Sault Ste. Marie Community Greenhouse Gas Reduction Plan
2020 - 2030

Approved: December 14, 2020

Prepared by: FutureSSM

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Land Acknowledgment

The City of Sault Ste. Marie (the City) acknowledges, with respect, that we are in Robinson-Huron Treaty territory, that the land on which we are gathered is the traditional territory of the Anishinaabe; home of Garden River First Nation, Batchewana First Nation and the Metis Nation. The City also acknowledges that this area is historically known as Bawating. The City recognizes the importance of our relationship with the Indigenous community, as we move forward together in Reconciliation, and the importance of meaningful consultation with the Indigenous community, who have a commitment to environmental stewardship.

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Message from the Mayor

On behalf of Municipal Council, I am pleased to introduce the Sault Ste. Marie Community Greenhouse Gas (GHG) Reduction Plan (2020 – 2030) to the community. It is an action-oriented document aimed at lowering community GHG emissions. Implementing the Sault Ste. Marie GHG Reduction Plan is an important objective as it aligns with the City's Strategic Plan, which encourages environmental sustainability. The recommendations will be implemented over time and will be assessed regularly to ensure compliance to future governmental reporting requirements. Thank you to the Federation of Canadian Municipalities for supporting this initiative.

Thank you to our stakeholders who contributed to the development of this plan. Implementation will require communal efforts from both the City and our partners.

The plan represents a significant milestone, but is also the beginning as we now look to community members to support and help us realize our sustainability goals.

Sincerely,

Mayor Christian Provenzano

List of Acronyms

AC – Community Adjustment Committee

ADSB – Algoma District School Board

BAU – Business as usual

CO_2 – Carbon dioxide

CFCs - Chlorofluorocarbons

CDES – Community Development Enterprise Services

CDF – Community Development Fund

CRI – Climate Risk Institute

CSPA – Canadian Steel Producers Association

CSPGNO - Conseil scolaire public du Grand Nord de l'Ontario

EV – Electric Vehicle

FCM – Federation of Canadian Municipalities

GHG – Greenhouse Gas

GMF – Green Municipal Fund

HSC – Housing Services Corporation

HSCDSB – Huron-Superior Catholic District School Board

ICLEI – Local Governments for Sustainability

IESO – Independent Electricity System Operator

IPCC – Intergovernmental Panel on Climate Change

IT – Information Technology

LCA – Life-Cycle Analysis

LED – Light Emitting Diode

LIC – Local Improvement Charge

MCIP – Municipal Climate Innovation Program

MNRF – Ministry of Natural Resources and Forestry

MW – Megawatts

NCCN – Northern Climate Change Network

OLG – Ontario Lottery and Gaming Corporation

OP – Official Plan

PACE - Property Assessed Clean Energy

PCP – Partners for Climate Protection

R&D – Research and Development

RAIN – Rural Agri-Innovation Network

RFP – Request for Proposal

SSM – Sault Ste. Marie

SSMIC – Sault Ste. Marie Innovation Centre

STAC – Sault Trails Advocacy Committee

tCO_2e – tonnes of carbon dioxide equivalent

USA – United States of America

Executive Summary

The Corporation of the City of Sault Ste. Marie (the City) received funding in 2019 from the Federation of Canadian Municipalities (FCM) to increase community and corporate climate change capacity. This included the development of a greenhouse gas (GHG) emissions inventory and reduction plan. The Sault Ste. Marie Community GHG Reduction Plan 2020 – 2030 (GHG reduction plan) is a document that sets out the actions required on a short, medium and long-term basis in order to reduce GHG Emissions in Sault Ste. Marie.

The recommended GHG reduction actions are broken down into seven key sectors with associated objectives, timelines, task leads and partners. Each section of the action plan is followed by insights pertaining to municipal, provincial and federal policy and legislation alignment as well as financing and funding opportunities. The seven sectors are:

1. Buildings & Energy – Community
2. Buildings & Energy – Corporate
3. Transportation
4. Waste
5. Green Space
6. Economic Development
7. Municipal Leadership

The goal for GHG reduction in Sault Ste. Marie is net zero by 2050. The City intends to take a staged approach to achieve this goal, and will focus on a GHG reduction target of 10% corporate and 5% community between 2020 – 2030, with an increasing scale of reduction target between 2030 and 2050. The first 10-year target aligns with the individual targets for corporate and community GHG reductions as recommended by the FCM. The corporate portion of the 10-year target is predominantly based on implementing a series of outstanding energy efficiency retrofits. It also allows for further reduction opportunities beyond the current target. The plan should be viewed as a living document to compensate for regulatory reporting requirements and new technology. A 10-year window also allows the City sufficient time to plan, develop, implement, and then measure the results of their GHG reduction efforts in preparation for carbon neutrality by 2050. This aligns with the 2015 *Paris Agreement* and the 2020 Canadian Federal Government Speech from the Throne which plans to legislate net-zero emissions by 2050 (Government of Canada, 2020). In order to meet this ambitious goal, the City will need to embed GHG emissions reduction efforts across corporate operations.

The GHG reduction plan is a roadmap that assigns responsibilities and timelines to GHG actions to both the City and the greater community. Financing alternatives are included that focus on both internal and external opportunities, as well as action alignment to municipal, provincial and Federal legislation. With regards to implementation, it is recommended that the newly established Environmental Sustainability Committee act as the overseeing body to assist in the review and implementation of the GHG reduction plan. It is also recommended that the City assign and/or establish a staff position to oversee City environmental sustainability commitments. To ensure project momentum, the plan also recommends ten priority tasks to be completed in year one. This will form a baseline for more complex projects in the future.

To be successful in reaching its planned and future GHG reduction objectives, the City will need to take a holistic approach to climate change action. By embedding GHG reduction efforts across all operations and departments, combined with other community efforts, the City will serve as an example and leader in climate change mitigation. The City must also continue to adapt to climate change by adopting projects and strategies that will lessen both the physical and economic impact on assets and residents. By understanding and limiting GHG emissions, the City will improve its commitment to environmental sustainability.

1. Introduction

Climate change is one of the most significant issues of our time. To combat it, society needs to aggressively reduce GHG emissions as they have, and will continue to result in, implications to the natural and built environment, economies and people. Aggressive action must be taken to limit the creation of further GHGs and their future impacts.

Governments around the world are doing their part by developing GHG reduction plans to reduce community emissions as well as build climate change resiliency. Municipalities have a significant role to play when it comes to combating climate change by acting as the sustainability leaders within their communities. The City has demonstrated leadership by developing a community GHG emissions inventory and reduction plan, which is the first step in working towards measuring emissions reduction progress.

The GHG Reduction Plan sets the course for short and long-term climate action, with regards to the major sources and drivers of emissions in the areas of buildings and energy, transportation, and solid waste. It also addresses GHG reduction opportunities associated to green space, economic development and municipal leadership.

The plan builds on and provides direction for existing City policies and plans that consider environmental sustainability. It also recognizes the shared responsibility for making emissions reductions by both corporate and community operations. The plan reinforces the need for an integrated municipal sustainability agenda that addresses long term economic, social and environmental priorities as part of building a healthier and more climate change resilient community.

The GHG Reduction Plan was developed using a three-phase approach including:

- Phase 1: GHG Emissions Inventory (Completed February 2020)
- Phase 2: Stakeholder Engagement (Completed May 2020)
- Phase 3: Plan Development (Draft Completed September 2020)

In Phase 1 of the project, a community GHG emissions inventory was developed to understand where community GHG emissions come from. This also included an update to the Corporate GHG emission inventory, which had not been revised since 2009. Data for the community GHG emissions inventory was sourced from utility consumption metrics (PUC and Enbridge), City staff engagement, reports, and publicly available data. Both community and corporate GHG emission inventories also included a business-as-usual (BAU) forecast, which projected emissions if no reduction action was taken to reduce them. The inventories can now be used as a tool to measure community progress towards GHG emissions reduction by reviewing them on a regular basis. See Appendix 1 for the Community GHG Emissions Inventory Methodology Report.

Phase 2 of the project involved engaging with the public and key stakeholders to obtain their perspectives and input on actions to be included in the plan. The majority of stakeholder consultations took place over the course of four months from February to May 2020. Four types of consultations were conducted, including: Youth, In-Person, Online and Direct Outreach. Primary stakeholders were identified as key players with regards to energy consumption and climate change including: energy suppliers, large energy users, the City, health / public services, business owners, community groups, and academic institutions. They were consulted with on an individual basis either by phone or with an online questionnaire. Online outreach was

conducted through a survey where citizens could provide insight regarding opportunities, barriers and priorities with regards to the GHG reduction plan. The consultation team received 25 responses from the Youth Awareness survey, had over 200 attendees at a series of five in-person consultations, received 167 responses to the online survey and received feedback from 17 key stakeholders that were part of a direct outreach initiative. Consultations also occurred with the City's Municipal Environmental Initiatives Committee (Green Committee) to discuss GHG reduction target selection. See Appendix 2 for a more in-depth summary of the outreach and results of the Stakeholder Consultation phase.

Stage 3 of the plan incorporated reviewing insights from Stages 1 and 2 to develop an action plan and prioritize the recommended activities. The plan provides recommendations on how to reduce community GHG emissions, as well as save money, increase energy efficiency, improve community health, create jobs and improve the corporate image and community relations by taking climate action.

The following section of this report will provide background information and context on Sault Ste. Marie and the project methodology used to develop the GHG Reduction Plan.

2. Background

2.1 Sault Ste. Marie Context and GHG Reduction Motivators

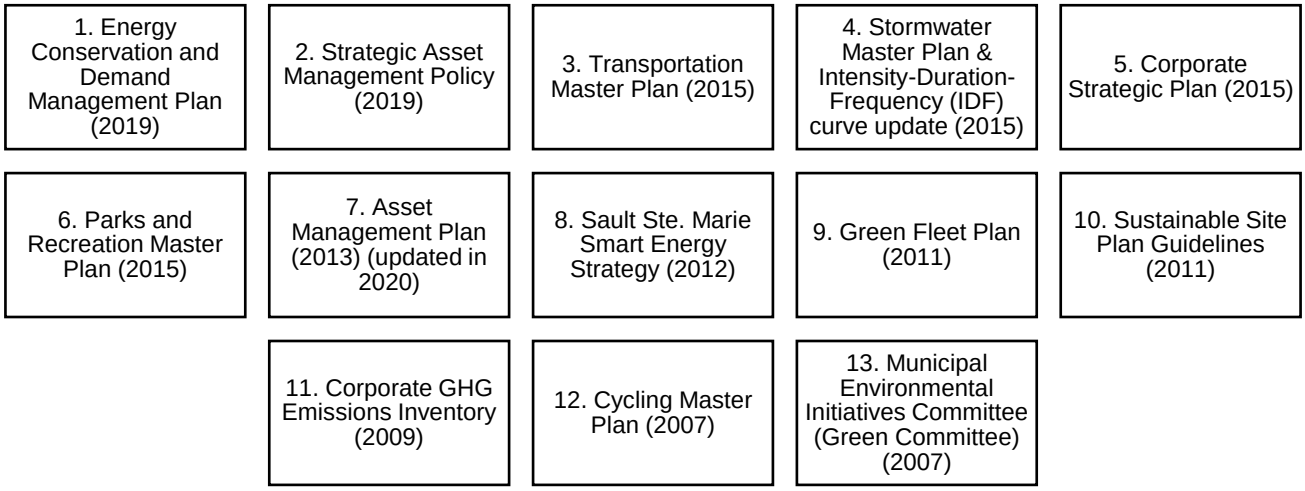
Sault Ste. Marie (the Sault) is a medium sized single tier municipality located in Northern Ontario with a population of 73,368 people (Statistics Canada, 2017). It is located along the St. Mary's River and borders the northern part of the state of Michigan in the United States of America (USA). Major industry and business sectors include steel manufacturing and fabrication, forestry, lottery and gaming, Information Technology (IT); and Tourism (Invest Sault Ste. Marie, n.d.). The Sault is home to a multi-modal transportation hub, with access to the TransCanada Highway, rail, a seaway shipping port and a regional airport with regular flights to Toronto, Ontario (Invest Sault Ste. Marie, n.d.). Regional emissions were not within the scope of this project; however, it is important to consider the emissions associated to being a transportation hub, as it opens opportunities for exploring regional emission reduction initiatives.

According to recent population projections, Sault Ste. Marie's population is expected to increase by 14% by 2037 (Metro Economics, 2019). This population growth will require around 4,000 new homes and also increase energy demand for goods and services for residents and commercial businesses (Shape the Sault, 2020). Sault Ste. Marie's growth will increase demand for energy and associated GHG emissions. Proactive planning and a combination of both behavioral and technological change can encourage economic growth while also lowering GHG emissions. The GHG Reduction Plan can contribute to other community goals and aspirations, including economic development, transit, equity, energy management, land-use planning as well as asset management. In particular, with regards to economic development, increasing uptake in energy efficiency projects (e.g. retrofits, energy storage), can result in job growth while reducing emissions. This opens up avenues to grow Sault Ste. Marie's clean technology sector, furthering on the City's previous declaration as the 'Alternative Energy Capital of North America'[1].

[1] O'Neill, K. (2017). *SSM as the Alternative Energy Capital of North America.* Retrieved from: https://irp-cdn.multiscreensite.com/8a9a3aa5/files/uploaded/alternative_energy_capital_of_north_america.pdf

On a corporate level, the development of the GHG Reduction Plan supports a number of existing plans at the City. These plans are highlighted in the graphic below.

Figure 1: City of Sault Ste. Marie Corporate Climate Action to Date



These plans and initiatives support sustainability through the means of asset management such as energy efficiency and land use planning. In addition, the City's Official Plan (OP) is in the process of being updated and will incorporate climate change and GHG reduction polices and strategies. Though the above plans address sustainability; other than the 2009 Corporate GHG Emissions Inventory, none specifically relate to community GHG emissions reduction, further strengthening the motivation for this report.

2.1.1. Northern Climate Change Network

In addition to the above plans, the City also participated in a two-year (2018 - 2020) project called the Northern Climate Change Network (NCCN) led by the Climate Risk Institute (CRI) which worked with five northern Ontario municipalities to advance their climate change adaptation planning and risk assessment efforts. The CRI in partnership with the City held two workshops (one in September 2019 and one in January 2020) to identity and assess risks in Sault Ste. Marie associated to climate change. As an end product of the risk assessment process, the CRI presented the City with the *Sault Ste. Marie Community Climate Change Risk Assessment* report, which was completed in February 2020. A variety of climate risks emerged as a high priority, in particular those associated with infrastructure damage (e.g. road washouts, loss of utility services and flooding) (Climate Risk Institute, 2020).

It is recommended that this document be viewed as the initial stage of developing a climate change adaptation plan. Risks identified in the report are recommended to be used to prioritize climate change vulnerabilities within the City and assist in the development of adaptation strategies. Climate change adaptation is a sound investment, as the 2019 Global Commission on Adaptation Report shows that investing US $1.8 trillion in climate adaptation can generate US $7.1 trillion in total benefits (Global Commission on Adaptation, 2019). Adaption includes early warning systems, climate-resilient infrastructure and housing and investments in water resources.

Summary

Many of the above-mentioned plans and projects helped inform the GHG Reduction Plan, as they support the development of goals and objectives for Sault Ste. Marie's environmental and sustainability performance. It is recommended that the GHG Reduction Plan implementation be coordinated with existing City plans and strategies that govern land use, transportation, housing, waste and energy.

The following section of this report discusses the methodology used for the creation of the GHG Reduction Plan.

2.2. Partners for Climate Protection Program.

In February of 2019, the City received funding from the Federation of Canadian Municipalities (FCM) Municipal Climate Innovation Program (MCIP) to increase capacity to reduce community GHG emissions. This funding aligns with the community development pillar of Environmental Sustainability, which was identified as one of four strategic priorities in the Community Adjustment Committee (AC) report *A Common Cause and New Direction for Sault Ste. Marie* (Community Adjustment Committee, 2017). FutureSSM was tasked with implementing and building on recommendations in the AC report, including creating a community GHG emissions inventory to help plan and implement municipal climate change priorities.

To support municipalities in creating GHG emissions inventories, the FCM and ICLEI – Local Governments for Sustainability (ICLEI Canada) created the Partners for Climate Protection (PCP) Program to provide a forum for municipal governments on how to reduce GHG emissions. Participation in the program includes the completion of a 5-milestone framework which is intended to guide the municipality towards the development of a Climate Action Plan. The program is free to join and allows member cities to gain access to tools, resources, a community of practice and an online tool that assists in the development of GHG emissions inventories.

