



Community Energy and Emissions Plan (CEEP)
A Plan for Climate Action in the Township of Billings



A Message from the Mayor

On behalf of Billings Municipal Council and staff I would like to say a few words about our Community Energy and Emissions Planning Process. This plan has been a work in progress for several years as we collected data to support making wise and energy efficient changes and reduce green house gas emissions at both the municipal operations level and at the taxpayer level.

Many committed citizens have provided valuable ideas and feedback thus far, and these have had a direct influence on the action plan contained in this report. We all need to become better stewards of our environment as global climate change is here, indisputably. There are many of areas of our daily lives where we can all make a difference if we focus and commit to making some changes.

Energy consumption is a significant cost to the municipality of Billings as well as its constituent businesses and households, and energy use is one of the largest drivers of climate change. Therefore, reducing our energy consumption must be a top priority as we all need to find ways to reduce our energy use. The township can play its part by ensuring that our public buildings and infrastructure are as energy efficient as possible and by encouraging our residents to do the same.

Something as simple as composting organic waste, as well as increasing our re-use and recycling, of products and materials, are small individual steps, but together they will make a measurable difference. We are so fortunate to live in a place with still clean waters, carbon capturing forests and world class natural attractions which all contribute to a better quality of life for us all.

Together, we have a collective obligation to ensure no further degradation of our environment for future generations to come. We can create a community where our energy consumption is significantly reduced and create a safe and cleaner environment. With your help today, we will!

Thank you,

Mayor Ian Anderson

A Message from the Billings Climate Action Committee (CAC)

The collective actions of our society, along with our daily choices, have had an impact of raising GHG levels and thereby causing climate change. In response this committee was created to help forward the charge to reduce GHG emissions in our community by 50% by the year 2030. We all call this beautiful island home, and it is with love for our home that we all volunteered as committee members to help maintain its health and beauty for future generations.

We are happy to submit this community energy and emissions plan as a guide to making real progress in the various areas identified, building on the community engagement achieved through the successful survey that was an integral part of the planning process. We are grateful for all the assistance of those involved in creating this rich and detailed document, especially the two Climate Change Coordinators who shouldered the bulk of the work and guided our committee process.

Now we look forward to implementing the many local ideas set forth in this plan and taking concrete steps to meeting the global challenge of climate change. It is our sincere hope that continued community engagement and collaboration with other groups around the island will lead to successful implementation of the actions this plan contains. There are some big challenges ahead, if we are to leave the planet in better shape for our grandchildren in 2051.

July 2021

ACKNOWLEDGEMENTS

Thank you to everyone that participated in the development of the Community Energy and Emissions Plan (CEEP). Strong leadership from Municipal Council and the Climate Action Committee (CAC) has helped to advance our community's response to climate change.

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United Manitoulin Island Transit	Quest	Mindemoya Public School
Manitoulin Expositor & Recorder	Oakville Enterprises	Alterum
Climate Risk Institute	ReThink Green	Ethelo

This project was made possible by a two-year staff grant from the Government of Canada, the Federation of Canadian Municipalities (FCM) and the Municipal Energy Program (MEP) through Ontario's Ministry of Energy, Northern Development and Mines (ENDM). This staff grant was shared with the Municipality of Central Manitoulin and was a major source of funding for the development of the Community Energy and Emissions Plan (CEEP) and related activities, including the development of a Greenhouse Gas (GHG) inventory for corporate and community emissions, management of stakeholder/committee and community engagement initiatives, and research on local government climate change mitigation/adaptation best practices.

The Township of Billings would also like to acknowledge the significant contributions from citizens and partnership organizations that participated in this planning process. Over 250 members of our community contributed to these consultation efforts by attending events/committee meetings and participating in a community-wide educational engagement survey on climate change.

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INDIGENOUS LAND ACKNOWLEDGEMENT

As we gather and create community climate change plans – we are reminded that the Township of Billings is situated on treaty land that is steeped in the rich Indigenous history of the Ojibwe, Odawa, and Potawatomi peoples. Mnidoo Mnising/Manitoulin Island is sacred to the Anishinaabe people and stewardship of the land and water that surrounds us is the thing that binds us.

Today and always the Township of Billings acknowledges the United Chiefs and Councils of Mnidoo Mnising (UCCMM) on whose traditional territory outlined by the 1862 Manitoulin Island Treaties and the unceded territory of Wiikwemkoong make up the land that is called Manitoulin Island and where we all call home.

May our collaborative efforts to prevent the impact of climate change on Manitoulin Island, protect and preserve our shared natural assets be led by the principles outlined in the 1990 Friendship Treaty, Maamwi Naadmaading Accord.

Table of Contents

Preface	1
A Letter From the Future – 2050	2
Executive Summary.....	3
1 A Vision for Climate Action	5
1.1 Township of Billings – Prosperous and Resilient	5
1.2 The Role of Local Governments in Climate Change Action.....	6
1.3 The Corporate-Community Relationship: Terminology	7
1.4 Township of Billings – Strategic Plan 2018 to 2021	7
1.5 Environmental Responsibility – Mitigation vs. Adaptation.....	8
1.6 Vision and Targets.....	9
CEEP Mission Statement and Co-Benefit Framework.....	11
2 Planning for Change	12
2.1 Applying a Guiding Framework for Climate Change Action.....	12
2.2 Planning Timeline and Community Engagement.....	13
3 Climate Change in the Township of Billings	15
3.1 By 2050 – Local Climate Change Risk and Impact.....	15
3.2 Greenhouse Gas Emissions Update	16
4 Taking Climate Action	17
4.1 Shared Natural Spaces	17
4.2 Challenges and threats.....	18
4.2.1 How do other communities overcome these barriers?.....	18
4.2.2 Strengths and Opportunity – Carbon credits & data sharing	19
4.2.3 Taking Action – Shared Natural Spaces.....	20
4.3 Buildings	25
4.3.1 Municipal Buildings and Facilities	25
4.3.2 Taking Action: Municipal Buildings, Facilities	27
4.3.3 Community Buildings	29
4.3.4 Taking Action: Building Buildings on our Strengths	31
4.4 Transportation	33
4.4.1 Taking Action: The Municipal Fleet.....	33
4.4.2 Taking Action: Community Owned Transit	34
4.5 Waste	36
4.5.1 Challenges and threats.....	36
4.5.2 Strengths and opportunities – Community engagement and shared procurement	37
4.5.3 Taking Action: Municipal and Community Waste Reduction	37
5 Plan Implementation.....	40
5.1 Recognition of the Value of Collaboration.....	40
6 Conclusion.....	43
7 Glossary and Acronyms.....	44
8 Appendixes.....	46
A. Climate Action Committee Terms of Reference	46
B. Local Climate Projections.....	46
C. Updated Greenhouse Gas Inventory for the Township of Billings	46
D. Community Engagement Survey.....	46

List of Figures and Tables

Figure 1: The Role of Local Governments in Climate Action	6
Figure 2 The relationship between corporate and community climate action planning.	7
Figure 3: Climate Change Adaptation and Mitigation	8
Table 1: The CEEP structure – the vision statement in action (with action categories)	10
Table 2: CEEP – The Climate Action Co-Benefit Framework, with example community benefits	11
Figure 4: The Township of Billings CEEP Process Milestones	13
Table 3: Key CEEP events, milestones, and progress to-date	13
Figure 5: Interactions of climate risk and impacts	15
Table 4: Planning natural asset management using the Co-Benefits Framework	19
Table 5: Natural Shared Spaces – Key collaborative objectives for taking corporate and community climate action	21
Table 6: Action to protect, restore, enhance natural spaces, key actions, partners, roles, resources - N1, capacity.	21
Table 7: Action to protect, restore, enhance natural spaces – actions, partners, roles, resources – N2, water	22
Table 8: Action to protect, restore, enhance natural spaces – key actions, partners, roles, resources – N3, mitigation, adaptation	23
Table 9: Municipal Buildings - Key objectives, with detailed actions, notes and considerations	27
Figure 6: Manitoulin energy poverty cost burden	29
Table 10: Community benefits from collaborative action on community buildings using the co-benefit framework	31
Table 11: Residential heating equipment 2021 versus 2030 - results of the GHG inventory (Appendix C)	32
Table 12: Taking action - reducing energy poverty while improving community resilience, housing, affordability, and creating healthy, comfortable homes	33
Table 13: Community co-benefits from increased ride sharing and an electrified transit system for Manitoulin	34
Table 14: Taking action – Reducing transportation costs and developing a connected, safe community	35
Table 15: Community co-benefits from waste reduction, using the co-benefits framework	38
Table 16: Taking Action – waste management - reducing overall consumption and landfilling	38
Table 17: Examples of successful climate-change-related collaborations	41

PREFACE

A child growing up in a Canadian town after World War II would have witnessed community sirens installed in neighbourhoods. They may have practiced crawling under their desks to prevent injury from debris resulting from the potential detonation of an atomic bomb. Nuclear war was (and still is) a threat to human existence.

Children today are facing a new threat to their existence, one which was not considered when the threat and terror of total nuclear war haunted us. Humans are destabilizing the earth's ecology in many ways. We are taking more and more resources out of the environment while pumping back massive quantities of waste and poison, changing the very composition of the earth's soils, the water, and the atmosphere. Habitats become degraded, large numbers of plant and animal species are facing extinction or have already become so. Nuclear war is still a threat today, and for the foreseeable future, but a changing climate is a present reality, and its destructive impact for human existence is growing. There is scientific consensus that human activity, especially the generation and emission of what are collectively as greenhouse gases especially carbon dioxide, are causing the earth's climate to change.

“Hazards resulting from the increasing intensity and frequency of extreme weather events, such as abnormally heavy rainfall, prolonged droughts, abnormal extreme winds, environmental degradation, or sea-level rise and cyclones are already causing an average of more than 20 million people to leave their homes and move to other areas in their countries each year¹.”

Globally, people living along seacoasts and especially on islands are already feeling the effects of climate change. Forecast sea level rises and these environments will undoubtedly be disproportionately impacted by climate change. While the ecology is different – freshwater as opposed to salt water – Manitoulin is, in effect, an island in the centre of the vast inland sea complex of the Great Lakes. So, our island too faces the real possibility of experiencing disproportionate disruption from the increasing impacts of global climate change. However, there is opportunity for Manitoulin Islanders to learn from other island communities, be they in salt or fresh water, and begin planning a resilient and prosperous future that acknowledges the past can no longer predict. We must also acknowledge that the increased hazard and resulting stress on our infrastructure due to climate change must be factored into community planning and decision making.

Manitoulin Island has a beautiful but fragile ecology. It is the meeting place for Boreal, Carolinian, and even Atlantic seaside plants. It is on the great eastern North American migratory bird flyway and with four distinct seasons, offers natural beauty and processes which are unparalleled in most of the world. The Island sequesters more carbon than it produces, and we depend on large nations to come to climate change accords to attempt a decrease in greenhouse gas emissions. Our small population can seemingly do little to affect the huge scope of the problem globally. What we can do is develop and implement a plan for our community to become part of the climate change solution rather than continuing to contribute the problem.

Recognizing that this is the first planning period of what will be a 30-year challenge, we asked local students to project themselves "30 years into the future" and to report back to the present-day community revealing what they found – the conditions resulting from *deliberate, collaborative, and local* efforts to address climate change. What follows is their report.

¹ United Nations Refugee Agency: Climate Change and Disaster Displacement. <https://www.unhcr.org/climate-change-and-disasters.html>

A LETTER FROM THE FUTURE – 2050

Dear Manitoulin Residents of 2021,

We just recently got together and took a trip around Manitoulin Island to experience where we all grew up and talked about all the improvements. Looking out through our self driving public transportation, it is clear that the land has been protected with the utmost care, and when our vehicle stopped to recharge, Lake Huron was wonderfully pristine. All the stewardship and care that has preserved the island over the last few decades was crucial to mitigate the effects of climate change, providing a sustainable role model for communities across Canada.

Within the local townships, we stopped to visit the familiar heritage buildings that had been retrofitted for efficiency while maintaining the Manitoulin charm. We were delighted to see rooftop gardens on many of the municipal buildings and businesses, consistently solar powered homes and offices, and a highly visible composting program. We are pleased that new housing projects have undergone rigorous environmental assessment for approval ensuring that new residents contribute to the green vision. This includes restrictions on household waste and net-zero energy consumption. The addition of tiny homes in the community was also very welcomed and provided great eco-friendly places for tourists to stay. Thanks to the climate action plan and the subsequent incentives, all residents have gladly supported the improvements.

After touring the communities, we re-lived our fond memories on Lake Manitou via the very popular paddle-share program, uncontaminated by pollution or invasive species. We returned to shore famished and quickly found one of the many organic community gardens. The youth greeting us shared that the organic garden was fully stocked by products from the co-operative farm and local suppliers. We learned that from their inception, these farms integrated the cultivation and harvesting of traditional foods and medicines in partnership with the Anishinabek on Manitoulin. These farms are both a source of food security for many locals, as well as a thriving Manitoulin attraction.

Investment and concerted sacrifice at the global level has mitigated so many potential catastrophes: including violent weather and heatwaves, increased skin cancer and disease rates, water scarcity and mass extinction. We hope efforts continue on Manitoulin and in communities across the world. Our tour around the island has reminded us that the vibrancy and beauty of Manitoulin is a product of its citizen's love. Manitoulin is a model that has moved past just surviving and is now focused on living harmoniously and graciously as stewards for future generations.

Jocelyn Kuntsi, 46
Ethan Theijsmeijer, 46
Katie Chapman, 45
Rhys Allison, 45
Kal Alhadi, 48
April Torkopoulos, 50
Darci Debassige, 46
Hadeel Alhadi, 50
Victoria MacDonald, 51






Connor Phillips, 48
Zoe Redmond, 46
Jacob Maxwell, 51
Mackenzie Cortes, 48
Emma Cassidy, 47
Marshall Maciuk, 50
Rachael Orford, 47
Larissa Chevrette, 48

EXECUTIVE SUMMARY

The climate is changing – all over the world and in the Township of Billings. Past extreme weather, flooding and wildfire risks no longer provide adequate information to predict impacts and guide community planning efforts. Each community in Canada must develop community-specific plans to protect residents from climate change risk moving forward. A Community Energy and Emissions Plan (CEEP) will provide the Billings Community with a strategy to integrate climate risk considerations into to ensure that energy and emissions targets are fully integrated into all processes - both operational and planning.

This Community Energy and Emissions Plan (CEEP) is the culmination of over two years of joint community-based² study and consultation to investigate and articulate relevant climate change hazards and to assess the community's current state of preparedness for eliminating, mitigating, or adapting to these hazards. The result is a unique climate action plan that includes corporate and broader community actions, with successful outcomes for many being dependent on collaboration with other local, provincial, federal, private and NGO supporting partners. In fact, it has been a key strategic goal to identify collaborative opportunities to share resources, minimize and avoid the duplication of effort in community action, while simultaneously considering the need for the municipality to adopt customized corporate climate change plans that are specific, ambitious, have wide-spread community support and are attainable.

Small and rural local governments all over Canada are making similar plans all over those that have gone before Billings have provided the Township of Billings with useful examples and best practices to assist our community in the pursuit of sound decision-making that explicitly considers environmental responsibility. The plan also employs the concept of climate policy co-benefits as further incentive for the various actions.³

MISSION STATEMENT				
TO CREATE A RESILIENT AND NET-ZERO COMMUNITY BY 2050 AND SET A PATHWAY FOR 50% ENERGY AND GHG EMISSION REDUCTIONS BY 2030 THAT:				
HEALTH	NATURE	COMMUNITY BUILDING	ECONOMIC DEVELOPMENT	INNOVATION
				
Enhances Health and well-being of community members	Preserves and enhances local biodiversity and natural systems	Builds community through inclusion	Fosters a prosperous and sustainable local economy	Promotes innovation and growth

² The Township of Billings shared a Climate Change Coordinator (CCC) position with the Municipality of Central Manitoulin. The two municipalities are quite distinct in size, profile, and resources but there are commonalities. These will show in the different outcomes of their CEEP Plans. As the plans are operationalized, common actions may be shared where it makes sense to do so.

