Through this cycle, a healthy growing forest can help reverse climate change - while an unhealthy one can in fact accelerate it.

Figure 48 – Overview of the Carbon Cycle



Northern Bruce Peninsula is blessed with an abundance of forests, wetlands, alvars, and other naturalized areas. As shown in Figure 49, these areas represent more than 80% of all land on the Peninsula.

Figure 49 – Northern Bruce Peninsula Cover Types



Similar to agriculture, emissions from Northern Bruce Peninsula’s natural environment are not included as part of the inventory within the Climate Action Plan due to the limitations on data that is currently available. However, several factors point to the necessity of its inclusion in the Climate Action Plan, including:

- Recent national data suggests that Canada’s forests are generally storing less carbon⁵⁵ – a trend that if observed locally would negatively impact our ability to address climate change
- Several threats to local ecosystem health have recently emerged (e.g., invasive species like the Emerald Ash Bore)
- Increasing development and visitation will continue to put pressure on natural areas

Climate Action Plan

There are typically three methods for reducing the climate change impact of agriculture:

1. Stewardship (e.g., forestry management)
2. Restoration (e.g., tree planting)
3. Protection (e.g., land-use planning)

In Northern Bruce Peninsula, Method #1 is already well-underway through the active stewardship activities undertaken by several non-government organisations. These organizations include the Nature Conservancy of Canada, the Escarpment Biosphere Conservancy, and the Bruce Trail Conservancy – each with their own stewardship responsibilities. Saugeen Ojibway Nation preserves the 600 acre ‘Hunting Grounds’ and pursues stewardship on lands throughout the Peninsula

⁵⁵ Source: *CBC News*, Canada's forests actually emit more carbon than they absorb (2019)

Sector Details: Ecosystems

and their traditional lands. Both the provincial government -through its local provincial parks and nature reserves – and federal government – through its local national parks – contribute to stewardship as well. All of these organisations have current strategic conservation plans that drive their land stewardship activities, and most communicate with each other regularly on these activities.

Similarly, method #3 – protection through land-use planned – is already embedded within the Bruce County and Municipality of Northern Bruce Peninsula official plan and zoning process. Crucially, a new Official Plan for Bruce County is imminent and will contain the County’s first natural heritage system – further embedding ecosystem health preservation goals within policies.

Due to this existing body of work and policy regimes, the Climate Action Plan does not further actions in these areas. Instead, the Plan focuses on actions related to Method #2 – ecosystem restoration – in order to further the carbon sequestration potential of the Peninsula’s natural areas.



Climate Action 4.4

Measure climate impact of our natural areas

A foundational step to managing the climate impacts from our natural environment is taking stock of the current carbon sequestered or released from our natural areas. Unlike other sectors – where emissions inventories typically rely on measurement or estimates of energy consumption – for natural areas this requires the assessment of the overall ecosystem health and growth trajectory. It also requires a deep understanding of the current mix of trees and other plant life as species will vary in terms of their carbon sequestration potential.

For Northern Bruce Peninsula, the last comprehensive assessment covering the entirety of the peninsula was conducted in 2013 as part of the Bruce Peninsula Biosphere Association’s Conservation & Stewardship Plan. More recent assessments have been focused on specific areas – such as the Parks Canada’s State of the Park Assessment in 2018. As shown in [Figure 49](#), while these assessments looked at a broad range of indicators, a key component was evaluating forest health – which has direct implications for carbon sequestration potential.

As part of the Climate Action Plan, we will renew these past efforts and complete the first carbon inventory of Bruce Peninsula’s forests, wetlands, and other natural environments. In order to avoid duplication, we will incorporate these analyses in several large-scale reviews already underway targeting Bruce Peninsula’s natural environment.

Sector Details: Ecosystems

Figure 50 – Bruce Peninsula National Park Ecosystems Assessment (2018)⁵⁶

Indicators (include only the indicators applicable)	Measures	Status and Trend
Forest	<i>Salamander</i>	Good (Improving)
	<i>Down Woody Debris</i>	Good
	<i>Black Bears</i>	Poor (Declining)
	<i>Forest Birds</i>	Good
	<i>Fragmentation</i>	Fair
Freshwater	<i>Inland Water Quality</i>	Good
	<i>Beaver</i>	Good
	<i>Stream Fish</i>	Fair
	<i>Stream Temperature</i>	Fair
	<i>Inland Lake Fish Community</i>	Not ranked

Forest represents the park's main ecosystem, covering at least 84% of its surface area. Four measures are assessed currently, however insufficient information precludes an overall trend for this indicator. The status of this indicator is 'GOOD'.

- The *Redback Salamander* measure indicates the population is in 'GOOD' condition, having increased over the last decade.
- Down Woody Debris* was last assessed in 2015 and was ranked as 'GOOD'. This measure is being modified to better represent forest health as more data is collected.
- The *Black Bear* population is showing further signs of decline. Unsustainable harvest and other forms of non-natural mortality on the Peninsula have put this isolated, genetically distinct population at danger of becoming extirpated in less than 50 years. Population estimates based on the most recent (2015) data estimate the number of bears aged >1 year at 25.1 (CI = 11.9-52.7) and all bears at 39.2 (CI = 18.7-82.3). The next survey is planned for the spring 2018.
- Forest Birds* is ranked as 'GOOD', indicating the community's species composition and inter-annual variability is consistent with what would be expected naturally. An additional sub-measure based on functional diversity is being developed to rate the forest bird community. No trend in the data can be assessed at this time.
- The *Fragmentation* measure is being redeveloped. The historic condition in Information Centre on Ecosystems (ICE) database is 'FAIR'.

Freshwater in BNPN includes streams, inland lakes and wetlands. The status of the indicator is 'GOOD', however an overall trend cannot be assessed until more data is collected in the future.

- Inland Water Quality* (lakes and streams) is ranked as 'GOOD', meeting the Canadian Council of Ministers of the Environment (CCME) guidelines for the protection of aquatic life, and shows no trend (e.g., stable) at this time.
- Beaver* population density was 0.32 caches/km² in 2015, and is considered 'GOOD' based on historic measures. A trend cannot be determined until more data is collected in the survey planned for 2020.
- Stream Fish* is rated 'FAIR' at this time. Two stream systems (Dorcas Creek and Willow Creek) have thresholds developed and are assessed as GOOD and POOR respectively, however, the Crane River system does not as more data needs to be collected.
- Stream Temperature* is assessed for thermal suitability to support Brook Trout, the top native predator. The three streams in this measure are ranked 'POOR', 'FAIR' and 'GOOD' respectively. The overall status is 'FAIR' and no trend was detected in any of the systems.
- The *Inland Lake Fish Community* measure remains under development and cannot be rated at this time.

4.4 Measure climate impact of our natural areas

Initiative Summary

Objective	Conduct the first comprehensive assessment of the carbon sequestration potential and trends of Northern Bruce Peninsula's natural areas	
Initial Focus Areas	1. Confirm measures required to make sequestration assessment 2. Incorporate measures into Black Bear forestry study	
Organizational Lead	Parks Canada	Study is being led by Parks Canada – who have a natural tie-in to the Climate Action Committee
Resources Requirements	N/A	Can be incorporated within existing efforts
Proposed Targets	N/A	None yet relevant
Timeline	Near-Term	2022-2023

⁵⁶ Source: Parks Canada

		• Support completion of Parks Canada's Black Bear study and national carbon sequestration atlas to measure emissions from our natural areas • Assess need for and complete further analysis is required to develop first emissions inventory for local ecosystems
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Climate Action 4.5

Improve monitoring of ecosystem health

While the previous initiative will provide a strong data-driven foundation to support the carbon sequestration potential of local ecosystems, if it remains a one-time assessment, that will be insufficient for climate action. Forestry conditions can change – often rapidly, particularly in the case of the introduction of invasive species – and so there is a need to regularly monitor for new threats.

Much of the necessary monitoring occurs already, but there is little data sharing between organisations. Parks Canada, Bruce County, local environmental non-government organizations, Saugeen Ojibway Nation and others all have various programs to monitor ecosystem health, but there is no common information sharing forum.

For example, Parks Canada has established 27 forest health plots in Bruce Peninsula National Park monitored on a five-year rotating basis. Parks Canada also conducts species-specific monitoring – such as the aforementioned black bear study. Separately, the Bruce Peninsula Biosphere Association monitors water quality in their Six Stream Project within the agricultural drainage in the Ferndale Flats area, monitors salamander populations, recently began the Red-Headed Woodpecker project and has conducted other citizen science monitoring projects.

The Climate Action plan envisions creating just such a forum to afford interested groups – such as those listed above – the opportunity to share the results of their research / monitoring and discuss potential coordinated actions to take. While assembled for different purposes, the 17-member Parks Advisory Committee, the Bruce Peninsula Biosphere Association Environmental Network, and the Sources of Knowledge Forum would be good places to discuss such an initiative.

4.5 Improve monitoring of ecosystem health

Initiative Summary

Objective	There have been numerous initiatives to analyze local ecosystem health. We will implement a regular monitoring program that coordinates these previous efforts to measure climate change impacts	
Initial Focus Areas	1. Establishing a forum for ecosystem health data sharing 2. Convene forum and establish monitoring program	
Organizational Lead	Parks Canada	• Has the broadest scope and likely the best convening power • Many of these items already pursued by local environmental non-profits

Sector Details: Ecosystems

Resources Requirements	N/A	• Relatively low effort in order to coordinate • Potential some technical expertise required depending on the scope of eventual monitoring program
Proposed Targets	N/A	• None yet relevant
Timeline	Near-Term	2022-2023 • Outreach to stakeholder groups to establish forum • Initial gatherings to establish data collection schedule



Climate Action 4.6

Maximize carbon sequestration in forests & wetlands

While protection of ecosystems is important, a variety of factors affect the quality of forest, wetlands and the overall ecosystem such as forest management, connectivity of forests, human-induced damage to ecosystems, ability of species to adapt to climate change). In order to ensure a full-functioning ecosystem, restoration is required.

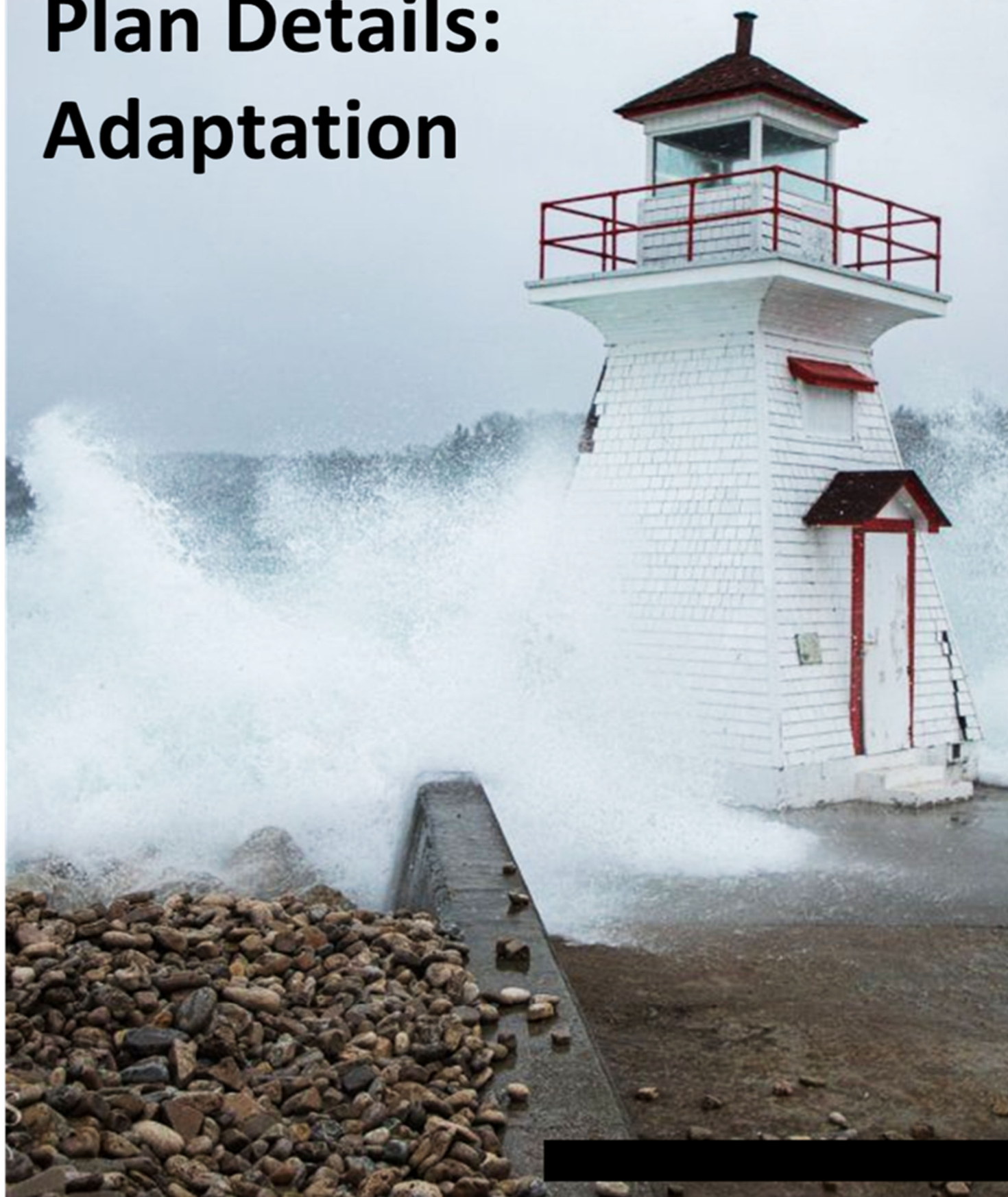
Many groups are already involved in restoration work. For example, Parks Canada is leading tree planting projects on the former agricultural land at Johnstone's Field. Parks Canada is also active in identifying and restoring trails – such as Singing Sands and several locations on Flowerpot Island. Various other non-profit groups already participate in annual tree planting and related restoration activities.

The Climate Action Plan envisions continuing these efforts over the coming decade, starting with the implementation of the forthcoming recommendations from the Black Bear Conservation Plan and Multi-species Recovery Plan.⁵⁷ Both studies are expected to identify and launch specific tree planting initiatives in order to improve forest connectivity and habitat expansion. Through the Climate Action Plan, we will support these initiatives but also ensure that they are conducted in such a way as to maximize their positive climate impact– for example, by focusing replanting on deciduous rather than coniferous trees given the former's high sequestration potential.