In September 2019, City Council passed a resolution to join the PCP. In doing so, the City committed to joining over 400 municipalities across Canada that are working to reduce community GHG emissions. The PCP is a five-milestone framework, which includes:

1. Creating a baseline emissions inventory and forecast;
2. Setting emission reduction targets;
3. Developing a local action plan;
4. Implementing the local action plan, and
5. Monitoring progress and reporting results.

As a first step in meeting their commitment, the City has met Milestone 1 by completing the corporate and community GHG inventory and forecast in February 2020. The inventories adhere to the PCP Protocol (Canadian Supplement to the International Emissions Analysis Protocol, Federation of Canadian Municipalities & ICLEI).

2.3 Understanding Climate Change

Feedback from both community consultations as well as members of the City's Green Committee included a need for public education about climate change and GHG reduction. The

following section of this report outlines key aspects related to climate change and its correlation to GHGs.

The energy we use to heat, cool and power our homes and workplaces, as well as to transport ourselves and the goods and services we consume generate GHG emissions. GHGs also occur through a phenomenon called the greenhouse effect which occurs when GHGs (specifically, carbon dioxide, methane, nitrous oxide and other gases known as chlorofluorocarbons (CFCs) that occur naturally, are "released into the atmosphere by heat from the sun and become trapped" (Government of Canada, 2018). The release of GHGs into the atmosphere; however, has been intensified by human activities, resulting in an increase in anthropogenic (human caused) emissions from the burning of fossil fuels, which are the primary cause of climate change. The effects of climate change are "impacting both human and natural systems as we see an increase in temperatures, shifts in precipitation patterns, as well as more frequent and intense heat waves" (Government of Canada, 2018).

The Government of Canada defines climate change as: "a long-term shift in weather conditions measured by changes in temperature, precipitation, wind, snow cover and other indications" (Government of Canada, 2015). Globally, temperatures have been increasing steadily due to Climate change. In particular, in Canada, "between 1948 and 2016, average temperatures have already increased by 1.7°C" (Government of Canada, 2019). Governments and policy makers from around the world have established targets and plans on reducing GHG emissions. Of particular importance, is the 2015 *Paris Agreement*, which aims to "limit temperature increase to 1.5°C above pre-industrial levels" and outlines actions "to undertake ambitious efforts to combat climate change and attempt to its effects" (United Nations Framework on Climate Change, 2020). The international agreement targets carbon neutrality by 2050; and will be assessed every five years to monitor progress. Carbon neutrality is defined as counterbalancing the emission of carbon dioxide ($CO_{2)}$ through carbon reduction and offsets (Merriam-Webster, 2020).

In 2018, the Intergovernmental Panel on Climate Change (IPCC) provided an update on global efforts regarding climate change. In their report, an assessment of around "6,000 peer-reviewed publications confirmed that climate change is already affecting people, ecosystems and livelihoods all around the world. It also reiterated that urgent mitigation ambition in the coming years is required as current trends indicate that global warming will surpass 1.5°C in the following decades" (Intergovernmental Panel on Climate Change, 2018). Specifically, the report stated that limiting warming to 1.5°C requires reaching net zero carbon dioxide (CO_2) emissions globally around 2050 (Intergovernmental Panel on Climate Change, 2018). Inaction will lead to environmental and social implications, as well as economic impacts. In fact, according to the *National Round Table on the Environment and the Economy*, inaction "could cost Canada between $21 billion and $43 billion per year by the 2050s" (Government of Canada, 2011). Alternatively, mitigation efforts can actually save money. "Public Safety Canada estimates that every dollar invested in mitigation saves $3 to $5 in recovery costs" (Office of the Auditor General of Canada, 2016).

Governments have leveraged international protocols such as the 2015 *Paris Agreement* to develop their own plans with regards to addressing climate change. In Canada, the Federal Government developed the 2016 *Pan-Canadian Framework on Clean Growth and Climate Change*, which outlines Canada's plan for reducing emissions as well as fostering economic growth. The framework supports the Canadian provinces and territories in their efforts on enabling clean growth across Canada. It also outlines Canada's carbon-pricing plan. Canada's

2020 Speech from the Throne also reiterates the Canadian government's commitment to climate action by committing to taking action on climate change (Government of Canada, 2020). In Ontario, the *Made-In-Ontario Environment Plan* created in 2018, outlines specific actions with regards to mitigating and adaptation to climate change while building provincial resilience (Government of Ontario, 2018).

In addition to the efforts of the federal and provincial governments, it is important to note that municipalities also have a role to play with regards to climate change. In fact, municipalities account for more than 70% of global GHG emissions. (C40, n.d.). The City recently completed a community GHG emissions inventory to fully understand local emissions from energy in buildings, transportation and waste. This inventory has been used to refine targets and will help track progress towards the goal of reducing local emissions. Updating this inventory on a regular basis will be a key step in monitoring GHG reduction efforts by both the City and the community.
The following section of this report reviews the GHG emissions inventory particulars, as well as the GHG emissions forecast.

3. Community Greenhouse Gas Emissions Inventory

The Sault Ste. Marie's community GHG emissions inventory refers to an estimate of aggregate emissions within the municipal boundary. Community emission metrics were broken down by sector and source to obtain an understanding of where community emissions come from. Prior to highlight the results of the community and corporate inventories, the next section of this report will review which emissions were omitted and why.

3.1 Excluded Emissions Data

The PCP program outlines optional reporting for several sources of emissions, including: off-road transportation, rail, waterborne navigation, aviation, incineration and open burning, agriculture, forestry and other land uses, and industrial processes and product use (IPPU). These emission sources are optional as they are often difficult to obtain with a level of accuracy and are beyond the control of a municipality. The community inventory in this report also excludes emissions from wood as it is considered biogenic in the PCP protocol, meaning that it assumes that carbon released during combustion is equal to carbon removed during the growth of the tree and it can be assumed that it is carbon neutral (ICLEI and FCM, 2014, p.10). The protocol does state that methane (CH_4) and nitrous oxide (N_2O) can be reported from wood combustion; however, this data is not readily available and figures for wood heat would be an estimate at best.

Industry Processes and Product Use Emissions

Industrial emissions from industrial processes and product use (IPPU) were not included in the City's community inventory; however, it is being shared in this section for transparency purposes as it discusses an additional source of emissions. As mentioned above, emissions from IPPU are not a required reporting attribute of the community greenhouse gas (GHG) emissions inventory under the PCP protocol. The reasoning for this is that there is an emissions threshold for industry that regulates them to report to provincial and federal governing bodies, which is not controlled by the municipalities in which they operate. Should a municipality decide to include IPPU in their inventory, a starting point is to submit a request to the industries that operate in their municipal boundary, and obtain both their energy consumption information as well as process emissions

information. Large emitters in Canada are required to report their GHG emissions under the Environment and Climate Change Canada (ECCC) Greenhouse Gas Reporting Program (GHGRP). This data is available publicly online. The GHGRP "has collected data from industrial facilities every year since 2004" and information is collected under section 46 of the *Canadian Environmental Protection Act" (*Environment and Climate Change Canada, 2019a).

The GHGRP uses a threshold which identifies reporting emitters. Of note:

> "2017 marked the first year of the expansion of the GHGRP where the reporting threshold was lowered to 10 kilotonnes (kt) of CO_2e, meaning that all facilities that emit 10 kt or more of GHGs in CO_2e per year are required to submit a report. The GHGs reported include: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF^6)" (*Environment and Climate Change Canada, 2019a)*.

In Sault Ste. Marie in 2017, there were three facilities that were required to report to the GHGRP. The facilities were:

1. Essar Power Canada Ltd.
2. Essar Steel Algoma Inc.[2]
3. Tenaris Algoma Tubes

The following table includes emissions data for the above three facilities reported under the GHGRP for 2017.

Table 1: Sault Ste. Marie IPPU GHG Emissions[3]

Line No.	Facility Name	NAICS Code	CH_4 (tonnes CO_2e / tonnes éq. CO_2)	N_2O (tonnes CO_2e / tonnes éq. CO_2)	CO_2 (tonnes CO_2e / tonnes éq. CO_2)
1	Essar Power Canada Ltd.	Other Electric Power Generation (221119)	12,578.50	3,456.80	1,415,052.45
2	Essar Steel Algoma Inc.	Iron & Steel Mills & Ferro-Alloy Mfg. (331110)	20,287.50	8,695.64	2,530,388.36
3	Tenaris Algoma Tubes	Iron & Steel Pipes & Tubes Mfg.(331210)	35.40	376.08	71,852.00
				TOTAL	**4,017,292.81**

This information is for reference purposes only and is publicly available online as reported by the emitting facilities. The total tonnes of CO_2e for local facilities that emit 10 kt of CO_2e was not input into the community GHG inventory. Stationary energy emissions from industrial natural gas was obtained from Enbridge and input into the inventory, which is further explained below. It can be assumed that the industrial natural gas metrics which were are included in the Enbridge data pull are also accounted in the IPPU emissions, which would also have resulted in a double count of this emissions metric. The next section of this report provides an overview on the reported community and corporate GHG emissions.

[2] Essar Steel Algoma Inc. is now known as 'Algoma Steel Inc.' due to company name change and restructuring.
[3] Government of Canada. (2019)

3.2 Community GHG Emissions Inventory Results

The community GHG emissions inventory provides an overview of all GHGs produced within the community of Sault Ste. Marie, for the baseline year of 2017, both by residents in their homes and by local businesses and institutions as they carry out their operations. Six key sectors were included in the community inventory including residential, commercial and institutional, and industrial stationary energy emissions (natural gas and electricity), solid waste, rail, non-specified sector energy emissions (propane and fuel oil), and on-road transportation.

In 2017, the community produced approximately 1,502,142 tonnes of carbon dioxide equivalent (tCO_2e). Figure 2 and Table 2 provide a summary of GHG emissions produced by each sector.

Figure 2: City of Sault Ste. Marie Community GHG Emissions by Sector

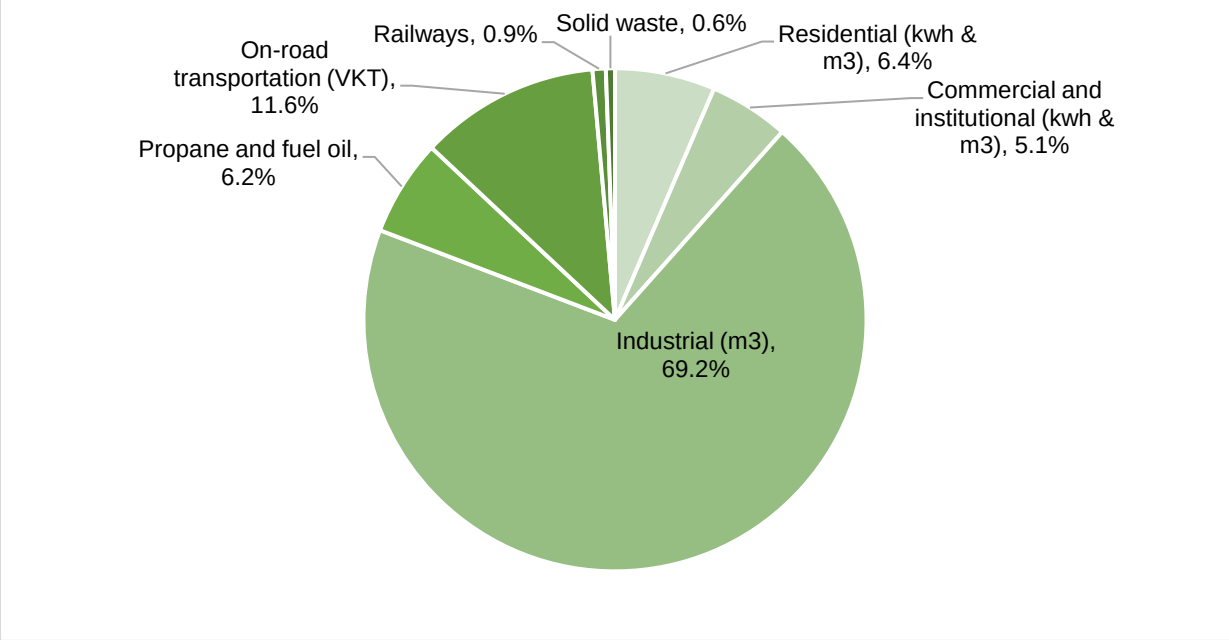


Table 2: City of Sault Ste. Marie Community Inventory and Energy Emissions by Sector

Category	Sector	Emissions (tCO_2e)	Data Scope
Energy	Residential	96,807	Electricity (kWh) and natural gas (m3)
	Commercial and institutional	77,078	Electricity (kwh) and natural gas (m3)
	Industrial	1,039,794	Natural gas (m3)
	Propane and fuel oil	93,080	Estimate of propane (l) and fuel oil (l)
Transportation	On-road transportation	173,847	Vehicle Kilometres Travelled (VKT)

	Railways	12,771	Estimate of emissions / km of rail track
Waste	Solid waste	8,764	Annual landfill gas (LFG) collected
	Total GHG Emissions	1,502,142	

The community GHG emissions inventory indicates that energy used in buildings is the largest source of GHGs. When you break down energy emissions by sector, the industrial sector emits the most emissions due to its consumption of natural gas. The residential sector use of natural gas and electricity contributes to the second highest amount of energy GHGs, followed by community estimates on propane and fuel oil use. It is important to note that in Ontario, electricity generation is cleaner than natural gas, therefore the emissions from the residential sector are considerably lower. Natural gas emissions from the industrial sector created the largest portion of GHG emissions in the community. This is reasonable as manufacturing is significantly more energy intensive than other sector operating within the City. The second largest source of emissions comes from transportation accounting for 12% of community emissions. The least amount of emssions are produced from the solid waste sector acccounting for just 0.6% of community emissions. Emissions are further reviewed by their fuel source in the following section.

3.2.1 Community Energy Use and Emissions by Source

Breaking emissions down by source provides a deeper understanding regarding what produces the most GHGs. Table 3 provides a summary of community emissions produced by energy source.

Table 3: Community Energy Use and GHG Emissions by Source (tonnes)

Source	Emissions (tCO2e)	Energy (GJ)	GHG (%)
Electricity	12,568	2,615,710	1%
Natural gas	1,201,110	24,302,305	91%
Diesel	12,770	163,981	1%
Fuel oil	76,515	76,515	5.8%
Propane	16,565	270,882	1.3%
TOTAL	1,319,528		100%

As can be seen in Table 3, natural gas is the primary cause of greenhouse gas emissions in Sault Ste. Marie. Natural gas is responsible for 91% of energy emissions, which minimizes electricity at 1%, the other significant energy source in buildings. The next largest emitter comes from fuel oil and propane emissions at 6.2%.

The concentration of industrial activity in Sault Ste. Marie is a significant contributor to the use of natural gas in the city. Industrial processes and heating of large industrial facilities use a large amount of natural gas and therefore creates a considerable source of emissions. The next section of this report reviews the results of the update to the coprorate emissions inventory.

3.3 Corporate GHG Emissions Inventory Results

The City's corporate GHG emissions inventory was not part of the original scope of this project; however, it was decided that an update from the latest inventory (2007) would provide a more current baseline. As well, it is important to note that the City has already implemented many initiatives that save money and reduce GHG emissions over the years. This section of the report contains high-level insights of the emissions and cost data collected internally. For a more thorough overview of corporate emissions by sector, please refer to Appendix G in Appendix 1 of this report.

The City of Sault Ste. Marie's corporate GHG emissions inventory refers to emissions from municipal operations in 2017. Corporate emission sources include municipal buildings, fleet and equipment, streetlights, and energy used for wastewater. It is important to note that due to the recently completed community GHG inventory having included emissions from community waste, it will not be included in the corporate inventory. In 2017, the City produced approximately 10,857 tCO_2e and cost the City approximately $8,394,614 in energy and fuel costs. The following table illustrates the tCO_2e by sector.

Table 4: City of Sault Ste. Marie Corporate 2017 GHG Emissions

Sector	Emissions (tCO2e)	Energy (GJ)	Cost
Building	3,652	122,903	$3,027,157
Fleet and Equipment	6,076	86,327	$2,610,905
Streetlights	48	9,955	$932,934
Water & Sewage	1,080	53,741	$1,818,410
Total	**10,857**		**$8,394,614**

The majority of 2017 corporate GHG emissions came from fleet, followed by buildings, then wastewater and streetlights.

Due to the fact that the City completed a corporate GHG emissions inventory in 2007, an overall comparison for corporate emissions and costs between 2007 and 2017 was conducted. Results are shown in Table 5 below.