³ Karlsson, Mikael; Alfredsson, Eva; & Westling, Nils, 2020. *Climate policy co-benefits: a review.* <https://doi.org/10.1080/14693062.2020.1724070>

Community Energy and Emissions Plan (CEEP) Vision Statement in Action	
Corporate (O) Actions	Community (Θ) Actions
Include actions that the local government has operational control over (e.g. - fully owns an asset or has jurisdiction to implement operational services and programs to enhance health, safety, and environmental policies) and will lead climate action. The local government will endeavour include these actions in strategic planning and annual budgets, leveraging funding and collaborative opportunities whenever possible.	Include actions that are led by the community, as individuals or collectively, to reduce emissions within their local government boundary. Local government may have <i>influence</i> over these programs/services, but direct community involvement is critical to success of action. Community partners to take a leadership role and responsibility for action will be sought. Local government will play a leadership role and can provide financial assistance/incentive strategically, to support action.
Shared Natural Spaces	
Minimize (mitigate) impacts of climate change on community by taking action to protect, restore and enhance natural systems. Protect people and property from natural hazards and promote sustainability best practices in the local agricultural, forestry, tourism sectors.	
Corporate natural spaces or Greenspace includes - forests, community gardens, beaches, wetlands, waterways, trails, and roadside stormwater drainage <u>owned</u> and <u>operated</u> by the municipality.	Community natural spaces or Greenspace includes - forests, agricultural, beaches, wetlands, waterways, trails, hunt/nature/tourism camps <u>owned</u> by <u>private residents</u> , but influence community overall.
Buildings	
Reduce by 50%, below 2018 levels, by 2030	
Actions will increase energy efficiency and the adoption of renewable energy and low carbon technologies and build climate resilience in new and existing buildings.	
Municipal Buildings and Facilities	Community Homes and Buildings
Transportation	
Reduce by 50%, below 2018, levels by 2030	
Actions reduce vehicle trips, promote active and public transportation, and accelerate low carbon/GHG transportation options.	
Municipal Transportation	Community Transportation
Waste Reduction	
Reduce by 50%, below 2018 levels before 2030	
Reduce overall consumption by promoting circular economy concepts and increase waste diversion through recycling rate increases and home composting program	
Efficient and effective operation of the landfill; the promotion of community awareness regarding, waste (landfill and recycling) services in the municipality	Active community participation and engagement in the circular economy, waste reduction and diversion programs

1 A VISION FOR CLIMATE ACTION

The climate is changing – all over the world and in the Township of Billings. Each community in Canada will need to mitigate and adapt to climate change risk differently – this is the Township’s plan to integrate climate risk considerations into existing operations and help prepare our community for climate change.

1.1 TOWNSHIP OF BILLINGS – PROSPEROUS AND RESILIENT

As residents of the world’s largest freshwater island, tucked in between where Lake Superior runs into Lake Huron and Georgian Bay blooms into the North Channel – our community is remote and unique. For generations, our remoteness has contributed to the development of a unique culture – grounded in resilience and ingenuity, unquestionably connected to the land, and indisputably influenced by the land and waterscape.

Currently, our main economic drivers are tourism and agriculture – huge, broadly encompassing sectors of economic activity. Building these sectors over generations is a testament to our collective home-grown resilience, our commitment to sustainability, and our acknowledgement that protecting our land, air and water for future generations are deeply rooted values. Many of our local economic, environmental, social, and cultural practices demonstrate practical leadership in sustainability and resilience. These community values are a strength – in fact, the Greenhouse Gas (GHG) study that was conducted as part of this project found that our community absorbs (sequesters) more carbon than we create through human activity.

Many of our current local economic, environmental, social, and cultural practices demonstrate leadership in sustainability and resilience.

For the Township of Billings, this GHG emissions reality puts our municipality in a small sub-set of local governments in Canada and it is both our strength and a weakness. While most municipalities in Canada will find it challenging to increase carbon sequestration to help mitigate the impact of climate change, our challenge will be to *keep* it and protect it from climate change risk so our shared natural assets can continue to sustain our way of life.

Global average temperatures continue to rise, worsening extreme weather events and endangering vital ecosystems. This means the things we value and depend upon for our very survival – human health, water, agriculture, energy, transportation, and the environment – are at great risk. Around the world the climate crisis is intensifying and the impact in the Township of Billings has already begun. Out of 77 eco-regions across southern Canada, the Manitoulin-Lake Simcoe eco-region was identified in the top nine most significant and threatened places for biodiversity. As one of the top nine crisis areas, this eco-region hosts 75 species that are included on the list of national Species-At Risk (SAR) and about 40 species of global concern⁴. Of greatest importance, however, is Manitoulin Island’s central location within the Great Lakes and how it connects this important eco-region with the rest of North America. This island is a key element of the Manitoulin-Lake Simcoe eco-region and just as indigenous peoples have used Manitoulin Island for centuries as a central meeting place for trade and socialization – the unique biodiversity hosted by this island continues to support human activity in Central North America. Reducing the GHG generation in Billings Township by a further 50% by 2030 will be a valuable contribution to ensuring the Government of Canada meets its GHG reduction commitments. As climate change continues to intensify our community is vulnerable – our reliance on natural assets to support our economy, in all its varied aspects, is at risk.

⁴ Nature Conservancy of Canada “Unique study pinpoints key places to stem biodiversity loss in Canada’s South” (March 3, 2021). Retrieved From: <https://www.natureconservancy.ca/en/who-we-are/news-room/in-the-news/unique-study-pinpoints-key.html>

This reality above makes the *global* climate change challenge a *local* challenge that *must* be addressed.

Any vision for climate action must first acknowledge our strengths and vulnerabilities, as well as the unique challenges and climate risks that are not entirely within the Township’s control. Developing this Community Energy and Emissions Plan (CEEP) provides a set of actions for the Township of Billings, as a municipal corporation and a community, to mitigate and adapt to the impact of climate change over the next 30 years, building upon the uniqueness and resilience of our culture. We need to remember that small actions to protect, preserve and enhance natural spaces *locally* will make an impact *globally*.

1.2 THE ROLE OF LOCAL GOVERNMENTS IN CLIMATE CHANGE ACTION

As the level of government in Canada closest to the everyday lives of citizens, Municipalities are in an ideal position to respond to climate change. According to the Federation of Canadian Municipalities (FCM), municipalities have control of 44-50 percent of Canada’s GHG emissions⁵. Municipalities are also responsible for providing affordable and reliable services to residents that will be impacted by climate change risk. If our municipality (corporately and as a community) has influence over 44-50% of GHG emissions within our jurisdiction, it is safe to say that the other 50 to 56% will be influenced by people and organizations who live in elsewhere, but travel to our township for work or pleasure. Figure 1 shows how local governments can influence the components of climate action⁶.

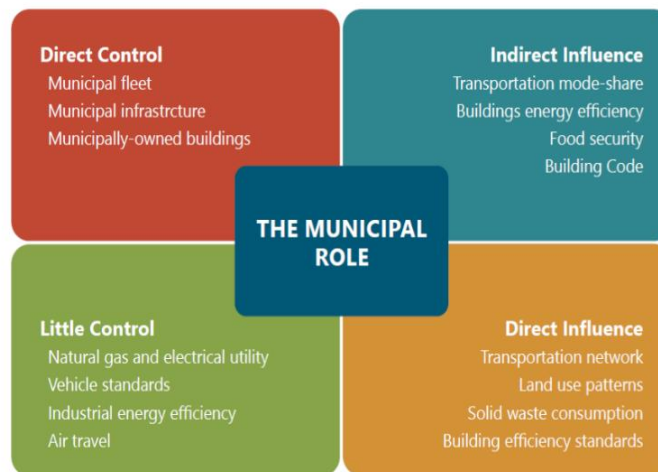


Figure 1: The Role of Local Governments in Climate Action

The Township of Billings is undertaking this climate change planning process because it will provide an explicit climate change perspective as the municipality continues to pursue environmental, social, and economic sustainability. This is the township’s initial CEEP, and the approach taken will:

- Primarily consider areas where the municipality has *direct* control and *direct* influence, per figure 1. If the municipality does not currently provide a service in an area where a local government can have direct control/influence – potential partners and collaborative opportunities will be explored.
- Where the municipality has indirect, or little control, comment in this plan will be high level with a focus on encouraging near-term partnership and collaboration to jump start community-based climate action.

⁵ Federation of Canadian Municipalities, Act Locally: The Municipal Role in Fighting Climate Change (2009). <https://fcm.ca/sites/default/files/documents/resources/report/act-locally-municipal-role-fighting-climate-change.pdf>

⁶ Dufferin Climate Action Plan “The Role of Local Governments p. 29” (April 2021).

1.3 THE CORPORATE-COMMUNITY RELATIONSHIP: TERMINOLOGY

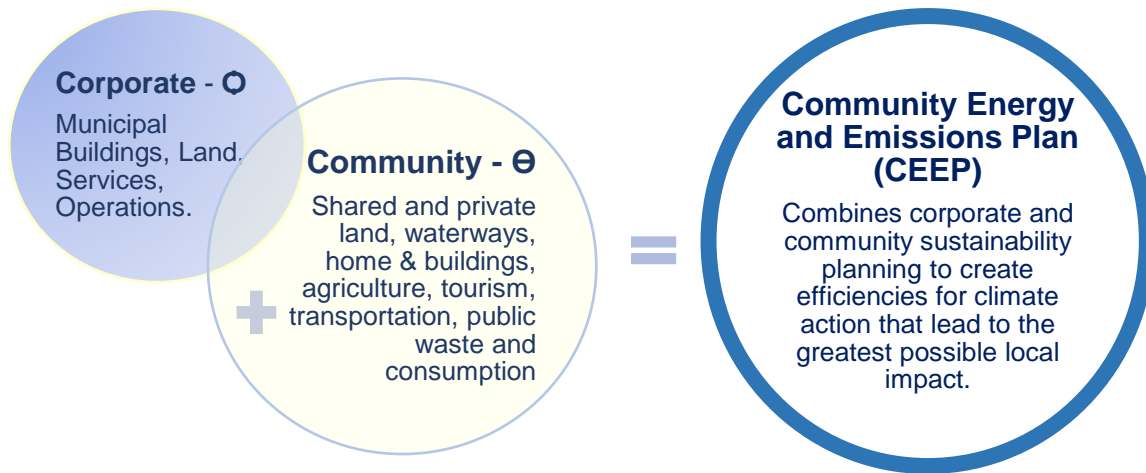


Figure 2 The relationship between corporate and community climate action planning.

For this report, and in keeping with commonly used practices to define the parameters for climate change mitigation planning, the land, services, and operational areas over which the municipality has direct control will be referred to as “corporate”. All other land, service or operational (living, lifestyle) areas will be referred to as “community”. This nomenclature is supported by the Partners in Climate Protection (PCP) program and the corporate and community categories are used to measure community carbon sequestration capacity, energy and GHG’s within a defined municipal boundary. Figure 2 outlines the commonly used structure in climate change planning that has been considered for the township’s CEEP and can help define the difference between corporate and community emissions for measurement, management, and implementation of local climate action⁷. Using this structured approach, it becomes possible to begin identifying areas for priority action, collaboration, and further investigation.

This plan will also consider how the municipality will connect its other important planning processes to climate change to ensure critical services provided by the municipality continue to meet standards expected by the community as climate impacts increase and new opportunities emerge.

1.4 TOWNSHIP OF BILLINGS – STRATEGIC PLAN 2018 TO 2021

Billings Township Strategic Plan 2018 to 2021: Vision Statement

The Township of Billings is a vibrant community where new people are excited to relocate and existing residents are happy to stay because of the sustainable economy, the artistic and cultural diversity, and the beauty of the environment. Guided by the vision of its citizens, Billings Township is a safe and progressive community that practices environmental responsibility, provides dependable services, and maintains its rich cultural heritage.

This year Billings will create a new strategic plan for the next 4yr planning cycle. The CEEP, on the other hand, has a planning horizon for the next 30yrs, setting GHG reduction targets for 2030 and 2050, with a specific focus on implementing climate action to meet the townships environmental goals. The township may change specific environmental goals over the next 5 to 30 years but a continued commitment to environmental responsibility will remain at the core of the township’s vision for the foreseeable future, and this needs to be acknowledged in future strategic planning cycles. Manitoulin Island’s main economic

⁷ Partners in Climate Protection (PCP) Protocol, Local Governments for Sustainability and Federation of Canadian Municipalities (FCM) (2014). Retrieved from: <https://fcm.ca/sites/default/files/documents/resources/report/protocol-canadian-supplement-pcp.pdf>

sectors, tourism, and agriculture, rely on the long-term protection and preservation of the environment and biodiversity. Our artistic and cultural diversity is fundamentally tied to the natural environment. This CEEP and any vision, mission and actions for this plan will provide a roadmap for the township to continuously pursue sound decision-making processes that consider environmental responsibility and the associated co-benefits. Codifying a sustainability strategy into existing processes will ensure that the township continuously seeks to improve upon its commitment to environmental stewardship in the long-term.

1.5 ENVIRONMENTAL RESPONSIBILITY – MITIGATION VS. ADAPTATION

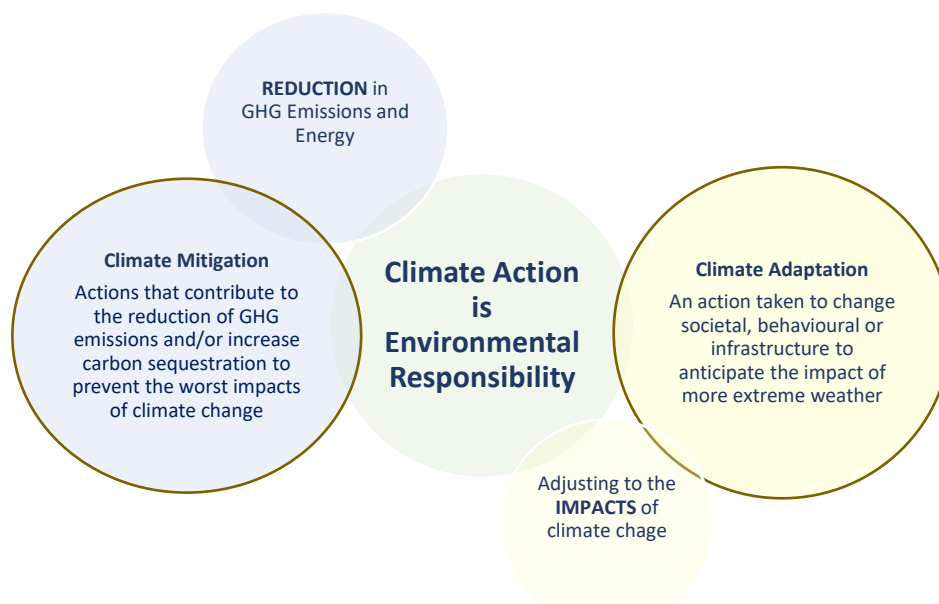


Figure 3: Climate Change Adaptation and Mitigation

Figure 3 is a graphical depiction of the relationship between climate change mitigation and adaptation. In a finite system like planet earth, environmental responsibility is at the core of financial and social responsibility. If adequate planning and environmentally responsible policies and best practices are implemented by local government, it will ultimately lead to sound financial and social decision making. Billings has maintained a commitment to environmental responsibility throughout several long-term planning cycles. When the project to create a Community Energy and Emissions Plan (CEEP) was proposed – project coordinators sought to build upon the strong environmental approaches that Billings has already been applying, which have included the following:

- Continuous maintenance of roads, stormwater, and other engineered community assets associated with roads and land-use
- Implementation of a streetlight replacement project (2019-2020)
- Deep Energy Retrofit (DER) measures to improve energy efficiency during the Old Mill municipal office renovation (2019/20)
- Energy efficiency improvements were incorporated in the Kagawong Water Treatment Facility upgrade (2018)
- A geothermal system was installed in the Kagawong Park Centre in 2009
- The Township has had an active Waste Management/Go Green committee working on environmental responsibility initiatives of Council for over a decade and this transitioned into the development of a new Climate Action Committee (CAC) to provide stewardship and drive community engagement activities for the CEEP Process

- A burgeoning energy conservation and management process for municipally owned buildings and facilities, based on building condition assessments conducted in 2018
- Continuous maintenance of parks and natural shared spaces like the Bridal Veil Falls trail network, the Billings Connection Trail, and the Kagawong municipal marinas that provide access to the North Channel
- An existing relationship with Manitoulin Streams to educate residents and visitors regarding the Kagawong River watershed, and promotion of sustainable use of the same, while implementing ecologically sound waterway restoration and maintenance projects

Following from these, the purpose of this CEEP is to outline a vision for action to:

- Increase and improve environmental responsibility for the long-term
- Build on the excellent work that has been done by community members, municipal staff, and partners
- Provide Billings a corporate GHG reduction plan and;
- Apply a community-based collaborative approach for the implementation and monitoring of community GHG emission reductions and realization of the associated co-benefits.