⁵⁷ These initiatives are being led by Parks Canada, Saugeen Ojibway Nation, and the Ontario Ministry of Natural Resources and Forestry. Both projects are scheduled to conclude in 2022.

Part 3f

Plan Details: Adaptation

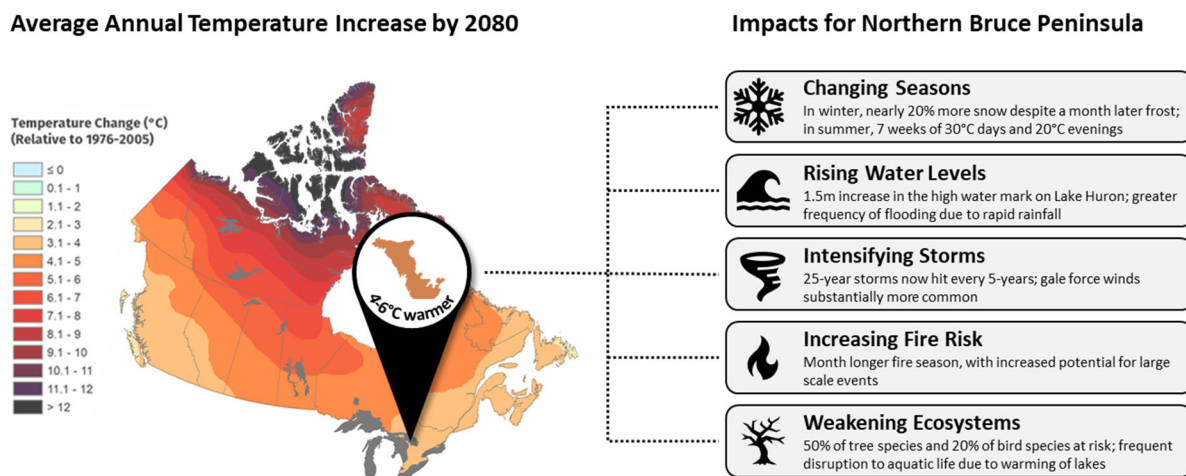


Sector Details: Climate Adaptation

Background on Climate Risks

While actions to reduce Northern Bruce Peninsula's contribution to climate change are clearly imperative, on their own they remain insufficient. Some portion of change is now unavoidable and will have significant impacts for communities across the globe. Five impacts of climate change have been identified for Northern Bruce Peninsula – summarized in Figure 51 below.

Figure 51 – Local Impacts of Climate Change



Source: Prairie Climate Centre, Climate Atlas of Canada (2019)

Northern Bruce Peninsula has a variety of community efforts and municipal programs manage risks such as these. However, most have been designed under climate conditions that will soon be a thing of the past.

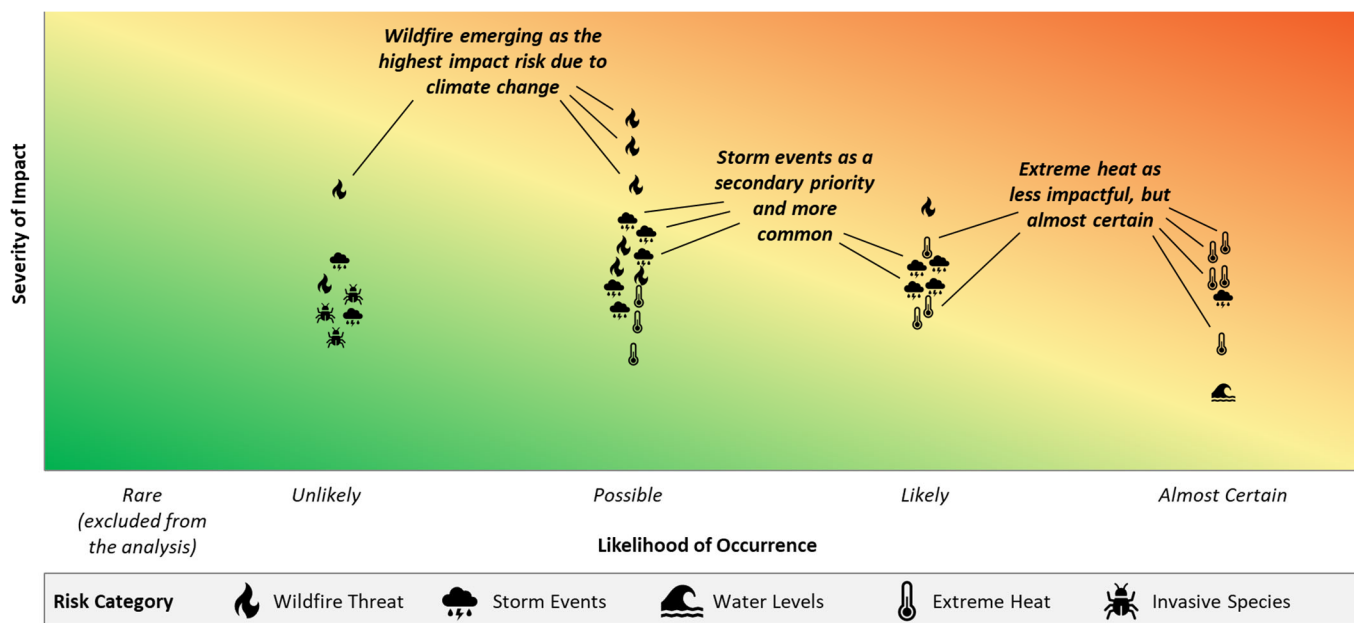
Through consultation with climate change experts, municipal staff, and community members have identified several priority risks arising from climate change. The results are illustrated in Figure 52. This iteration of the Climate Action Plan is focused on the highest priority climate change risks, although future iterations may consider other adaptation actions for additional risks.

Based on this analysis, the two highest priority risk categories for Northern Bruce Peninsula are:

- **Wildfire** is by a large margin the most significant risk for the peninsula. Not only is the likelihood of a major fire event expected to significantly increase, but the potential impact with respect to personal security, property damage, and for economic / ecological impact are severe.
- **Storm Events** are the next most significant risk relates due to increasing frequency of major wind, rain, snow and ice storms. The Peninsula's remote location, low population density, and other characteristics such as the presence of multiple single route in-and-out communities put it at particular risk.

Several other risks were identified as part of this analysis including the potential impacts of heatwaves or invasive species. These were generally deemed lower priority and thus not the focus of this version of the Climate Action Plan, but may be targeted during future iterations.

Figure 52 – Priority Climate Change Risks



Climate Action 5.1 Prevent wildfire ignition and spread

Crucial to reducing the risk of wildfire is prevention. Every individual on the peninsula has a role to play in this effort, both in reducing the number of ignitions, or helping limit fire's eventual spread. Increased tourism on the peninsula has increased the risk of fires started by visitors who may not be aware of the risk and how to mitigate it. The Climate Action Plan will use several strategies to engage the community, ensuring they are prepared to play their part.

For visitors, the focus will be on educating and enforcing fire-safety related rules. For homeowners, the Climate Action Plan will focus on deploying the FireSmart program. Developed in British Columbia but now expanding nation-wide, FireSmart educates homeowners on a variety of ways to reduce their property's exposure to fire. Examples of the tactics promoted by FireSmart are typically separated by zone – as shown in Figure 53. Working with Parks Canada, Saugeen Ojibway Nation, and others, a critical first step will be to refine the tactics used by FireSmart to ensure they are aligned to other environmental goals (e.g., avoiding excess brush clearing or deforestation).

Sector Details: Climate Adaptation

Figure 53 – FireSmart Methods for Homeowners⁵⁸



5.1 Prevent wildfire ignition and spread

Initiative Summary

Objective	New development and growing visitors are increasing the Peninsula's risk of fire. We will implement a new community program – FireSmart – designed to educate and prepare community members and visitors for fire.	
Initial Focus Areas	1. Implement FireSmart program for community education and readiness 2. Ongoing outreach and training to seasonal residents and visitors	
Organizational Lead	Municipality (Fire Chief)	- Aligns with the Municipality's ownership of emergency management plans - Potential to partner with resident / community associations for communication
Resources Requirements	Medium	Potential costs include: \$10,000 → FireSmart educational materials and delivery to the public through mail, media, social media, and in person presentations \$6,000 → Fire Department staff time to deliver the program \$4,000 → Community FireSmart Representative to champion FireSmart <i>Note: there is potential for these costs to be funded via grants; Northern Bruce Peninsula currently has a grant under consideration by Intact Climate Centre; if the grant is not approved, they would be as part of a future budget request as part of the Municipality's annual process</i>

⁵⁸ Source: British Columbia Ministry of Forests, Lands, and Natural Resources Operations

Sector Details: Climate Adaptation

Proposed Targets	N/A	No targets set for adaptation initiatives
Timeline		2022 - Establish a Community FireSmart Representative. - Contact FireSmart Canada to support a community wildfire risk assessment - Work with Sustainable Tourism Advisory Group to develop educational material for visitors and mechanisms to enhance accountability for failure to comply with requirements. 2023+ - Establish partnerships with community organizations to implement plan (e.g., resident associations)



Climate Action 5.2 Support our volunteer firefighter force

While prevention remains the most effective method to reduce the risks posed by wildfire, Northern Bruce Peninsula must also ensure it is prepared for eventual – and likely inevitable – wildfire events. Doing so will require significant additional investments in the community's volunteer-based firefighter force.

Through the Climate Action Plan, we will expand the training offered to Northern Bruce Peninsula's firefighters. To date, their training has focused on combating structural or urban fires which, while important, does not sufficiently prepare for wildfire. Along with their mutual aid partners - such as the fire departments of South Bruce Peninsula and Chippewas of Nawash - we will launch a regular certification and training program to ensure that they are prepared.

In parallel to training, the Climate Action Plan will also invest in additional wildfire-specific firefighting equipment. This will initially focus on two new portable pumps and other forest-fire specific equipment for firefighters which will help to safeguard our firefighters. Additional equipment needs will be evaluated annually as part of the Municipality's budgeting process.

5.2 Support our volunteer firefighter force

Initiative Summary

Objective	While the traditional focus of our volunteer firefighters has been on urban fire, the requirements to fight wildfire are different. We will acquire new equipment and training to prepare for this potential risk.
Initial Focus Areas	- Introduce wildfire-specific training for volunteer firefighter crews - Acquire necessary pumping equipment for wildfire

Sector Details: Climate Adaptation

	3. Create a fire protection Community Risk Assessment	
Organizational Lead	Municipality (Fire Chief)	Aligns with the Municipality's ownership of emergency management plans
Resources Requirements	~\$100,000	Potential costs include: \$41,500 → Course cost for SP103 per student is \$350 (\$17,500 for all); wages for 50 Firefighters for 16 hours of training = \$24,000 \$20,000 → Two portable pumps with a cost of \$15,000. Additional forest firefighting equipment with a cost of \$5,000 \$25,000 → Creation of a fire protection Community Risk Assessment
Proposed Targets	N/A	No targets set for adaptation initiatives
Timeline	Near-term	2022 - Firefighters from NBP and mutual aid partners take SP 103 "Municipal Fire Department Forest Firefighter Training Course" training modules - Purchase two new portable fire fighting pumps and additional equipment for fighting forest fires, including backpack style pump tanks, hoses and nozzles, racks, shovels, and brooms. 2024 - Create a fire protection Community Risk Assessment – ensuring compliance with provincial requirements



Climate Action 5.3

Expand preparations for evacuations

A crucial, final component of wildfire readiness is ensuring the entire community is prepared for the largest and potentially most disruptive events. While the Municipality's annual emergency management exercises provide an opportunity to practice wildfire-related routines and practices, the most complex scenarios are not regularly tested.

In particular, through consultation with Municipal staff, the highest potential risk identified due to climate change was a large-scale wildfire event requiring evacuation of the Peninsula. Clearly, this would be a highly complex and incredibly challenging scenario to manage. While the likelihood that such an event occurs remains small, climate change will increase that risk considerably.

The Climate Action Plan will ensure the response to this high-risk event is planned for and routinely tested. The testing will include not only Municipal staff but the various community members who will need to be involved including resident groups, paramedics, the Golden Dawn long-term care facility, Chi Cheemaun ferry, and tour boat operators.

Sector Details: Climate Adaptation

5.3 Expand preparations for evacuations

Initiative Summary

Objective	Northern Bruce Peninsula has greatly expanded its emergency planning in recent years. We will incorporate and run exercises to prepare for the highest risk climate-related events.	
Initial Focus Areas	1. Partner with tour boat operators, Chee-Cheemaun and others to test evacuation scenarios 2. Conduct biannual testing of evacuation procedures	
Organizational Lead	Municipality (Fire Chief)	• Aligns with the Municipality's ownership of emergency management plans • Would include partnership with tour boat operators – who will be key supporters of any such program
Resources Requirements	Low	• Primary costs will be staff time in order to prepare, run, and debrief on exercise • May be some compensation required for participating tour operators (e.g., for fuel and / or time)
Proposed Targets	N/A	• No targets set for adaptation initiatives
Timeline	Near-term	2022 • Convene Chi Cheemaun ferry company, and local later boat operators for exploratory session on evacuation procedures • Define basic operational parameters of how an evacuation would unfold 2023 • Conduct test of evacuation procedures, likely in low tourist season; update procedures as a result 2025+ • Regular retesting of evacuation scenarios, targeting at minimum every two years



Climate Action 5.4

Update emergency communication protocols

Each of the risks heightened by climate change highlight the need to prioritize and target support towards Northern Bruce Peninsula's most vulnerable members. Due to the Peninsula's demographics – specifically, that residents are older than regional or provincial averages – there is a higher proportion of the local community who are at increased risk and may require assistance. When combined with the limited local emergency response resources, (for example, the lack of local

Sector Details: Climate Adaptation

police force and volunteer nature of firefighters), this poses a unique challenge as climate change increases the risks the Peninsula faces.

The Climate Action Plan will invest in strong communication protocols to help prioritize and more easily reach vulnerable persons on the Peninsula. First, it will revive the Municipality’s previous at-risk persons registry – promoting the sign-up and self-registry by community members. This list will provide future emergency responders a clear set of priorities of who to contact first during major storms or other events.

Second, the Climate Action Plan will also promote the creation of local “Check Your Neighbour” programs that establish norms and procedures for contact between residents during emergencies. Such programs have been proven to be useful in many other communities as an additional channel for emergency management, outreach and prioritization. It also builds on the Peninsula’s long history of volunteerism and community involvement.