Table 5: Corporate Inventory Comparison Figures

	2007	2017	Change (∆) Summary
Emissions (tCO_2e)	18,243	10,857	↓40%
Cost ($)	$6,832,99	$8,389,40	↑23%

The decrease in corporate emissions compared with an increase in costs, may be due to different sources of data being used for the benchmarking information than for the original baseline inventory and should be taken lightly. It may also be due in part to measures implemented by the corporation such as LED outdoor lighting upgrades and building upgrades and retrofits.

Table 6 shows the comparison between 2007 and 2017 across the various categories of the corporate GHG emissions inventory as well as the increase (or decrease) in both emissions and cost values.

Table 6: Comparison of Corporate Inventories for 2007 and 2017

Sector	2007		2017		Change (Δ) Summary	
	Costs	**tCO_2e**	**Costs**	**tCO_2e**	**Costs**	**tCO_2e**
Buildings	$2,393,598	6,694	$3,027,156.71	3,652.33	↑26%	↓45%
Vehicle Fleet and Equipment	$2,510,310	7,295	$2,616,113	6,076	↑4%	↓17%
Outdoor Lighting	$889,975	1,779	$932,933.58	47.83	↑5%	↓97%
Wastewater	$1,034,142	2,414	$1,818,408.66	1,080.29	↑76%	↓55%
Refuse	$4,965	60	N/A	N/A	N/A	N/A
Total	**$6,832,990**	**18,243**	**$8,394,614**	**10,857**	**↑23%**	**↓40%**

It is important to note that due to different sources of data for the 2007 inventory and the 2017 corporate GHG inventories, the categories may not be comparing exactly the same type or number of activities, buildings, etc. In particular, corporate waste was no longer being measured at the time that this report was developed, therefore it is not included at all. As well, corporate fuel consumption by vehicle is not regularly recorded by department; therefore, estimates were created based on the average retail price of fuel (both gasoline and diesel) in 2017. In addition, as of 2014, Ontario no longer used coal to create electricity under the *Ending Coal for Cleaner Air Act* (2015) which greatly contributed to lower emissions for all electricity use.

Lastly, it is also important to recognize that the cost of electricity has increased despite reductions on the part of the municipality. Please see Appendix F in Appendix 1 for a comparison overview of electricity rates between 2007 and 2017 from the Ontario Energy Board (OEB).

The 2017 community and corporate GHG inventories provide a baseline for which GHG reduction can be measured in the future. The next section of this reports looks at emissions projections for both the community and the corporate GHG inventories if no action is taken over the next 20 years.

3.4 Business-as-usual Emissions Projection

A business-as-usual (BAU) emissions forecast is used to estimate future GHG emission levels in the absence of local government action on climate change based on projected population growth. Based on Sault Ste. Marie population projections, which estimate population growth to increase 14% in the next 20 years, BAU emissions were extrapolated based on a 0.7 percent average annual population growth rate (Metro Economics, 2019). This assumes emissions will increase at the same rate as population growth. The following table and figure show the BAU forecast over 20 years for the community of Sault Ste. Marie and the City (corporate emissions).

Table 7: Total Community Current and BAU Emissions

Category	Year	tCO_2e	tCO_2e Increase
Baseline Emissions	2017	1,502,142	↑ 224,890 (or 14%)
BAU Emissions	2037	1,727,032	

If Sault Ste. Marie does not make any changes, community emissions are estimated to increase 14% (or 224,890 tCO_2e) in the next 20 years.

Figure 3: Community BAU GHG Emissions Forecast

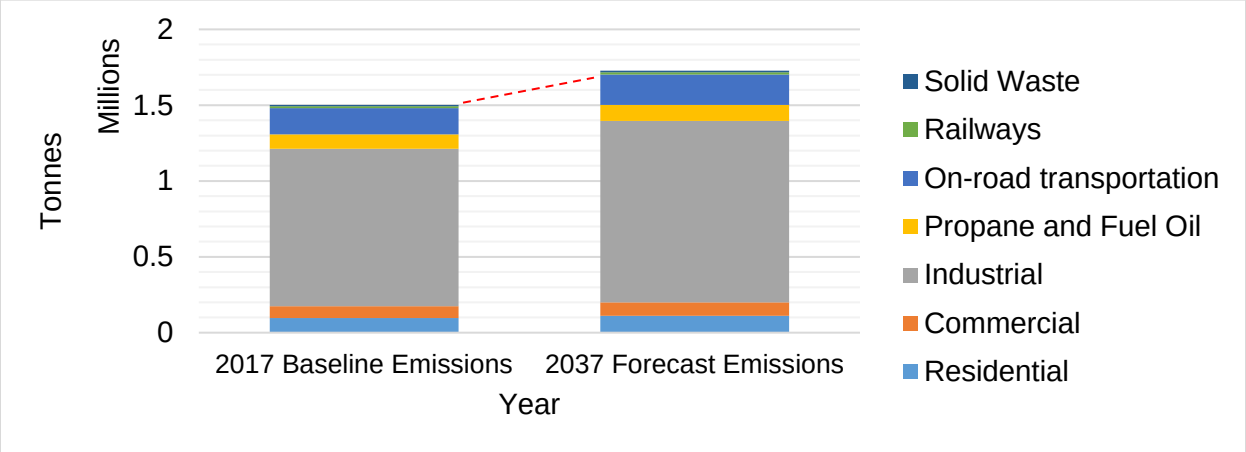
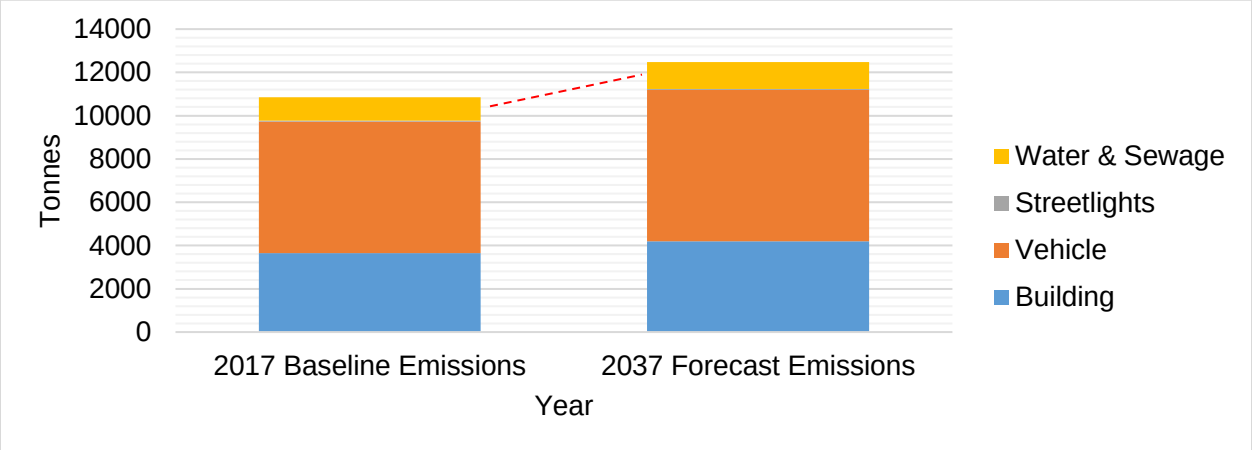


Table 8: Corporate BAU GHG Emissions Forecast

Category	**Year**	**tCO_2e**	**tCO_2e Increase**
Baseline Emissions	2017	10,856	↑ 1,626 (or 14%)
BAU Emissions	2037	12,482	

Figure 4: Corporate BAU GHG Emissions Forecast



If Sault Ste. Marie does not make any changes, corporate emissions are estimated to increase 14% (or 1,626 tCO_2e) in the next 20 years.

The BAU emissions for both the community and the City indicate what emissions will look like in twenty years if no action or changes are made. This sets the stage for action to create an action plan to reduce GHG emissions.

The next section of this report discusses the recommended GHG reduction targets that the City should try to meet in the short term (10 years as recommended by the FCM PCP) and long term (30 years).

4. GHG Reduction Target

A GHG reduction target provides a municipality with a goal to strive towards in pursuing GHG emissions reduction. Under the PCP program, municipalities are encouraged to participate in target setting. It is important to note that this practice is voluntary and can be established and updated at any time. Different targets can be established for both the community and local government sectors. Often times a more aggressive target is selected for local governments as these emissions are under the direct influence of the municipality and are easier to control. Figure 5 highlights the spheres of influence of different government authorities over the major activities responsible for GHG emissions in communities.

Figure 5: Spheres of Government Influence[4]

Many governments, international organizations, corporations and businesses around the world have set climate change mitigation goals, as part of their strategy to reduce GHGs. In particular:

- International: The United Nation's Intergovernmental Panel on Climate Change (IPCC) has committed to a 45% reduction below 2010 levels by 2030 and net zero by 2050 (International Panel on Climate Change, 2018).

[4] Federation of Canadian Municipalities (FCM) & Local Governments for Sustainability (ICLEI). (n.d.). *Reaching Milestone 2: How to set emissions reduction targets.* Retrieved from: https://fcm.ca/sites/default/files/documents/resources/guide/how-to-set-emisison-reduction-targets-pcp.pdf

- Canada: The Federal government has pledged to reduce emissions by 30% below 2005 levels by 2030 and be net zero by 2050 (Government of Canada, 2017).
- Ontario: The Provincial government has committed to reducing emissions by 30% below 2005 by 2030 (Government of Ontario, 2018).

Municipalities play a crucial part in achieving emission reduction objectives and many have already set their own targets. The following table contains some examples of targets set by other local governments under the PCP program.

Table 9: Emission Reduction Targets Adopted by Other Local Governments

Local Government	Baseline	Target Year	Reduction Goal
City of Peterborough	2011	2031	30% corporate and community (City of Peterborough, n.d.)
City of Thunder Bay	2016	2050	Net zero[5]
City of Timmins	2017	2027	10% Corporate and 5% Community (City of Timmins, 2019)
City of Greater Sudbury	2016	2050	Net zero (City of Greater Sudbury, 2019)
City of Hamilton	2005 Corporate; 2006 Community	2030 / 2050	Corporate and Community: 50% reduction of 2005 GHG levels by 2030 and an 80% reduction of 2005 GHG levels by 2050 (City of Hamilton, n.d.)
City of Windsor	2014	2030 / 2041	Corporate and Community 20% reduction by 2030 and 40% by 2041 (City of Windsor, 2017)

The PCP reduction targets are the annual quantity of GHGs that a jurisdiction commits to reducing from their community and local government operations by a given year. They are expressed as a percentage reduction in emissions in the target year, relative to the baseline emissions. In Sault Ste. Marie's case, it is a percentage reduction from the 2017 baseline emissions by the target year of 2027. By establishing an emission reduction target, and officially adopting this target through a council resolution, a local government fulfills Milestone 2 of the PCP program.

The PCP program, recommends a target of 10% reduction for local government operations and 5% for the community within 10 years of joining the program. The City should be aware that targets should be seen as an interim policy development tool that can and should be refined and increased over time. The target that the City adopts following this report should be seen as the first step in that direction. This report should be viewed as a living document and it is recommended that it be reviewed regularly to acknowledge emissions reduction

[5] S.Stevenson (A/Sustainability Coordinator, EarthCare, City of Thunder Bay), personal communication, July 27, 2020.

accomplishments, as well as assess new technologies and governmental requirements as mandated by both the Provincial and Federal Government.

4.1 Sault Ste. Marie Community and Corporate GHG Target Selection

Both the community and members of the City's Green Committee were invited to provide feedback on GHG reduction targets. They were provided with insight on international, federal, provincial targets; PCP suggestions as well as examples of what other municipalities have committed to as far as GHG reduction targets are concerned. Members of the Green Committee were presented with a series of strategic alternatives to choose from, and asked to select their preferred GHG reduction target. Target alternatives were substantiated with insights regarding opportunities for reduction based on planned corporate energy efficiency retrofits, as well as community GHG reduction projects. Estimates tied to outstanding retrofits identified in the City's 2019 Energy Conservation and Demand Management Plan, the 2010 IB Story facility audits, 2020 planned retrofits and potential future retrofits, show a possibility of energy efficiency GHG reduction savings of 9%. This equates to approximately 987.48 tCO_2e and energy savings valued at approximately $619,689.06. Please see Appendix 3 for more details on specific outstanding energy retrofits. The majority of responses from the Green Committee selected a GHG reduction target of 10% corporate reduction and 5% community reduction in 10 years. Please see Appendix E in Appendix 2 of this report for more details. Outreach to the community, as well as more aggressive targets adopted by other municipal governments, indicated interest in seeking target alignment with the Federal Government target of net zero emissions by 2050 which has also been considered in the recommended target of this plan.

Target Selection:

The City's goal for GHG reduction is net zero by 2050. The City will take a staged approach to achieve this goal, and will focus on GHG reduction target of 10% corporate and 5% community between 2020 – 2030, with an increasing scale of reduction target between 2030 and 2050.

The City's GHG reduction target is two tiered. Firstly, the City's planned energy efficiency retrofits and confirmed community GHG project commitments align with the Green Committee's selection of a 10% corporate and 5% community GHG reduction target in 10 years. This also aligns with the individual targets for Corporate and Community GHG reductions as recommended by the FCM. For the City, this will require an approximately 1% reduction in corporate emissions every year. For the community to reduce emissions by 5%, GHGs will need to be reduced by 7,510.71 tCO_2e per year. To put this into perspective, this is the equivalent to:

- GHG emissions from 1,623 passenger vehicles driven for one year, or,
- Emissions avoided by 1.6 wind turbines running for a year; or,
- Carbon sequestered by 124,191 tree seedlings grown for 10 years[6].

This target approach will recognize current energy efficiency plans, and also allows for further reduction opportunities above and beyond the target as the plan will be framed as a living document. A 10-year window also allows the City sufficient time to plan, develop and implement and then measure the results of their GHG reduction efforts.

[6] United States Environmental Protection Agency. 2018. *Energy and the Environment. Greenhouse Gas Equivalencies Calculator.* Retrieved from: https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

The second tier of the GHG reduction target is more ambitious, which aims for net zero emission by 2050. This aligns with the *Paris Agreement,* and the recent 2020 Speech from the Throne by the Canadian Federal Government which plans to legislate net-zero emissions by 2050 (Government of Canada, 2020). A target of net zero would require a minimum reduction/offset of emissions by approximately 3.3% (or 49,570.69 tCO_2e per year) across the community every year over the next 30 years, or 33.3% every decade. To put this in perspective, this is the equivalent to:

- GHG emissions from 10,709 passenger vehicles driven for one year, or,
- Emissions avoided by 10.7 wind turbines running for a year; or,
- Carbon sequestered by 819,662 tree seedlings grown for 10 years[7].

Summary

The community GHG emissions inventory and reduction plan are important steps towards the City's goal of becoming a net-zero community by 2050. The GHG reduction plan outlines efforts for the next 10 years and must be revised in at least the next 5 years to come up with a more detailed cost and emissions reduction modeling plan until 2050.

To move forward with this ambitious target, implementation will have to be achieved by community-based collaboration, regular tracking and reporting of target reduction achievements and adopting a climate lens to all decision making. This in particular will be instrumental as it will need to take into consideration the GHG emissions impacts of all planned and future investments. Other options that should be considered are GHG reduction opportunities related to the COVID-19 recovery, such as creating a work from home policy which will lower vehicle emissions. If the City wishes to commit to carbon neutrality it will require a series of changes both to its governance approach, as well as the adoption of technological and behavioral changes.

The next section of this report details the GHG reduction plan. It is important to note that this plan should be revised in a minimum of 5 years to undertake more specifics about the costs and GHG savings in order to reach the carbon neutrality objective by 2050.

[7] United States Environmental Protection Agency. 2018. *Energy and the Environment. Greenhouse Gas Equivalencies Calculator.* Retrieved from: https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

5. GHG Reduction Plan

5.1 Overview of Recommended Actions

The Sault Ste. Marie GHG reduction plan focuses on actions to be completed within a 10-year timeframe: 2020 to 2030. It also lays some of the preliminary groundwork for net-zero emissions by 2050.

The following vision will guide the GHG Reduction Plan:

Vision

The City of Sault Ste. Marie (the City) will reduce GHG emissions from the energy and building, transportation, and waste sectors, and pursue green space, municipal leadership and economic development opportunities. The City will work in partnership with residents, businesses, industry, non-profit organizations, and other community to achieve emissions reduction in Sault Ste. Marie.

The plan recommends 60 actions (14 of which are already in progress) and is broken down into seven key sectors, predominantly based on emission sources and reduction action opportunities. Actions are based on both community and corporate efforts. The sectors are as follows:

1. Buildings & Energy – Community
2. Buildings & Energy - Corporate
3. Transportation
4. Waste
5. Green Space
6. Economic Development
7. Municipal Leadership

A context and GHG reduction opportunity overview for each sector of the action plan is furthered below.