The Township is committed to building upon its capacity to pursue best practices in environmental sustainability and has already approved the continuation of collaborative partnership with the Municipality of Central Manitoulin (and other municipalities and First Nation communities) to continue implementing the actions outlined in this CEEP.

In the current climate change context, municipal governments need to consider the reality that if the local government does not begin to increase its response to the impacts of climate change – the cost of inaction *now* will lead to unmanageable response costs *later*. These future costs will be large, and could take many forms, including carbon pricing costs, increased health costs, and costs associated with emergency response *after* a flood, wildfire, or similar extreme weather event. Thus, any vision for climate action must consider how environmental responsibility can be increased through proactive adaptation and mitigation actions (Figure 3) to respond to the impacts of climate change, while simultaneously considering the social and financial benefits which can accrue with adaptation and mitigation efforts.

Mitigation and adaptation actions lead to Low-Carbon Resilience (LCR), a concept which allows a community to apply a lens that coordinates adaptation and mitigation strategies in planning, policy, and implementation processes. LCR strategies have co-benefits for health, equity, biodiversity, and community livability. These co-benefits will be the foundational elements of this CEEP's mission and vision on a path to net-zero carbon by 2050.

1.6 VISION AND TARGETS

Throughout this climate change planning project, the Township of Billings has engaged the public, municipal leadership, staff, and several community groups and businesses to collect ideas and synthesize a vision for the future of an environmentally responsible and resilient community. This includes a commitment to building upon current programs, services, and partnerships, as well as seeking new opportunities for collaboration.

Moving forward into the implementation, monitoring and adjustment phases of this plan, it will be helpful to align the vision, objectives, and actions into both Corporate (○) and Community (Θ) categories so there is a basis for determining what level of involvement the township will have in leading climate action. As the climate change survey results show (Appendix D), most community members are supportive of the municipality taking direct corporate climate action, as well as supporting community climate action. This Community Energy and Emissions Plan (CEEP) will recommend two primary approaches to mitigation: 1) carbon sequestration and energy/GHG reduction in the four main categories where the municipality has direct control and, 2) Exercising a positive influence on community actions. Table 3 provides a visual






summary of the CEEP categories, goals and foundational objectives which will be extrapolated on in Section 4: “Taking Climate Action.

Table 1: The CEEP structure – the vision statement in action (with action categories)

Community Energy and Emissions Plan (CEEP) Vision Statement in Action	
Corporate (O) Actions	Community (Θ) Actions
Include actions that the local government has operational control over (e.g. - fully owns an asset or has jurisdiction to implement operational services and programs to enhance health, safety, and environmental policies) and will lead climate action. The local government will endeavour include these actions in strategic planning and annual budgets, leveraging funding and collaborative opportunities whenever possible.	Include actions that are led by the community, as individuals or collectively, to reduce emissions within their local government boundary. Local government may have <i>influence</i> over these programs/services, but direct community involvement is critical to success of action. Community partners to take a leadership role and responsibility for action will be sought. Local government will play a leadership role and can provide financial assistance/incentive strategically, to support action.
Shared Natural Spaces	
Minimize (mitigate) impacts of climate change on community by taking action to protect, restore and enhance natural systems. Protect people and property from natural hazards and promote sustainability best practices in the local agricultural, forestry, tourism sectors.	
Corporate natural spaces or Greenspace includes - forests, community gardens, beaches, wetlands, waterways, trails, and roadside stormwater drainage <u>owned</u> and <u>operated</u> by the municipality.	Community natural spaces or Greenspace includes - forests, agricultural, beaches, wetlands, waterways, trails, hunt/nature/tourism camps <u>owned</u> by <u>private residents</u> , but influence community overall.
Buildings	
Reduce by 50%, below 2018 levels, by 2030	
Actions will increase energy efficiency and the adoption of renewable energy and low carbon technologies and build climate resilience in new and existing buildings.	
Municipal Buildings and Facilities	Community Homes and Buildings
Transportation	
Reduce by 50%, below 2018, levels by 2030	
Actions reduce vehicle trips, promote active and public transportation, and accelerate low carbon/GHG transportation options.	
Municipal Transportation	Community Transportation
Waste Reduction	
Reduce by 50%, below 2018 levels before 2030	
Reduce overall consumption by promoting circular economy concepts and increase waste diversion through recycling rate increases and home composting program	
Efficient and effective operation of the landfill; the promotion of community awareness regarding, waste (landfill and recycling) services in the municipality	Active community participation and engagement in the circular economy, waste reduction and diversion programs



CEEP MISSION STATEMENT AND CO-BENEFIT FRAMEWORK

The following CEEP mission statement was developed from the community survey responses and the municipality’s commitment to climate action by linking carbon sequestration, energy and GHG emission reduction actions to the important co-benefits that are the pillars of a resilient and future net-zero community⁸:




MISSION STATEMENT				
TO CREATE A RESILIENT AND NET-ZERO COMMUNITY BY 2050 AND SET A PATHWAY FOR 50% ENERGY AND GHG EMISSION REDUCTIONS BY 2030 THAT:				
HEALTH	NATURE	COMMUNITY BUILDING	ECONOMIC DEVELOPMENT	INNOVATION
				
<p>Enhances Health and well-being of community members</p>	<p>Preserves and enhances local biodiversity and natural systems</p>	<p>Builds community through inclusion</p>	<p>Fosters a prosperous and sustainable local economy</p>	<p>Promotes innovation and growth</p>

When the township and community come together to implement these targets – the co-benefits can often be measured and have greater impact on a community than the direct environmental benefits associated with carbon sequestration and energy consumption/GHG reductions. Table 2 provides an overview of these co-benefits. The infographics denoting co-benefits will be used throughout this planning report to identify how each climate action will create a positive impact on the community and serve as a reminder that key performance indicators regarding impact are often more than just the energy measured or the GHG emissions that are saved.

Table 2: CEEP – The Climate Action Co-Benefit Framework, with example community benefits

Co-Benefit (Symbol)	Example Community Co-Benefits
	<p>Climate action enhances health and well-being of community members by:</p> <ul style="list-style-type: none"> ● Improving air quality, reducing risk of illness and disease ● Addressing land-use based health inequities ● Supportive infrastructure that encourages an active lifestyle ● Reducing risk of injury and illness from extreme weather exposure ● Reduces risk to critical water, sanitation, and power infrastructure ● Reduces social isolation by providing pathways for everyone to participate
	<p>Environmental responsibility is connected to climate action as described in Figure 4 and can also result in:</p> <ul style="list-style-type: none"> ● Improved biodiversity ● Improved water retention and absorption, reducing flood risk ● Stable air quality and increasing natural carbon sequestration ● Creates and protects habitat

⁸ Karlsson, Mikael; Alfredsson, Eva; & Westling, Nils, 2020. *Climate policy co-benefits: a review*. <https://doi.org/10.1080/14693062.2020.1724070>

Co-Benefit (Symbol)	Example Community Co-Benefits
	<ul style="list-style-type: none"> Improves water quality
	<p>Climate actions can result in building a stronger community by:</p> <ul style="list-style-type: none"> Increasing educational opportunities for all ages Increasing access to recreational parks, greenspace, and trails Building spaces, natural and engineered, that generate a sense of space Making accessibility and equity improvements to encourage everyone to participate Supports for local healthy food systems and security
	<p>Enhancing our local economy through climate action looks like:</p> <ul style="list-style-type: none"> Improvements to energy reliability and security, and a reduction in energy poverty Waste reduction and optimization of local resources Improves cost savings for businesses and residents Creates local jobs Growth in our local economy by incentivizing sustainable businesses and lifestyles
	<p>Enhancing innovation through climate action looks like:</p> <ul style="list-style-type: none"> More community-based partnerships that result in the adoption of low GHG alternatives More supporting partnerships with local, provincial, and national public, private and non-profit organizations to accelerate energy and sustainability transition

2 PLANNING FOR CHANGE

2.1 APPLYING A GUIDING FRAMEWORK FOR CLIMATE CHANGE ACTION

The Township of Billings is committed to a community-based, inclusive planning approach for climate action that considers climate risk and impacts. The GHG reduction targets in this CEEP are supported by the majority of those that participated in the community-wide climate engagement conducted in the winter of 2021. By conducting a community-wide survey, climate-change planning in the Township of Billings has achieved established that there is broad community support, thus providing municipal leadership and Climate Action Committee (CAC) members with the credible community feedback required to pursue ambitious and attainable climate action targets. Just like we adapted to COVID-19 and are mitigating the worst impacts of this virus – together we will confront climate change, learning from what our community has achieved by working together to manage this global pandemic.

The framework for creating the Community Energy and Emissions Plan (CEEP) is based on the Partners for Climate Protection (PCP) protocol, which relies heavily on community engagement through the entire planning process. The publication of this first Community Energy and Emissions Plan (CEEP) began when the municipality passed the following motion in 2018 to join PCP and the Municipal Climate Innovation Program:

TOWNSHIP OF BILLINGS CLIMATE COMMITMENT

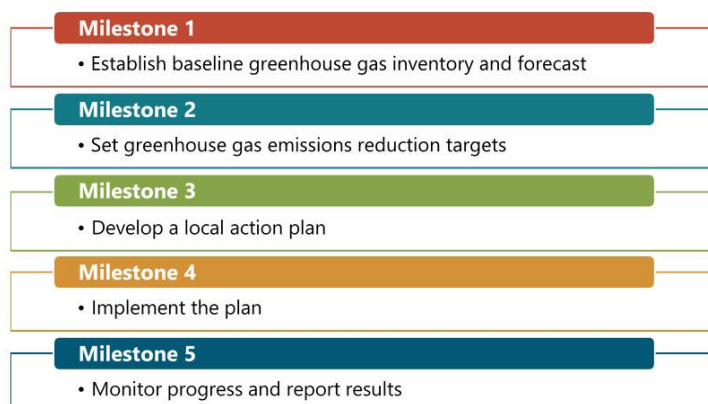


Figure 4: The Township of Billings CEEP Process Milestones

On March 18, 2019,⁹ the Township of Billings joined the Partners in Climate Protection Program administered by FCM and ICLEI. The Partners for Climate Protection (PCP) program, from ICLEI — Local Governments for Sustainability (ICLEI Canada) and FCM, is a framework useful in guiding the Township of Billings in doing its part to mitigate and adapt to climate change. It consists of a five-step Milestone Framework that has been, and will be, the guide for municipal staff to bring climate action to Billings. There are now over 350 municipalities across Canada who are members of the PCP network and have developed long-term plans to take climate action on both a corporate and community level.

2.2 PLANNING TIMELINE AND COMMUNITY ENGAGEMENT

Table 3: Key CEEP events, milestones, and progress to-date

Date/Period	Event, Milestone or Progress Made
May 2019	Central Manitoulin and Billings hire a Climate Change Coordinator to begin CEEP process Work begins on collecting corporate and community energy and GHG emissions data for Central Manitoulin and Billings.
June 2019	Municipal staff are surveyed on climate change and awareness of GHG emission reduction co-benefits
July-August 2019	The CCC attends the Kagawong market and Summerfest in Billings, to interact with residents and begin community engagement outreach activities.
October-December 2019	Weekly columns are published in the Manitoulin Expositor leading up to a Climate Change Open Houses in Billings in December.

⁹ 2019-082 Alkenbrack – Hunt

BE IT RESOLVED that the Township of Billings review the guidelines on Partners for Climate Protection member benefits and responsibilities and then communicate to FCM its participation in the PCP program and its commitment to achieving the milestones set out in the PCP five-milestone framework; and BE IT FURTHER RESOLVED that the Township of Billings appoints the following persons to oversee implementation of the PCP milestones and be the points of contact for the PCP program within the municipality: Michael Hunt and Megan Bonenfant.
Carried

Date/Period	Event, Milestone or Progress Made
December 2019	Billings holds its open house with members of the public to discuss climate change planning on December 4 th . This event included key supporting partners such as the Share/Go Green Committee from Manitoulin Secondary School, Manitoulin Streams, Council, and municipal staff.
Jan-March 2020	Significant progress is made on GHG inventory for Central Manitoulin and Billings.
March 2020	<p>The CCC attends an educational event resulting from a collaboration between the Climate Risk Institute and the Northern Ontario Climate Change Network (NCCN)</p> <p>Billings Council finalizes a Terms of Reference (TOR) for a Climate Action Committees (CAC) of Council to begin working with the CCC on the CEEP.</p>
April 2020	The Billings CAC begins meeting with the CCC monthly to steward the planning process.
September 2020	<p>The Billings CAC review community GHG inventory and make a recommendation to Council to proceed with a community-wide climate change engagement survey to improve community GHG information and collect widespread community feedback on GHG targets and climate change actions.</p> <p>The CCC attends Northern Ontario Permaculture Research Institute (NOPRI) to receive feedback from local sustainable food system advocates on planning process</p>
October 2020	<p>The CAC and CCC organize a series of events for Waste Reduction week, stewarding community discussions about composting, producer responsibility legislation and glass recycling on Manitoulin Island – approximately 35 community members attend virtual events and participate in the climate change youth artwork contest.</p> <p>The CCC presents Collaborative Model idea for community climate action to the Manitoulin Island Municipal Association and discusses a regional Electric Vehicle Charging Network strategy and business plan.</p> <p>New LED Streetlights are installed in Billings, reducing monthly energy bills.</p>
February 2021	There are 4882 page views of the Climate Change Engagement survey to set community and corporate GHG emission targets and priorities – 188 people responded to the survey, more participated in other forms of community engagement.
May 2021	<p>With the assistance of Alterum, and using community survey data, the community GHG inventory is updated, and modelling completed.</p> <p>Since March 2018 - the start of this planning process – more than 50 articles have appeared in the Manitoulin Expositor about climate change and this count does not include articles about flooding, high water, and windstorms. 20% of local media has been related to this municipal project.</p>
June – July 2021	Final revisions to the CEEP report; Presentation to Council for acceptance and initialization of implementation. Further, CAC recommends that Council establish a standing CAC committee to guide CEEP implementation.