While the Municipality will champion these activities, the Climate Action Plan envisions them being jointly pursued with other community groups. The local Peninsula Family Health Team, food banks, churches, and neighbourhood associations each have their own membership and network that, once combined, will help ensure the Peninsula is better prepared to manage the increased risks posed by climate change.

5.4 Update emergency communications protocols

Initiative Summary

Objective	The Peninsula’s demographics mean it has a higher proportion of vulnerable persons. We will revitalize the municipality’s persons-at-risk registry and implement a “Check-on-your Neighbour” program.	
Initial Focus Areas	1. Develop a municipal at-risk persons registry to aid in prioritizing outreach during emergency situations 2. Encourage the development of local “check-on-you neighbour” programs	
Organizational Lead	Municipality (Clerks Office)	Aligns with the Clerk’s office’s role as the primary liaison between the community and municipality
Resources Requirements	Low	Likely only requires staff / volunteer time
Proposed Targets	N/A	No targets set for adaptation initiatives
Timeline	Ongoing	2022 - Conduct exercise to refresh at-risk persons list; includes setting parameters around confidentiality and information security - Establish procedures for regular refreshing (e.g., biannually) 2023+ - Develop education package on check-your-neighbour programs and share with resident groups

Sector Details: Climate Adaptation

- Encourage their development and promotion of programs



Climate Action 5.5 Reduce risks for isolated communities

Analysis with Municipal staff highlighted several other groups facing unique risks due to climate change that should be prioritized. With increasing potential for major storms or fires, the potential for events to physically cut-off and isolate certain parts of the community will grow. Several neighbourhoods on the Peninsula are particularly exposed to this risk of isolation as they rely on a single road for access.

The Climate Action Plan will help ensure these unique risks are addressed. Initially, the focus will be on ensuring up-to-date information about these communities – their residents, structures, and other unique features or needs. This knowledge will serve as the foundation for any neighbourhood-specific planning or responses required.

The ongoing focus of the Climate Action Plan will be ensuring there is regular outreach to these communities to inform them of their unique risks and appropriate preparedness tips.

5.5 Reduce risks for isolated communities

Initiative Summary

Objective	Several parts of the Peninsula are vulnerable to being physically cut-off during major storms (and fires). We will set up an annual campaign with these communities to help them manage during such events.	
Initial Focus Areas	1. Identify communities facing greatest isolation risk on peninsula 2. Regular communication and outreach about plans in case of emergency 3. Survey communities to better understand level of risk	
Organizational Lead	Municipality (Fire Chief)	• Aligns with the Municipality's ownership of emergency management plans • Potential to partner with local resident associations for communication and coordination
Resources Requirements	Low	• Likely requires only staff or volunteer time
Proposed Targets	N/A	• No targets set for adaptation initiatives
Timeline	Ongoing	2022

Sector Details: Climate Adaptation

	- Review existing settlement maps of Northern Bruce Peninsula and identify key communities at risk - Survey / collect information on these communities on number of homes, occupancy, seasonality, and other demographic features - Develop isolation preparedness manual / factsheet for these communities (i.e., what to do, where to go) 2023+ - Annual outreach to these communities to ensure information remains up-to-date and awareness of procedures during isolation events
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Climate Action 5.6

Increase resilience of our infrastructure

As the frequency and intensity of severe weather events grows, ensuring that Northern Bruce Peninsula’s infrastructure is appropriately prepared will be critical to ensuring the ongoing wellbeing of the community.

Similar to other initiatives, the Climate Action Plan envisions a crucial first step to better understand the specific nature of the risk posed to our infrastructure. This is most critical in terms of flooding – where at present little is known about the expected impacts of climate change. To this end, supporting the County’s current project to establish and maintain accurate flood maps is a key initial step.

More critically, the Climate Action Plan will also influence future infrastructure design standards and requirements to ensure that they adequately account for expected weather conditions due to climate change. In many cases, this will require redefining the extreme scenarios infrastructure is designed for, in order to ensure they reflect the latest climate projections. These new requirements will feature in infrastructure design, procurement, construction, and maintenance immediately, and be regularly incorporated as part of the Municipality’s Asset Management Planning.

This initiative also represents a key opportunity to address priorities of the Saugeen Ojibway Nation. In particular, developing new approaches to mitigate flood risk along Northern Bruce Peninsula’s shorelines that also address ecosystem preservation goals – such as avoidance of further shoreline hardening that reduces fish habitat – will be included as part of the analyses conducted for infrastructure development and work permits.

5.6 Increase resilience of our infrastructure	
Initiative Summary	
Objective	Northern Bruce Peninsula’s infrastructure roads, bridges, and other infrastructure were designed for climate conditions that have changed
Initial Focus Areas	1. Incorporate updated climate projections in standards for infrastructure design

Sector Details: Climate Adaptation

	2. Complete shoreline mapping to update flood risk planning and develop appropriate policy and operational responses 3. Explore opportunities to improve accessibility of Highway 6 during storms	
Organizational Lead	Municipality (Public Works Manager)	Ultimate owner of road design and repairs
Resources Requirements	Low (Evaluation only)	- These considerations can largely be incorporated / evaluated as part of other municipal studies - Note that the specific initiative around shoreline work is being funded in partnership with other municipalities
Proposed Targets	N/A	No targets set for adaptation initiatives
Timeline	Near-term (2022-2023)	Ongoing - Regularly review infrastructure design requirements to ensure that they adequately account for expected weather conditions due to climate change. Evaluate options for windbreaks on Hwy 6 in the Ferndale and Eastnor flats. - Consider climate change impacts in the design, construction and maintenance of built infrastructure 2022 - Participate in completion of shoreline mapping initiative - Evaluate options for windbreaks in Ferndale to reduce risks of road closure 2023 - Update existing flood risk assessment and emergency plans based on results of shoreline mapping



Part 4

Our Path Forward

Photo Credit: Bruce Trail Conservancy

Roles & Responsibilities

A unique feature of the Climate Action Plan is that it will be implemented by a combination of public and non-profit sectors. While many other communities are able to rely primarily on leadership from the local municipality for climate planning, due to its smaller size Northern Bruce Peninsula does not have such a luxury. Instead, local environmentally focused non-profits will play a key supporting role in delivering components of this plan. To ensure coordination between these groups and the Municipality, the Climate Action Committee is expected to continue to play a key oversight role for the overall Plan. These relationships are described in further detail in Figure 54.

Figure 54 – Climate Action Plan Roles



MUNICIPAL STAFF

Lead the initiatives in the Climate Action Plan that are specifically related to municipal policies or services. Relevant departments would include public works, facilities, and emergency management.



COMMITTEES OF COUNCIL

Lead the initiatives in the Climate Action Plan that require specific research or analysis in order to advise council on appropriate steps. While the specific committees will change over time depending on council's direction, previous committees that would be relevant include Climate and Waste Management.



COMMUNITY ORGANIZATIONS

Lead the initiatives in the Climate Action Plan that are focused on education, awareness, or promotion. These organizations will also leverage their expertise in acquiring grants in order to help fund various initiatives. Example organizations include environmental charities or neighbourhood resident groups.

Funding & Resourcing

In the development of the plan, each initiative was assessed for the level of investment required, duration of those investments (i.e., ongoing vs. one-time), and potential sources of funds (e.g., volunteering, federal / provincial grants, or the municipal budgets). In many cases, the exact amounts aren't yet known until specific research studies outlined in the plan are completed.

Figure 55 summarizes the expected resourcing needs within the plan. Where an initiative is the responsibility of the Municipality, the investments required by the Climate Action Plan are expected to be prioritized annually as part of the municipal budget process. Where an initiative is the responsibility of a community group, resources will need to be procured from either grants or volunteers.

Our Path Forward

Figure 55 – Climate Action Plan Funding Sources & Needs

Source of Funds	Description	Inclusions in the Plan
 Grant Funding (Fed / Prov)	- Primarily accessed by the community groups to support their work - Likely applied for annually (depending on length of grant)	Grant Application #1: Ongoing electrification and energy conservation campaign Grant Application #2: Charging infrastructure build-out / completion
 Operating Budget (Municipal)	- Used for any permanent changes recommended for municipal services - Brought forward annually as part of municipal budgeting process	None yet proposed until further study completed Potential inclusions: organic / yard waste disposal budget; wildfire prevention strategies; retrofit financing support for homeowners / businesses
 Capital Budget (Municipal)	- Used for infrastructure improvements to improve climate resilience - Likely to be project dependent (i.e., investment made)	Capital Investment #1: firefighting equipment Capital Investment #2: arena energy efficiency Others investments TBD and will be timed with asset replacement schedule (e.g., cycling infrastructure, vehicle replacement)

Proposed Workplan

Northern Bruce Peninsula's Climate Action Plan is targeted for implementation by 2030. This timeframe was selected due to its alignment with the internationally recognized window for society to act on climate change in order to avoid its most significant consequences. Although there are still many significant climate actions required after 2030 to prevent and protect against climate change – such as achieving net-zero for all homes and buildings – these are outside of the scope of this Plan.

The proposed timeline for the Climate Action Plan is shown below. Recognizing the inherent uncertainty in Climate Action Planning – for example, due to future changes in technology or government policy – it focuses on specific, high-priority initiatives in the early years of the plan (2022 – 2026).

Overall, this timeline should be viewed as a guide: it reflects the ideal sequencing of work but will evolve over time as other priorities emerge or funding becomes available. Ultimately, the availability of funding, capacity of resources, and alignment with other municipal strategies and priorities will be the primary guide for this work.

Our Path Forward

Pillar	Initiative	Lead Organization	Resourcing		Timeline					
			Expected Cost	Resourcing Type	2022	2023	2024	2025	2026+	
 CUTTING CONSUMPTION Reducing day-to-day through improved efficiency and conservation	1.1 Conservation Campaign	Community Orgs	Low	Grant / Volunteering	Plan & Launch		Ongoing Execution & Refinement			
	1.2 Municipal Policies	Municipality	N/A	-	Policy Analysis & Proposals					
	1.3 Efficiency Industry	Cmttee of Council	Low	Grant / Volunteering	Recruiting	Training Support & Funding				
	1.4 Cycling Infrastructure	Municipality	TBD (Med)	Capital Budget			TBD based on future municipal / county plans			
	1.5 Pedestrian Mobility	Municipality	TBD (Low)	Capital Budget	Safety Improvements		Remainder TBD based on future municipal plans			
	1.6 Off-peninsula trips	Cmttee of Council	Low	Grant / Fundraising	Visitor Emissions Strategy					
 ELECTRIFYING EVERYTHING Transitioning to electricity for energy needs and eliminating fossil fuels	2.1 Home Electrification	Community Orgs	Low	Grant / Volunteering		Ongoing Execution & Refinement				
	2.2 Retrofit Funding Program	Municipality	TBD	Operating Budget		Feasibility Study				
	2.3 Municipal Facility Retrofit	Municipality	TBD (High)	Capital Budget	Design & Implement for Arena		Remainder TBD based on future municipal plans			
	2.4 Electric Vehicle Campaign	Community Orgs	Low	Grant / Volunteering		Ongoing Execution & Refinement				
	2.5 Charging Infrastructure	Cmttee of Council	Med	Fundraising / Grants	Promote Private Charger Installs	Expand Public Charger Network				
	2.6 Heavy-Duty Vehicles	Cmttee of Council	N/A	-		Ongoing Monitoring & Analysis				
 WIPING-OUT WASTE Reducing solid waste generation within the community and its corresponding emissions	3.1 Backyard Composting	Cmttee of Council	Low	Volunteering	Waste Audits & Surveys	Ongoing Promotion & Refinement				
	3.2 Organic Collection	Municipality	TBD (High)	Operating Budget		Feasibility Study				
	3.3 Yard Waste Alternatives	Cmttee of Council	TBD (Med)	Operating Budget	Analysis & Identification		Remainder TBD based on results of analysis			
	3.4 New Recycling Options	Municipality	TBD (Med)	Operating Budget	Analysis & Identification		Remainder TBD based on results of analysis			
	3.5 Blue Box Adoption	Cmttee of Council	Low	Volunteering		Analysis of Options				
	3.6 Waste Policies	Municipality	N/A	-	Reassess Fees	Update Waste Plan	Ongoing Implementation of Policy Changes			

Our Path Forward

Pillar	Initiative	Lead Organization	Resourcing		Timeline					
			Expected Cost	Resourcing Type	2022	2023	2024	2025	2026+	
 NURTURING NATURE Protecting the natural environment's ability to sequester carbon	4.1 Sustainable Farming	Community Orgs	Low	Grant / Volunteering		Ongoing Execution & Refinement				
	4.2 On-Farm Innovation	Community Orgs	Low	Grant / Volunteering		TBD	Annual pilot	Annual pilot	Annual pilot	
	4.3 Protect Farmland	Municipality	N/A	-		Ongoing Activity				
	4.4 Carbon Inventory	Parks Canada	Low	Grant / Volunteering		Develop inventory & recommendations				
	4.5 Ecosystem Monitoring	Parks Canada	Low	Grant / Volunteering		Establish forum	Ongoing Information Sharing			
	4.6 Ecosystem Restoration	Parks Canada	TBD	Capital budget		Complete species conservation studies	Remainder TBD based on results of studies			
 PROTECTING THE PENINSULA Reducing the risks and impacts from climate change	5.1 Prevent Wildfire	Municipality	Med	Grant / Operating Budget		Launch FireSmart	Ongoing Execution & Refinement			
	5.2 Support Firefighters	Municipality	Med	Grant / Capital Budget		Equipment & Training Purchases	Fire Risk Assessment			
	5.3 Evacuation Preparedness	Municipality	N/A	-		Initial Planning & Coordination	Bi-annual practice	Bi-annual practice	Bi-annual practice	
	5.4 Emergency Comms	Cmtee of Council	N/A	-		Refresh Vulnerable People Lists				
	5.5 Isolated Communities	Cmtee of Council	N/A	-		Develop Resources				
	5.6 Infrastructure Resilience	Municipality	TBD (High)	Capital Budget		Shoreline Map	Update flood risk assessments			

Policy Enhancements

While the workplan addresses the known areas requiring climate action, undoubtedly more will arise throughout the course of implementing the Plan. Many of these will be in response to new opportunities – such as emerging technologies – or initiatives by other levels of government. Naturally, this Climate Action Plan – developed in 2021 and 2022 – cannot anticipate all of these future developments.