Buildings & Energy – Community

The building and energy section of this report accounts for emissions generated through the use of electricity, natural gas, propane, and heating oil. Emissions are created in the process of generating, delivering, and consuming forms of energy. Energy use is primarily consumed for space heating, cooling, appliances and lighting. In Sault Ste. Marie, when you break building emissions down by subsector (residential, commercial and institutional, and industrial), the largest emitter is the industrial sector based on their consumption of natural gas. This high level of GHG emissions from the industrial sector is reasonable as manufacturing and industry are more energy intensive than other industrial sectors, such as mining. As such, industry has its own objective and associated actions in the GHG reduction plan. Industrial emissions are regulated by the Provincial and Federal governments and corporations have their own specific plans and targets. For example, net zero by 2050 is the aspirational target of the Canadian Steel Producers Association (CSPA), of which local steel manufacturer and major employer, Algoma Steel Inc. is

an active member. Their emissions strategy will be aligned with the CSPA and federal and provincial governments.

When it comes to community actions, a focus on energy efficiency projects is encouraged. Other action areas in the GHG reduction plan include exploring the possibility of diversifying the energy supply (e.g. increasing renewable energy use on municipal buildings and in the community).

Buildings & Energy Corporate

Currently, corporate operations result in approximately 1% of community-wide emissions. While this number may seem low, the Municipality has a responsibility to lead and demonstrate practices that will encourage broader emission reduction within the community to achieve climate targets and positively impact sustainable economic development. The corporate GHG emissions inventory indicates an opportunity to achieve emission reductions by focusing on fleet and equipment as well as the corporate building stock. When it comes to corporate actions, similar to the community, a focus on energy efficiency projects is encouraged. This aligns with the recently completed *Third party service review of municipal operations* which was presented to Council on January 6, 2020, which recommends pursuing and implementing energy efficiency projects. According to KPMG this has potential cost savings of up to $100,000 annually (KPMG, 2019).

Transportation

In the Sault Ste. Marie community GHG emissions inventory, the transportation sector includes emissions from the mobile combustion of gasoline and diesel and was broken down by on-road transportation and railway diesel. The majority of transportation emissions come from on-road transportation which is often one of the highest emitting sectors in Ontario due to the heavy reliance on personal vehicles with combustion engines. As well, according to the *Canadian Municipal Backgrounder* (an annual survey of mayors and councillors in more than 400 municipalities across Canada, 90% of Sault Ste. Marie residents commute to work by car, 5% walk, 4% use transit and 1% bike (Canadian Municipal Barometer, n,d.). This presents ample opportunity to improve upon active transportation in Sault Ste. Marie.

Waste

It is important for the City to continue, as well as increase their efforts to divert waste from the municipal landfill to reduce community emissions associated to solid waste. One such way would be exploring the possibility of expanding landfill gas capture. This will be included as part of the landfill expansion plans, and should also consider the use of the gas as a form of energy generation. Organics curbside collection is another initiative that is encouraged and aligns with the shift of the Province of Ontario to a circular economy as outlined in their 2017 *Strategy for a Waste-Free Ontario: Building the Circular Economy*. In addition, *Ontario's Food and Organic Waste Policy Statement* requires Northern Ontario municipalities with populations greater than 50,000 to recover 50 percent of food waste generated by single-family dwellings by 2025. As well, the Government of Ontario has proposed a new Blue Box regulation which will see recycling responsibilities handed off to producers and increase the list of materials accepted, including "paper and plastic cups, wraps, foils, trays, and bags and other single use items such as stir sticks, straws, cutlery and plates" (Government of Ontario, 2020). Legislation and implementation timelines are being developed by the Province with the details for compliance by the City at its initial stages.

Green Space

Trees and other forms of natural vegetation are an important part of a sustainable City and contribute to the well-being of residents. The *Ontario Municipal Act* advises municipalities to adopt and maintain policies with respect to protecting and enhancing the tree canopy and natural vegetation in the canopy (Government of Ontario, 2001). This relates to GHG reduction as trees have the ability to offer a myriad of environmental benefits and mitigate climate change, including counteracting heat islands by providing shade as well as absorbing carbon dioxide and offsetting emissions. It is important to note that as trees get old or diseased, they must be managed or possibly removed to make way for younger trees that store more carbon at a faster rate than older ones. A combination of good forest management and planting pest and disease tolerant species will achieve optimal urban forest benefits as well as carbon sequestration for the community.

Economic Development

The City has, and continues to work on diversifying their economy for the benefits of their residents. This includes working on ensuring it can welcome businesses to the community to help create quality jobs that bring newcomers and discourage youth outmigration. One avenue that the City has pursued is growing its 'green economy' through alternative and renewable energy projects within and around Sault Ste. Marie. There is ample opportunity to grow this sector, in particular when it comes to energy efficiency projects. In fact, the *Pan-Canadian Framework on Clean Growth and Climate Change* states that Canada's GDP is expected to see a net increase of $356 billion due to energy efficiency projects. This comes from energy savings, reduced cost of living and local spending (Environment and Climate Change Canada, 2019). By creating and fostering an environment that is conducive to clean-technology businesses, the Sault can also work on being part of the solution towards climate change mitigation.

Municipal Leadership

Corporately, the City has an opportunity to impact both their operations and be a leader in the community to reduce GHG emissions. Within the community, many organizations acknowledge the importance of sustainability and climate change action; however, they do not have a specific mandate and/or plan to address it. The City can lead the way for climate action across the community by leveraging climate investment opportunities, increasing community awareness, and improving operations. Partnerships will be a very important component of the community implementation strategy. Seeking funding from provincial and federal governmental institutions, improving efficiency with commercial organizations and engaging with citizens through local environmental and community groups will be critical.

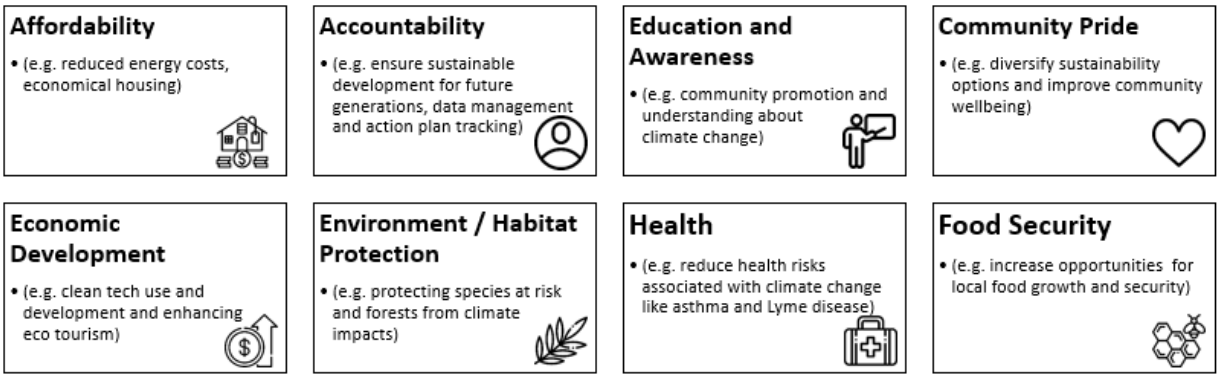
GHG Reduction Plan Breakdown

The recommended actions under each section of the plan integrate both initiatives that are already underway (e.g. energy efficiency), and new recommendations to advance GHG emission reduction from corporate operations and the greater community. Each of the actions highlights potential task leads, timelines, alignment to existing plans and performance measures. Insight regarding existing policy and legislation as well as funding is highlighted as the end of each section. It must be noted; however, that a more thorough and detailed technical and financial analysis will be required to refine energy and emission reduction potential and the financial costs.

Guiding Principles

In addition to the seven sectors identified in the plan, a series of eight guiding principles that align with emissions mitigation actions were extrapolated from the community consultations. They highlight a series of reoccurring opportunities that integrate with climate change action. The following eight principles with an associated example are highlighted below.

Figure 6: GHG Reduction Plan Guiding Principles



These underlying principles are directly related to reducing GHGs and should be incorporated into the recommended action plan to further progress towards community emissions reduction.

A core recommendation identified by stakeholders was a need for increased education and awareness about climate change. Therefore, education is infused as an objective across many of the sectors of the GHG reduction plan. Each goal is divided into two to four objectives and associated action items, leads/partners, a timeframe and alignment and performance indicators to measure implementation success. Occasional infographics are included in the performance indicators section with community facts, ideas and insights that can contribute to furthering the recommendation action.

Timelines for Action

Actions within the plan have been broken down into separate timeframes, in particular due to resource constraints and other barriers to implementation. The timing and length of actions can be adapted to respond to changes in policy, technology and funding. The following legend illustrates the different times for each action:

Immediate: action to begin right away	
Short Term (1-2 Years)	
Medium Term (3-5 Years)	
Long Term (5+ Years)	
Ongoing: action has been initiated and will continue throughout the life of the plan	

These actions were developed with guidance from input from both community and municipal staff and Council stakeholders. Actions should be viewed as a starting point and are expected to change over time. They are divided into corporate and community actions. Corporate actions strongly align with the City's 2019 Energy Conservation and Demand Management Plan and highlight both energy and GHG reduction savings. The following section of this report is the GHG Reduction Action Plan.

5.2 GHG Reduction Plan

Buildings and Energy – Community

	OBJECTIVE	ACTIONS	RESPONSIBILITY	WHEN	PERFORMANCE MEASURES
BUILDING AND ENERGY - COMMUNITY	**a. EDUCATION**	a. Increase education and awareness regarding the relationship between energy use and GHG emissions. b. Increase the number of local schools enrolled in Eco Schools Canada (eco-certification program for K-12).	***Lead*** • City (CD&ES) ***Partners*** • Environmental Sustainability Committee • Algoma University • Sault College • Schools (e.g. Algoma District School Board (ADSB), Huron-Superior Catholic District School Board, Conseil Scolaire catholique du Nouvel-Ontario, and Conseil scolaire public du Gran Nord de l'Ontario) • Non-profits	⚡	• Develop a webpage on the City's website as a source of information about the GHG reduction plan and energy efficiency saving opportunities. • Create a local 'Student Energy' Chapter. Chapter (at either Algoma University of Sault College). This will allow students to leverage the global brand and organizational knowledge to take action on energy in their communities by facilitating energy debates, executing energy projects, or hosting regional summits. https://studentenergy.org/chapters/. • Number of schools enrolled in Eco-Schools Canada. For more information visit https://ecoschools.ca. **Create a series of public forums (in-person and virtual) to engage community member and business participation in GHG-reduction activities.**
	b. REDUCE ENERGY CONSUMPTION AND OPTIMIZE ENERGY EFFICIENCY	a. Increase uptake in residential and commercial energy efficiency retrofits that reduce the use of fossil fuels.	***Lead*** • The City (CD&ES) ***Partners*** • IESO • Utilities (PUC & Enbridge)	⚡	• Number of completed commercial and residential retrofits **Average energy savings for natural gas home renovation under the Enbridge Home Energy Rebate Program is 17%. Only 11% of 34,485 single-family homes have participated in the program in the Sault. (Carolyn Suter, Advisor, Municipal Energy Solutions Group, Enbridge)**

	OBJECTIVE	ACTIONS	RESPONSIBILITY	WHEN	PERFORMANCE MEASURES
BUILDINGS & ENERGY - COMMUNITY	**2. REDUCE ENERGY CONSUMPTION AND OPTIMIZE ENERGY EFFICIENCY**	b. Increase the number of new homes and business builds to incorporate energy efficient equipment (e.g. new furnaces, weather stripping, efficient lighting, etc.).	***Lead*** • The City (Planning Department), Engineering ***Partner*** • Sault Ste. Marie Construction Association		• Number of new energy efficient homes built that go above the Ontario Building Code.
		c. Research policies for efficient new builds that go above the Ontario Building Code.	***Lead*** • The City (CD&ES, Engineering, Planning)		• Develop a Green Building Policy.
		d. Develop a community energy efficiency retrofits program (either for energy efficiency retrofits or renewable energy).	***Lead*** • The City (CD&ES) ***Partners*** • PUC • Enbridge • Heliene		• A GHG Reduction Plan that recommends residential home energy efficiency with council approval. • Application to the FCM Community Efficiency Financing (CEF) Initiative (Application launches early 2021).
		e. Encourage the use of energy reduction devices such as thermal imaging heat devices.	***Lead*** • The City (CD&ES) ***Partners*** • Sault Ste. Marie Public Library • PUC		• Purchase of thermal imaging camera and develop a rental program in partnership with the Public Library ($200 - $500) • Number of rentals of the device  **84% of residents surveyed said they would conduct a free do-it yourself home energy consumption audit to help understand their energy consumption and implement energy saving strategies at home.**
	3. INDUSTRIAL / COMMUNITY ENERGY EFFICIENCY	a. Continue to consult with local industrial facilities to understand their current and planned energy efficiency and GHG reduction efforts.	***Lead*** • Local Industry ***Partners*** • The City • Enbridge, IESO		 **Algoma Steel has 3 GHG reduction projects anticipated to reduce annual GHG emissions by approximately 79,000 tonnes are either complete or underway at Algoma. (5% community GHG reduction potential).**

	OBJECTIVE	ACTIONS	RESPONSIBILITY	WHEN	PERFORMANCE MEASURES
BUILDING AND ENERGY - COMMUNITY	**3. INDUSTRIAL / COMMUNITY ENERGY EFFICIENCY**	b. Foster an environment that encourages new community energy projects to increase sustainable energy opportunities.	***Lead*** • PUC / The City (EDC) ***Partners*** • Private Sector • Natural Resources Canada	↻	• Number of energy innovation projects **The PUC Distribution's Smart Grid Project has a target of being operational in 2022 with an estimated potential to save energy savings worth 2,804 tonnes of CO_2 annually. (PUC, 2019)**
	4. ALTERNATIVE ENERGY GENERATION	a. Explore opportunities for increasing the use of solar photovoltaic (PV) electric net metering in Sault Ste. Marie.	***Lead*** • The City (CD&ES) ***Partners*** • PUC • Heliene	›	• Number of renewable energy projects implemented in Sault Ste. Marie **Rooftop Solar Potential of 69,300 tCO_2e per year (based on 88% rooftops covered in solar) (Google Environmental Insights Explorer, 2020).**
		b. Investigate the use of energy storage integration to move forward with balancing clean energy projects.	***Lead*** • The City (CD&ES) / PUC	›	• Number of energy storage projects

Resources	
Supporting Programs and Policies/Legislation	***Financial Resources Available / Required***
Municipal • The *Municipal Act* provides municipalities with the ability to pass a by-law respective to the economic, social and environmental wellbeing of the municipality, including climate change. • The *Ontario Planning Act* provides municipalities with authority to mandate sustainable urban design through site plan approvals. • A site Control By-law can be used to ensure that any new developments meet certain standards and regulations (e.g. energy efficiency).	**1. FCM Community Efficiency Initiative (CEF)** A $300 million fund that was created to support municipalities and partner organizations to accelerate home energy projects (open for applications in Winter 2020/2021). **2. Save on Energy** https://www.saveonenergy.ca/en *a. Home Assistance Program* b. *Small Business Lighting* ($2,000 incentives towards eligible energy efficient lighting upgrades) *c. Retrofit Program* (Prescriptive and custom incentives to reduce electricity consumption for commercial and industrial organizations)

Provincial • IESO 2021-2024 Conservation and Demand Management Framework • *Made-in-Ontario Environment Plan (2018)* • *Ontario Building Code (2017)* **Federal** • *Pan-Canadian Framework on Clean Growth and Climate Change (2016)* • *National Energy Code (2015)*	**3. Enbridge Save Money & Energy Programs** https://www.uniongas.com/business/save-money-and-energy • Residential i. Home Efficiency Rebate ii. Home Winterproofing Program iii. ENERGY STAR® for New Homes • Commercial a. Equipment Incentive Program a. Custom Engineering Incentive Program b. Commercial Savings By Design **4. Federation of Canadian Municipalities Green Municipal Fund** *Projects that Reduce fossil fuel use in fleets:* a. Capital Projects • The project should reduce GHG emissions by 20% compared to an existing or modeled baseline measurement. • Receive a low-interest loan of up to $5 million and a grant worth up to 15% of the loan; cover up to 80% of your eligible costs. • High-ranking project loans and grants: These qualify for a low-interest loan of up to $10 million and a grant worth up to 15% of the loan; cover up to 80% of your eligible costs. b. Pilot Projects • Grant: Up to $350,000 to cover up to 50% of eligible costs c. Studies • Grant: Up to 50% of eligible costs to a maximum of $175,000 **5. Canadian Infrastructure Bank $10 billion Growth Plan** $2.5 billion for Building Energy Efficiency Retrofits https://cib-bic.ca/en/growth-plan/

Buildings and Energy – Corporate

	OBJECTIVE	ACTIONS	RESPONSIBILITY	WHEN	PERFORMANCE MEASURES
BUILDING AND ENERGY - CORPORATE	**1. GREEN FINANCING**	a. Develop a local improvement charge (LIC) by-law to allow clean energy improvement financing for new buildings/or upgrades, including green standards in Sault Ste. Marie.	***Lead*** • The City (Planning Department), Engineering, Community Services ***Partner*** • FutureSSM • PUC	»	• By-law resolution • Number of LIC applications • Number of completed updates to buildings
		b. Review and streamline the Municipal Environmental Initiatives (Green) Committee to oversee applications to the Green Initiatives Program under the Community Development Fund (CDF), and act as the overseeing body for the GHG reduction plan implementation.	***Lead*** • The City (CD&ES) ***Potential Members*** • Utilities, Council, Business, Health, Science or Natural Resources, Non-profit or environmental group and Industry	↻	• Establish a new term of reference • Create a by-law accepting new terms of reference by Council • Elect Committee members • Number of meetings held per year
	2. ENERGY EFFICIENCY	a. Continue implementing energy efficiency retrofit projects identified in the IB Story Audits of 2010 and the 2019 Energy Conservation and Demand Management Plan (see Appendix 3 for a list of City retrofits).	***Lead*** • The City (Facility Managers)	↻	• Number of energy efficiency retrofits completed per year.