3 CLIMATE CHANGE IN THE TOWNSHIP OF BILLINGS

3.1 BY 2050 – LOCAL CLIMATE CHANGE RISK AND IMPACT

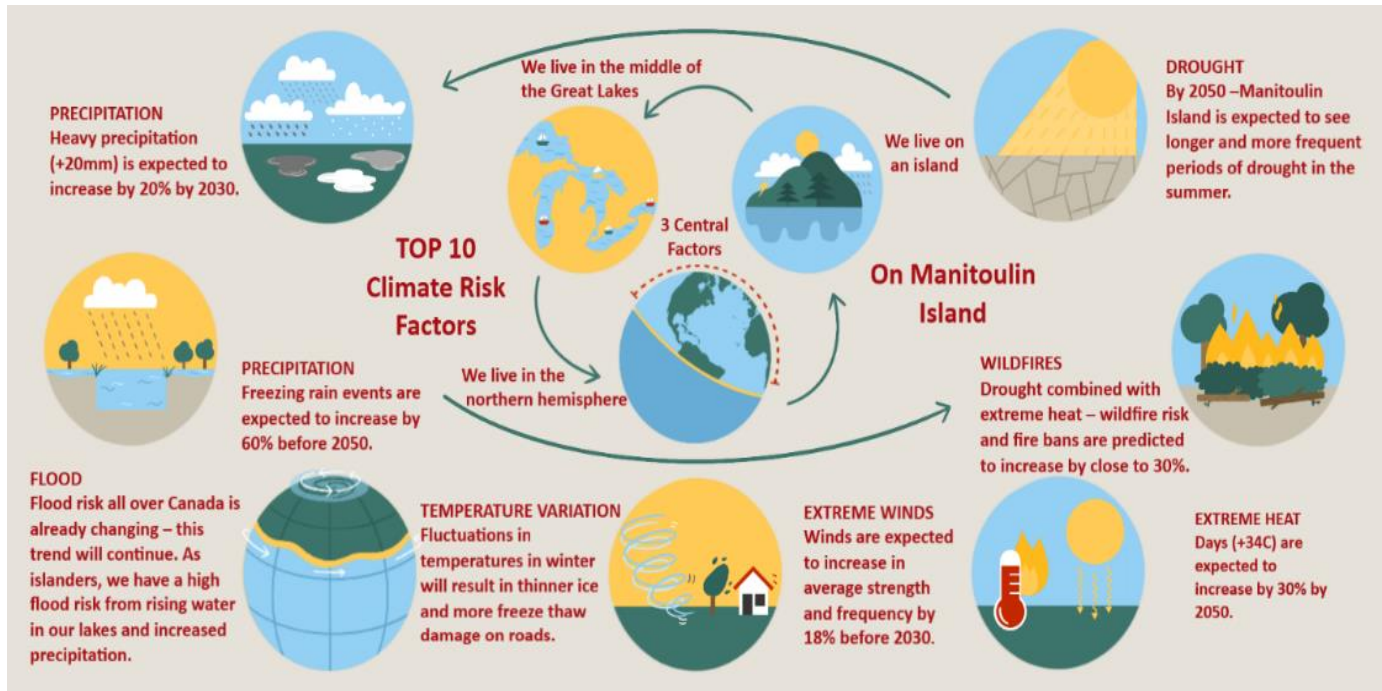


Figure 5: Interactions of climate risk and impacts

3.1.1.1 FACTORS IN CLIMATE RISK FOR MANITOULIN ISLAND¹⁰¹¹

3 Central Factors - make climate change risk unique for Manitoulin Island and impact all 10 of top risk factors for our island.

Great Lakes: Our location in the middle of the Great Lakes means that our climate is influenced by several weather streams that collide over this massive freshwater ecosystem. In turn, this means over time; our weather is becoming more unpredictable and extreme.

Northern Hemisphere: The northern hemisphere is warming faster than the southern hemisphere. Some people like this change but it is already starting to have significant impacts on growing seasons, infrastructure, and biodiversity.

Manitoulin Island: By now, you might be thinking the Great Lakes and the Northern hemisphere are not that unique. When you combine them with the fact that we live on the largest freshwater island in the world, it creates another layer of climate risk vulnerability that can exponentially influence how unpredictable, extreme weather will impact our communities. This means that living on an island in the middle of the great lakes, in the Northern hemisphere, starts to compound the climate change implications for our island. Our climate change predictions are different than mainland Ontario - they show more extremes - much higher

¹⁰ Climate is different from weather. **Weather** reflects short-term conditions of the **atmosphere** while **climate** is the **average** daily **weather** for an extended period at a certain location.

¹¹ Data used for climate projections on Manitoulin Island was derived from several sources, including the Partners for Climate Protection (FCM), the Institute for Catastrophic Loss Reduction (ICLR) & Climate Risk Institute, as well as the Wind Energy Institute of Canada. A basic data grid can be found in the appendices.

winds, longer more extreme precipitation events and when it gets hot, we are more susceptible to drought and wildfire than our mainland neighbours.

Drought: By 2050 – Manitoulin Island is expected to see longer and more frequent periods of drought in the summer.

Wildfire: Drought combined with extreme heat increase our risk of wildfire. Manitoulin Island has not experienced a significant wildfire for over 100 years. Sustainable forest management is practiced on the island, but it is not widespread. Wildfire risk and fire bans are predicted to increase by close to 30% by 2050 on our island without mitigation and management of our forested areas.

Extreme Heat: Days (+34C) are expected to increase by 30% by 2050.

Extreme Winds: Winds are expected to increase in average strength and frequency by 18% by 2030, resulting in more property damage and unsafe open water conditions.

Temperature Variation: Fluctuations in temperatures throughout the winter months will result in thinner ice cover on lakes and more freeze thaw damage on roads.

Precipitation: Freezing rain events are expected to increase by 60% before 2050. Heavy precipitation (+20mm in a single event) is expected to increase by 20% by 2030.

Flood: Flood risk all over Canada is changing, with risk increasing in many, but not all, areas of the country. This trend will continue. As islanders, we have a high flood risk from rising water in lakes. The key to understanding flood risk on Manitoulin Island will be to utilize Indigenous knowledge and increase scientific research - including using innovative mapping technics that will advance knowledge regarding how all our ecosystem characteristics influence flooding and allow us to enhance flood prevention and mitigation. Using innovative technology like Lidar – combined with on-the-ground field experience in water management and habit restoration will make a significant contribution to building a more flood resilient community by 2030.

3.2 GREENHOUSE GAS EMISSIONS UPDATE

As indicated in Milestone 1 of the PCP program (above) is to create a GHG inventory for both corporate and community emissions in the municipality. This Milestone was completed in August 2020 However, once the Climate Action Committee began meeting and discussing how to use the GHG inventory, committee members and staff recognized that further investigation would be required to improve the accuracy of the community GHG inventory, particularly regarding the information for residential buildings and transportation. In addition, while GHG inventories can help inform decision making – setting targets requires community support and consensus. Therefore, in December 2020 the CAC recommended to Council that a community-wide survey would be useful in improving community GHG data and to seek input and build consensus on climate actions and energy consumption//GHG reduction targets.

After the community survey results became available, the CCC arranged for new data to be combined by a carbon modelling software firm called Alterum. Alterum's carbon accounting software uses electricity intensity grid information, Statistics Canada, and other baseline data to building a community emissions profile. This data analysis can then be customized with the addition of specific community data, like Hydro One consumption information, survey responses, and other GHG data, resulting in a refinement of the community and corporate GHG inventory. The result is more accurate modelling and more reliable projections to help visualize target reduction goals and the impact of a combination of climate actions.

Results from the updated GHG inventory can be found in Appendix D. The community data collected from the survey has improved our overall understanding of energy used in residential buildings and community transportation in Billings, and the application of the new information has been applied in section 5.4.1. In

addition, Business as Usual (BAU) and other future emissions modelling projections have been included in Appendix D so that municipal staff and community organizations can use this information to track progress more easily moving forward.

4 TAKING CLIMATE ACTION

Taking action to prevent further climate change, as well as mitigate climate impacts occurring now and, in the future, and finally, adapting to climate change, are the ultimate goals of the CEEP process, to that end, this section outlines

4.1 SHARED NATURAL SPACES

CEEP VISION STATEMENT IN ACTION #1

SHARED NATURAL SPACES

Minimize (mitigate) impacts of climate change on community by taking actions to protect, restore and enhance natural systems, protect people and property from natural hazards and promote sustainability best practices for all local businesses with a focus on enhancing support for the agricultural, forestry, tourism sectors.

Within the boundaries of Billings Township, our community sequesters more carbon than we currently emit, absorbing 22 069 tCO₂e per year. Our forests, wetlands, grasslands, farmland, lakes, and streams are strongly connected to our cultural values, livelihoods, health, and wellbeing. The carbon that is sequestered here is already contributing positively to climate action.

Natural spaces are often referred to as natural assets for the purpose of planning. No matter who owns land, all our natural systems and assets are connected. When it rains – water moves through the soil and into our shared lakes, aquifers, and streams where we all obtain our drinking water. When a forest is removed, it impacts the air that we all breath. To describe the interconnectedness of natural assets, planning documents often go one step further and refer to these spaces as a natural heritage system. The Township of Billings has had a long-term commitment to maintaining Natural Heritage System features and areas. This commitment is outlined in the District of Manitoulin Official Plan October 29, 2018:

“The Manitoulin Planning Board, and its member municipalities, are committed to maintaining and promoting a healthy natural environment and protecting its unique and special Natural Heritage Features for the present generation and all successive generations”¹²

As part of long-term planning policy – the District of Manitoulin Island Planning Board will undertake a consultation process within the next year to develop a Natural Heritage System Strategy. All community stakeholders interested in achieving climate action goals related to the protection, preservation and enhancement of Manitoulin Island’s shared natural spaces ought to participate in the development of this strategy. Moreover, this consultation process will provide all local governments party to Manitoulin Official Plan with the opportunity to accelerate the implementation of the goals articulated in the strategy. The planning board is responsible for shared planning policy, but it is the direct responsibility of the municipality to implement strategies within each community protect to preserve and enhance Natural Heritage System features. As part of the process, the Manitoulin Planning Board will also be seeking participation from indigenous communities to develop the Natural Heritage System Strategy, highlighting the importance of

¹² District of Manitoulin Official Plan D.6 Natural Heritage and Open Space Strategy pg. 148. Retrieved (July 2020): http://www.manitoulinplanning.ca/images/43/Manitoulin_OP_Approved_by_MMAH_October_29_2018_Reduced.pdf

integrating indigenous knowledge into our community's long-term strategy to care for our natural assets that interconnect.

Adequate response to climate change will require collaborative action to preserve and enhance natural spaces. This will include the investment of resources by local island governments, AND cooperation and collaboration with individuals, and organizations at the local, provincial, federal levels

Currently, the Township of Billings and other communities on Manitoulin Island play a key role in caring for natural assets, but data gaps, vulnerability assessments for natural hazards (like wildfire and flood) are insufficient to help inform local decision making. Municipal capacity, in terms of available staff, time for training, and oversight is stretched to a maximum. Many of the strategies listed in the District of Manitoulin Island Official Plan related to protection, preservation and enhancement of natural spaces are a challenge to implement for all communities. Adequate response to climate change will require collaborative action to preserve and enhance natural spaces. This will include the investment of resources by local island governments, AND cooperation and collaboration with individuals, and organizations at the local organizations, provincial, federal levels.

4.2 CHALLENGES AND THREATS

One challenge for the Township of Billings and all municipal governments on the island is the reality that local governance structure in Northern Ontario is single tier, unlike Southern Ontario, where a two-tier system exists: There are pros and cons to both structures. One draw-back of not having an upper district-wide tier, is the reality that there is no readily available executive or administrative structure to assist in finding shared solutions to challenges held in-common by many municipalities within the same geographic region. It is perhaps not surprising then, that with a few notable exceptions, we do not have a history of effective district-wide collaboration¹³. Resources, both human and fiscal, are stretched to the limit. Overcoming the barriers related to inadequate funding, limited technical expertise, and maxed-out staff capacity remains a series challenge. Given the structure and context within which they operate, it is inherently difficult for local island governments to embrace “the common good.”

4.2.1 HOW DO OTHER COMMUNITIES OVERCOME THESE BARRIERS?

To prevent floods, sequester more carbon and consider *natural* solutions in addition to *engineered* solutions many municipalities in Southern Ontario are grouped together through watersheds and local conservation authorities. These bodies have traditionally provided expert advice on how development activities in each water-shed based district impact the shared natural environment. The benefit of having a conservation authority in a regional district is that it brings together multiple local governments within the common watershed, which leads to a greater scientific understanding of how development activities in each local government impact the shared water resources regionally.

In addition to the presence of conservation authorities in Southern Ontario, many larger municipalities often have municipal staff who specialize in fields like stormwater management, land resources and parks. These departments work with conservation authorities and community stakeholders to mitigate flood, wildfire, and other natural hazard risks and this scientific understanding helps to inform long-term planning, permitting and natural asset management processes at the local level.

In Waterloo Region Ontario, a third-party non-for-profit called REEP Green Solutions that has been working with multiple municipalities, the University of Waterloo and other community members and organizations to address climate change impacts. This organization started in 1999 to help improve home energy efficiency

¹³ Fire protection mutual aid, the Manitoulin Municipal Association, and the Manitoulin Planning Board are examples of exception.

but has since expanded its community climate action work to include forest/tree stewardship, stormwater and water conservation, renewable energy, and electrification of transit.

In summary, this CEEP is not suggesting that a conservation authority should or must exist to adequately manage natural assets to achieve natural shared space climate goals. However, the identification of this potential environmental management and governance gap provides the opportunity to clearly outline one of the key barriers for Billings in implementing natural asset protection, preservation, and enhancement strategies. On a positive note, many of the environmental policy fundamentals that can lead Billings toward climate change solutions are already outlined in the District of Manitoulin Official Plan.

4.2.2 STRENGTHS AND OPPORTUNITY – CARBON CREDITS & DATA SHARING




Transform challenges into opportunity through innovative partnership

While conservation authorities offer benefits where collaborative activities between local governments result in cleaner water, air, and land, the absence of a collaborative organizational and governance structure to continuously steward climate action on Manitoulin Island presents an opportunity for local governments to consider innovative approaches. All local governments on Manitoulin Island could benefit from the enhancement of local scientific and indigenous knowledge of our natural environment.



Manitoulin Streams has played an important role on the Island in contributing to improved capacity to perform environmental, as have First Nations like Wiikwemkoong. This research capacity is required to adequately measure, monitor, and maintain the natural assets so vital to combating climate change. Manitoulin Streams is a local organizational asset that has demonstrated how careful and collaborative work in environmental protection can be implemented for widespread community benefit, including in Billings.

The benefits accruing from a collaborative approach to Natural Asset Management Planning can be outlined using the climate action co-benefits framework presented earlier in this document¹⁴:

Table 4: Planning natural asset management using the Co-Benefits Framework

Symbol	Explanation
 Health	<ul style="list-style-type: none"> Nature heals – the natural environment is a key determinant of healthy outcomes for any population. Increasing scientific research and utilizing indigenous knowledge will improve understanding of our island ecosystem, resulting in a healthier environment.
 Nature	<ul style="list-style-type: none"> By joining together, the community can preserve, protect, and enhance more shared natural spaces and access more funding opportunities Enhancing essential eco-systems in the Manitoulin Lake-Simcoe eco-region to ensure they continue to provide habitat for people and wildlife.
 Community Building	<ul style="list-style-type: none"> Preserving, enhancing, and increasing shared natural spaces for people to gather and socialize. Implementing community-based collaborative projects to protect, preserve and enhance our natural assets - building community connection and a “sense of place.” More events and community projects for the natural environment was in the top 3 actions supported in the community climate change survey

¹⁴ Karlsson, Mikael; Alfredsson, Eva; & Westling, Nils, 2020. Climate policy co-benefits: a review. <https://doi.org/10.1080/14693062.2020.1724070>

Symbol	Explanation
 Economic Development	<ul style="list-style-type: none"> Natural asset management can create more local jobs in forestry, agriculture, and other primary industries, as well as environmental science and technology. Preservation and protection of the land and water contributes directly to increased value in Manitoulin Islands largest economic sectors – Tourism – in all its diversity, and Agriculture.
 Innovation	<ul style="list-style-type: none"> Sharing natural asset, flood and water quality data will lead to a better overall understanding of scientific and indigenous knowledge in the community. Use the most innovative technology and methods (e.g., drone, GIS, and Lidar) to create a Natural Asset Inventory and flood maps. Build local knowledge of these technologies to ensure regular monitoring, mitigation and adaptation actions can be taken as climate change increases the vulnerability of local habitats.