However, the Plan can prepare for them. In part, this will be achieved through regular monitoring of progress and making adjustments accordingly – as described in the following section. However, equally critical will be a series of policy enhancements designed to embed consideration of climate change into all decisions made by the Municipality – not just those identified in this plan.

To achieve this goal, two specific policies have been identified:

- The **Climate Lens Policy** integrates action for climate change into decision-making throughout the Municipality. The policy outlines a process to help the Municipality achieve the targets and actions identified in the Climate Action Plan. These actions identified focus on mitigation and adaptation measures in the key areas of transportation, waste, and facilities management.
- The **Green Procurement Policy** is a specific version of the Climate Lens. It is designed to ensure that all major municipal purchases include an assessment of the climate compatibility of the goods and services being procured – as well as the vendors who are providing them.

Drafts of these policies and further descriptions of how they can be implemented are described in Appendix E.

Monitoring Progress

A crucial component of any Climate Action Plan is measuring the impact of initiatives to ensure that the overall emissions reduction targets are being met. Not only is this a key requirement of the Federation of Canadian Municipalities Partners for Climate Protection Program – of which Northern Bruce Peninsula is member – but it will help diagnose implementation issues early enough to be addressed.

Figure 56 shows the three components to the Climate Action Plan's measurement approach. The annual measurement is focused on measuring corporate emissions. The semi-annual measurements track progress against the initiatives within the plan. Finally, the measurements conducted every four years are envisioned as a full reproduction of the analysis contained within this plan in order to facilitate the evaluation and adjustment of initiatives.

Figure 56 – Climate action Plan Measurement Approach

	Corporate Emissions Update	Climate Action Plan Update	Community Emissions Update
Frequency	Every Year	Every 2 Years	Every 4 Years
Responsibility	Municipal Staff (potentially supported by Climate Committee)	Committee of Council (supported by community organizations and municipal staff where necessary for data gathering)	
Approach	- Focus is on municipal energy consumption - Estimates developed using financial reports	Focus is on the initiatives in the plan and evaluating progress against them	- Focus is on updating emissions inventory - Reuse templates from initial exercise
Example Metrics <i>(To be confirmed as part of assessments)</i>	- Total spend and energy consumption - Broken down by facility and energy type (e.g., gasoline vs. propane vs. electricity)	Total number of plan initiatives launched, in progress, or completed	- Emissions by sector over time and projected - Note: will likely reassess emissions target

Appendix A

Emissions Inventory Methodology

Appendix A – Emissions Methodology

Background

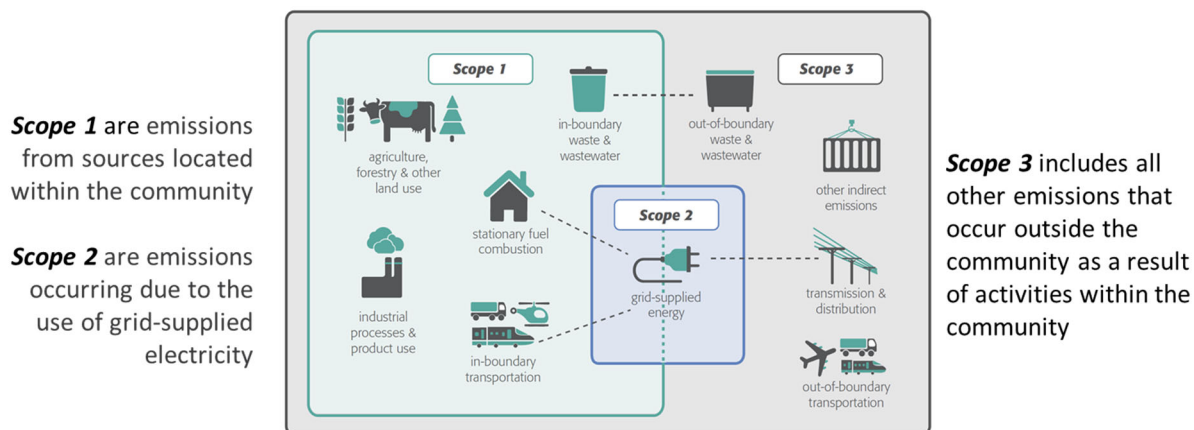
Northern Bruce Peninsula’s emissions inventory was developed using the guidance of globally recognized best practices. As its core, the emissions inventory follows the Global Protocol for Community Scale Greenhouse Gas Emission Inventories (GPC Protocol) – a global standard methodology for data capture and emissions estimation. The inventory also uses the Partners for Climate Protection Protocol (PCP Protocol) – a Canada-specific supplement describing additional methodological considerations and assumptions that are unique to the Canadian context.

The approach and methodology were frequently reviewed by the Climate Action Committee membership as well as other subject matter experts to ensure it represented a credible and fair estimate of emissions contribution. The Committee is also grateful to the staff of the Federation of Canadian Municipalities and ICLEI – Local Governments for Sustainability for their review and recommendations during this process.

Scope

When estimating emissions, communities must first consider the scope of their inventories. Per Figure 57, the GPC Protocol typically recognizes three distinct scopes of emissions that can be considered:

Figure 57 – GPC Protocol Emissions Inventory Scopes



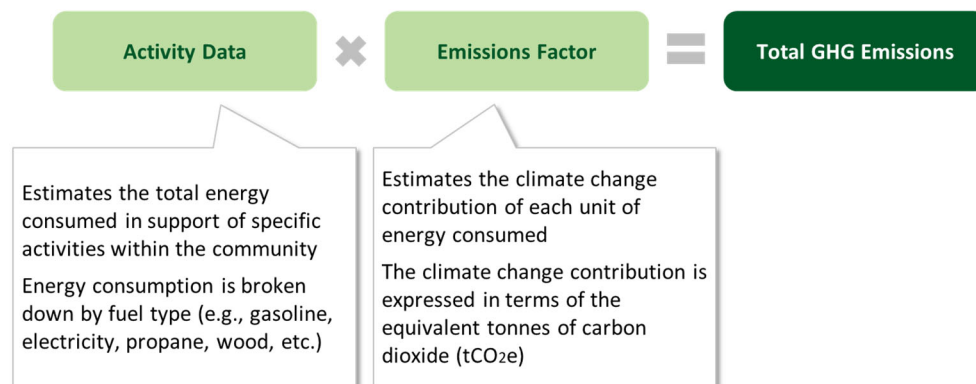
Based on a review of peer examples, the Northern Bruce Peninsula emissions inventory focuses on only Scope 1 and Scope 2 emissions – with some exclusions, such as agriculture – as they are the least computationally complex and the most addressable through specific initiatives. Scope 3 emissions may be considered as part of future inventories.

Approach

Emissions inventories are developed in a two-stage process shown in Figure 58. The first step involves estimating the amount (and type) of energy consumed by specific activities within the community – such as the distance traveled, or heat produced. The second step then applies a specific “emissions factor” to each unit of this energy consumption in order to estimate its GHG contribution.

Appendix A – Emissions Methodology

Figure 58 – Emissions Inventory Calculation Approach



Note that in order to apply an emissions factor, all emission types – such as carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) – were required to be converted to a common unit of measure. As is standard practice, all emissions gases were converted to carbon dioxide equivalents (CO₂e), using the Intergovernmental Panel on Climate Change (IPCC) 4th Assessment global warming potentials. Note that other greenhouse gas emissions were deemed immaterial for the purposes of the inventory.

Methodology & Data

The baseline year for the emissions inventory is 2016. This was found to be the year with the most complete dataset and was able to rely on more accurate census information for several key measures.

Where possible the emissions inventory was developed with observed activity and energy consumption data from the community. Where this proved impractical, a combination of census or survey data was the preferred alternative. Peer, provincial, or national averages have been used only where necessary.

For the Corporate Inventory, the municipality provided actual observed energy consumption and cost data wherever available (e.g., buildings fleet, streetlights, waste-water management). In some instances, energy consumption has been estimated by taking the total expenses paid and dividing it by an average per unit price – such as converting total fleet fuel expense to total gasoline / diesel consumption.

For the Community Inventory, seven components were considered:

1. Stationary Energy – Residential
2. Stationary Energy – Non-Residential
3. Transportation – On-road
4. Transportation – Off-road
5. Transportation – Waterborne
6. Transportation – Airborne
7. Solid Waste

The methodology and assumptions for each of these components is described in detail below.

Appendix A – Emissions Methodology

Source	Calculation Approach	Source	Comments & Assumptions
Buildings – Residential	Total Units	StatsCan	Heating Energy by Type: BPBA survey was conducted in Summer 2021 of 400+ local residents Energy Intensity: uses provincial average for single family home. Electricity Consumption: uses data provided by HydroOne for residential sector (base year of 2020)
	Average Size	StatsCan	
	Total Size (m²)		
	Avg Energy Intensity (GJ per m ²)	NRCan	
	Total Energy Use	NRCan	
	Energy used for Heating (%)		
	Total Heating Energy	BPBA Energy Survey	
Buildings – Non-Residential	Heating Split by Energy Source (%)		Electricity Consumption: uses data provided by HydroOne for residential sector (base year of 2020)
	Total Heating Energy by Source		
	Emissions Factor by Source	NRCan	
	Total Residential Emissions (tCO₂e)		
	Total Residential Assessment (\$)	MNBP	
	Total Non-Residential Assessment (\$)	MNBP	
	Ratio of Residential to Non-Residential		
Transportation – On-Road	Total Residential Emissions	See above	Heavy Duty Vehicles: same process / methodology used to estimate emissions and then add to the total Exclusions: trips made by tourists / visitors are not included as part of the inventory
	Ratio of Residential to Non-Residential	See above	
	Total Non-Residential Emissions (tCO₂e)		
	Total Permanent Households	StatsCan	
	Average Vehicles (per Household)	BPBA Transport Survey	
	Total Vehicles		
	Average Vehicle KMs Traveled	BPBA Transport Survey	
	Total KMs Traveled		
	% Of Light Duty Vehicles	BPBA Transport Survey	
	Total KMs by Light Duty Vehicles		
	Fuel per KM for Light Duty Vehicles	PCP Protocol	
	Total Fuel Consumed		
	Emissions Factor by Source	NRCan	
	Total Emissions		

Appendix A – Emissions Methodology

Source	Calculation Approach	Source	Comments & Assumptions
Transportation – Airborne	Total Fuel Sold at Municipal Airports (\$)	<i>MNBP Various Public Sources NRCan</i>	- Only one municipal airport (Tobermory) and all fuel sales will be concentrated there - Captures substantially all non-commercial boating activities - Does not yet capture several larger operators with private fuel supplies (e.g., Chi-Cheemaun, Tour operators)
	÷ <u>Average Aviation Fuel Price (\$ / L)</u>		
	Total Aviation Fuel Consumed		
	X <u>Emissions Factor by Source</u>		
Transportation – Waterborne	Total Emissions	<i>MNBP Various Public Sources NRCan</i>	
	Total Fuel Sold at Municipal Marinas (\$)		
	÷ <u>Average Aviation Fuel Price (\$ / L)</u>		
	Total Aviation Fuel Consumed		
Solid Waste	X <u>Emissions Factor by Source</u>	<i>MNBP MNBP PCP Protocol PCP Protocol</i>	
	Total Emissions		
	Total Waste Generated		
	X <u>Percentage of Waste Diverted</u>		
	Net Waste Generated		
	X <u>Waste Composition by Type (%)</u>		
	Net Waste by Type		
	x <u>Degradable Carbon by Type</u>		
	Total Degradable Carbon		
	<i>Degradable carbon is then converted into its Methane Generation Potential, which is converted to its CO₂ equivalents</i>		
	<i>For more details on the methodology, see the PCP Protocol section on Solid Waste</i>		

Appendix A – Emissions Methodology

Inventory Exclusions

As previously mentioned, Northern Bruce Peninsula’s emissions inventory focuses on Scope 1 and 2 emissions. However, even within these scopes there three categories of emissions that have been excluded from this Climate Action Plan.

The first exclusion was **visitor emissions** as there was insufficient data available on the number of visitors and distances traveled in order to develop a credible estimate. Instead, the Climate Action Plan envisions participating in the University of Waterloo’s Tourism Community Emissions Study – a project with other seasonal destinations in Ontario to measure and strategize for ways to reduce visitor emissions. The results of that study will be added to the Northern Bruce Peninsula emissions inventory in future iterations. This work is described in greater detail in initiative *1.6 Reduce emissions from off-peninsula trips*.

The second exclusion from the inventory was **ecosystem emissions** – such as those resulting from release or storage of carbon by our forests and wetlands. Similar to visitor emissions, there was insufficient data available in order to develop an appropriate estimate, however the Climate Action Plan envisions participating in separate studies to close this gap. Several initiatives underway by Parks Canada will provide the information necessary in order to complete a local emissions estimate that also will be added in future iterations of the Plan. This work is described in further detail in initiative *4.4 Measure climate impact of our natural areas*.

The final exclusion from our emissions inventory was **agricultural emissions**. Estimating agricultural emissions is notoriously challenging due to data limitations, uncertainty regarding scope, and scientific disagreements regarding the appropriate methodologies. These emissions were also not required as part of the Federation of Canadian Municipalities’ Partners for Climate Protection Program in which Northern Bruce Peninsula was participating.

However, as part of the Climate Action Plan work a preliminary estimate was still developed. Two approaches were used: one bottom-up based on livestock / farm counts, and one based on regional estimates. In both cases, only “on-farm” emissions were considered while various “off-farm” activities contributing to farming were excluded.⁵⁹ Additionally, all emissions were converted to their CO₂ equivalent (CO₂E). This is particularly important for agriculture as farming activities generate a variety of different emissions which contribute differently to climate change.⁶⁰

While more precision is needed before including agricultural emissions in our emission inventory, the preliminary estimates they provide are useful in determining which initiatives we should pursue through the Climate Action Plan. Further details on the results of these estimation approaches are provided below.

⁵⁹ Examples of “off-farm” emitting activities includes transportation of farm products to markets or processing centers (thereby generating vehicle emissions) or processing of fertilizer for farm use (generating emissions due to the energy intensity of producing fertilizer).

⁶⁰ For example, emitting 1kg of Nitrous Oxide (N₂O) has 310 times the effect on global warming as emitting 1kg Carbon Dioxide (CO₂). N₂O emissions are particularly important in the agricultural context as they are a repercussion of widespread fertilizer use.