	OBJECTIVE	ACTIONS	RESPONSIBILITY	WHEN	PERFORMANCE MEASURES
BUILDING AND ENERGY - CORPORATE	**2. ENERGY EFFICIENCY**	b. Take a portfolio approach to energy efficiency by establishing an implementation plan specifically for retrofits of existing buildings (if plans are dated or nonexistent, a revision of the audit should be done.	***Lead*** • The City (facility managers) • Asset Management Committee		• Development of an implementation plan for existing retrofits. • Number of audits / studies conducted for high energy consumption facilities.
		c. Include wording in all request for proposals (RFP) for capital projects to include applying for Ontario energy incentives.			• Number of corporate tenders with energy efficiency and/or sustainability wording included in the final tendering document.
		d. Ensure zero-emission technology is incorporated in regulations and public tenders.			• Carbon neutrality requirements included in tendering documents.
	3. ENERGY MANAGEMENT	a. Integrate sustainable energy technology and energy management practices across the municipality.	***Lead*** • The City (Finance / Asset Management, Engineering and Purchasing)		• Number of tenders that include energy efficiency and/or sustainability wording **Incorporate Life-Cycle Analysis (LCA) into the procurement process**
		b. Integrate energy and climate considerations into the Asset Management Process.			• Create a section on Climate Change mitigation and adaption in the revised asset management plan.
		c. Improve energy data tracking and use (e.g. utility meters and databases).	***Lead*** • The City (CD&ES)		• Provide increased funding to staff for facility operations and empowering facility staff to act on identified energy saving opportunities.

BUILDING AND ENERGY -- CORPORATE	OBJECTIVE	ACTIONS	RESPONSIBILITY	WHEN	PERFORMANCE MEASURES
	4. ALTERNATIVE ENERGY	a. Commission a study to evaluate the business case for the deployment of hydrogen fuel cell applications as part of establishing a role for a low-carbon economy and community energy strategy.	***Lead*** • The City ***Partners*** • Industry (e.g. Algoma Inc.)	›	• Consult with external stakeholders (e.g. Industry, Public and Private Sector) to encourage a consortium approach for hydrogen use.
		b. Explore the feasibility of renewable energy procurement. (Note: the business case must be evaluated based on current renewable energy cost and effectiveness)	***Lead*** • The City ***Partners*** • Enbridge • PUC	»	• Feasibility studies that incorporate renewable energy into municipal facilities.
		c. Increase the amount of solar power generation within municipal buildings and parking lots.	***Lead*** • The City ***Partners*** • Heliene	»	• Number of solar power installation implemented **Rooftop solar installation planned for Transit Building in 2023.**

Resources	
Supporting Policies/Legislation	***Financial Resources Available / Required***
Municipal • City Asset Management Plan Update (2020) • The *Municipal Act* provides that a municipality may make bylaws imposing, fixing and providing methods of enforcing payment for charges of local improvements (local improvement charges (LIC). • The *Municipal Act* (2001) gives municipalities the ability to pass a by-law that is respective of the economic, social and environmental wellbeing of the municipality, including climate change. • The *Ontario Planning Act* (1990) provides municipalities with authority to mandate sustainable urban design through site plan approvals.	**1. Save on Energy** https://www.saveonenergy.ca/en Retrofit Program **2. Enbridge Save Money & Energy Programs** https://www.uniongas.com/business/save-money-and-energy Commercial • Equipment Incentive Program a. Custom Engineering Incentive Program b. Commercial Savings By Design • **Federation of Canadian Municipalities Green Municipal Fund**

Provincial • IESO 2021-2024 Conservation and Demand Management Framework • *Made-in-Ontario Environment Plan (2018)* **Federal** • *Pan-Canadian Framework on Clean Growth and Climate Change (2016)* • *Canadian National Hydrogen Strategy* (in progress)	**3.** City of Sault Ste. Marie Community Development Fund Environmental Sustainability stream has $50,000 that can be used towards community environmental sustainability projects. • **Canadian Infrastructure Bank $10 billion Growth Plan** $2.5 billion for Building Energy Efficiency Retrofits https://cib-bic.ca/en/growth-plan/

Transportation

	OBJECTIVE	ACTIONS	RESPONSIBILITY	WHEN	PERFORMANCE MEASURES
TRANSPORTATION	**1. ACTIVE TRANSPORTATION**	a. Increase education and awareness about the environmental, economic and health benefits related to active transportation.	***Lead*** • Algoma Public Health ***Partners*** • Sault Cycling Club	↻	• Include information on webpage for active transportation **Encourage employers to provide a bicycle for employees to travel to local meetings.**
		b. Develop and maintain bike friendly infrastructure (e.g. bike lanes, trails and racks make cycling a safer, more attractive option for travel and commuting.	***Lead*** • The City (Planning Department) ***Partners*** • Sault Cycling Club / Sault Trails Advocacy Committee (STAC) • Tourism SSM	↻	• Number of bike lanes, trails and bike racks installed in the community **Sault Ste. Marie currently has 50 kilometers of bike infrastructure as of October 2020.**
		c. Initiate a commuter challenge (e.g. annual bike to work week or car-free day).	***Lead*** • The City (CDE&ES) ***Partners*** • Sault Cycling Club	›	• Number of participants in bike-to-work day **Convert to kilometres saved which can be applied to tonnes of carbon dioxide**

	OBJECTIVE	ACTIONS	RESPONSIBILITY	WHEN	PERFORMANCE MEASURES
TRANSPORTATION	**1. ACTIVE TRANSPORTATION**	d. Encourage local companies to reward cyclists (e.g. develop reward program for those who are bike friendly, such as a parking spot by the door covered from the rain.	**Lead** • Large local Employers (e.g. The City, ADSB, Algoma Inc, Ontario Public Service, OLG) ***Partners*** • Sault Cycling Club • Local Bicycle Companies (e.g. Vélorution, Algoma Bicycle Company, Duke of Windsor)	›	• Number of companies who develop specific bicycle parking **The City could encourage incorporation cycling infrastructure for new builds.**
		e. Create an inventory of bike trails, including shortcut trails.	***Lead*** • Sault Cycling Club ***Partners*** • Sault Ste. Marie innovation Centre (SSMIC)	›	• Number of trail submissions • Development of a trail map **Encourage submissions online from community members as part of the trail inventory development**
	2. INCREASE TRANSIT RIDERSHIP	a. Improve transit options and non-motorized accessibility to major centers.	***Lead*** • The City ***Partners*** • Service Providers	»	• Transit ridership
		b. Create incentives for public transit use as a strategy to increase ridership.	***Lead*** • The City (Transit) ***Partners*** • Sault College • Algoma University • Schools (e.g. ADSB)	›	**Explore offering public transit passes at discounted prices to encourage high school, college and university students to use public transit.**
		c. Seek input from key bus users (e.g. seniors, students, commuters, etc.)			• Ensure bus route information online is correct/up-to-date **Promote the on-demand transit app via social media (e.g. Instagram)**

	OBJECTIVE	ACTIONS	RESPONSIBILITY	WHEN	PERFORMANCE MEASURES
TRANSPORTATION	**2. INCREASE TRANSIT RIDERSHIP**	d. Educate the public on how to use bus routes (they will be more inclined to use them if they know how).	***Lead*** • The City (Transit)	›	• Number of education sessions **Work with Corporate Communications to develop a series of 'How To' videos for the transit website**
	3. ZERO-EMISSIONS TRANSPORTATION	a. Support transportation electrification infrastructure opportunities (e.g. electric vehicles charging stations).	***Lead*** • The City (CD&ES) ***Partners*** • PUC • Local Builders	↯	• Number of charging stations installed
		b. Transition to purchasing only vehicles that are highly efficient and run on zero-carbon and renewable energy fuels.	***Lead*** • The City (Transit, Public Works)	»	• Number of zero emission vehicles purchased **In 2020, Public Works engaged a consultant to conduct a Fleet Services Review. The study will assess the integration of zero emission vehicles into their fleet. Insights could be leveraged to other departments.**
		c. Support transportation electrification opportunities (e.g. electric vehicles, alternative energy vehicles, buses, etc.		»	• Number of electric vehicles purchased **The Canadian Federal Government has a mandate that all federally financed bus purchases will be zero emissions in 2023. (*Office of the Prime Minster, 2019*)**
		d. Develop and/or commission a community zero-emission vehicle strategy	***Lead*** • City (CD&ES, Transit, Public Works) ***Partners*** • Car dealerships • PUC	↯	• Number of charging stations and electric vehicles purchased.

	OBJECTIVE	ACTIONS	RESPONSIBILITY	WHEN	PERFORMANCE MEASURES
TRANSPORTATION	**3. ZERO-EMISSIONS TRANSPORTATION**	e. Update Green Fleet Plan	***Lead*** • City		• The Green Fleet Plan was completed in 2011. A review of costs and new technology is encouraged.
	4. PLANNING	a. Review potential actions that align with existing City Plans (e.g. Transportation Master Plan (2015), Green Fleet Plan (2011), and Cycling Master Plan (2007).	***Lead*** • The City (Planning Department)		• Number of active and low emission transportation actions implemented in associated plans.
		b. Encourage land use planning that reduces the distance people have to travel by car.	***Lead*** • The City (Planning Department)		• New developments proximity to active transportation routes.

Resources	
Supporting Policies/Legislation	***Financial Resources Available / Required***
Municipal • *Transportation Master Plan* (2015) • *Green Fleet Plan* (2011) • *Cycling Master Plan* (2007) **Provincial** • *Made-in-Ontario Environment Plan* (2018) **Federal** • *Pan-Canadian Framework on Clean Growth and Climate Change* • *Canadian National Hydrogen Strategy* (in progress)	• **Natural Resources Canada Zero Emission Vehicle Infrastructure Program** https://www.nrcan.gc.ca/energy-efficiency/energy-efficiency-transportation/zero-emission-vehicle-infrastructure-program/21876 • **Federation of Canadian Municipalities Green Municipal Fund** *Projects that Reduce fossil fuel use in fleets:* Capital Projects • The project should reduce GHG emissions by 20% compared to an existing or modeled baseline measurement.

	• Receive a low-interest loan of up to $5 million and a grant worth up to 15% of the loan; cover up to 80% of your eligible costs. • High-ranking project loans and grants: These qualify for a low-interest loan of up to $10 million and a grant worth up to 15% of the loan; cover up to 80% of your eligible costs. <u>Pilot Projects</u> • Grant: Up to $350,000 to cover up to 50% of eligible costs <u>Studies</u> • Grant: Up to 50% of eligible costs to a maximum of $175,000 **3. Federal Government COVID-19 Resilience Funding** • $3.3. Billion is available for projects at a larger cost share - 80% for municipalities. • Project's eligible costs must be under $10 million, construction must start no later than September 30, 2021, and it must be completed by the end of 2021. • Funding for active transportation infrastructure, including parks, trails, foot bridges, bike lanes and multi-use paths 4. **Canadian Infrastructure Bank $10 billion Growth Plan** $1.5 billion for zero emission buses https://cib-bic.ca/en/growth-plan/

Waste

	OBJECTIVE	ACTIONS	RESPONSIBILITY	WHEN	PERFORMANCE MEASURES
WASTE	**1. EDUCATION**	a. Educate and engage residents and business about waste diversion.	***Lead*** • The City (Public Works – Waste Management) ***Partners*** • Clean North		• Number of education outreach initiatives conducted per year.

	OBJECTIVE	ACTIONS	RESPONSIBILITY	WHEN	PERFORMANCE MEASURES
WASTE	**2. WASTE DIVERSION**	a. Review strategies and policies that support ways to divert waste to extend the life of the landfill.	***Lead*** • The City (Public Works – Waste Management) ***Partners*** • Clean North		• Study for landfill life extension
		b. Encourage businesses and residents to reduce waste put into the landfill by using recyclables and reusable products.		›	• Number of businesses that have a recycling station and/or program at their establishment
		c. Reduce the environmental impacts of City operations to demonstrate commitment and spur innovation (e.g. reducing or eliminating single use plastic products at facilities and events).			• 100% elimination of single use plastics at all municipal facilities and events. **The City has started overseeing the waste collection from various departments across the municipality again. Education and measurement of weights of waste will help understand and reduce corporate emissions.**
		d. Explore organic waste diversion from the landfill.		↯	• Conduct composting feasibility study **Ontario's Food and Organic Waste Policy Statement requires Northern Ontario municipalities with populations greater than 50,000 to recover 50 percent of food waste generated by single-family dwellings by 2025 (Government of Ontario, 2019).**
	3. WASTE TO ENERGY	a. Expand landfill gas capture as part of landfill expansion plans and review feasibility of using the gas as a form of energy generation.	***Lead*** • The City (Public Works – Waste Management)	›	• Use of gas as a form of energy **Develop incentives for landfill gas capture systems and power generation**

Resources	
Supporting Policies/Legislation	***Financial Resources Available / Required***
Municipal • Sault Ste. Marie Solid Waste Management Environmental Assessment Draft **Provincial** • *2018 Made-in-Ontario Environment Plan* • *Strategy for a Waste-Free Ontario: Building the Circular Economy* • *2018 Ontario Food and Organic Waste Policy Statement* **Federal** • *Pan-Canadian Framework on Clean Growth and Climate Change*	**1. Federation of Canadian Municipalities Green Municipal Fund** *Energy Recovery or district energy, Waste Diversion, Waste Stream Management* *A.* Capital Projects • The project should reduce GHG emissions by 20% compared to an existing or modeled baseline measurement. • Receive a low-interest loan of up to $5 million and a grant worth up to 15% of the loan; cover up to 80% of your eligible costs. • High-ranking project loans and grants: These qualify for a low-interest loan of up to $10 million and a grant worth up to 15% of the loan; cover up to 80% of your eligible costs. B. Pilot Projects • Grant: Up to $350,000 to cover up to 50% of eligible costs C. Studies • Grant: Up to 50% of eligible costs to a maximum of $175,000

Green Space

	OBJECTIVE	ACTIONS	RESPONSIBILITY	WHEN	PERFORMANCE MEASURES
GREEN SPACE	**1. FOREST MANAGEMENT**	a. Manage City woodlands and street trees for the purpose of carbon offsetting, heat sinks and aesthetics.	***Lead*** • The City (Parks)	↻	• Review City forestry management lands and forestry practices.
		b. Encourage the planting of native, and non-invasive tree species that are resilient to climate change and provide high levels are carbon sequestration.	***Lead*** • The City **Partners** • Ministry of Natural Resource (MNRF) • Schools	↻	• Number of trees planted per year