Moreover, if combined, this data can be used to value land, discover interconnected waterways and eco-systems so that accurate economic and environmental contributions of natural assets to the community can be considered locally. Once natural spaces have adequate valuations one can conduct vulnerability assessments and the economic loss resulting from climate change induced extreme weather. Plans to protect, preserve, monitor, and enhance spaces can be executed. Finally, when data is made public – everyone in the community will benefit by having access to the environmental due diligence performed and this will provide every landowner in the district an understanding of the carbon sequestered on their land and how protecting and preserving natural assets can generate property income by selling carbon credits.

Advancing our scientific understanding and indigenous knowledge of our natural assets and most importantly sharing how to use this information to maintain and enhance our land, water and air will ultimately lead to positive community-wide outcomes, like:

- 1. Increased Resilience:** The community's ability to bounce back and sustain increased extreme weather events with less recovery time.
- 2. Risk Avoidance:** Once community members have access to improved scientific understanding and indigenous knowledge about Manitoulin Island's natural systems, our community will be able to identify key areas of concern that are more vulnerable to climate related impacts like flooding, wildfire, and drought. This data will help municipal leaders and property-owners/residents to prioritize adaptation or mitigation actions – like building away from a flood zone or managing high risk forests to reduce wildfire risk.

4.2.3 TAKING ACTION – SHARED NATURAL SPACES

In comparison with the other "Taking Action" sections in this plan, acting for our natural environment to increase carbon sequestration and mitigate climate change will require the greatest level of regional collaboration. By pooling information and resources, we can meet the increased capacity demand that will be required to support these activities. Key objectives (Table 3) are long-term goals while specific actions (Table 4) will provide a short to mid-term plan to jump start climate action for our shared natural spaces in pursuit of key objectives.

Table 5: Natural Shared Spaces – Key collaborative objectives for taking corporate and community climate action

Key Objective	#	Detail
Corporate – ☉ Municipality leads development of project with supporting partners + Community – ☹ Develops capacity and resources in partnership with NGOs/community partners, with support from the municipality.	N1	Increase local capacity, knowledge sharing, and educational opportunities by teaming up with local partners to deliver grant application support and services for local businesses to sequester more carbon and protect, preserve, and enhance natural spaces.
	N2	Create a valuation and protection system of stormwater and natural purification systems linked to drinking water sources in the community.
	N3	Continue and enhance the effective management, rehabilitation, and valuation of natural shared spaces to increase our climate mitigation and adaptation capacity in preparation for increased climate change impacts.

Table 6: Action to protect, restore, enhance natural spaces, key actions, partners, roles, resources - N1, capacity

N1				
Increase local capacity, knowledge sharing and educational opportunities by teaming up with local partners to deliver grant application support and services for local businesses to sequester more carbon and protect, preserve, and enhance natural spaces.				
Natural Asset Action	Action Detail	Local Government Role	Supporting Partners	Investment (Resources) Required
N1Θ1	Promote, educate, and incentivize the adoption of climate-friendly practices in the agricultural, forestry and sustainable tourism sectors	Support these community led actions by combining capacity/resources with other local governments and partners	Project lead (to be identified) leads a collaborative approach through an advisory panel which includes: <ul style="list-style-type: none"> Local businesses in key sectors including agriculture, forestry, and tourism Other local governments: municipalities and First Nations. Local, regional, and provincial NGOs Academic partners and sector experts 	\$, Staff Time - Municipal \$\$ - Provincial \$ - Federal \$ - Community Pool together municipal, partner and community investment to leverage Provincial & Federal funding opportunities
N1Θ2	Encourage ecologically-regenerative agricultural practices that will increase cover crops to control run off and soil erosion, riparian zones, tile or controlled natural system drainage	CAC work collaboratively and directly with community partners and other local governments to coordinate joint grant submissions, governance, and on-the-ground implementation activities on a per grant/project basis		
N1○1	Encourage high energy efficiency, low-GHG facilities and operations	Consider the creation of Incentive based by-laws to encourage the protection, preservation, and enhancement of natural spaces in all property development and maintenance processes		
N1○2	Create the municipal organizational structure to support N1Θ1 and N1Θ2	Adjust municipal committee structure to support these community initiatives by: Appoint a staff person and CAC member(s) to work directly with community partners and local		\$ - Municipal Community - capacity and involvement in organizational discussions

N1 Increase local capacity, knowledge sharing and educational opportunities by teaming up with local partners to deliver grant application support and services for local businesses to sequester more carbon and protect, preserve, and enhance natural spaces.				
Natural Asset Action	Action Detail	Local Government Role	Supporting Partners	Investment (Resources) Required
		<p>governments to coordinate joint grant submissions, governance, and on-the-ground implementation activities on a per grant/project basis</p> <p>Appoint CAC members to relevant, existing Council committees</p> <p>CAC members and CAC staff-lead participate quarterly in joint collaborative meetings with partners</p>		

Table 7: Action to protect, restore, enhance natural spaces – actions, partners, roles, resources – N2, water

N2 Create a valuation and protection system for stormwater and natural purification systems linked to drinking water sources in the community.				
Natural Asset Action	Action	Local Government Role	Supporting Partners	Investment Required
N2Ø3	Develop a source water monitoring program that can proactively identify areas of health and safety concern.	Support these community led actions by combining capacity/resources with other local governments and partners, as appropriate.	<p>Project lead (to be identified) leads a collaborative approach through an advisory panel which includes:</p> <ul style="list-style-type: none"> Local businesses in key sectors including agriculture, forestry, and tourism Other local governments: municipalities and First Nations. Local, regional, and provincial NGOs Academic partners and sector experts <p>Consider external advisors with a wide range of water resources credentials.</p> <p>Ministry of Natural Resources</p> <p>Manitoulin Streams (possible to integrate flood mapping into Natural Asset Inventory – see below)</p>	<p>\$ - Municipal \$\$ - Provincial \$\$ - Federal \$\$ - Private Sector</p> <p>\$ - Community</p> <p>Pool together municipal and community investment to leverage Provincial & Federal and private funding opportunities.</p> <p>** Note: Flood mapping is insufficient (10m resolution) which means it is difficult to use this data to inform decision making or identify vulnerable areas.</p>
N2Ø4	Combine, update, and manage a flood mapping and management system.	In collaboration with Manitoulin Planning Board and other local governments, Billings will need to consider where a project like this will fit into the organizational structure at the municipality.		

N2 Create a valuation and protection system for stormwater and natural purification systems linked to drinking water sources in the community.				
Natural Asset Action	Action	Local Government Role	Supporting Partners	Investment Required
N2O3	Support water protection initiatives	<p>Update stormwater management plans and consider natural solutions whenever possible to manage stormwater.</p> <p>(e.g., Create or restore nearby wetlands rather than installing new culverts, dams or engineered flood management systems)</p> <p>Support these community-led actions by combining capacity/resources with other local governments and partners.</p> <p>Work directly with community partners and local governments to coordinate joint grant submissions, governance and on the ground implementation activities on a per grant/project basis.</p>	<p>With stable financial support from local governments, apply for grants to start and implement water monitoring program.</p> <p>Project lead (to be identified) leads a collaborative approach through an advisory panel which includes:</p> <ul style="list-style-type: none"> Local businesses in key sectors including agriculture, forestry, and tourism Other local governments: municipalities and First Nations. Local, regional, and provincial NGOs Academic partners and sector experts Manitoulin Planning Board Ministry of Natural Resources Manitoulin Streams (possible to integrate flood mapping into Natural Asset Inventory – see below) 	<p>\$ - Municipal \$\$ - Provincial \$\$ - Federal \$ - Community</p> <p>Pool together municipal and community investment to leverage Provincial & Federal and private funding opportunities.</p>

Table 8: Action to protect, restore, enhance natural spaces – key actions, partners, roles, resources – N3, mitigation, adaptation

N3 Ensure the effective management, rehabilitation, valuation, and enhancement of natural shared spaces to increase our climate mitigation and adaptation capacity in preparation for increased climate change impacts.				
Natural Asset Action	Action	Local Government Role	Supporting Partners	Investment Required (Resources)
N3O1	Increase scientific understanding and utilize indigenous knowledge of current natural systems to protect and enhance local shared natural spaces	Support these community led actions by combining capacity/resources with other local governments and partners.	<p>Project lead (to be identified) leads a collaborative approach through an advisory panel which includes:</p> <ul style="list-style-type: none"> Local businesses in key sectors including agriculture, forestry, and tourism 	<p>\$ - Municipal \$\$ - Provincial \$\$ - Federal \$ - Community</p> <p>Pool together municipal and community investment to leverage Provincial & Federal and private</p>
N3O1	Participate in community-based project N3O1: Create a Natural Asset Inventory and per O.			

N3 Ensure the effective management, rehabilitation, valuation, and enhancement of natural shared spaces to increase our climate mitigation and adaptation capacity in preparation for increased climate change impacts.				
Natural Asset Action	Action	Local Government Role	Supporting Partners	Investment Required (Resources)
	Reg. 588/17 develop a Natural Asset Management Plan (NAMP) and integrate it into the corporate Asset Management Plan (AMP) by the regulatory deadline of July 1, 2023		<ul style="list-style-type: none"> Other local governments: municipalities and First Nations. Local, regional, and provincial NGOs Academic partners and sector experts <p>With stable financial support from local governments apply for grants to start and implement a Natural Asset Inventory for local governments and community natural assets. Once a Natural Asset Inventory is complete – the community can use this to make a Natural Asset Management Plan (NAMP) that will map future projects that require restoration, protection, or enhancement to reduce climate risk.</p>	funding opportunities.
N3Ø2	Increase tree cover and protection	Consider development of a community-based collaborative tree, shrub, and plant supply program to increase climate resilient tree species and manage tree cover loss from climate related impacts.	<p>Project lead (to be identified) leads a collaborative approach through an advisory panel which includes:</p> <ul style="list-style-type: none"> Local businesses in key sectors including agriculture, forestry, and tourism Other local governments: municipalities and First Nations. Local, regional, and provincial NGOs Academic partners and sector experts <p>With stable financial support from local governments apply for grants to start and implement a tree, shrub, and plant cover program.</p>	
		Review municipal by-laws to encourage tree protection and preservation.	<p>Consultation with Manitoulin Streams and other community groups.</p>	

N3 Ensure the effective management, rehabilitation, valuation, and enhancement of natural shared spaces to increase our climate mitigation and adaptation capacity in preparation for increased climate change impacts.				
Natural Asset Action	Action	Local Government Role	Supporting Partners	Investment Required (Resources)
N3O2	Protect and enhance municipal owned and operated natural spaces.	Work with community partners to train outdoor municipal staff and volunteers to identify species at risk, invasive species and protect, restore, and effectively manage natural systems.	<p>Training capacity delivered with CAC / community resources.</p> <p>Consultation with Manitoulin Streams and Western Manitoulin Community Garden and other local food sovereignty groups to:</p> <p>Facilitate training and create educational materials for natural system preventative maintenance programs on municipal owned land</p>	<p>\$ - Municipal \$\$ - Provincial \$\$ - Federal \$ - Community</p> <p>Pool together municipal and community investment to leverage Provincial & Federal and private funding opportunities.</p>

4.3 BUILDINGS

CEEP VISION STATEMENT IN ACTION

Reduce GHG Emissions by 50%, below 2018 levels, in corporate and community buildings by 2030.

Actions will increase energy efficiency and the adoption of renewable energy and low carbon technologies, thereby building climate resilience in new and existing buildings.

By 2050 – all new buildings in Canada must meet more rigorous GHG emission standards. Heating and powering homes and community buildings accounts for about half of the GHG emissions created by Canadians. In Billings, homes, and community buildings account for 43% of GHG emissions. Next to protecting and enhancing natural assets to mitigate the impact of climate change, systematically upgrading the homes and buildings to improve energy efficiency and reduce overall energy costs, will create the greatest climate change mitigation impact in the township.

In the recent climate engagement survey – 50% of survey participants indicated they would be considering home renovations to improve energy efficiency within the next 5 years. Survey participants also supported setting a 50% GHG emissions reduction goal for community and corporate homes and buildings.

4.3.1 MUNICIPAL BUILDINGS AND FACILITIES

To meet these ambitious and attainable goals, the township will need to consider general best practices for energy efficiency and net-zero planning every time a renovation or new building is considered in the asset management planning process. The townships current strategic plan states:

Continue to pursue rational, cost-effective, and efficient use of municipal property, buildings, and facilities, to maximize the availability of public space, in the context of the results of the structural condition assessment reports.¹⁵

¹⁵ Priority Area: Municipal Infrastructure Maintenance and Improvement, Action Item #2, Appendix A: Priorities and Action Items: Detailed Implementation Process and Schedule, pg. 13, Township of Billings Strategic Plan 2018-2021.

4.3.1.1 OPPORTUNITY: COMMUNITY GREEN BUILDING PROGRAMS

GREEN MUNICIPAL BUILDINGS FEASIBILITY CHECKLIST

- Baseline information on current environmental performance – this means keeping GHG Inventory and energy consumption up to date, so it can be easily retrieved when a project is being considered
- A technical explanation of how the proposed project will meet or exceed the GMF environmental eligibility criteria, environmental criteria vary per building type and renovation
- Include contextual details for various project options.
- Describe the selection criteria and models that support expected environmental performance.
- Assess operational and maintenance costs – are staff trained and qualified to be maintaining new renewable energy equipment? Factor in capacity costs for on-going maintenance to ensure equipment is optimized building operation
- Describe key project risks, propose solutions, and offer risk management recommendations – include insurance and contractual risk transfer considerations

FCM's Green Municipal Fund (GMF) has operated for 20yrs to support innovative green building designs of community buildings. Since August 2020, discussions with GMF on potential projects on Manitoulin Island has resulted in the development of actions listed in Table 6.

To prepare for green building (aka, green construction) funding opportunities it is critical to have a CEEP that is integrated into the municipal Asset Management Plan. This way, when applying to any type of funding for municipal building upgrades, Billings can apply a standardized approach to evaluating the environmental, financial, service, usability and long-term maintenance and operational considerations on each project. FCM provides funding to complete feasibility studies for capital/renovation projects and capital grants/loans for construction of green municipal buildings. These municipal building funds are competitive, and every time Billings Council is considering renovations or capital construction to municipal buildings, the following best practices ought to be considered in conjunction with actions outlined in Table 6:

- If feasibility study funding is required, the municipality should plan for a multi-month grant response period. Therefore, it is ideal to have engineering, contractor and other renewable energy and building energy efficiency experts already selected through a preferred vendor RFP process. Selecting qualified engineering, contractors and renewable sector experts is essential to meeting environmental performance requirements for grant opportunities.
- The municipality can invest in Front End Engineering Design (FEED) for any project and skip applying for a feasibility study grant for renovation and capital grant project. However, in this situation, submissions still require all the elements that would be done in a feasibility study. The municipality will want to ensure that a feasibility study checklist is used every time a renovation or capital project is contemplated to understand the true costs of a building. Integrating the feasibility checklist into engineering design contracts will ensure that professional services completed on FEED meet grant submission requirements. Ideally, all RFPs will be structured for FEEDs to ensure that projects have adequate information to qualify for multiple grants. Often, green building grants can be stacked with normal infrastructure or building accessibility grants – this gives a project a better overall business plan and higher score for innovation on grant applications.

4.3.1.2 STRENGTHS - RENEWABLE ENERGY

The Township of Billings owns a 750kW hydroelectric generating station that is currently leased until 2028 to Oakville Enterprises Corporation (OEC) Inc. and is separately incorporated as Kagawong Generating Station (KGS). The KGS typically generates more than 3000MWh of electrical power each year.