Appendix A – Emissions Methodology

Agricultural Emissions Method #1: Bottom-up

The bottom-up emissions estimation approach breaks down emissions into four sources shown below:

Source	Description	Calculation Approach	Source(s)
Soil Organic Carbon (SOC)	Gradual release of CO ₂ into the atmosphere due to the decomposition of organic matter	X Agricultural Land in hectares (HA) X <u>Loss of SOC per HA per year</u> Total CO₂	Ontario Ministry of Agriculture, Food, and Rural Affairs
On-Farm Fossil Fuels	CO ₂ produced from the burning of fossil fuels to power on-farm equipment ⁶¹	X Agricultural Land X <u>Fuel Consumption per HA</u> Total Fuel in Litres X <u>Emissions Factor for Gas / Diesel</u> Total CO₂	Ontario Ministry of Agriculture, Food, and Rural Affairs PCP Protocol
Livestock Emissions	Methane production of manure or enteric fermentation as a result of digestion	X Total Livestock Counts X <u>Methane generation per Livestock</u> Total Fuel in Litres X <u>Emissions Factor for Methane</u> Total CO₂	Bruce County Ontario Ministry of Agriculture, Food, and Rural Affairs
Fertilizer Application	Gradual release of Nitrous Oxide (N ₂ O) as a result of the decomposition of fertilizers	X Agricultural Land X <u>Fertilizer Use per HA</u> Total N₂O X <u>Emissions Factor for N₂O</u> Total CO₂	Ontario Ministry of Agriculture, Food, and Rural Affairs

Total agricultural emissions under this method equate to 4,000 tonnes of CO₂e per year. This represents 10-15% of total annual emissions if it were included within our inventory. The vast majority of these emissions are from fertilizer use, with a meaningful proportion resulting from livestock as well.

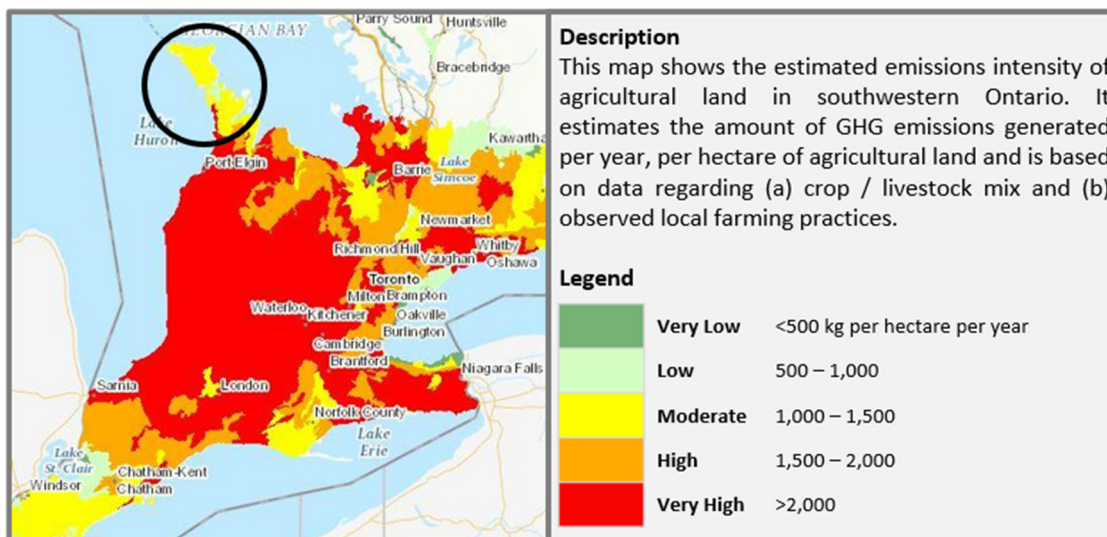
Agricultural Emissions Method #2: Top-Down

The top-down method estimates total emissions based on total farming land area and an estimate of emissions intensity of agricultural activities that take place therein. The intensity is intended to account for each of the four primary sources of agricultural emissions identified in the bottom-up methodology described above. Total productive agricultural land is provided via the Agricultural Census performed by Statistics Canada, whereas the emissions intensity of land is estimated by the Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAFRA).

As shown in Figure 59, OMAFRA estimates greenhouse gas emissions to be between 1,000 - 1,500 kg CO₂e per hectare per year in Northern Bruce Peninsula. This falls within the “moderate” range provincially - with the large proportion of higher emitting cattle increasing the emissions intensity. Countering this factor is the small average size of local farms. **Total agricultural emissions under this method equate to 10,000 tonnes of CO₂e per year. This represents 20-30% of total annual emissions if it were included within our inventory.**

⁶¹ Note that energy use associated with farming properties (such as electricity or propane) have already been estimated as part of the overall Buildings sector. They are not specifically included here.

Figure 59 –Agricultural Emissions Intensity in Southwestern Ontario⁶²



⁶² Source: *Government of Canada, Agricultural Greenhouse Gas Indicator (2021)*

Appendix B

Emissions Projection Methodology

Appendix B – Projection Methodology

Background

Future emissions are estimated by applying a growth rate to the emissions inventory for a baseline year. This growth rate may vary by inventory (i.e., corporate or community) and category (e.g., buildings, transportation, waste, etc.). The growth rate is typically influenced by several factors, such as:

- **Demographic Change** (e.g., population growth, household formations)
- **Behavioral Changes** (e.g., commuting needs, consumption habits)
- **Economic Activity** (e.g., business or production expansion)
- **Policy Initiatives** (e.g., federal, provincial)

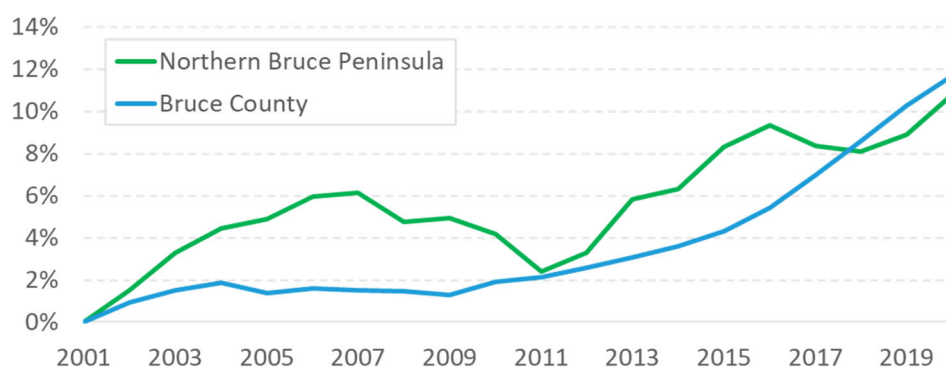
Combining these factors into a credible growth estimate can be challenging as their impacts are frequently interdependent and their future trajectories are unclear. The FCM PCP program typically recommends municipalities take a more simplistic approach that relies on a small subset of dominant factors which are likely to account for the majority of change in the forecast period.

Approach & Results

For the Northern Bruce Peninsula, expected future population growth was selected as the primary driver of future emissions. This approach was chosen due to the fact that the baseline inventory skews heavily towards residential emissions – which are closely tied to population growth. Business emissions are a relatively small portion of total emissions but are also primarily tied to population (e.g., retail, health, education).

Updated population projections are provided by the Ontario Ministry of Finance on an annual basis in between national census surveys. Note that projections are provided for Census Divisions – in our case, Bruce County – and not for Census Subdivisions like Northern Bruce Peninsula. Per Figure 60, however, the county and municipality have grown similarly over the past two decades – notwithstanding brief fluctuations in the mid-2000s and mid-2010s. For the purposes of our emissions inventory, we have assumed that the Municipality's population will grow at a similar rate to the county.

Figure 60 – Historical Population Growth Percentage (Indexed to the year 2000)



Source: Statistics Canada, Population estimates, July 1, by census subdivision, 2016 boundaries

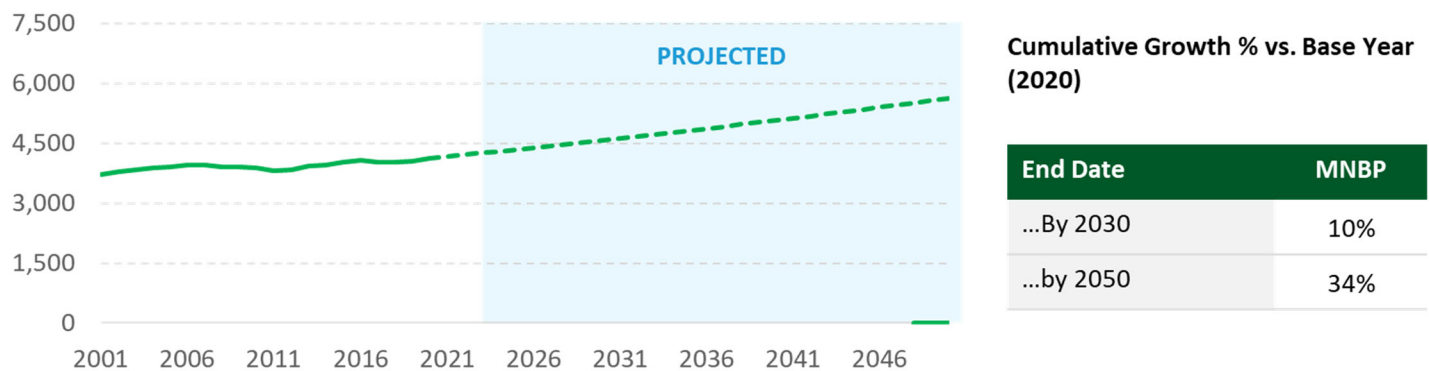
Compound Annual Growth Rates (%)

Period	MNBP	BC
2000-20	0.54%	0.59%
2010-20	0.62%	0.92%
2018-20	1.25%	1.43%

Appendix B – Projection Methodology

Based on the above, Figure 61 shows the projected population growth for Northern Bruce Peninsula. It implies a total growth in population of 12% by 2030 and 34% by 2046.

Figure 61 – Projected Population Growth for Northern Bruce Peninsula



Source: Statistics Canada for 2020 and Ontario Ministry of Finance projections (Spring 2021).

Impact of Policy Initiatives

Northern Bruce Peninsula does not operate in a vacuum – other levels of government will have significant influences on its ability to meet climate-related goals as well. Both the Federal and Provincial governments have climate action related plans of their own with a host of initiatives designed to reduce emissions and minimize the impacts of climate changes.

In order to determine which initiatives would be relevant for Northern Bruce Peninsula, we used three criteria:

- **Specific** – only initiatives targeting specific sectors or emitters were included
- **Enforceable** – initiatives must have explicit, quantifiable impacts to be included
- **Time-Bound** – initiatives need to identify a specific time horizon for compliance

As a result of these criteria, three initiatives were identified as primary influencers of our climate plan:

- New Building Codes (Federal)
- Fuel Efficiency Standards (Provincial)
- Electric Vehicle Mandates (Federal)

The approach for incorporating each of these initiatives is described in detail below.

Buildings - New Building Codes

The 2016 Pan-Canadian Framework calls for all new buildings to be “Net-Zero Energy Ready” by 2030.

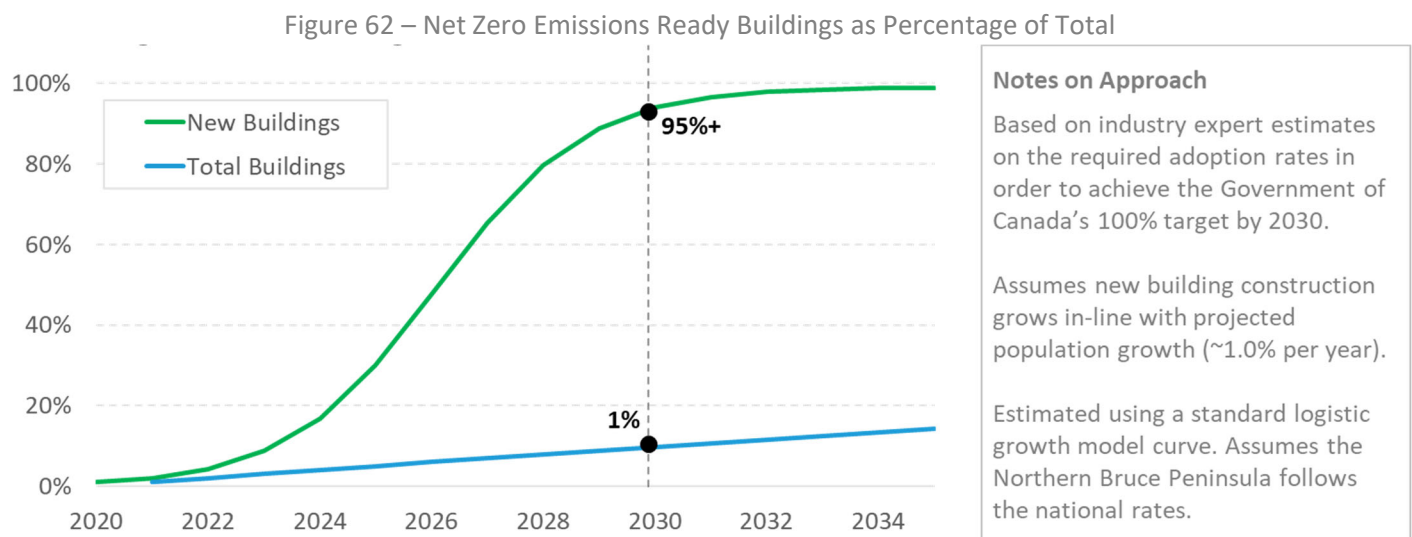
This is distinct from Net-Zero Energy (NEZ) buildings, which includes only those that use energy that can be generated through on-site renewable sources (e.g., solar or geothermal). By contrast, Net-Zero Energy Ready (NEZr) term recognizes that on-site renewable energy technology may not be ready or practical by 2030, but other features of the buildings should be prepared for its eventual implementation when the technology is available. Note that NEZr buildings also require a

Appendix B – Projection Methodology

variety of efficiency improvements relative to traditional construction methods – such as changes in building orientation to maximize passive heat absorption from sunlight.

The proposal will be enforced through the provincial level building codes based on a “model code” (i.e., a blueprint) introduced by the federal government in 2020. While NEZ buildings are ~100% more efficient (given their exclusive use of on-site renewable sources) NEZr buildings are estimated to be between 40-50% more efficient.