	OBJECTIVE	ACTIONS	RESPONSIBILITY	WHEN	PERFORMANCE MEASURES
GREEN SPACE	**2. PLANNING**	a. Develop an Urban Forest Management Plan, including an inventory of the tree canopy to understand Sault Ste. Marie's carbon sequestration potential.	***Lead*** • The City (Public Works – Parks and Planning) ***Partners*** • Private Sector • SSMIC	›	• Inventory of tree canopy and carbon sequestered.
	3. ENVIRONMENTAL STEWARDSHIP	a. Partner with local school boards (e.g. ADSB) to participate in an Environmental Stewardship activity with a focus on nature preservation (e.g. building a butterfly garden or hosting a community tree plant).	***Lead*** • ADSB • Algoma University ***Partners*** • The City (CD&ES)	›	• Completion of an Environmental stewardship activity (consider holding it on an ongoing basis). **76% of Youth surveyed said they would be interested in participating in an Environmental Stewardship activity, in particular nature preservation (e.g. building a butterfly garden or hosting a community tree plant).**
		b. Encourage tree planting and preservation of natural areas a priority as part of community sustainability efforts	***Lead*** • The City (Public Works – Parks) ***Partner*** • Clean North	›	• Tree planting initiative

Resources	
Supporting Policies/Legislation	***Financial Resources Available / Required***
Provincial • The *Ontario Municipal Act* (2001) allows single tier municipalities to prohibit and regulate the destruction or injuring of trees both inside and outside of woodlands (e.g. Tree By-Law).	**1. Federal Government COVID-19 Resilience Funding** $3.3. Billion is available for projects at a larger cost share - 80% for municipalities. Project's eligible costs must be under $10 million, construction must start no later than September 30, 2021, and it must be completed by the end of 2021. Funding for disaster mitigation and adaptation projects, including natural infrastructure, flood and fire mitigation, and tree planting and related infrastructure. **2. Tree Canada -** Community Tree Grants https://treecanada.ca/greening-communities/community-tree-grants/

Federal • *Pan-Canadian Framework on Clean Growth and Climate Change (2016)*	**3. Great Lakes Guardian Fund** (grants up to $25,000) http://www.grants.gov.on.ca/GrantsPortal/en/OntarioGrants/GrantOpportunities/PRDR016022 Project goals must include: a. Protect water quality for human and ecological health b. Improve wetlands, beaches and coastal areas c. Protect habitats and species **4. Habitat Stewardship Program for Species and Risk** $25,000 to $100,00 per project **5. TD Friends of the Environment Foundation Grant $2,000 to $8,000** https://www.td.com/corporate-responsibility/fef-grant.jsp

Economic Development

	OBJECTIVE	ACTIONS	RESPONSIBILITY	WHEN	PERFORMANCE MEASURES
ECONOMIC DEVELOPMENT	**1. SUSTAINABILITY**	a. Encourage local businesses to embrace sustainability (e.g. investigate creating a sustainable business membership program such as Green Economy North https://www.greeneconomynorth.ca/	***Lead*** • The City (Economic Development) ***Partners*** • Sault Ste. Marie Chamber of Commerce • Clean North • Sault Ste. Marie Innovation Centre (SSMIC) • Community Development Corporation		• Number of busineses committed to sustainabiliy in their operations **88% of youth surveyed showed an interest in frequenting a sustainably minded establishment**
	2. LOCAL FOOD PRODUCTION	a. Support local food production and consumption to reduce transportation emissions and costs of importing food to the community.	***Lead*** • Rural Agri-Innovation Network (RAIN) ***Partners*** • The City (CD&ES) • Mill Market SSM		• Number of agribusiness endeavors launched.

	OBJECTIVE	ACTIONS	RESPONSIBILITY	WHEN	PERFORMANCE MEASURES
	2. LOCAL FOOD PRODUCTION	b. Expand opportunities and markets for Sault Ste. Marie locally grown products.	***Lead*** • RAIN		• Number of local producers that are selling goods outside of Sault Ste. Marie.
	3. CLEAN MARKET GROWTH	a. Encourage the development of a low-carbon economy in Sault Ste. Marie (e.g. develop a Smart Park that encourages energy efficiency, LEED building standards) to encourage clean-tech companies to relocate and/or expand in Sault Ste. Marie. Continue to work with local partners (private sector, indigenous groups and non-profits) to encourage clean growth opportunities.	***Lead*** • The City (Economic Development) ***Partners*** • Sault Ste. Marie Construction Association • Sault Ste. Marie Chamber of Commerce • SSMIC		• Number of clean-tech businesses in Sault Ste. Marie. • Number of people employed in the clean-tech / low carbon economy jobs.  **Clean innovation feeds a fast-growing global market for environmental solutions that will be worth $2.5 trillion by 2022 (Smart Prosperity, 2019)**

Resources	
Supporting Policies/Legislation	***Financial Resources Available / Required***
Provincial • *Made-in-Ontario Environment Plan (2018)* **Federal** • *Pan-Canadian Framework on Clean Growth and Climate Change (2017)*	**Rural Agri-Innovation Network** • Sustainable New Agri-Food Products & Productivity (SNAPP) Program – COVID 19 Response • SNAPP Sustainable New Agri-Food Products & Productivity Program

Municipal Leadership

These actions are all associated to the City as the lead, therefore the 'responsibility' column has been omitted.

	OBJECTIVE	ACTIONS	WHEN	PERFORMANCE MEASURES
MUNICIPAL LEADERSHIP	**1. HUMAN RESOURCES**	a. Assign and/or establish a position at the City to manage energy and sustainability initiatives, ensuring integration in all aspects of City operations and to act as a key municipal liaison towards community climate action.		• Hiring of one (1) human resource to focus on energy and sustainability projects and GHG reduction plan implementation and/or revision of an existing job description.
		b. Assign the newly established Environmental Sustainability Committee to oversee the implementation of the Sault Ste. Marie GHG Reduction Plan and climate change action across the community.		• Bylaw for accepting the Terms of Reference for the Environmental Sustainability Committee.
	2. FINANCING	c. Leverage climate investment opportunities from all levels of government and private sector to encourage research and development (R&D) opportunities for the community to be a test site for GHG reduction strategies.		• Number of climate investment opportunities applied for and successfully approved per year.
	3. OPERATIONS / LEGISLATION	a. Introduce a 'Climate Lens' policy (evaluate and consider the climate impacts of all major City decisions, including financial decisions), to ensure City investments, policies and programs are supporting climate change goals.		• Creation of a Climate Lens Policy  **A Climate Lens can incent behavioral change and incorporate climate impacts while furthering growth of a low-carbon economy. (Infrastructure Canada, 2019)**

	OBJECTIVE	ACTIONS	WHEN	PERFORMANCE MEASURES
MUNICIPAL LEADERSHIP	**3. OPERATIONS / LEGISLATION**	b. Draft bylaws and design infrastructure that encourage GHG mitigation at the citizen-level (e.g. discounted parking for electric vehicles)	›	• Number of by-laws created that address GHG mitigation
		c. Embed the GHG reduction plan into the Municipal and Community Planning Process.	↯	• Incorporate tasks into City policies and job descriptions and including them into the budgeting process. • Monitor implementation • Report regularly to council • Integrate GHG reduction plan objectives into policies and regulations (e.g. Official Plan, Zoning By-Law, Site Control By-law, Municipal Policy Manual).

Resources	
Supporting Policies/Legislation	***Financial Resources Available / Required***
Provincial • *Made-in-Ontario Environment Plan (2018)* **Federal** • *Pan-Canadian Framework on Clean Growth and Climate Change* (2016)	**Federation of Canadian Municipalities Green Municipal Fund** *A.* Capital Projects • The project should reduce GHG emissions by 20% compared to an existing or modeled baseline measurement. • Receive a low-interest loan of up to $5 million and a grant worth up to 15% of the loan; cover up to 80% of your eligible costs. • High-ranking project loans and grants: These qualify for a low-interest loan of up to $10 million and a grant worth up to 15% of the loan; cover up to 80% of your eligible costs. B. Pilot Projects • Grant: Up to $350,000 to cover up to 50% of eligible costs C. Studies • Grant: Up to 50% of eligible costs to a maximum of $175,000

6. Implementation

The development of the GHG reduction plan is a positive step for the City in reducing GHG emissions. In order for the plan to move forward, the City must follow through on implementation, and monitor GHG reduction results. This aligns with Milestones 4 and 5 in the FCM PCP Program. Accomplishing this in 10 years will complete the City's participation in this voluntary national climate change action program, and is encouraged.

Implementing and overseeing the action plan will require staff time from several of the City's departments. The departments who have participated in the creation of the plan should continue to play an active role in the monitoring and implementation of the plan. In addition, tracking and reporting of relevant data will be necessary to produce annual reports and plan updates. It is recommended that these departments work to identify opportunities to implement the plan and include this in their annual work programs and budgets.

The GHG Reduction Plan creation utilized a comprehensive approach to ensure that action items identified were created with direct feedback from the City, residents and businesses. Upon completion of the plan, a review of different alternatives was conducted to identify potential champions for leading implementation. These strategies are preliminary and will require further discussion pertaining to staff availability and budget requirements. The following table outlines the proposed implementation alternatives.

Table 10: Sault Ste. Marie GHG Reduction Plan Implementation Alternatives

Scenario	Benefits	Limitations
a. Assign and/or establish a staff position to oversee the GHG mitigation project implementation and environmental sustainability tasks and commitments (e.g. support the efforts of the Environmental Sustainability Committee, embed a culture of climate action in the City and submit annual City O.Reg. 507/18 reporting).	Ensure task completion accountability by assigning responsibility to a specific human resource. Key tasks can include embedding the GHG reduction plan into plans, policies and other aspects of Corporate operations. Wages could be subsidized by energy savings from retrofit projects.	Require assignment of operational funds and supervision from an existing department.
b. Distribute specific GHG mitigation projects and tasks to existing staff.	No additional human resource cost.	Existing staff have high workloads and may not prioritize actions.
c. Assign responsibility for monitoring implementation to Environmental Sustainability Committee (Committee of Council).	No cost for volunteer committee. As it is a committee of council it will ensure that it can monitor GHG reduction plan implementation by reporting to Council.	Limited accountability as committee is volunteer

Recommendation

FutureSSM recommends Scenario C: 'Assign responsibility for monitoring implementation to the revised Green Committee (a committee of council) which will be assigned to assist in the review and implementation of the GHG reduction plan)'. To add to this, it is also recommended that a staff resource be assigned and/or established to support the committee in implementing the GHG Reduction Plan. FutureSSM has led the development of this plan through a funded position made possible by the FCM MCIP Staff Grant. It is recommended that other funding sources be explored to ensure the longevity of this position. Reviewing the possibility of using savings from energy efficiency retrofits to fund this position is also another possibility. Assigning a resource within the City is one of the best ways to maintain continuity with this project, to implement actions and the make sure that regular GHG emissions inventories are completed and kept up to date. This resource could ensure that a culture of climate action is embedded within the organization. Alternatively, collaboration with other entities within the community such as the PUC is encouraged to implementing priority action items, in particular with regards to vehicle electrification and energy efficiency and the synergies associated to increasing electricity use as a source of GHG mitigation.

The GHG Reduction Plan guides the implementation of actions over the next 10 years. Certain recommendations can be accomplished fairly quickly. Other recommendations will need to be spaced out over time such as land-use planning strategies. In order to maintain buy-in and momentum on the project, a list of priority action items is detailed below to help move forward with project implementation for the first year.

6.1 Corporate Priority Action Items

The Sault Ste. Marie GHG reduction plan contains 60 actions that are recommended to be implemented at a variety of different timeframes. The champion around implementing these actions should be the City as well as the Environmental Sustainability Committee. In addition, partnerships with other community groups will facilitate task completion.

On a corporate level, there are five specific actions that the City should focus their implementation efforts to meet and quite likely exceed their preliminary 10-year target of reducing emissions by 10% from the 2017 baseline. These projects fall under the energy and buildings, transportation, green space and municipal leadership sectors of the action plan. A high-level overview of the insight and estimate reduction potential behind these savings and specifics pertaining to the action is listed below:

Energy & Buildings

1. Insight: GHG reduction savings potential from energy efficiency and renewable energy projects is summarized in Appendix 3 and Appendix 4 of this report. These projects have the potential to reduce corporate emissions by 987.48 tCO2e (or approximately 10%) from the 2017 baseline.

   Action: Continue to prioritize the implementation of energy efficiency retrofits, in particular those that reduce the use of natural gas, identified in the 2019 Energy Conservation and Demand Management Plan as well as others identified by FutureSSM.

2. Insight: The Transit Building Solar System Installation estimates annual GHG savings of 3.23 tCO_2e (AECOM., 2011).

   Action: Complete the Transit building solar system installation by 2023.

Transportation

3. Insight: An electric vehicle (EV) produces approximately 94% fewer emissions than an internal combustion engine (ICE) vehicle. As well, converting 2 existing diesel City buses to electric buses has the potential to reduce corporate baseline emissions by approximately 2%. Though EVs tend to be more expensive than ICE vehicles, there are a variety of existing incentives for both vehicles and infrastructure (e.g. Natural Resources Canada Zero Emission Vehicle Infrastructure Program) that can help municipalities with the capital costs of EV conversion.

   Action: Continue to explore the possibility of incorporating low-emission and zero-emission vehicles for corporate fleets.

Green Spaces.

4. Insight: The US Environmental Protection Agency (EPA) states that a "medium growth coniferous or deciduous tree, planted in an urban setting and allowed to grow for 10 years, sequesters [an average of 30.6 tonnes of] carbon, respectively" (United States Environmental Protection Agency, 2020). If the City planted 10 trees in 1 specific year (e.g. 2021), in 10 years (2031) those trees could reduce baseline corporate emission by approximately 3%.

   Action: Increase the number of trees planted per year, in addition to conducting an urban tree canopy study to understand offsets from the City's tree canopy.

Municipal Leadership

5. Insight: A Climate Lens can encourage behavioral change and incorporate climate impacts while furthering growth of a low-carbon economy. (Infrastructure Canada, 2019).

   Action: Introduce a 'Climate Lens' policy (evaluate and consider the climate impacts of all major City decisions, including financial decisions), to ensure City investments, policies and programs are supporting climate change goals.

In addition to the above five specific projects, a series of ten priority tasks has been identified for implementation by the City in the next twelve months. Some of these tasks are already underway and will lay the foundation and encourage project momentum for more time-consuming tasks in the future. The following table outlines priority tasks, their description, timeline and potential leads/partners required.

6.2 Priority Action Items – Year 1

Priority Task	Task Overview	Stat Date	Lead / Partners
1. Review and revise the Green Committee Terms of Reference to incorporate a community approach to GHG reduction in Sault Ste. Marie.	The Green Committee was recently transitioned to become the 'Environmental Sustainability Committee' which will take a more community approach to environmental projects. It is a committee of council and will ensure accountability and buy in for GHG reduction.	Fall 2020 (COMPLETE)	• Community Development & Enterprise Services • Future SSM Staff Support
2. Determine Budget Requirements for Year One; Explore capital funding requirements / appoint staff resources.	Review projects for 2020/2021 and apply for funding. Leverage climate investment opportunities from all levels of government and private sector to encourage research and development (R&D) opportunities for the community to be a test site for GHG reduction strategies.	Fall 2020	• Future SSM Staff Support
3. Create a webpage on the City website to act as a 'one-stop-shop' for community Climate Change information, funding and projects'	Work with the City's Corporate Communications Department to develop a community resource hub on energy and climate information.	Fall 2020	• FutureSSM Staff to work with Corporate Communications to design and create web page

Priority Task	Task Overview	Timeline	Lead / Partners
4. Prioritize corporate energy efficiency retrofits to be completed in 2020/2021 (see Appendix 3 for the list).	Work with Facility Managers to submit retrofits to the IESO and Enbridge Rebate programs to ensure that incentive opportunities are maximized.	Fall 2020/ Winter 2021	• Future SSM Staff Support • Finance Department • Asset Management Committee
5. Create a supplemental municipal climate action summary for each City Department.	Review GHG Reduction Plan with all City department heads to ensure all actions (planned and future) are accounted for. A summary will be provided to the City which will encapsulate all actions and allow for easy identification.	Winter 2021	• FutureSSM Staff support
6. Ensure the city's policies and programs align with supporting the GHG Reduction Plan Objectives and Targets.	Assist in formulating and recommending environmental and sustainability policies, plans and practices.	Fall 2020 / Winter 2021	• City of Sault Ste. Marie Clerks Department • Future SSM Staff Support • Environmental Sustainability Committee
7. Undertake youth led Environmental Stewardship activity to encourage sustainability.	Partner with local school boards to participate in an Environmental Stewardship activity with a focus on nature preservation (e.g. building a pollinator garden or hosting a community tree plant).	Spring 2021	• Future SSM Staff Support • Schools (e.g. ADSB)
8. Develop a community retrofit program (apply to the FCM Efficiency Financing Initiative)	The funding program requires a community Climate Change Plan that recommends residential home energy efficiency with council approval.	Winter 2020/2021	• Future SSM • Staff Support • PUC

Priority Task	Task Overview	Timeline	Lead / Partners
9. Increase local uptake of Eco Schools Canada Registration in schools in Sault Ste. Marie.	Reach out to local school boards and assist with Eco Schools Canada Registration.	Fall 2020 / Winter 2021	• Future SSM Staff Support • ADSB
10. Streamline City Broader Public Sector Energy Reporting (O.Reg. 507/18)	Explore energy tracking software and data management programs and costs for use by the City (e.g. Energy Star Portfolio Manager, RETScreen and Association of Municipalities of Ontario Energy Software (ECT) Program).	Fall 2020 / Winter 2021	• Future SSM Staff Support

The next section of this document highlights internal and external financing and funding opportunities to assist with task implementation.