In addition to the hydro generating station in Kagawong, Billings has a ground source heat pump at the Park Centre. Combined with the hydro station, these two renewable energy community building features demonstrate a strength and opportunity to provide education to residents on how these renewable energy sources help to reduce GHG emissions and energy costs. Some municipalities in Canada have begun organizing tours of community buildings that feature renewable energy to teach residents how to manage, maintain and optimize renewable energy systems. Working with local non-for-profits to deliver community tours of these renewable energy solutions already operating in the region could help improve community engagement and support for future renewable energy projects for municipal buildings.

4.3.2 TAKING ACTION: MUNICIPAL BUILDINGS, FACILITIES

Table 9: Municipal Buildings - Key objectives, with detailed actions, notes and considerations

Municipal Buildings Action Sub-Component #	Objectives	Action Details and Notes
MB1O Improve organizational capacity	<ul style="list-style-type: none"> • The corporate climate actions in the CEEP will replace the Conservation and Demand Management (CDM) plan, as it has more ambitious reduction targets and a specific implementation, monitoring and measurement strategy. • The municipality will hire a certified energy management professional (Certified Energy Manager (CEM) or Energy Advisor (EA) to advise on the establishment of an appropriate energy management system that can be updated monthly and track projects. This is an action that would potentially benefit from a <i>collaborative approach</i> with other local governments. • The municipality will Integrate energy data into the AMP, as this plan is developed, so it can be actively managed and reviewed regularly through existing organizational structures. • A municipal staff member will be trained on the basics of energy management and how to spot air leakage, moisture, and insulation issues in a municipal facility. 	<ul style="list-style-type: none"> • Improve municipal staff capacity to implement energy efficiency projects for buildings: <ul style="list-style-type: none"> ○ Create an energy efficiency and reduction strategy ○ Integrate energy and emissions considerations into the municipal Asset Management Plan (AMP) ○ Update AMP and associated documents listed in Appendix C: Implementation Chart • Provide quarterly updates to Council and relevant Council committees on energy and emissions consumption and management to ensure the municipality is on target to meet reduction goals.
MB2O Energy Efficiency: Minor and major refits	<ul style="list-style-type: none"> • To improve energy efficiency management, the municipality will: <ul style="list-style-type: none"> ○ Create a sustainability policy and procedure manual, which will include checklists that Council, committees, and staff can use when evaluating energy efficiency components of a building during regular AMP review. ○ Set a standard for reporting to Council that facilitates effective decision-making. ○ Continue to modify the organizational structure to allow for consideration of 	<ul style="list-style-type: none"> • Consider minor and major building envelope upgrades, building automation and lighting upgrades as part of all municipal building renewal projects. • Perform energy audits on buildings when renovations are being considered, including blower door tests (pre/post project) to ensure the project can qualify for incentives. Do the energy audit at this same time as the pre-construction conditional assessment. • <u>Note:</u> While the municipality considers energy retrofit upgrades on renovation and new building projects

Municipal Buildings Action Sub-Component #	Objectives	Action Details and Notes
	<p>current energy performance, regular maintenance time/costs, engineering life.</p>	<p>it is not codified in any municipal policies, procedures, or AMP. This means the benefits of energy efficiency projects are not easily tracked.</p>
<p>MB3O Energy Efficiency: Preventative Maintenance and regular monitoring</p>	<ul style="list-style-type: none"> The municipality will include the maintenance, fill dates, and repair dates on all equipment associated with energy systems in AMP. Ensure that the maintenance/regular monitoring details for assets are included with capital project proposals. 	<ul style="list-style-type: none"> Consider updating all municipal building maintenance procedures to optimize energy use. Consider seasonal checks and updates to committee and Council with quarterly Energy Management Reports (EMRs).
<p>MB4O Energy Efficiency Standards</p>	<ul style="list-style-type: none"> Allow the CEEP to override the CDM for corporate energy efficiency targets. Examine the best method of including rigorous building standards into asset mgmt. For example, this might be by establishing a by-law or including elements of the ISO 50001 standard into asset mgmt. policy and planning. Identify specific capital and maintenance budget allocations that relate to achieving energy and emissions operational maintenance standards. Set an energy efficiency capital expenditure budget target during the annual yearly budgeting process. 	<ul style="list-style-type: none"> Incorporate building envelope, automation and lighting upgrade standards and targets for municipal buildings/facilities renewal projects in a municipal by-law to create a plan to achieve ISO50001 standards. <u>Note:</u> The Conservation and Demand Management Plan for 2019 to 2024 has several goals and objectives from an organizational perspective that require regular attention and oversight from Council committees.
<p>MB5O Energy Efficiency – Deep Energy Retrofits and Achieving Net-Zero Emissions</p>	<ul style="list-style-type: none"> For retained assets, conduct Front-End Engineering Designs (FEED) with DER and NZ lifecycle analysis in the context of AMP. When considering building envelop, roofing or other major renovations – invest the time and energy required to apply for feasibility study grants to compare minor, major and deep energy retrofits, lifecycle costs and return on investment. When considering any new municipal buildings – prepare the required feasibility studies to make these buildings net-zero ready. 	<ul style="list-style-type: none"> If a building/facility has a conditional assessment of poor or very poor, establish a feasibility study priority list. Feasibility scope should consider financial implications for Deep Energy Retrofit (DER) and Net-Zero (NZ) and accessibility standard upgrades to maintain service levels compared to repurposing and market conditions for consolidation of assets.
<p>MB6O Energy Efficiency – Water Efficiency</p>	<ul style="list-style-type: none"> Once smart meters are installed at the Park Centre, start tracking water usage alongside energy usage for geothermal and hydro. Consider rain-water capture technologies whenever replacing roofs to offset water consumption where possible. 	<ul style="list-style-type: none"> Install smart water metering to major equipment at facilities to better understand water consumption trends and ensure that equipment is operating at optimal efficiency. <u>Note:</u> Billings does not measure or actively manage water consumption in any municipally owned buildings or facilities.

4.3.3 COMMUNITY BUILDINGS

When it comes to residential homes and community buildings the township can have indirect influence improving energy and emissions performance. However, in a small rural community like Billings, programs and help accessing provincial and federal grants can be delivered more effectively by working collaboratively with other partners to provide energy efficiency improvement services to people that live on Manitoulin Island.

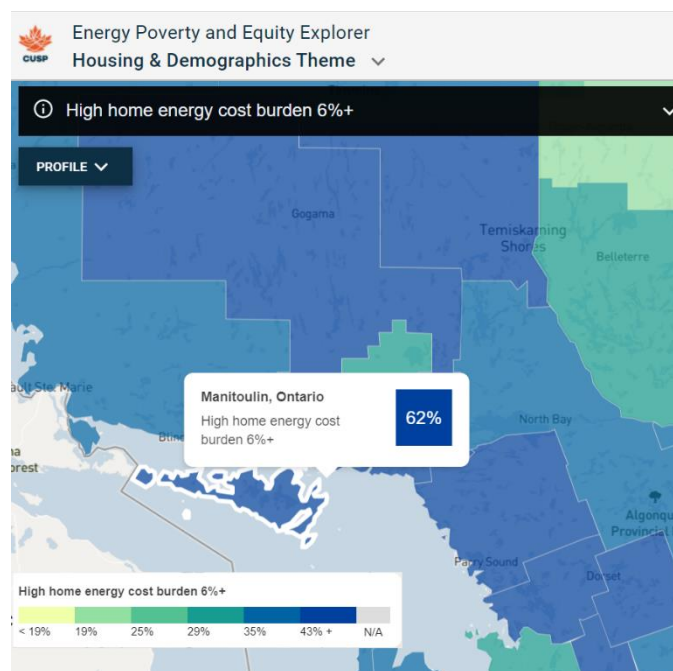


Figure 6: Manitoulin energy poverty cost burden

Energy is a significant cost in Canadian communities, seasonal fluctuations in temperature has great influence on our energy costs. Average annual energy spending can be as much as \$12 million in communities of less than 10,000 people¹⁶. With a population of a little more than 13,000 people¹⁷, islanders spend more of our annual income on energy than almost every Canadian. 62% percent of Manitoulin Island residents spend over 6% of their annual income on energy costs¹⁸, which is the second highest energy burden rate in Canada. Terminology commonly used to describe high home energy cost burdens is *energy poverty*.

Energy poverty refers to the experience of households or communities that struggle to heat and cool their homes and power their lights and appliances. Those in this situation face multiple challenges and impacts, including:

- Discomfort from living in cold and drafty homes.
- Disruptions from abrupt utility shutoffs, such as inability to cook and spoiled food.
- Sacrificing other essentials such as groceries and medication to keep up with energy bills.
- Increased incidence of respiratory illness in children and infants
- Higher stress and poorer mental health outcomes for adults.
- Difficulty participating fully in community life¹⁹

¹⁶ Partners in Climate Protection: Small and Rural Communities Climate Action Guidebook: <https://www.pcp-pcc.ca/resources/guide-climate-action-in-small-and-rural-communities>)

¹⁷ This is the *district* population. Statistics Canada, 2016 Census.

¹⁸ Canadian Urban Sustainability Practitioners (CUSP) Energy Poverty and Equity Explorer. Retrieved (February 2021): <https://energypoverty.ca/mappingtool/>

¹⁹ Canadian Urban Sustainability Practitioners. Retrieved (2021) from: <https://energypoverty.ca>

Energy poverty also makes energy planning challenging at a local government level for several reasons. Prominent among those reasons, is the reality that there is no “typical” demographic that experiences energy poverty. The condition can impact people in variable income brackets, backgrounds, and geographical regions. Reviewing the energy poverty tool used to create Figure 7 above reveals that rural and northern Canadian communities have higher energy burdens.²⁰ The key demographic data impacting energy poverty on Manitoulin Island is the age of homes, median income and costs associated with having several home heating/energy sources because of unreliable hydro service.

Electricity from Ontario’s power grid is the main source of energy for over 80% of Manitoulin’s residents, and grid-supplied electricity is the cleanest source, next to renewably generated off-grid electricity. The cost of electricity from the Ontario grid is relatively expensive and can be a relative financial burden for some households. Traditionally²¹, wood heating is a relatively inexpensive on Manitoulin Island, although firewood prices have fluctuated during the pandemic²². Sustainable forestry practices exist in several communities, including a wood pellet manufacturing and home heating program in Wiikwemkoong.

The reality of the reliance on electricity for heating represents what might be viewed as “a double-edged sword” – on one side is the fact that Ontario has a low-carbon electricity grid, which means most residents are purchasing relatively clean energy already and using propane, wood, or oil as backup or supplemental supply for heating, cooling, or appliances. The downside is that the delivery charges and affordability of clean energy from Ontario’s grid is the most *expensive* heating option. The cost of energy from Hydro One has a significant influence on energy poverty for residents of Manitoulin, and influences consumer behaviour in terms of seeking alternatives such as firewood. Moreover, power is delivered to Manitoulin Island via one transmission station in Little Current, referred to by Hydro One staff as Manitoulin TS. From the Manitoulin TS electricity is distributed throughout the island and the most prolonged outages are due to line disruptions between the Manitoulin TS and homes²³. While Hydro One has increased risk management mitigation effort by widening right of ways and increasing the frequency of removing vegetation growth surrounding these high-risk lines, projected increases in extreme weather events related to climate change may cancel out these increased preventative maintenance measures. This makes grid reliability an on-going consideration in building greater energy resilience on Manitoulin.

According to the community-wide survey that was completed for this CEEP, and can be found in the appendices, prolonged power outage is the number one worry from citizens when they think about the impact of climate change in our community. This finding was not surprising, given the one-transmission-line scenario. Despite the presence of renewable energy generation developments on Manitoulin, this energy is fed into the Hydro One grid and is therefore not available to islanders through a direct, parallel distribution system. When it comes to power outages, islanders are left to rely on alternative fuel and electricity sources to ensure adequate back-up in the event of a power outage – and many households and businesses have no, or inadequate, back-up electricity. Therefore, the Township of Billings maintains a designated emergency response centre (Kagawong Park Centre) with back-up power for the geothermal system provided by a propane-fuelled generator.

These research findings on energy poverty and reliance on electricity from Ontario’s power grid in the community present unique challenge *and* opportunity for climate change and energy planning locally. By identifying weaknesses, it is possible to target action to build a more resilient and climate-friendly

²⁰ Ibid.

²¹ This is relative to electric heating, and there are indications that this is no longer the case – firewood prices have increased during the last few years. In addition, the relative cost of heating with wood is dependent on several factors, including the efficiency of the wood burning appliance in use.

²² The information regarding firewood cost fluctuations during the pandemic is anecdotal.






²³ Hydro One – Email inquiry by Climate Change Coordinator, March 6, 2020

community that has sufficient back-up energy to prevent human health impacts in the event of prolonged power outages.

4.3.4 TAKING ACTION: BUILDING BUILDINGS ON OUR STRENGTHS

In developing the CEEP, the Township of Billings Climate Action Committee has considered several trends and has also explored opportunities to accelerate the development of community-wide support systems that can incentivize energy efficiency and low carbon energy generation. There has also been consideration given to the fact that, while local governments can directly influence positive behavioral changes in building efficiency, a community-wide effort will require provincial and federal financial support to enable local resource deployment and capacity development. There is a need for consistent advocacy to ensure small and rural communities can sustainably access an adequate level of support, and this represents a role for local government leadership.

Table 10: Community benefits from collaborative action on community buildings using the co-benefit framework

Co-Benefit	Broad Objectives and Considerations
	<ul style="list-style-type: none"> • Decrease Energy Poverty • Decrease incidence of respiratory illness in children and infants • Lower stress and poor mental health outcomes for adults
	<ul style="list-style-type: none"> • Sustainable, energy efficient and low carbon energy sources in community buildings help protect, preserve, and enhance the natural environment by significantly lower GHG emissions.
	<ul style="list-style-type: none"> • Increase the quality of community energy and emissions data so incentive and grant program engagement with community members can be custom tailored for Billings residents. • Share local expertise, knowledge and strengths in the construction and building-code sector.
	<ul style="list-style-type: none"> • Maximize and accelerate community-wide access to energy efficiency services and grants. • increase affordability and economic opportunity to create a more resilient and affordable community. • Build on local expertise, knowledge and strengths in the construction and building-code sector.
	<ul style="list-style-type: none"> • Build the capacity required to provide sustainable professional support locally to deploy innovative energy efficiency and low carbon infrastructure. • Deliver innovative community-based energy auditing solutions that provide detailed quotes, return on investment, lifecycle analysis, engineering, contractor, and materials information for low carbon home energy solutions.

Sometimes to transform challenges into opportunities it is first important to look towards existing local strengths and successes in other Canadian communities to envision how these actions can come to life to reach the ambitious target of 50% energy and emissions reductions by 2030.

4.3.4.1 LOCAL STRENGTH #1: COMMUNITY SUPPORT

188 Billings residents responded to the community-wide climate change engagement survey that was completed as part of the CEEP process. These engagement results and participation are a community strength and provide data results that can help target programs, services, and assist is in reaching out goals. To meet a goal of 50% energy and emissions reductions by 2030 – residents in the municipality must update 11 pieces of fossil fuel burning equipment used to heat or power the home each year, over the next 30 years. Table 7 and Appendix C (the updated GHG Inventory) provide the data supporting this assertion.

Table 11: Residential heating equipment 2021 versus 2030 - results of the GHG inventory (Appendix C)

Residential Home Heating Method	Year	
	2018	2030
Oil furnaces	32	16
Wood furnaces	177	89
Propane	111	56

However, with 50% of the survey participants also indicating that they were planning energy efficiency renovations or upgrades in the next 5 years, 11 equipment upgrades a year is attainable. By providing local expertise and grant support this target could be accelerated, but this will require increased educational, technical, and administrative expertise to maximize access to grant opportunities and technical development in the region.