Adoption of the new approaches is estimated to be slow near-term, rising in the latter portion of the decade and reaching 100% adoption by 2030. As the regulation only applies to newly constructed homes, a significant portion of the housing stock in Northern Bruce will remain unaffected – overall, only 10% of homes are expected to be NEZr by 2030. The result is a 2% reduction in overall emissions, or 5% of total emissions from the buildings sector.



Transportation - Fuel Efficiency Standards

Provincial legislation in Ontario mandates 15% of fuels must be from renewable sources - such as ethanol - by 2030. These sources typically yield ~50% lower emissions than typical sources. Currently renewable fuels represent only ~5% of total fuel volume, implying a decrease of ~5% of total transportation emissions as this standard is adopted.

Transportation - Zero-Emission Vehicles

ZEVs primarily refers to electric vehicles, given their reliance on a (relatively) low emitting electricity grid in Ontario. Several factors beyond our control will drive ZEV adoption, particularly technological innovation improving the affordability and availability – the impacts of which are not modeled in our inventory.

Legislatively, there are several complementary initiatives that will influence adoption. Specifically:

- The Federal government’s ZEV mandate, which presently requires 100% of new vehicles sold by 2035 to be zero-emissions

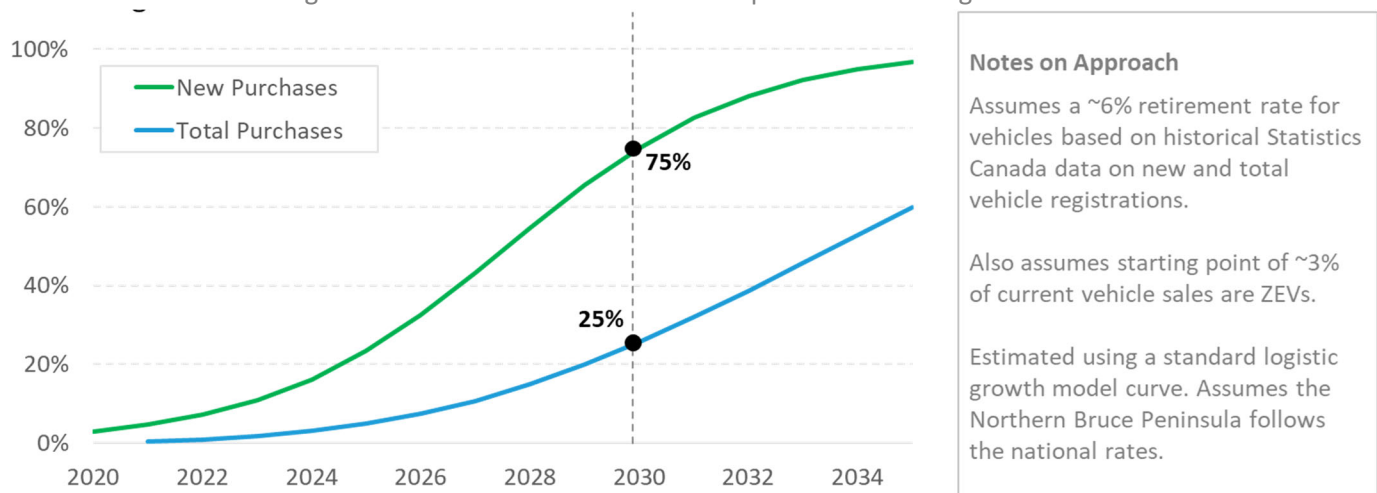
Appendix B – Projection Methodology

- The Federal government’s new Passenger & Light Truck emissions regulations, which targets at 1.5-5.0% improvement annual improvement in fuel efficiency by 2025, primarily through the adoption of ZEVs

Modeling the impacts of these changes is similar to ZEV buildings. There is a gradual adoption curve, culminating in 100% adoption of ZEVs at 2035 (which is outside of our projection window). The adoption will be gradual – likely starting slow in the early parts of the decade and accelerating as the ZEV mandate approaches. As the regulation only applies to newly purchased vehicles, a significant portion of the current fleet in Northern Bruce Peninsula will remain unaffected – overall, ~25% of vehicles are expected to be ZEVs by 2030

Overall, the result is a ~15% reduction in overall emissions.

Figure 63 – Zero-Emission Vehicles Adoption as Percentage of Total



Appendix B – Projection Methodology

Baseline & Target Years

The Federation of Canadian Municipalities typically recommends selecting a baseline year for the purposes of setting emissions reduction targets that aligns most closely with the data used to develop the corporate / community emissions inventory. Recognizing that emissions inventories will unavoidably include a variety of assumptions and datasets, the intent is to ensure that the baseline year is as accurate as possible for the purposes of setting targets.

For Northern Bruce Peninsula, a baseline year of 2020 was chosen given that it matched the source year for several key datapoints –including electricity consumption, waste generation, and municipal energy use – or was sufficiently close to recent survey data conducted in 2021 – in particular, for heating source types, vehicles per household, and vehicle types.

2030 was selected as the target year given its alignments with key milestones in the federal government’s climate plans.

Figure 64 – Emissions Inventory Key Data & Assumptions

Sector	Data / Assumption	Year	Source	Region
Buildings	# of Households	2016	Statistics Canada	Local
Buildings	Average Size (Sqft)	2016	Statistics Canada	Local
Buildings	Energy Intensity Per Sqft	2018	Natural Resources Canada	National
Buildings	Heating as % of Energy use	2018	Natural Resources Canada	National
Buildings	Heating Type as % of Total	2021	Bruce Peninsula Biosphere Association	Local
Buildings	Electricity Demand	2020	HydroOne	Local
Transportation	Vehicles Per Household	2021	Bruce Peninsula Biosphere Association	Local
Transportation	Avg. Travel Per Vehicle	2013	Federation of Canadian Municipalities	Provincial
Transportation	Vehicles by Type	2021	Bruce Peninsula Biosphere Association	Local
Transportation	Fuel Usage per KM by Type	2013	Federation of Canadian Municipalities	National
Solid Waste	Total Waste Generated	2020	Municipality of Northern Bruce	Local
Solid Waste	Waste Generated by Type	2013	Federation of Canadian Municipalities	National
Municipal	Building Energy Use	2020	Municipality of Northern Bruce	Local
Municipal	Fuel Usage	2020	Municipality of Northern Bruce	Local

Target Setting

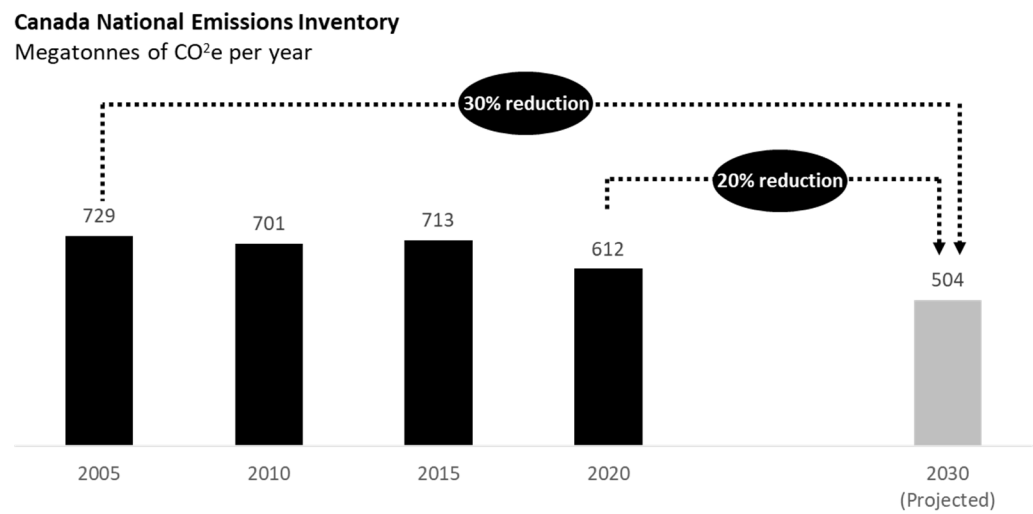
When developing the target for Northern Bruce Peninsula, the project team evaluated targets set by peer municipalities with similar populations (i.e., fewer than 10,000 residents). Though different baseline and target years made comparison more difficult, in general, emissions reduction targets ranged from a low of 6% (from 2015 – 2028) to a high of 24% (from 2016 – 2036).

A separate key consideration of the project team was the federal targets, given the extensive influence federal initiatives have on emissions reduction potential at the local level. The Government of Canada has set increasingly ambitious emissions reduction targets over time. Although the most recently announced federal targets call for a 40% reduction by 2030 from 2005 levels, not all of these reductions are accounted for within existing policies. As such, the previous 30% reduction target by 2030 from 2005 levels was used for the purposes of comparison. Converting this target from a baseline

Appendix B – Projection Methodology

year of 2005 – which was used in the Federal Plan – to a baseline year of 2020 – which was used in the Northern Bruce Peninsula plan – results in an emissions reduction target of ~20% by 2030.

Figure 65 – Federal Emissions Reduction Targets



Appendix B – Projection Methodology

Inventory Results

The breakdown of our emissions target by sector and energy source is shown below. The differences in reduction potential reflect the expected focuses of individual initiatives.

Figure 66 – Detailed Emissions Inventory (tCO₂e)

Category	2020	2030	% Reduction
1. BUILDINGS	14,060,909	12,601,837	-10%
Commercial & Industrial	1,392,852	1,278,291	-8%
Electricity	296,546	350,676	18%
Fuel Oil	89,619	65,997	-26%
Propane	881,703	730,462	-17%
Wood	124,984	131,157	5%
Municipal	215,154	165,862	-23%
Electricity	40,678	38,644	-5%
Fuel Oil	43,670	29,114	-33%
Propane	130,806	98,105	-25%
Residential	12,452,903	11,157,684	-10%
Electricity	1,031,090	1,493,367	45%
Fuel Oil	933,689	687,582	-26%
Propane	9,185,985	7,610,282	-17%
Wood	1,302,139	1,366,453	5%
2. SOLID WASTE	4,822,364	4,794,201	-1%
Food	652,467	648,657	-1%
Garden	682,537	678,551	-1%
Paper/Cardboard	1,177,000	1,170,126	-1%
Plastics & Other	1,069,099	1,062,855	-1%
Textiles	122,817	122,100	-1%
Wood Products	1,118,444	1,111,912	-1%
3. TRANSPORTATION	16,084,462	10,106,186	-37%
Aviation	10,524	11,625	10%
Municipal	372,951	223,771	-40%
Diesel	327,712	196,627	-40%
Gasoline	45,239	27,143	-40%
Off-Road	1,091,230	652,722	-40%
Residents, On-Road	13,663,600	8,172,922	-40%
On-Road Electricity	-	-	-
On-Road Fuel	13,663,600	8,172,922	-40%
Visitors, On-Road	-	-	-
Waterborne	946,157	1,045,146	10%
GRAND TOTAL	34,967,735	27,502,224	-21%

Appendix C

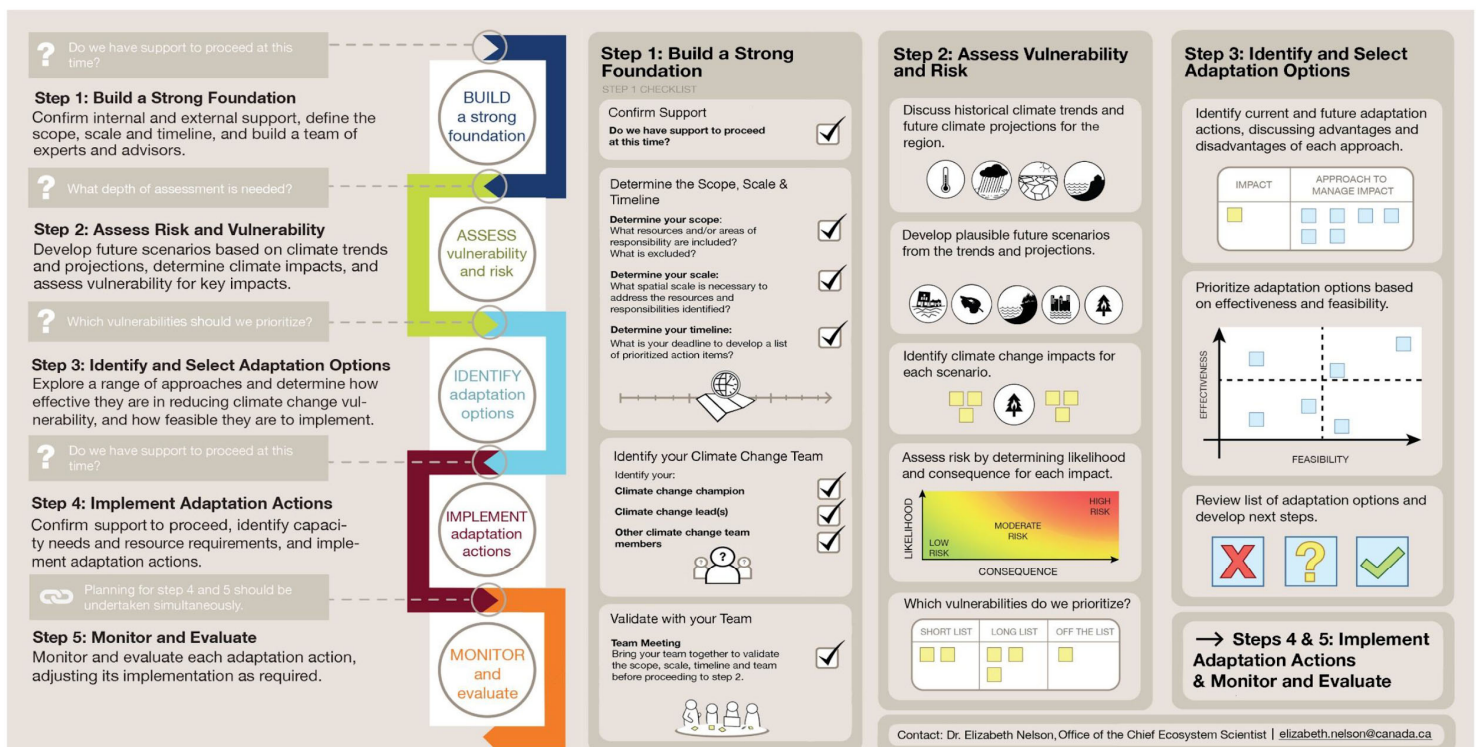
Climate Risk Methodology

Appendix C – Climate Risk Methodology

Background

A key component of climate change planning is assessing the risks that it poses for a particular community and developing unique strategies to address them (frequently referred to as “climate adaptation”). As part of the development of this Climate Action Plan, Northern Bruce Peninsula assessed its own unique climate risks using an adapted version of the Parks Canada climate adaptation framework shown in Figure 67. This section will briefly summarize the results of each phase of analysis in this framework.