7. Financing the GHG Reduction Plan

Cities, like other governmental organizations can access and utilize various financing options for emission reduction projects. The following section of this report highlights internal capital as well as external funding and grant options researched and available as of the end of October 2020.

Internal Financing Opportunities

Climate change mitigation strategies, like other projects come with a cost. This can impact staff interest and resource availability to see mitigation projects come to fruition. Using a climate lens to all capital projects could encourage mitigation efforts and project implementation. There are several options for financing the activities of the GHG Reduction Plan. The following options relate to allocating internal funds to reducing GHG emissions.

i. Federal Gas Tax Fund

The Federal Gas tax program can be used to fund municipal sustainability projects. The City receives over $4,000,000 annually from the Canada Gas Tax Fund and estimates indicate it will receive the following funds over the next three years[8]:

- 2020: $4,451,418
- 2021: $4,653,755
- 2022: $4,653,755

Funds could be allocated to infrastructure projects, community energy systems, public transit, studies and training to improve capacity as well as waste diversion projects. The City could consider using expected increase from Gas Tax Funds ($202,337 from 2020 to 2021) to fund GHG reduction projects. Any revenue or savings could be directed to a new reserve fund for eligible projects rather than levy reduction, as set out in the *Reserve and Reserve Fund Policy* to set up new reserves.

ii. Internal Revolving Energy Fund

Cities can establish a permanent revolving fund to finance energy efficiency and greening programs that reduce GHGs or conserve energy. A revolving fund uses the energy savings from any retrofits, such as LED upgrades, and invests them into a capital reserve fund specifically dedicated to energy and emissions reduction projects. The revolving fund could be recapitalized using either the actual savings of future projects, the estimated savings of the projects, or a balance transfer from the general fund of unspent energy dollars[9].

[8] AMO. Estimated AMO Allocations of the Federal Gas Tax Fund 2019 – 2023. Retrieved from: https://www.amo.on.ca/AMO-PDFs/Gas_Tax/Agreements_and_Allocations_GTF/2019-2023-Allocations.aspx

[9] Green Fund Program. (2020). Retrieved from: https://carleton.ca/fmp/energy-and-sustainability/get-involved/green-revolving-fund/

For example, the planned solar project at the new transit building has an anticipated annual revenue of $133,000, which could be another source of revenue for the fund[10]. As well projected savings from pending retrofits is estimated at $ $677,584.32 in energy costs (see Appendix 3 and 4 for a breakdown of estimated energy savings from City retrofits and planned and potential renewable energy projects). By establishing a revolving fund for environmental programs, the City can further sustainability project completion with the savings as well as allocations from the capital budget process.

iii. Community Development Fund – Green Initiatives Program

Earlier in 2020, $50,000 from the Municipal Environmental Initiatives (Green) Committee was allocated to the Community Development Fund for their Green Initiatives Program. Funding from this program will be for projects that support the City's environmental plans and practices, in particular the reduction of GHG emissions, water quality/rehabilitation or increase energy efficiency. Non-profits and City departments can apply for these funds to further priority actions identified in the GHG reduction plan. A funding application process for community organizations to access this fund is in the process of being established.

iv. Local Improvement Charges (LIC)

A local improvement charge (LIC) is a low interest loan that is provided to property owners by the municipality. The province of Ontario amended the *Ontario Municipal* Act in 2012 to allow LICs to be used for energy efficient upgrades.

An example of a similar program is the Solar City Program in Halifax, where property owners can incorporate solar energy projects through a program financed with the municipality. The City places a LIC on the property after the solar project is installed. A charge is applied to the property and not the individual and is a separate change from the property owners tax bill[11].

Recommendation

As indicated above, there are multiple internal financing opportunities that can be leveraged to allocate budget funding for sustainability initiatives, including the GHG reduction plan. These suggested financing opportunities should be reviewed in more detail. In the interim, this could be assigned to the Community Development & Enterprise Services Department (CD&ES) as they were the overseeing department of the GHG Reduction Plan.

External Funding Opportunities

In addition to utilizing internal funding mechanisms, Cities have access to various financing options that help with emission reduction projects. Some of the financing mechanism include grants. That being said, the City will also need to explore using their own resources to a certain degree if they wish to accomplish further GHG emissions reduction actions. The following section outlines federal, provincial and private sector funding that is available as either a loan or a grant to fund sustainability projects.

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[10] AECOM. (2011). *The Corporation of the City of Sault Ste. Marie Rooftop Solar Photovoltaic System at Transit Services and Public Works and Transportation – Feasibility Study.*
[11] Halifax Regional Municipality. (2020). *About Solar City.* Retrieved from: https://www.halifax.ca/home-property/solar-projects/about-solar-city-halifax

i. Canadian Infrastructure Bank $10 billion Growth Plan

On October 1, 2020, the Canadian Federal Government released a spending package of $10 billion to be administered by the Canadian Infrastructure Bank (CIB) called the Growth Plan. The Growth Plan targets new investments in five priority pillars. Three pillars of relevance to the Sault Ste. Marie GHG Reduction plan are:

1. **$1.5 billion for zero emission buses:** To expand and accelerate the adoption of zero emission buses which will modernize bus fleets, reduce GHGs and reduce operating costs over the long-term. This supports the government's goal of 5,000 new zero emission buses.

2. **$2.5 billion for energy efficient building retrofits:** To improve energy efficiency of existing buildings and help larger real estate owners modernize their assets. Improved energy efficiency will reduce GHGs and operating expenses.

3. **$2.5 billion for clean power:** To facilitate interprovincial electricity transmission or interties, clean power and storage. This step will support clean power, reduce greenhouse gas emissions and help Canada in its 2030 and 2050 emissions reduction targets.

The program is designed to fund the capital expenditures through the CIB financing with the project energy savings over a period time to act as the repayment. For more information, please visit: https://cib-bic.ca/en/growth-plan/

ii. Federal Government COVID-19 Resilience Funding

$3.3. Billion is currently available from Infrastructure Canada for GHG mitigation projects at a larger cost share, with 80% for municipalities.

To be eligible for funding under the COVID-19 Resilience Stream, the project's eligible costs must be under $10 million, construction must start no later than September 30, 2021, and it must be completed by the end of 2021.

It will fund the following types of projects:

- Retrofits, repairs and upgrades for provincial, territorial, municipal and Indigenous buildings; health infrastructure; and schools;
- COVID-19 response infrastructure, including measures to support physical distancing;
- Active transportation infrastructure, including parks, trails, foot bridges, bike lanes and multi-use paths; and
- Disaster mitigation and adaptation projects, including natural infrastructure, flood and fire mitigation, and tree planting and related infrastructure.

For more information about this program please visit:
https://www.infrastructure.gc.ca/plan/covid-19-resilience-eng.html

iii. Enbridge Residential and Commercial Energy Efficiency Funding Programs

Enbridge Gas Inc. offers both residential and commercial customer's incentives for energy efficiency measures that reduce consumption of natural gas. For the commercial sector programs include energy management and monitoring, financial incentives as well as retrofits.

For more information on this program, please view the following link: https://enbridgesmartsavings.com/business-energy-management/programs-and-campaigns/commercial-custom-retrofit-program

Residential customers are eligible for a rebate of up to $5,000 towards home renovations for those who own a gas furnace. For more information about this program, please view the following link: https://enbridgesmartsavings.com/home-efficiency-rebate

iv. Independent Electricity System Operations (IESO) Energy Conservation Programs

The IESO 2021 – 2024 Energy Conservation Programs for Commercial, Industrial and Institutional Consumers will offer incentives valued at $457 million to support energy planning and conservation. Incentives vary based on program type. The following is a list of all the programs currently available (note some of these programs may change as of January 4, 2021).

a. Aboriginal Community Energy Plan (ACEP) Program
b. Education and Capacity Building Program
c. Save on Energy – Energy Managers
d. Save on Energy – Performance Program Incentives for Multi-Site Businesses
e. Save on Energy – Home Assistance Program for Residents
f. Save on Energy – Process and Systems
g. Save on Energy Retrofit Program
h. Save on Energy – Small Business Lighting Program
i. Save on Energy – Training & Support Initiatives

For more information on the programs, please visit www.ieso.ca.

As well, a new residential Energy Affordability Program (2021 – 2024) is being launched in January 2021. This program will provide energy saving measures to eligible households and will help them reduce their home energy costs and improve home comfort. This will be offered by the IESO. As more details are available, they will be shared with the community.

v. Green Municipal Fund

The Green Municipal Fund (GMF), is a funding program administered by the Federation of Canadian Municipalities (FCM). It provides municipalities with financial support for all stages of 'green' projects, including, planning, feasibility studies, pilot projects and capital projects. Funding specifies include:

Capital Projects

- The project should reduce GHG emissions by 20% compared to an existing or modeled baseline measurement.
- Receive a low-interest loan of up to $5 million and a grant worth up to 15% of the loan; cover up to 80% of your eligible costs.

- High-ranking project loans and grants: These qualify for a low-interest loan of up to $10 million and a grant worth up to 15% of the loan; cover up to 80% of your eligible costs.

Pilot Projects
- Grant: Up to $350,000 to cover up to 50% of eligible costs

Studies
- Grant: Up to 50% of eligible costs to a maximum of $175,000

For more information on GFM funding, visit: https://fcm.ca/en/funding

i. FCM Community Efficiency Financing Initiative

In 2020, the FCM launched the Community Efficiency Financing (CEF) Initiative, which is a $300 million fund to support municipalities and partner organizations to accelerate home energy projects. Property Assessed Clean Energy (PACE), Local Improvement Charge (LIC) financing and utility on-bill financing are just some examples of financing models used by municipalities delivering residential energy programming. The program launched in the Spring of 2020 and the next intake round for the Winter of 2020/2021 stream will require a community Climate Change Plan that recommends residential home energy efficiency with council approval. This aligns with recommendations outlined in the Buildings & Energy – Community section of the GHG reduction plan.

For more information on the program, please visit:
https://data.fcm.ca/documents/funding/gmf/cef-application-guide-gmf.pdf

ii. Housing Services Corporations (HSC) Social Housing Funding

The HSC is a non-profit organization in Ontario that focuses on the long-term health and sustainability of Ontario's social housing. They offer social housing organizations energy services, utility management and building asset management programs. By operating social housing more efficiently, energy and GHG savings are a result. Key programs that they offer are listed below:

a. Housing Services Corporation's Utility Management Program
b. Housing Services Corporation's Community Champion Program
c. Housing Services Corporation and Infrastructure Ontario's Green Loan Program
d. Housing Services quarterly Energy Services newsletter "Energy matters"
e. Sustainable Housing Asset Resource Exchange SHARE

For more information about the programs, housing providers can visit:
https://www.hscorp.ca/our-programs-and-services/energy-services/

The following section of this report highlights opportunities to monitor project implementation progress.

8. GHG Reduction Plan Monitoring and Evaluation

The GHG Reduction Plan includes multiple actions that vary from being implemented, in short, medium and long-term intervals. Focusing on the short-term actions help facilitate small wins

and maintain project buy in. As such, an annual review is recommended to ensure that tasks are accomplished within their specific time frames.

Milestone 5 of the PCP is “Monitoring”. It is important to monitor at the early stage of implementation to measure progress and emissions reduction metrics. The tasks and deliverables are outlined in the plan with key performance indicators to ensure proper monitoring. Action plan tasks also outline leads and project partners. The implementation strategy also furthers accountability through using both a committee of council and also the assigning and/or establishment of a human resource to ensure plan implementation. Specific monitoring and evaluation actions include:

- Monitoring and Updating the GHG Emissions Inventory:
  With a community GHG emissions inventory and corporate update now complete, the City now has a methodology to monitor whether actions are reducing emissions within the community (see Appendix 1). ICLEI recommends that GHG emissions inventories be completed every 5 years to assess if growth projections were correct and if emissions targets should be reassessed and/or updated.

- Action Item Review:
  Information about the measures that have been implemented should be documented for reporting and monitoring purposes. This can be helpful when it comes to reporting project progress as well as applying for future project funding. Measure metrics such as cost, time of implementation, sources involved and energy and GHG savings can be measured.

In addition to the overall monitoring requirements, each section of the GHG Reduction Plan includes performance indicators that can help with ensuring implementation. These measures are summarized by plan section below.

Buildings & Energy – Community
- Development of a community climate change and energy information webpage on the corporate website.
- Number of completed retrofits.
- Number of new homes built above the Ontario Building Code.
- Development of a Green Building Policy.
- Development of a home energy efficiency retrofits program.
- Megawatts (MW) of installed renewable energy.

Buildings & Energy – Corporate
- Energy consumption per square foot of buildings.
- Environmental Sustainability Committee meetings and actions.
- Number of retrofits completed per year.
- MW of renewable energy installed.

Transportation
- Transit ridership numbers.
- Active transportation infrastructure installed.
- EV charging infrastructure installed.
- Number of zero emission vehicles purchased.

Waste
- Waste emissions.
- Reduction programs created and implemented.
- Elimination of single use plastic at all municipal facilities.

Green Space
- Number of trees planted per year.
- Inventory of the community tree canopy.

Economic Development
- Number of businesses with an active commitment to sustainability.
- Number of new clean tech businesses in Sault Ste. Marie and people employed in clean-tech / low carbon economy jobs.

Municipal Leadership
- Assigning and/or establishing a human resource dedicated to energy and sustainability tasks.
- Number of climate investment opportunities and projects completed per year.
- Incorporation of GHG reduction action into existing staff job descriptions and policies.

The above recommendations are a preliminary outline of the actions required to progress on GHG mitigation actions in Sault Ste. Marie. An overseeing staff resource and/or committee should continue to work to establish annual priorities.

9. Conclusion

The GHG Reduction Plan includes a series of emissions reduction objectives and actions for both the community (residents and businesses) and the City. It is a progressive step, and encourages a commitment to become more sustainable on an environmental, social and economic level. It builds on the City's participation in previous energy efficiency projects and their efforts to lower GHG emissions. These include the City's plans for installing solar panels at the transit station, as well as completing energy efficiency projects such as the GFL Memorial Gardens LED Lighting retrofit which was completed in the autumn of 2020. Implementing the plan will help further and support objectives from strategic plans such as the 2019 Energy Conservation and Demand Management Plan. Communication and increased community education and awareness is an integral part of the strategy that is included across all seven sectors. Moving forward towards implementation not only has an impact on GHG emission targets, but also opens up opportunities for the City from a reputational standpoint, and their goal of encouraging people and business to relocate to Sault Ste. Marie, as people want to live and work in green municipalities. For example, Vancouver's 'Green Brand' is valued at $31 billion, outperforming San Francisco, Singapore, Sydney, Shanghai and Hong Kong on perceptions of sustainability" (Ryan, 2016).

The report provides an initial overview of the objectives and actions as well as the indicators required to monitor progress on community GHG reduction. In order to be successful, emissions reduction efforts must become part of the operational culture of the City. In addition, Council must understand that both human and financial capital will be required. It is also recommended that monies saved from energy conservation projects be set aside in a rotating sustainability fund dedicated to implementing the plan and other community environmental projects. The plan acknowledges that there are municipal constraints and recommends funding (both

governmental and private sector) that can further help with implementation. The breakdown of actions in ongoing, immediate, short, medium and long term helps with a more phased implementation approach. It must be noted however; that this plan should be viewed as a living document and will evolve over time as technologies, funding and regulation regarding climate change mitigation change.

As noted earlier in the context of the plan, governmental legislation such as the 2015 *Paris Climate Accords*, the *Pan- Canadian Framework on Clean Growth and Climate Change* and the 2018 *Made-in-Ontario Environment Plan* indicate that that climate change action cannot be ignored. The 2020 Federal Government Speech from the Throne's plan to legislate net zero emissions by 2050 also reiterates the importance of community GHG emissions reduction. The City must stay up to date on legislation as well as climate action funding programs as climate change will and already has impacted municipal operations, with a considerable cost. The municipality should continue to work towards mitigating climate change by lowering their operational emissions; however, it must also prepare for adapting to climate change. The City's *Climate Change Risk Assessment* (2020) is an excellent starting point for this and can be further utilized to prioritize adaptation strategies.