4.3.4.2 LOCAL STRENGTH #2: LOCAL BUILDING EXPERTS

Municipal building officials play a key role in the implementation of property and buildings standards locally. They work directly with members of the public and while they spend a lot of time inspecting and enforcing local, provincial, and other building code standards, their in-depth knowledge, experience and understanding of buildings locally is important to advancing climate-action. Climate change plans ought to acknowledge that the municipal staff have direct contact, influence and expertise in construction and building more climate resilient structures. Building upon community strengths that allow municipal staff and local contracting/engineering experts to review current local policies to that encourage voluntary green buildings standards is a strategy that is working around the country. Moreover, collaborative voluntary green building projects can promote job creation, upskilling the workforce, sustainable development growth and innovation in the community.

4.3.4.3 LOCAL STRENGTH #3: SIZE MATTERS

In this case, Manitoulin Island's small population size matters. With 739 households within the Township of Billings boundaries²⁴, working with the community to deploy energy efficiency retrofits and low carbon energy source upgrades, relatively small investments and household transitions have a big impact. Pair this with the fact that bureaucracy should technically be less of a barrier for implementation of non-financial incentive and green building standards, makes being small a strength.

More examples and case-studies on how other small and rural communities are implementing green building incentives and voluntary standards can be found by picking up almost any other community's CEEP but the best practices and examples relied upon for this plan are as follows:

²⁴ MPAC Household count for the Township of Billings – retrieved July 2019

- Towards Low Carbon Communities: Creating Municipal Green Development Standards (An Implementation Toolkit for Municipal Staff) – Clean Air Partnership (Accessed October 2020) <https://www.cleanairpartnership.org/wp-content/uploads/2020/10/GDS-toolkit.pdf>
- Small and Rural Communities Climate Action Guidebook Partners for Climate Protection (PCP) Program (April 2021) <https://www.pcp-ppc.ca/resources/guide-climate-action-in-small-and-rural-communities>

Table 12: Taking action - reducing energy poverty while improving community resilience, housing, affordability, and creating healthy, comfortable homes

Table 12 Taking Action: Reducing energy poverty while improving community resilience, housing affordability and healthy comfortable homes				
Buildings (B)	Action	Local Government Role	Supporting Partners	Investment Required
B01	Conduct energy auditing, grant/incentive application support, educational and financing programs	<p>Support these community led actions by combining capacity/resources with other local governments and partners.</p> <p>Work collaboratively with community partners and other local governments to coordinate joint grant submissions, governance and on the ground implementation activities.</p>	<p>Lead: (to be determined)</p> <p>The lead will oversee the creation of an advisory panel, comprised of:</p> <ul style="list-style-type: none"> • local energy advisors, contractors, and qualified persons to conduct home energy upgrades. • Academic Partners and Sector experts. • Indigenous and Non-Indigenous Neighbours and local governments. 	<p>\$ Municipal</p> <p>\$\$ Provincial</p> <p>\$\$ Federal</p>

4.4 TRANSPORTATION

Transportation is the second largest source of GHG emissions on Manitoulin Island. About 85% of people living on Manitoulin Island own a vehicle. According to survey respondents, most commute for work irregularly which is may be correlated to the proportion of the population who are retired. An increase in the ability of people to work remotely, recently spurred by the implications of the COVID-19 pandemic is another trend contributing to reduced personal vehicle use.

14 internal combustion powered vehicles will need to be replaced by electric vehicles in the township, each year, to reach 2030 and 2050 GHG reduction goals. This section will focus primarily on the community actions that can be pursued to reach these goals, with only brief comment on recommendations for the township to consider for electrifying the municipal fleet.

4.4.1 TAKING ACTION: THE MUNICIPAL FLEET

On a corporate level, the municipality is committed to reviewing low carbon transportation opportunities for the municipal fleet and has incorporated fuel efficiency considerations into heavy truck RFP's. This practice must continue from now until 2050. Electrification of heavy vehicles and other utility trucks that the municipality relies on for operations is dependent on projected industry advancements and cost reductions of electrifying heavy vehicles. This is likely to begin accelerating in the next 10yrs. Each time the municipality tenders for a new vehicle in our small fleet in the next 30yrs, the market conditions will have changed and RFP's need to review each time to ensure that electrification opportunities are not missed. In the meantime, the municipality should continue staff training practices that promote climate-friendly and fuel-efficient

driving habits. When it comes to municipal staff and driver safety – Billings is best in class, and this is a strength that will need to continue as electrification of the municipal fleet is considered.

Immediate opportunities, while the municipality waits for the inevitable market changes and electrification innovations in the heavy vehicle sector – investing in smaller, road certified utility vehicles to perform outdoor maintenance activities-has been discussed throughout the CEEP process. Investing in one or two road certified utility vehicles is a viable option to replace older trucks that cannot access parks, trails, and other natural spaces that municipal staff must access for maintenance. Investment in an electric utility vehicle would also mean that the municipality could install EV chargers at municipal garages so that when heavy vehicles are feasible to transition, the infrastructure is ready for charging.

4.4.2 TAKING ACTION: COMMUNITY OWNED TRANSIT



During the development of this project, a new cooperative, non-for-profit transit organization named United Manitoulin Island Transit (UMIT) was founded. This transit organization is currently operating because of an administrative relationship with Central Manitoulin, allowing them to access a transit-oriented grant that is only available to municipalities. In the absence of any local governments taking on the responsibility for stewarding public transit on the island, the collaborative community-based approach designed by UMIT has begun to fill the gap.




Since beginning a bus route operation in the Spring of 2020 – a route that does not currently service the Township of Billings - UMIT has accumulated a significant amount of transportation data that has allowed them to analyze their operations and adjust services. In December 2020, after the release of several new federal government programs to support the expansion of electric vehicle charging networks all over Canada, UMIT began discussing transportation electrification opportunities with the Climate Change Coordinator from Central/Billings. UMIT has an ideal community-based corporate structure to deliver a regional electrified transit system on Manitoulin Island and armed with data from this project and their own consistent data collection on usage the future of rural transit solutions will require:

- The creation of innovative business plans that can adapt to fluctuating seasonal usage.
- The electrification of ride-share fleets to realize marginal revenue gains while paying drivers fairly.
- The collection and use of applied, real-time usage data to coordinate transit and maximize system efficiencies.

Electrified public transit systems offer and host of potential community co-benefits, some of which are outlined in table 16:

Table 13: Community co-benefits from increased ride sharing and an electrified transit system for Manitoulin

Co-Benefit Category	Potential Community Benefits
	<ul style="list-style-type: none"> • Transportation is one of the largest stressors for modern families. Shared transportation can alleviate some of this stress and lead to better health outcomes • Shared transportation helps facilitate safe travel and keeps traffic levels low on our highways and could lead to less instances of impaired driving.
	<ul style="list-style-type: none"> • Improving EV infrastructure facilitates the transition to electric vehicles for everyone, and helps us reach GHG reduction more quickly protecting the environment

Co-Benefit Category	Potential Community Benefits
	<ul style="list-style-type: none"> Shared transportation options can improve inter and intra community relationships and reduce isolation for individuals.
	<ul style="list-style-type: none"> Shared transportation options allow significant cost savings for families that will not have to purchase and maintain additional vehicles. Incorporating online apps and data sharing for transportation sharing can involve financial opportunities for local entrepreneurs New economic opportunities arise with the introduction of ridesharing and less reliance on personal vehicles for all transportation needs.
	<ul style="list-style-type: none"> Shared transportation options will assist in tracking GHG emissions by facilitating data collection relating to transportation trends.

RURAL TRANSIT CASE STUDY: REGIM

REGIM is a transit system comprised of partner municipalities in small, rural, island communities responsible for organizing transit in the territory of Gaspésie-Les Îles, in Quebec. This community has strikingly similar demographics, geography, and a slightly larger population than Manitoulin Island. Looking at the way they have structured a unique electric ride-share program that also supports the expansion of community EV charging stations for members of the public to use is like looking at Manitoulin Island's future transit system.

Over time, and with minimal financial burden on local municipalities, this organization has leveraged relatively small community and municipal investments to secure significant federal and provincial grants. This funding has contributed to fleet expansion and the installation of EV charging stations. This transit service provides an array of options for users, bike share, electric vehicle car sharing services, ridesharing/carpooling apps for smartphones and a small bus system²⁵.

Table 14: Taking action – Reducing transportation costs and developing a connected, safe community

Transit (T)	Action	Local Government Role	Supporting Partners	Investment Required
T01	Work with local government partners to expand low and zero emission vehicle uptake and charging networks	Identify and collaborate with local partners	Lead: (to be determined – possibly UMIT?)	\$ Municipal \$\$\$ Provincial \$\$\$ Federal \$ Community \$ Private
T02	Expand public transit, ridesharing, and support fleet electrification		Indigenous and Non-Indigenous Neighbours and local governments	
T03	Increase public awareness of climate-friendly travel modes. Educate and disseminate knowledge regarding these modes		Angel Bus Network?	

²⁵ RÉGÎM (Retrieved January 2021) <https://regim.info/en/about-the-regim/the-regie/>

4.5 WASTE

For well over a decade, Manitoulin Island local governments have known that our landfills are filling up too

CEEP VISION STATEMENT IN ACTION # 4

Reduce overall consumption by promoting circular economy concepts and increase waste diversion through recycling rate increases and home composting program

fast and the cost to ship our waste off-island will be prohibitive. About 10yrs ago, several local governments worked together to have a waste audit and report completed for the island. The report was supposed to help create a collaborative waste management approach to deal with over 10 aging landfills on the island. The ultimate recommendation was to ship household waste to Dodge Landfill, and this was not the collaborative solution local governments could agree with. In the absence of a collaborative approach, each municipality opted to manage recycling contracts and landfill/waste management independently.

In 2018, Billings had 64 tons of recycling hauled to Blind River and 576 tons of household waste went into the Billings landfill. The GHG emissions from all waste activities in Billings community, after recycling is hauled away (16tCO₂e) and household garbage is about 800tCO₂e. This is about 5% of the overall GHG emissions produced in Billings. The environmental impact of community waste on the environment is not just measured in GHG emissions and these GHG emission calculations do not consider the GHG emissions from private citizens that burn or bury waste, which is a common practice in the community.

4.5.1 CHALLENGES AND THREATS

4.5.1.1 OLD LANDFILLS, FRACTURED BED ROCK AND REGULATORY RISKS:

As mentioned in Shared Natural Spaces section, Manitoulin Island has unique geology. It is called carbonate bedrock and is composed mainly of limestone and dolostone. Take a stroll on the famous Cup and Saucer trail or look closely at the rocks surrounding Bridal Veil Falls and anyone can see the uniqueness of these rock formations and how they can form large visible cracks. Throughout time, the weather and surface water enlarge these cracks – eventually forming karst, grikes and underground caves that interconnect to streams, rivers and lakes that supply drinking water²⁶. Across most of Manitoulin, including the Billings landfill location these subterranean bedrock formations are extensive and while the landfill is located reasonably far from settlement areas, hazardous waste from the landfill could still cause ground water contamination because many cracks, karsts and grikes interconnect and are a mere 1.25km distance below ground from the Kagawong River. Thankfully, the landfill site does have some monitoring stations, and landfilling methods continue to improve. However, there is no way of knowing the true risk of interconnected cracks in the bedrock, unless detailed Lidar mapping, hydrogeology, and field studies, as suggested in the Shared Natural Spaces section (4.2), are completed for the region. This makes the data collected for natural spaces additionally useful in protecting human health and drinking water from potential future landfill contamination.

Leaky landfills designed on top of fractured bedrock would not be approved by the province today without liners and collection systems to capture the methane gas and hazardous substances that seep out of landfills, called hazardous leachate. The province may approve the expansion of these landfills because the original design pre-exists hazardous leachate and methane gas collection requirements but there is undoubtedly risk that these sites are a potential threat to groundwater. This makes leaking landfills a known and manageable risk that requires community investment to prevent further migration of contaminants into drinking water sources. Since we now know that sites with fractured bedrock are not a good choice for

²⁶ M. Coniglio, P, Karrow, P Russell, Manitoulin Rocks! Rocks, Fossils and Landforms of Manitoulin Island (Earth Sciences Museum, University of Waterloo in partnership with the Geological Association of Canada and the Gore Bay Museum, 2006)

landfill location, public health and groundwater impact will continue to need consideration for ongoing operation, and especially expansion, of existing sites.

4.5.1.2 REGULATORY NEW PRODUCER RESPONSIBILITY RECYCLING SYSTEM IN ONTARIO:

Right now, every local government on the island procures recycling haulage services from a third-party to haul recycling off-island. In Ontario, municipalities under 5000 are not required to recycle glass – so the third-party recycling contractor stopped picking up glass and glass started filling up island landfills. Small and rural communities that individually procure recycling services will always be at a disadvantage and subject to private sector and provincial regulatory risk. A good example of this is that Billings indicated that it would be willing to move over to the new producer responsibility recycling system as early as 2023 but was pushed to 2025. Either way, by 2025 producer responsibility legislation in Ontario will require producer to be fully responsibility for Blue Box services provincewide²⁷. While some policy experts state that this will save taxpayer dollars, give producers incentive to redesign products and make them easier to recycle – it is inevitable that this will have an impact on small and rural communities that may transition to this new system more slowly or may see an increase in recyclable materials on the municipally operated landfills if producers refuse to pick up all recyclable items for communities under 5000, like they have done for glass recycling on the island.

4.5.2 STRENGTHS AND OPPORTUNITIES – COMMUNITY ENGAGEMENT AND SHARED PROCUREMENT Food Waste – An Overlooked Climate Mitigation Measure

42% of the GHG emissions created from the food we eat are created during the production, processing, transportation, and disposal phase²⁸. Approximately, one third of Canada’s food is never eaten producing unnecessary emissions throughout the entire food system, as well as methane when it is disposed of in the landfill²⁹. It is estimated that close to 40% of the waste deposited in the Billings landfill is food waste. By reducing food waste in the landfill, Billings could realize GHG emissions reductions, save tax dollars due to lower volumes of waste in the landfill and reduce the potential for hazardous leaching.

Although Billings has implemented a composting program in the past, close to 50% of the residents that participated in the climate change survey did not know about the program. Only 5% said they would not want to compost from home – indicating that home composting could be the most cost efficient and easiest way for Billings to reduce GHG emissions from waste, especially if consistent education and engagement is pursued as part of an integrated waste diversion approach.

4.5.3 TAKING ACTION: MUNICIPAL AND COMMUNITY WASTE REDUCTION

Based on the challenges, threats, strengths, and opportunities for safe and improved waste reduction in Billings – climate actions will focus on steps that can be taken by the municipality (corporately) and in the community by residents in collaboration with the municipality, other local governments, and organizational partners.

²⁷ *Producer Responsibility for Ontario waste diversion programs*. Retrieved from <https://www.ontario.ca/page/producer-responsibility-ontarios-waste-diversion-programs>

²⁸ US Environmental Protection Agency, *Opportunities to Reduce Greenhouse Gas Emissions through Materials and Land Management Practices (2009)* Retrieved from <https://www.epa.gov/sites/production/files/2016-08/documents/ghg-land-materials-management.pdf>

²⁹ National Zero Waste Council, *Reducing Food Waste and Cutting Canada’s Emissions: Policies for Reaping the Environmental, Economic, and Social Benefits (2016)*. Retrieved from <http://www.nzwc.ca/Documents/NZWCSubmissionOnPan-CanadianFrameworkForCombatingClimateChange.pdf>

Table 15: Community co-benefits from waste reduction, using the co-benefits framework






Co-Benefit Category	Potential Community Benefits
	<ul style="list-style-type: none"> Reducing leachate and methane gas coming from the landfill helps ensure long-term access to safe drinking water sources in the community.
	<ul style="list-style-type: none"> Reducing leachate and methane gas coming from the landfill helps ensure a clean environment. Converting brush into chip waste will assist with composting this waste, increase soil quality in our environment and reducing GHG emissions.
	<ul style="list-style-type: none"> Sharing of tools and other items, as well as other circular economy events, helps promote interaction in the community and facilitate positive relationships Additional community events like a composting program or circular economy activities facilitate data collection relating to GHG emissions.
	<ul style="list-style-type: none"> Sharing of tools and other items helps save money for households but providing a low-cost alternative to investing in these items themselves Maintaining a clean environment such as the Kagawong River helps maintain the tourist industry for our community as the river and the falls a prime destination for tourists. Methane gas collection at the landfill can be used as an energy source, reducing municipal energy usage, and saving money. Increasing household composting can reduce the need for purchasing commercial fertilizers for home gardens, saving money.
	<ul style="list-style-type: none"> Having no power sources at the landfill now presents opportunity for innovative applications of renewable energy, waste to energy technologies and gas capture systems.