Figure 67 – Parks Canada Climate Adaptation Framework



Step 1 – Build a Strong Foundation

The initial steps in the Parks Canada framework focus on gathering a team and establishing a clear mandate for climate adaptation. In the case of Northern Bruce Peninsula, the Climate Adaptation Team was composed of experts from the Climate Action Committee, along with representatives from municipal staff – including the Fire Chief, Municipal Clerk, Chief Administrative Officer, and Public Works Manager.

Step 2 – Assessing Vulnerability and Risk

The second component of the framework is focused on assessing the unique vulnerabilities of the Peninsula due to the impacts of climate change. Fortunately, there was a longstanding history of climate science focused on the Peninsula and five key impacts of future climate change – described in Section 1.

Each of these impacts was broken down into a series of scenarios and key risks which were ultimately evaluated and prioritized based on the likelihood of occurrence and the expected consequence – as shown in Figure 68 below.

Appendix C – Climate Risk Methodology

Figure 68 – Climate Adaptation Consequence Assessment

Criteria	Negligible (1)	Minor (2)	Moderate (3)	Major (4)	Catastrophic (5)
Social					
Public Health & Safety	Appearance of a threat but no actual harm	↔	Small number of injuries or cases of illness	↔	Large number of fatalities or serious injuries, or permanent illness
Displacement	Appearance of a threat but no actual displacement	↔	Isolated instances of temporary displaced people on a widespread scale	↔	Large number of permanently displaced people on a widespread scale
Loss of Livelihood	No changes to people's normal routine and way of life	↔	Moderate disturbances leading to short-term changes in people's normal routines and way of life	↔	Large disturbances leading to permanent changes in people's normal routines and way of life
Cultural Aspects	Appearance of a threat but no actual impact on cultural identity (i.e. traditions and customary practices)	↔	Moderate impact on cultural identity (i.e. traditions and customary practices) for multiple social groups	↔	Unprecedented loss of cultural across the wider community
Economic					
Property Damage	No damage and costs incurred by the owner (\$)	↔	Moderate damage and costs incurred by the owner	↔	Catastrophic damage and costs incurred by the owner
Economic Growth	No real impact to the local economy and growth	↔	Isolated areas of reduction in economic performance relative to current forecasts	↔	City-scale decline leading to widespread business failure, loss of employment and hardship
Community Livability	No real pressure on current services	↔	Isolated but noticeable examples of decline in services	↔	Permanent decline in services, causing the city to be seen as very unattractive and unable to support community
Public Administration	No real stress on public administration	↔	Public administration would be under severe pressure on several fronts	↔	Public administration would fall into decay and cease to be effective
Environment					
Air	Appearance of a threat but no real impact to air quality	↔	Moderate increase in periods of reduced air quality in the short/medium term	↔	Very frequent periods of reduced air quality
Water	Appearance of threat but no real reduction in water quality/quantity	↔	Moderate, widespread reduction in water quality/quantity in the short/medium-term	↔	Irreversible, widespread reduction in water quality/quantity
Soil & Vegetation	Appearance of threat but no real impacts on soil or vegetation	↔	Moderate, widespread impacts on soil or vegetation in the short/medium-term	↔	Irreversible, widespread impacts to soil or vegetation
Ecosystems Function	Appearance of a threat but no real damage to the ecosystem and its functions	↔	Isolated but moderate instances of damage to the ecosystem that could be reversed with intensive efforts	↔	Major and widespread loss of ecological functions and irrecoverable damage

Step 3 – Identify & Select Adaptation Options

Working with municipal staff, a variety of options were assessed to minimize the impact of each of these risks. These options were prioritized based on their expected impact and the investment required.

Appendix D

Public Consultation Results

Appendix D – Public Consultation

Overall Consultation Approach

Public consultation serves a critical role for any local plan to ensure it addresses the community's unique concerns, interests, and needs. For Northern Bruce Peninsula's Climate Action Plan this was especially important given the need for the community to take action individually in order to achieve the plan's objectives.

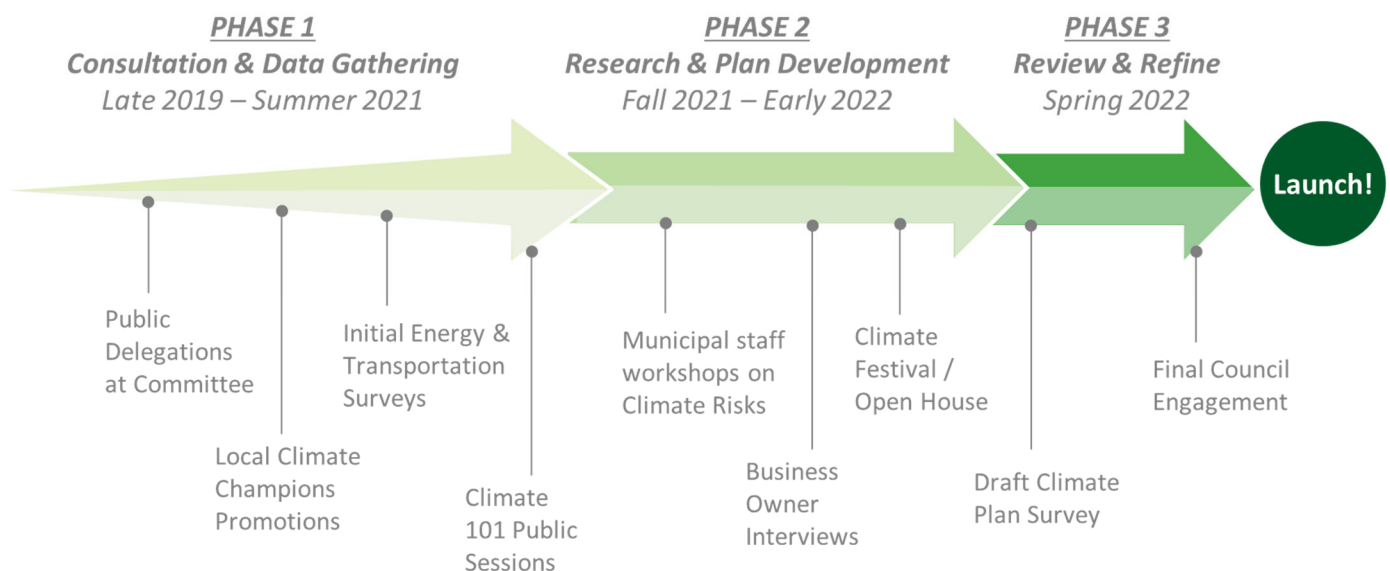
The engagement approach used in development of the plan varied by community group. For example, for residents, a mix of formal consultations – such as surveys and webinars – and informal consultations – such as open houses and in-person meetings – were used. For other groups – such as business owners, indigenous communities, and municipal staff – consultation typically involved interviews or workshops.

COVID-19 posed challenges to the public consultation process. For the majority of the project, public health restrictions prevented many in-person engagements envisioned by the Climate Action Committee as part of the project. Instead, the team relied primarily on virtual methods of engagement – such as Zoom meetings or online surveys.

Overall, more than 1,000 residents, business owners, and other community members are estimated to have been engaged as part of the Climate Action Plan process. This represents nearly a quarter of the full-time residents on the Peninsula – one of the highest public participation rates in any recent local study.

The remainder of this section summarizes the results of the public consultation shown below. Note that detailed results from the surveys and public consultation events are available upon request.

Figure 69 – Climate Action Plan Consultation Approach



Appendix D – Public Consultation

Phase 1 Feedback

The first phase of public consultation focused on gathering views from the community on the types of strategies they wanted to see included in the Climate Action Plan. The intent was not to identify specific initiatives, but rather set a clear direction for the project. Feedback gathered in this phase could generally be categorized into the six themes shown below.

Figure 70 – Public Consultation Feedback (Phase 1)

Feedback Theme	Description
Build on the work already underway	- Many of the early consultation comments highlighted the long history of climate action in Northern Bruce Peninsula and wanted to see this past work reinforced through the Climate Action Plan - A commonly cited example was the Municipality's successful curbside recycling program – which achieved the highest adoption rates of any community in Bruce County after only a few years of operation
Ensure there are actions for everyone	- Significant concern was raised that the actions in the Climate Action Plan would be unaffordable to many members of the community (e.g., purchasing an electric vehicle, upgrading one's home) - Respondents flagging this concern recommended the Climate Action Plan include low-cost actions everyone can take – such as composting organic waste or energy conservation
Address the impact of visitors	- Concerns around the climate impacts of visitors was frequently cited as a concern that should be addressed by the Climate Action Plan - The impacts highlighted were two-fold: (1) the emissions caused by visitor travel to / stays on the Peninsula, and (2) the risks caused by visitors that will be accentuated by climate change – such as more wildfire ignitions
Align with other municipal goals	- Respondents in phase 1 saw opportunities to achieve or support other long standing community objectives through the Climate Action Plan - Examples included expanding the current housing stock (e.g., by supporting new, low emissions development), offering more recreational amenities (e.g., support for cycling / walking as zero-emissions alternatives, and upgrading municipal infrastructure
Emphasize communication	- Phase 1 consultation pointed to awareness as a key barrier preventing the community from pursuing climate action - This was particularly true for new technologies (e.g., electric vehicles) where respondents indicated a view that there was not enough information about their practicality or affordability
Focus on only what is practical	Respondents frequently cited a desire that the Climate Action Plan be appropriately scoped for a community of Northern Bruce's size and avoid including actions that only larger communities could reasonably afford to pursue (e.g., public transportation)

Appendix D – Public Consultation

In addition to the above, the first phase of public consultation gathered the community’s views and interests in several initiatives that were expected to be centrepieces of the eventual plan – specifically, electric vehicles, heat pumps, energy audits, and other home energy upgrades. Details on the feedback received through these surveys can be found in the Buildings Section (2.1 *Support Home Electrification*) and Transportation Sections (2.4 *Adoption of Electric Vehicles*).

Phase 2 Feedback

The second phase of consultation focused on gathering inputs on specific components of the emerging plan. Improving public health conditions allowed for more of these consultations to be held in-person. The feedback provided in this phase helped the Climate Action Committee develop a final list of initiatives to be included in the plan. A summary of the feedback received is shown in Figure 71 below – organized by stakeholder group.

Figure 71 – Public Consultation Feedback (Phase 2)

Source	Description
Business Owners <i>Provided via interviews conducted by the committee</i>	- Several sectors indicated that electrification wasn’t yet practical for them (e.g., ones reliant on heavier-duty vehicles) and change would come later in the plan - Owners pointed to funding programs they had already used, but were interested in getting help with applying for or identifying additional opportunities - Many businesses demonstrated an interest in participating in waste initiatives
Municipal Staff <i>Provided via multiple staff workshops and interviews</i>	- Staff highlighted their views on the greatest areas of climate risk – wildfire, isolation events – and strategies to address them (see Appendix C for more details on the findings) - Staff reinforced that the plan needs to fit in with the existing budget / planning cycles - Staff indicated an interest in new climate-related policies to support decision making– see Appendix D for more details
General Public <i>Provided via Climate Festival and other interactions</i>	- Wanted to ensure that the plan did not focus only on energy but also other sources of greenhouse gas emissions as well (e.g., waste, natural environment) - Indicated a need to better explain within the plan why electricity is clean in Ontario - Suggested volunteers be a key component of the plan in order to take advantage of the many efforts already underway related to climate change

Phase 3 Feedback

The third phase of public consultation presented the community with excerpts from the draft Climate Action Plan and asked for feedback on its clarity and importance. Respondents were also asked for recommendations on potential ways to improve key components of the plan.

Figure 72 below provides a summary of the feedback received in this phase of consultation. Overall, the responses demonstrated support for the Climate Action Plan – and generally viewed the included initiatives as clear and important. Several overarching comments were addressed through the presence of this Technical Report – specifically, the desire for

Appendix D – Public Consultation

additional details on timelines, targets, and specific actions. Respondents also indicated a strong need for a list of actions individuals could take to support the plan – an asset that will be developed as part of promotion for the Plan.

Figure 72 – Public Consultation Feedback (Phase 3)

Pillar	Percentage of total respondents indicating the plan's contents are...		Specific feedback
	...very clear	...very important	
 CUTTING CONSUMPTION	71%	77%	Education: Emphasize education first before pushing for people to act – there isn't enough awareness on what energy we use and where emission come from Tourism: ensure cutting emissions from tourists is in-scope; these represent a large component of the total Individuals: provide specific examples, education, and promotion of what individuals can do in order to contribute to the initiatives
 ELECTRIFYING EVERYTHING	57%	72%	Build-on Existing Programs: focus on promoting the many existing funding programs for electrification before attempting to create anything new Advocate for a Clean Energy Grid: raise awareness about why Ontario's energy grid is low emitting and then advocate provincially for policies that support it Ensure Fair Access: avoid subsidies that privilege one group over others; look for opportunities to provide broad access to financial supports for electrification
 WIPING-OUT WASTE	71%	76%	Be More Ambitious: building on the years of success with waste diversion, set a higher target than 10% reduction in per person waste Emphasize Waste Prevention: plan relies heavily on waste diversion, but needs to help build a culture that encourages reduce waste prior to creating it (e.g., avoiding single-use plastics or products with excess packaging) Visitors & Business Waste: create dedicated strategies focusing on helping businesses reduce their waste Neighbourhood Composting: encourage the creation of group composting that will be easier to manage and wildlife-proof than bins at individual homes
 NURTURING NATURE	72%	69%	Local Food: promote purchase of foods from local growers, reducing the carbon footprint of what we eat Incorporate Wetlands: expand focus within the to other natural areas that can sequester carbon not just forests – particularly wetlands Financial Supports for Farmers: recognize the financial strains on farmers and help them acquire grants / funding in order to achieve these goals Adaptation in Agriculture: long-term, help farmers prepare for the impact of changes in the climate (e.g., changing growing season, livestock heat stress)
 PROTECTING THE PENINSULA	66%	73%	Education of Visitors: better educate visitors on the risks of fire and safe practices; look at increasing the fines for rule-breakers Wind breaks: help reduce the risk of isolation by incorporating wind-breaks along highway 6 as well as encouraging tree planting Clarify the Science on Impacts: many of the climate projections are uncertain and (at times) feel contradictory; increase coordination of those sharing projected impacts and communicate more broadly on what we are likely to see

Appendix D – Public Consultation

Saugeen Ojibway Nation

Saugeen (Bruce) Peninsula is within the traditional territories of the Anishinabek Nation: The People of the Three Fires known as Ojibway, Odawa, and Pottawatomie Nations. The Chippewas of Saugeen, and the Chippewas of Nawash, known collectively as the Saugeen Ojibway Nation, are the traditional keepers of this land thus have a critical role to play in any Climate Action Plan focused on the Peninsula.