Table 16: Taking Action – waste management - reducing overall consumption and landfilling

Waste (W)	Action	Local Government Role	Potential Supporting Partners	Investment (Resources) Required
W01	Re-institute an in-home composting support program	Partial financial contribution to the composting program and;	<ul style="list-style-type: none"> Private sector School Board 	Municipal \$/Staff time
W02	Track composter use, waste, and GHG emission reductions from community-based composting program	Promotion – communication through website, social media with other waste management information	<ul style="list-style-type: none"> (note that Manitoulin Secondary School is in Billings, and is a significant waste generator for 	Other investment should be secured through the private sector, provincial & federal grants, and community fundraising efforts (e.g., to begin the community owned waste

Waste (W)	Action	Local Government Role	Potential Supporting Partners	Investment (Resources) Required
W03	Create local circular economy opportunities – organize reuse and repurposing events, repair seminars and eventually consider a permanent tool share library and reuse centre.	Communications and advertising through website, social media with other waste management information sharing.	the municipality <ul style="list-style-type: none"> Alterum (as a possibility) for data management of program and resulting GHG savings 	and operated tool share library and reuse centre)
WO1	Integrate leachate and methane gas collection systems into Kagawong sequential fill design	Create a committee of Council to improve waste management oversight and operations.	External expertise can provide technical, cost, GHG savings, joint compactor procurement and grant application support to secure compactors and woodchippers at landfill site.	\$\$ - Municipal \$\$ - Provincial \$\$- Federal
WO2	Install a power source at the landfill – hydro or renewable to operate more compaction and wood chipping equipment	Start setting aside a larger percentage of tax revenue annually to meet future infrastructure needs at landfill sites.		
WO2	Increase municipal staff support at the landfill to improve covering, chip clean yard waste instead of burning and operate recycling compaction equipment.			
WO4	Integrate tourism advertisements with waste diversion and management messaging	Every time the municipality advertises tourism digitally or in print, include messaging about keeping natural tourism attractions clean and waste free.	Local businesses to create advertisements that encourage waste free tourism	\$ - Municipal
WO5	Continue to grow the Kagawong Market to increase access to local food. Encourage re-use type vendors at the market	Economic Development Committee work more effectively with the market management	Local food producers	Municipal \$, plus capacity and volunteer time of organizing community members

5 PLAN IMPLEMENTATION

5.1 RECOGNITION OF THE VALUE OF COLLABORATION

This plan presents an inspiring but challenging list of actions to make significant progress against climate change in our municipality. The sheer length of this document and the depth of detail can make it seem daunting, as climate change is certainly the most wide-ranging crisis of this century. One of the main challenges in implementing this plan is finding and allocating the resources (human and financial) to undertake the actions. The following list is a summary of some of the major considerations in proceeding with implementation:

- Actions need to be prioritized with a mind to timing, logistics, dependencies (i.e., are some actions dependent on the implementation of others?) and the level of financial and staff-time resources required.
- Which actions require what type of collaborative engagement, and with whom?
- Which actions are the “quick wins,” those that can feed and maintain momentum by demonstrating progress?
- The need for developing local and partnered plans to go forward to implement each action.
- What processes and mechanisms could/should be used to monitor implementation and assess performance?

Reviewing this list makes it clear that there is a significant amount of work needed to move forward with implementation of the CEEP. The municipality will need to dedicate adequate human and financial resources, over time, to ensure the success of the plan. This implementation challenge should not be underestimated, given the already existing reality that municipal administrative responsibility has grown significantly and rapidly over the past few years. The increased administrative burden of implementing the CEEP is further reason for the municipality to ensure that adequate human resources are in place to meet our administrative responsibilities.

It is also clear that partnering with other local governments and NGOs (on potentially varied scales – local, regional, and provincial) will be vital to plan implementation and ensuring its ultimate success. Climate change is a world-wide challenge and working together is essential to be able to meet this crisis. A collaborative approach is required to implement the community (Θ) actions in this plan and once established, this collaborative approach can begin to provide capacity and support if needed to implement corporate (○) actions.

Since the inception of this CEEP planning process, it has been acknowledged by both the Township of Billings and the Municipality of Central Manitoulin that sharing staff resources and collaborating on plan development processes, has been beneficial. Earlier this year, both municipalities expressed their intent to continue working collaboratively on CEEP implementation. For Billings this took the form of a motion at the March 15, 2021, Regular Meeting of Council, as follows:

2021 – 110 Motion: Barker – Jackson

That Council approves the continuation of the Central Manitoulin/Billings climate change planning and implementation partnership, once the current FCM/MEP grant has concluded and further, that Council approves the continuation of the Central Manitoulin/Billings climate change partnership resources including but not limited to sharing a staff resource (job title, hours etc. to be determined) and maintaining Council Climate Action Committee (s) once the current FCM/MEP grant has concluded provided that Central Manitoulin also approves..... Carried

There is strong support from both Councils to continue this work and share resources. However, at the time of writing climate change related staffing details have not yet been finalized.

Table 17: Examples of successful climate-change-related collaborations

Collaborative Successes Case-Study Samples	Evidence in Support of CEEP Implementation	Measurable Implementation Outcomes
<p>Hazardous Waste Days - Manitoulin Island (Local)</p> <p>A 17-year partnership between local Manitoulin Island municipalities to jointly procure and organize hazardous waste pick-up and safe disposal of residential hazardous waste.</p>	<p>Shared service between multiple municipalities on Manitoulin Island is possible</p> <p>Collaborative waste management procurement, programs and services is sustainable and manageable in the District of Manitoulin Island.</p>	<p>Decreased service and administrative fees for each partner</p> <p>Reduction of hazardous waste materials and environmental reduced contamination risk</p>
<p>Manitoulin Streams (Local)</p>	<p>Collaborating on natural solutions for the protection, conservation and enhancement of shared natural spaces is possible on Manitoulin Island.</p> <p>This non-profit has worked on natural asset protection, preservation, and conservation projects all over Manitoulin Island – project partners have included First Nations, municipal governments, agricultural small businesses, and educational institutions.</p>	<p>Flood management and protection of public and private property</p> <p>Habitat enhancement and restoration</p> <p>Biodiversity protection and conservation</p> <p>Enhanced carbon sequestration</p>
<p>Local Food Manitoulin – Community Gardens (Local)</p>	<p>Island-wide projects that provide customized and tailored community solutions is possible in Manitoulin Island.</p> <p>Community gardens that received initial financial support and on-going staff support from local governments were able to continue operating with less risk once grant funds for start up costs were exhausted.</p>	<p>Malnutrition in the community is decreased.</p> <p>Local jobs, volunteer and learning opportunities are created.</p> <p>Sustainable and sovereign food systems are created to building resiliency.</p> <p>Local food becomes more affordable and accessible.</p> <p>GHG emissions from the overall food system are decreased</p>
<p>Reep Green Solutions (Ontario – Waterloo Region)</p> <p>A collaborative non-profit that pairs academic research with practical action in the community and includes multiple municipal</p>	<p>Multi-municipal partnerships to implement climate action, particularly in service areas that are not generally offered by municipal governments have existed for over a decade in Ontario.</p>	<p>Provides organizational structure to deliver climate action programs and services that local governments do not have the resources to provide.</p> <p>Increases residents' access and success in obtaining provincial and federal grants to plant trees</p>

Collaborative Successes Case-Study Samples	Evidence in Support of CEEP Implementation	Measurable Implementation Outcomes
<p>governments as stakeholders.</p> <p>Projects that could apply here on Manitoulin Island: Home Energy Efficiency, Healthy Yards and Neighborhoods (backyard tree planting, home flood and wildfire protective services)</p> <p>https://reepgreen.ca/</p>	<p>REEP is just one highly successful model that started with community energy efficiency and has expanded its community climate action services over a 20yr period.</p> <p>Municipal governments have a role to play in the organization, but they are not ultimately responsible for it and can choose to opt-in in programs that are most appropriate for their community.</p>	<p>or improve home energy efficiency.</p>
<p>Our Energy Guelph</p> <p>https://www.ourenergyguelph.ca/</p>	<p>With an initial 5yr funding commitment from the municipal government, this non-for-profit will be financially independent within the first 4yrs of operation and will be responsible for delivering community energy efficiency services, expanding electric vehicle charging station infrastructure, leveraging initial capital to secure grants and providing technical and sustainability consulting services with the local community that helps the municipality reach and monitor community GHG emission goals.</p>	<p>Mobilization of local grass roots community action that starts with municipal led support for the start-up phase of the non-for-profit.</p> <p>By year 5, non-for-profit self-sustaining, reinvesting any profits back into the expansion of services and programs.</p>

6 CONCLUSION

Climate change is real – it is a threat to current and future generations. The Township of Billings recognized this and has played a leadership role in the community by beginning to tackle this through creation of the CEEP. This leadership was demonstrated by joining the PCP program, completing the climate change engagement survey, and approving the CEEP. This CEEP is the start – we must now all continue building on the relationships and collaborative opportunities, on various scales, that have presented themselves throughout this planning process to implement and monitor climate change actions in this plan.

Municipalities need not tackle climate action alone; many allies can and have been found in the local community. Other municipalities on Manitoulin Island have already expressed interest in sharing costs and resources that will benefit all communities involved. Establishing partnerships with existing and new community groups to drive community climate action is a key component of success. This success has already been realized through the establishment of collaborative partnerships like those illustrated in Table 10 on the island. Council's commitment to the CEEP will ensure that the work of climate action continues, hopefully guided, on Council's behalf, through a continuation of the Billings Climate Action Committee.

7 GLOSSARY AND ACRONYMS

The Community Energy and Emissions Plan (CEEP) uses several key terms and acronyms that are consistent within climate change conversations and literature. Whenever possible, plain language is used to describe scientific or economic concepts related to climate change. Many definitions outlined below have been adjusted into plain language descriptions that can be found in the Intergovernmental Panel on Climate Change (IPCC) and the Partners in Climate Protection Protocol (Canadian Supplement).

Definitions and Acronyms	
Adaptation	An action taken to change societal, behavioural or infrastructure to anticipate the impact of more extreme weather due to climate change
Asset Management Plan AMP	A tactical plan for managing municipal infrastructure (buildings, roads, parks) to deliver a standard of service agreed upon by the community for this infrastructure
Capacity	The combined strengths, attributes, and resources available to an individual, community, organization and/or local government that can be used to achieve established goals.
Carbon Dioxide Equivalent CO₂e	A metric used to compare emissions from various greenhouse gases. The global warming potential of any greenhouse gas can be converted to this carbon dioxide metric so that emissions can be represented using a common factor.
Carbon Sequestration	A natural or artificial process by which carbon dioxide is removed from the atmosphere and held in a solid (including biomass) or liquid form.
Carbon Sink	Anything that absorbs more carbon dioxide from the atmosphere than it releases.
Climate Action Committee CAC	The Council appointed committee responsible for the creation, oversight, recommendations, and future implementation of climate actions included in this Community Energy and Emissions Plan (CEEP) for the Township of Billings.
Climate Change	A change in average weather patterns that persist over long periods – at least 30 years or more. For this document – climate change refers specifically to human-caused changes in long term weather patterns that have occurred since the Industrial Era.
Climate-friendly	An action that is not harmful to the environment because it is not contributing to making climate change worse by burning/consuming carbon dioxide or other greenhouse gases.
Conservation and Demand Management Plan CDM	A regulatory reporting and management requirement for all public sector organizations under the Province of Ontario Energy Act, 2009 (O. Reg 397/11). A tactical plan for managing energy and emissions to meet community and/or organizational environmental responsibility goals and objectives.
Decarbonization	The reduction of greenhouse gas emissions using low or lower carbon power sources that achieve a lower output of greenhouse gasses into the atmosphere.
Deep Energy Retrofit DER	Energy conservation measure taken to minimize energy use for an existing building (usually by 50% or more) compared to baseline energy use.
Energy Poverty	The experience of households or communities that struggle financially to heat and/or cool their homes and power their lights and appliance.
Federation of Canadian Municipalities FCM	A national organization that brings together more than 2000 municipalities in Canada and represents over 90% of Canadians.
Greenhouse Gas Emissions GHGs	Gases in the atmosphere that absorb and emit infrared radiation contributing to the greenhouse effect.

Definitions and Acronyms	
Independent Electricity Service Operator IESO	Operates the Ontario power system in real time, ensuring reliability of the provinces power, balancing the supply of and demand for electricity on a second-by second basis and directing its flow across high-voltage transmissions lines to Ontarians.
Impacts	Impacts in the context of this report shall refer to the consequences from climate change, good and/or bad, expected and realized on human and natural systems.
Intergovernmental Panel on Climate Change IPCC	An international body established under the United Nation to assess the science, impacts and response options to climate change
Key Performance Indicator KPI	A quantifiable measure used to evaluate the success of an organization, individual or process in achieving a goal.
Low-Carbon Resilience LCR	Strategic alignment of climate adaptation and mitigation actions that simultaneously reduce enterprise/organizational risk, and produce health, economic, ecological, and social benefits.
Low Carbon	Power that is produced with substantially less greenhouse gas emissions than traditional fossil fuel/coal power generation.
Mitigation	Actions that contribute to the reduction of GHG emissions and/or increase carbon sequestration to prevent the worst impacts of climate change.
Major Retrofits	Modifications to an existing building that reduce energy or water consumption but require a larger investment – replacing window glazing and doors, updating inefficient heating, cooling systems, installing smart meters or other devices to help manage consumption.
Minor Retrofits	Modifications to an existing building that are low cost, easy to implement and offer good value for money and effort to reduce energy or water consumption – could include, sealing with caulking or spray foam, adding insulation, or upgrading lighting systems.
Net-Zero NZ	A target that completely negates the amount of greenhouse gases produce by human activity – generally achieved by reducing emissions and implementing methods to absorb greenhouse gases from the atmosphere.
Natural Asset and Natural Asset Inventory	Soil, air, water, flora, fauna which can deliver valuable services such as timber, fish, solar energy, erosion control, flood protection, drinking water, air purification. A natural asset inventory is a practice that measures and values these assets based on services they provide in a defined jurisdiction.
Partners in Climate Protection Protocol PCP	Partners in Climate Protection is a national network of over 400 municipalities with a shared goal of acting against climate change. The protocol, developed by PCP, is a set of detailed accounting and quantification guidelines for greenhouse gas emissions in a local government boundary.
Resilience	The capacity to recover quickly from difficulties.

8 APPENDIXES

The following appendices are available as separate documents on the Township of Billings website.

A. CLIMATE ACTION COMMITTEE TERMS OF REFERENCE

Explains the mandate and procedures of the Township of Billings ad hoc CAC

B. LOCAL CLIMATE PROJECTIONS

Detailed climate atlas data and other sources used to make climate predictions for Manitoulin Island

C. UPDATED GREENHOUSE GAS INVENTORY FOR THE TOWNSHIP OF BILLINGS

As analyzed and reported by Alterum (creator of energy and emissions profiles)

D. COMMUNITY ENGAGEMENT SURVEY

As analyzed and reported by Ethelo (community engagement specialists)