As part of the consultations for the Plan, the Climate Action Committee conducted several workshops with representatives from Saugeen Ojibway Nation in order to gather their ideas and input for the eventual plan. The analysis focused on evaluating the potential impacts from local climate change or the Climate Action Plan itself on five rights, interests, and responsibilities identified by Saugeen Ojibway Nation – as shown in Figure 73 below.

The intent of this analysis was to add or refine the Plan in order to ensure it supported or – at minimum – minimized the impact to these rights, interests, and responsibilities. This process was also envisioned as a first step towards longer ongoing engagement with Saugeen Ojibway Nation – described in more detail in *Section 4 – Path Forward*.

Impact of Climate Change

The first component of the analysis evaluated the impacts of the projected changes to the local climate (described in detail in *Section 1 – A Call to Action*). Impacts were split into those that were direct results of climate change and those that were caused by expected human responses to it. The latter category was prioritized for potential inclusion in the plan.

Figure 73 – Impact of Climate Change on SON’s rights, interests, and responsibilities

Local Impacts of Climate Change	RIGHTS, INTERESTS, & RESPONSIBILITIES				
	Ensuring a Safe and Stable Local Environment	Promoting the Economic Wellbeing of the Community	Preserving the Community’s Cultural Practices	Supporting Subsistence & Commercial Fishing	Ongoing Land & Title Claims
 Changing Seasons	Significant change in current species mix (e.g., 20% of bird species lost)	Potential for lost revenue for seasonal businesses dependent on winter weather	Disruption to seasonal practices, particularly those requiring snow / ice cover	Warming lakes will reduce the suitability of local environment for fish species	No significant impacts anticipated
 Rising Water Levels	Modest impact outside of aquatic habitats	Potential for flooding, storm, or fire damage disproportionately impacting lower income community members with fewer financial resources to recover	2 Strategies such as shoreline hardening will decrease fish habit – with significance as both a commercial & cultural practice		3 Greater potential for disputes regarding property boundaries and ownership
 Intensifying Storms	Fewer impacts identified		Impacts likely limited to storm event itself	More frequent disruption to operations due to storm	
 Increasing Fire Risk	1 Fire prevention methods may disrupt forest connectivity and local ecosystems		Impacts only expected under extreme scenarios	No significant impacts identified	No significant impacts identified
 Weakening Ecosystems	Potential for permanent disruption to ecosystems due to large-scale events	Enormous social and cultural significance of ecosystems to the community that will be damaged as it is threatened	Expected weakening of fish species due to warmer temperatures		

Limited impact
Risk / opportunity (due to climate change)
Risk / opportunity (due to human responses)

Impact of the Climate Action Plan

The second component of the analysis evaluated the impacts of the proposed initiatives within the Climate Action Plan itself. These impacts were focused primarily on Saugeen Ojibway Nation's ecological and economic interests and represented both risks to be mitigated and opportunities to be pursued.

Figure 74 – Impact of the Climate Action Plan on SON's rights, interests, and responsibilities

	RIGHTS, INTERESTS, & RESPONSIBILITIES				
Local Impacts of Climate Change	Ensuring a Safe and Stable Local Environment	Promoting the Economic Wellbeing of the Community	Preserving the Community's Cultural Practices	Supporting Subsistence & Commercial Fishing	Ongoing Land & Title Claims
 CUT CONSUMPTION	No significant Impacts identified – will generally be supportive through the reduction of pollution	4 The Plan's focus on recruiting / training contractors can support job creation for SON community	No significant Impacts identified		
 ELECTRIFY EVERYTHING					
 WIPE OUT WASTE	5 The Plan's focus on composting strategies can include SON and thus satisfy a longstanding community interest in the topic				
 NURTURE NATURE	6 The Plan's emphasis on ecosystem restoration can support a variety of SON's objectives (e.g., forest connectivity)	7 The Plan's emphasis on lower emitting agricultural practices can support SON's goals to minimize the environmental impact of agriculture			
 PROTECT THE PENINSULA		8 The Plan can evaluate restricting near-shore development – addressing SON's concern regarding encroachment on fish habitat			

Limited impactRisk / opportunity

Consultation Results

Figure 75 shows how these inputs were incorporated into the final list of initiatives within the Climate Action Plan. Beyond these specific refinements, several other refinements to how the plan is designed and communicated were identified:

- The *Climate Action Plan* should reframe the need for action from being *an opportunity* to one that is *our community's responsibility* – reflecting the Anishinaabe understanding of our collective duty to nature and the inherent value of preserving biodiversity
- The *Climate Action Plan* should seek opportunities to incorporate the concept of two-eyed seeing as part of its analysis – bringing together Indigenous and Western ways of knowing when assessing the impacts and strategies to address climate change
- The *Climate Action Plan* should analyze the impacts of growth on the natural areas of the Peninsula that help mitigate climate change and whether there is a limit to the amount of growth that the Peninsula can sustain

Appendix D – Public Consultation

Figure 75 – Modifications to the Plan based on Saugeen Ojibway Nation Input

Implication for SON	Relevant Plan Section	Specific Inclusions
1 Decrease in fish habitat due to shoreline hardening	Protect the Peninsula <i>5.6 Infrastructure Resilience</i>	- Conducting shoreline mapping for Peninsula to understand potential impacts of flooding / higher water levels - Use it to develop new zoning restrictions for development
2 Disruption to ecosystems due to fire prevention measures	Protect the Peninsula <i>5.1 Prevent Wildfire</i>	Engage SON as part of the design of FireSmart program (i.e., the homeowner fire prevention awareness) to help minimize the disruption to habitat / tree cover
3 Greater potential for disputes regarding property boundaries and ownership	Protect the Peninsula <i>5.6 Infrastructure Resilience</i>	Same as #1
4 Opportunity to support job creation for SON community	Cut Consumption <i>1.3 Efficiency Industry</i>	- Promote job / training opportunities for auditors, installers, and contractors within SON community - Pursue training grants to help prepare interested members
5 Opportunity to promote composting strategies within SON community	Wipe Out Waste <i>3.1 Backyard Compost</i> <i>3.2 Organic Collection</i>	- Share composting training / webinars with SON community - Include SON within design and business case for organics collection or drop-off programs
6 Opportunity to use replanting to address other goals (e.g., forest connectivity)	Nurture Nature <i>4.3 Ecosystem Restoration</i>	Completion of Black Bear and Multi-Species restoration plans with SON as a key member of the project team
7 Opportunity to tackle other impacts of agriculture beyond emissions	Nurture Nature <i>4.1 Low Emissions Agriculture</i>	Promote low emissions practices that also reduce water contamination and other environmental impacts (e.g., responsible fertilizer use)
8 Need to limit near-shore development to improve resilience & protect habitats	Protect the Peninsula <i>5.6 Infrastructure Resilience</i>	Same as #1

Appendix E

Municipal Policies (DRAFT)

Appendix E – Municipal Policies (DRAFT)

Climate Lens

The **Climate Lens Policy** integrates action for climate change into decision-making throughout the Municipality. The policy outlines a process to help the Municipality achieve the targets and actions identified in the Climate Action Plan. These actions identified focus on mitigation and adaptation measures in the key areas of transportation, waste, and facilities management.

The Climate Lens process is a simple set of questions that will help staff evaluate the climate compatibility of their recommendations to the Municipal council. Each question should be assessed as either a Yes, No, or Not Applicable. There are five questions that should be covered as part of the policy.

Figure 76 – Example Climate Lens Questions

Focus	Question
Cost	Does the proposal consider the full lifecycle ⁶³ cost of the initiative?
Resilience	Does the proposal consider the local impact of climate change and put in place strategies to reduce its potential risk?
Emissions	Does the proposal assess the emissions it will generate and propose strategies to reduce them?
Leadership	Does the proposal demonstrate that the Municipality is taking a leadership role in addressing climate change?
Alignment	Does the proposal align with the recommendations included as part of the NBP Climate Action Plan?

Staff making recommendations to the Municipal Council should include the results of the Climate Lens as part of their report to aid in decision making. The responses to two each of the five questions included in the policy can be appended to their report.

The Climate Lens should be applied to all decisions regarding:

- new infrastructure
- project or program design
- planning and policy documents

Note that for decisions regarding procurement, a specific version of the Climate Lens - the “Green Procurement Policy” - has been developed to support analysis and decision making.

⁶³ Life cycle costing is the process of compiling all costs that the owner or producer of an asset will incur over its lifespan. These costs include the initial investment, future additional investments, and annually recurring costs, minus any salvage value.

Appendix E – Municipal Policies (DRAFT)

Green Procurement Policy

The Green Procurement Policy is a specific version of the Climate Lens described previously. It is designed to ensure that all major municipal purchases include an assessment of the climate compatibility of the goods and services being procured – as well as the vendors who are providing them.

The Green Procurement Policy will require a life cycle cost assessment for all major purchases. This concept assesses the total cost of the goods or services throughout their existence: from production and manufacturing, distribution, usage to end of life. Life cycle costing therefore represents the full cost of a good or service – including non-financial or environmental costs, even though these will not necessarily have an associated dollar cost.

The following questions can be used to assess the lifecycle cost

Figure 77 – Example Green Procurement Policy Questions

Type	Factor
Financial	✓ Initiation costs (e.g., purchase, installation, delivery, or setup fees) ✓ Operating costs (e.g., fuel, labour, maintenance, repairs) ✓ Ancillary costs (e.g., safety equipment, training, financing, insurance) ✓ Disposal costs (e.g., resale, site remediation, toxic components)
Non-Financial	✓ If a good is made from raw materials, have they been obtained in an environmentally sound, sustainable manner? ✓ Are the goods manufactured in an environmentally sound manner? ✓ Are the goods durable as opposed to a single use or disposable item? ✓ Are the goods shipped with minimal packaging (consistent with the care of the good), preferably made of reusable, recycled or recyclable materials? ✓ Are there any harmful health effects for the user? ✓ Are there environmental impacts to be considered such as noise, GHG emissions, pollution? ✓ Are there toxic or hazardous materials used in the goods? ✓ Do the goods or services produce waste? Can they be recycled or disposed of in an environmentally safe manner? ✓ Is additional safety equipment or training required? ✓ Do the goods require the procurement of special cleaners and if so, are these 'green' as well? ✓ Are the goods recyclable in the local recycling program? ✓ Can the goods be re-used or donated to a local community organization?

Appendix E – Municipal Policies (DRAFT)

Implementation

The Green Procurement Policy will serve as an appendix to the existing Purchasing Policies for Northern Bruce Peninsula. The responsibilities for implementing the Green Purchasing Policy are outlined below.

Municipality's Responsibilities:

1. Ensure that procurement processes are sustainable, realizing cost savings and reducing the environmental impacts of services and operations
2. Play a leadership role in the community by:
 - To ensure the maintenance and administration of this policy and to report annually on its implementation.
 - Purchasing high quality, durable and efficient goods and services
 - Encouraging the marketplace to offer more greener options,
 - Eliminating or reducing toxins or health hazards to workers and the community,
 - Minimizing and diverting waste from our landfills,
 - Conserving natural resources
 - Identifying environmentally preferable goods and distribution systems
 - Minimizing negative environmental impacts such as greenhouse gas and air pollutants,
 - Supporting recycling markets.

Municipal Staff Responsibilities

The Chief Administrative Officer is responsible for oversight of the Green Procurement policy, including:

- To ensure the maintenance and administration of this policy and to report annually on its implementation.
- To amend forms and templates for proposals, quotations and tenders to reference the Green Procurement Policy.
- To assist departments to incorporate life cycle costing in procurement decisions and recommendations.
- To inform departments and contractors of their responsibilities under this policy and provide implementation assistance.
- To create an environment that supports the use of recycled, recyclable, and other environmentally preferred goods and services.
- To work with staff to decide where environmental factors can be introduced into the procurement process.
- To promote awareness among staff of greener goods and services, such as ENERGY STAR® rated goods for energy efficiency or other designations as available.

All staff are responsible for implementation of the Green Procurement policy, including:

- To promote awareness among staff of greener goods and services, such as ENERGY STAR® rated goods for energy efficiency or other designations as available
- Become familiar with this policy and apply it in procurement activities.
- Procure environmentally preferred goods whenever possible.
- The following green procurement factors are incorporated into the specifications for goods and services:
 - Durable and reusable items (avoid single use)
 - Made from recycled materials

Appendix E – Municipal Policies (DRAFT)

- Reduction of greenhouse gas and air pollutant emissions (i.e., through energy conservation), ENERGY STAR® rated if available or most energy-efficient option.
- Meets other labelling and environmental standards if applicable.
- Non-toxic or least toxic option, preferably compostable or biodegradable
- Recyclable, but if not recyclable, may be disposed of safely, or vendor will take back good at its end of life
- If made from raw materials, they have been obtained and manufactured in an environmentally sound, sustainable manner
- Results in minimal or no environmental damage during normal use or maintenance
- Minimum packaging (consistent with the care of the good), preferably made of reusable recycled or recyclable materials
- The life cycle cost of the good through the acquisition, operation, and end of good life, including environmental impacts (a cradle to grave approach)
- Reusable shipping packaging
- Complete a life cycle assessment of the goods being procured (see below).
- Pilot goods and services where appropriate to evaluate environmentally responsible alternatives
- Comply with applicable environmental legislative requirements in the procurement of goods and services.
- Proactively consider ways to reduce the impact of procurements on the environment and ways to use existing resources as alternatives to new procurements
- Meet periodically to report on the progress of policy implementation including:
 - The results of good evaluations and good trials,
 - Department experience or efforts to support sustainable procurement, including positive experiences as well as lessons learned (good and bad).
 - Track the procurement of sustainable goods and services to assist with annual reporting on this policy.

Appendix F

References

Appendix F – References

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