The GHG Reduction plan, and in particular the emissions inventory, lays the baseline for the City's commitment to emissions reduction. As the effects of climate change continue to become more and more regular (e.g. flooding, extended and more regular heat waves, droughts, etc.), cities must embrace both behavioral and technological change as a form of emissions reduction. The City must take a holistic approach to its efforts and embrace partnerships with community organizations to create a culture of sustainability that is expressed in its operations and business proceedings.

Appendix 1: GHG Emissions Inventory and Methodology Report

Click here to view the Sault Ste. Marie Community GHG Emissions Inventory Methodology Report.

Appendix 2: GHG Reduction Plan Stakeholder Engagement Summary

Click here to view the Sault Ste. Marie Community GHG Reduction Plan stakeholder engagement summary report.

Appendix 3: City Energy Efficiency Retrofits

The following series of appendices highlight outstanding, yet-to-be-confirmed and planned/potential energy efficiency retrofits at the City. The City's 2019 Energy Conservation and Demand Management (ECDM) Plan, outlines outstanding energy efficiency retrofits from the Asset Management Plan (2013) and the results of 10 facility energy audits conducted by IB Story from 2010.

Summary of Retrofits and Renewable Energy Projects and associated tCO2e savings

Plan	tCO2e
Asset Management Plan Outstanding Retrofit Measures	86.15
IB Story Audits	881.58
New Retrofits Identified by FutureSSM	14.57
Solar Panel Projects	5.18
Total	987.48*

Outstanding, and yet-to-be-confirmed retrofits represent a GHG savings potential of approximately 10% of corporate emissions.

The following appendices summarize outstanding energy efficiency measures in more detail.

Appendix 3.1. Retrofit Summary from IB Story 2010 Audits

The list of retrofit measures in this appendix was sourced from the City's 2019 Energy Conservation and Demand Management Plan and insights on whether retrofits were complete or incomplete were confirmed by facility managers through email or telephone correspondence with FutureSSM.

Outstanding projects (and those that have yet to be confirmed) from the 2010 IB Story audits have the potential to reduce corporate GHG emissions by approximately by **881.58 tCO_2e (or 8%)** and save $233,027 in energy costs. This is based on 2010 data and may change due to technological changes. Also some recommendations recommend fuel switching to natural gas for cost saving purposes. It is recommended that these be re-evaluated to evaluate alternatives with cleaner fuels and avoided costs (e.g. Federal Carbon Tax). It is important to note that this does not account for retrofits that have been completed. Prioritization of retrofit projects with highest payback, cost savings and GHG reduction, such as LED Lighting and Natural Gas reduction projects offer highest GHG reduction opportunities (Typically eligible for rebates from the IESO and Enbridge).

Summary

- 46 Incomplete
- 3 Partially Complete
- 17 Waiting on Confirmation

GHG Emissions: 881.51 tCO2e (8% of corporate emissions)

- Energy Savings: $233,027
- Estimated Cost: $2,253,274
- Average Total Payback: 10 years (estimate)

Retrofits - Not Complete

Fire Station No 1					
Measure No.		tCO2e	Energy Savings	Estimated Cost	Estimated Payback (yrs)
R2	Adjust Boiler Room Space Temperature Set Point	1	$100	NA	0
R4	Boiler Loop OAT Reset	2	$300	$1,000	3.3
R6	Vending Miser	0	$100	$200	2
R7	Improve Existing Boiler OAT Lockout Control	0	$40	$200	5
AG1	Replace Pneumatic Controls with Centralized DDC Control System	3	$600	$45,000	75
Total		6	$1,140	$46,400	

Fire Station No. 2					
Measure No.		tCO2e	Energy Savings	Estimated Cost	Estimated Payback (yrs)
R3	Vending Miser	0	$50	$200	4

AD1	Natural Gas Boiler for DHW and Supplementing Heat Pump	0	$1,000	$12,000	12
AD2	High-Efficiency Condensing Natural Gas Unit Heaters8	1	$200	$10,000	50
Total		2	$2,120	$26,600	

John Rhodes Community Centre					
Measure No.		tCO2e	Energy Savings	Estimated Cost	Estimated Payback (yrs)
R1	Optimize Floodwater Temperature	9	$1,900	$250	0.1
R1	Low-Flow Push Button Shower Faucets	71	$14,800	$37,500	2.5
R3	Dectron Unit For Aquatics Zone Dehumidification	216	$33,500	$140,000	4.2
R4	Low-e Ceiling for Each Arena	23	$10,200	$75,000	7.4
AD1	Floodwater Treatment System	11	$2,300	$35,000	15.2
AD2	Optimize Aquatics Zone Condition	36	$16,000	$2,500	0.2
AD3	VFD for Throttled Pool Pumps	17	$7,400	$35,000	4.7
AD6	Halogen Pot Lights to LED	7	$3,600	$7,500	2.1
AD7	Retrofit Arena MH Fixtures with High-Output T5 Fluorescent Fixtures	12	$6,100	$85,000	13.9
AD8	Retrofit Aquatics MH Fixtures with High-Output T5 Fluorescent Fixtures	7	$3,700	$38,000	10.3
AD9	Atmospheric to Condensing Boilers for Arena DHW and Floodwater	17	$3,600	$30,000	8.3
AG2	Turbidity Meter for Pool Filtration	0	$10,000	$50,000	5
AG4	Full Plant Heat Recovery	206	$43,000	$302,000	7
AG5	Building A/C via Refrigeration Plant	17	$7,400	$175,000	23.6
Total		668	$172,800	$1,060,750	

PWT Admin					
Measure No.		tCO2e	Energy Savings	Estimated Cost	Estimated Payback (yrs)
4	Controls: Occupancy Sensor Control for Lighting in Record Room	0	$ 30	$100	3.4
11	HVAC: Solar Domestic Hot Water System	2	$547	$18,000	32.9

12	HVAC: Solar Wall for Pre-heating Ventilation Air	2	$561	$22,000	39.2
13	HVAC: Install Dedicated Condensing Boiler for Perimeter Heating	9	$2,337	$45,000	19.3
14	Controls: Demand Control Ventilation	4	$1,168	$25,000	21.4
Total		55	$14,903	$487,200	

PWT Main					
Measure No.		tCO2e	Energy Savings	Estimated Cost	Estimated Payback (yrs)
3	Controls: Install Light Switches for HID Lighting Control	0	$2,312	$2,600	1.1
5	HVAC: Radiant Heaters Above Garage Doors	8	$1,954	$34,000	17.4
6	HVAC: Natural Gas Fired Make-up Air Unit	-2	$932	$ 8,000	19.3
10	HVAC: Solar Wall for Pre-heating Ventilation Air	61	$15,399	$240,000	15.6
11	Lighting: Skylights for Vehicle Bays with Daylight Harvesting	0	$1,709	$107,500	62.3
Total		67	$22,306	$402,100	

PWT Carpentry Shop					
Measure No.		tCO2e	Energy Savings	Estimated Cost	Estimated Payback (yrs)
1	Building Envelope: Replace / Install Exterior Door Seals	2	$ 383	$383	1.8
2	Building Envelope: Window Replacement	1	$337	$337	22.3
3	Controls: Programmable Thermostats	2	$411	$411	0.4
4	Controls: Occupancy Sensor Control for Lighting	0	-$122	$95	4.8
5	Lighting: T12 Fluorescent Fixtures to T8 with Electronic Ballasts	0	-$150	$188	6.9
6	HVAC: Electric Resistance Heating to Gas Fired Heating	0	$304	$316	19
Total		5	$859	$1,414	

PWT Test Lab					
Measure No.		tCO2e	Energy Savings	Estimated Cost	Estimated Payback (yrs)
1	Building Envelope: Replace / Install Exterior Door Seals	1	$320	$300	0.9

2	Building Envelope: Building Envelope Sealing	0	$104	$400	3.8
3	Controls: Programmable Thermostats	1	$380	$150	0.4
4	Lighting: T12 Fluorescent Fixtures to T8 with Electronic Ballasts	0	$94	$700	7.4
Total		2	$898	$1,550	

PWT North Storage Garage					
Measure No.		tCO2e	Energy Savings	Estimated Cost	Estimated Payback (yrs)
1	Building Envelope: Replace / Install Exterior Door Seals	38	$9,637	$6,000	0.6
3	Building Envelope: Insulation Upgrade	23	$5,772	$34,000	5.9
4	HVAC: Radiant Heaters Above Garage Doors	17	$4,435	$42,000	9.5
7	Lighting: Skylights for Vehicle Bays with Daylight Harvesting	0	$476	$45,000	94.5
Total		78	$20,320	$127,000	

Retrofits - Partially Complete

PWT Main					
Measure No.		tCO2e	Energy Savings	Estimated Cost	Estimated Payback (yrs)
1	Building Envelope: Replace / Install Exterior Door Seals	8	$1,921	$3,200	1.7
2	Building Envelope: Insulation Upgrade	15	$3,804	$75,000	19.7
Total		23	$5,725	$78,200	

PWT North Storage Garage					
Measure No.		tCO2e	Energy Savings	Estimated Cost	Estimated Payback (yrs)
2	Building Envelope: Overhead Door Replacement	56	$14,264	$120,000	8.4

Retrofits - Waiting for confirmation on status

Canteen Bellevue Park					
Measure No.		tCO2e	Energy Savings	Estimated Cost	Estimated Payback (yrs)
R1	Lighting Retrofit - T12 to T8	0.2	$70	$1,050	15
R2	Lighting Retrofit - Incandescent to CFL	0	$20	$25	1.3

R3	Lighting Retrofit - Exterior HPS and MH Lighting to LED	1	$460	$5,500	12
R4	Convert Domestic Hot Water Heating to Natural Gas	0	$170	$1,050	6.2
R5	Convert Canteen Heating to Natural Gas	0.1	$1,410	$4,500	3.2
R6	Convert Canteen Fryer to Natural Gas	-0.1	$120	$ 800	6.7
Total		1.2	$2,250	$12,925	

Greenhouse Bellevue Park					
Measure No.		tCO2e	Energy Savings	Estimated Cost	Estimated Payback (yrs)
R1	Lighting Retrofit - T12 to T8	0.1	$25	$130	5.2
R2	Lighting Retrofit - Incandescent to CFL	0.1	$60	$65	1.1
R3	Lighting Retrofit - Exterior HPS and MH Lighting to LED	0.4	$ 365	$2,090	5.7
R4	Convert Domestic Hot Water Heating to Natural Gas	3.2	$360	$1,400	3.9
R5	Overnight Temperature Setback in Greenhouse Potting Room	6.1	$600	$2,500	4.2
R6	Insulate Greenhouse Knee Wall	0.2	$110	$4,000	3.6
AD1	Lighting Retrofit - Propagating Greenhouse MH to Induction Grow Lighting	7.7	$110	$1,600	14.5
AD2	Greenhouse Night Curtain	21	$1,400	$17,800	12.7
AG1	Solar Thermal Space Heating	4	$3,940	$173,600	44.1
AG2	Geothermal Heat Pump	39.9	$3,000	$213,000	71
AG3	Greenhouse Glass Replacement	0.9	$170	$12,000	70.6
Total		83.6	$10,140	$428,185	

Appendix 3.2. Outstanding Retrofit Projects identified in the Asset Management Plan

List of retrofits sourced from the 2013 Asset Management Plan listed in the 2019 Energy Conservation and Demand Management Plan (note the Asset Management Plan has since been updated in 2020).

Estimates indicate approximate GHG savings of 86.15 tCO2e, which equates to approximately 1% of corporate emissions.

Outstanding Retrofits in Asset Management Plan						
Building	**Line #**	**ID**	**Location / Type**	**Description & History**	**Recommendation**	**Assumption and Calculations**
01 Main Library	9	B2010 Exterior Walls - Metal Siding		The top of the building is clad with horizontal metal siding including soffits. The finish of this siding has weathered, some panels have warped and many perimeter base pieces were missing.	Replacement at end of life is recommended. Remaining life extended due to condition and repairs timed to coincide with window replacement.	We have assumed an existing wall U-value of 0.405 based siding with foam insulation. New U- value of 0.203 with additional 2" of insulation. Saving is 0.75-1.0% of heating energy consumption
01 Main Library	10	B2010 Exterior Windows		The windows are prefinished aluminum with fixed sealed double-glazed panes. The date stamps of the sealed glazing units were varied including many stamped as 1965, 1979 and 1993. The frame finishes are faded, but there were no complaints about drafts or water penetration except from window (Invoicing room) near the	Windows have reached the end of their service life.	We have assumed an existing U-value of 0.55 based on aluminum windows and a new U-value of 0.48 for double panel low e and thermally broken windows. Saving is 1.5 - 3.0% of heating energy consumption.

				loading room. Spray foam was noted at the window exterior mullion indicating a patch repair in attempts to stop the water penetration. Many glazing panes had failed with severe fogging noted within the glazing panes of the back study room floor to ceiling windows.		
01 Main Library	29	0304008 Air Handling Units	Boiler Room	AC #1 uses chilled water to cool offices and rooms in the basement.	Replace AC#1 at the end of its service life. If AC#1 fails in service the areas of the building it serves will be without air conditioning	We assume the unit has on/off control only, and no VFD, and that a new unit would include a VFO. A correctly programmed VFO can reduce energy consumption by 10%.
01 Main Library	30	0304008 Air Handling Units	Boiler Room	The main library air handling unit conditions the air for all public areas of the building.	Maintain the unit by replacing fans and heating and cooling coils as required. If the air handling unit fails in service the majority of the library will be without air conditioning.	We assume the unit has on/off control only, and no VFD, and that a new unit would include a VFO. A correctly programmed VFO can reduce energy consumption by 10%

01 Main Library	31	310304008 Air Handling Units	Penthouse mechanical room	The return air fans for the main library air handling unit are two inline axial fans.	Replace the fans at the end of their service life. If the return air fans fail in service the heating and air conditioning system that serves the library will operate at greatly reduced capacity.	We assume the unit has on/off control only, and no VFO, and that a new unit would include a VFO. A correctly programmed VFO can reduce energy consumption by 10%
01 Main Library	34	D304008 Air Handling Units	Penthouse mechanical room	A Trane air handling unit supplies conditioned air to the lobby area. The unit is long past its expected service life	Replace the air handling unit at the end of its service life. If the air handling unit fails then heating and cooling to a large part of the library will be lost.	We assume the unit has on/off control only, and no VFD, and that a new unit would include a VFD. A correctly programmed VFD can reduce energy consumption by 10%.
01 Main Library	33	D303002 Direct Expansion Systems	Main floor mechanical room	A Carrier air conditioning unit cools part of the main floor. The unit rejects heat to a water cooled condenser. The unit is long past its expected service life.	Replace the air conditioning unit at the end of its service life. If the unit fails then cooling to that part of the building will be lost.	We assume the system operates at approximately 1.25kW/ton, and a new system with new rooftop cooling unit could operate at 0.9 KW/ton. This could result in up to 28% savings on electricity used for cooling with this unit.

01 Main Library	50/51	D502002 Lighting Equipment	Throughout	Lighting on the lower floor consists mainly of older fixtures using TS lamps.	Replace the fixtures at the end of their service life. Install motion detectors on the lighting systems on the lower floor.	Using LED T8s with occupancy sensors and assuming a schedule of 10 hours per week day and 6 hours on Saturday, a 52% savings on lighting electricity consumption is possible
08 PW Admin	28	D304008 Air Handling Units	Rooftop	There are two packaged Carrier rooftop units that supply forced air heating and cooling for the second level only. The units appear to each have a 4 ton cooling capacity and a 92,000Btu heating capacity.	Replace rooftop units at end of service life to maintain reliability.	We assume the system operates cooling at approximately 1.25kW/ton, and heating at 80% efficiency. A new unit could operate at 0.9 KW/ton cooling and 85% efficiency heating. This could result in up to 28% savings on electricity used for cooling with this unit, and a 5% savings in natural gas used for heating.

09 PW Garage A	8	B2010 Exterior Walls - Metal Siding	North and West Side	The exterior walls of the building are clad entirely with corrugated metal cladding with exposed mineral fibre insulation with vinyl vapor barrier at the interior, except the lowest 10 feet where there is a galvanized steel liner panel. At numerous locations on the east and south elevations, there is corrosion and mechanical damage throughout. At some locations, missing cladding has been replaced with plywood.	The appearance and condition of the metal cladding is such that we recommend complete replacement with insulated metal panels, consisting of two skins of metal with foam insulation in between. The consequence of not doing this would be continuously higher space heating costs, uncomfortable drafts, and ongoing water penetration.	We have assumed an existing wall U-value of 0.405 based two layers of metal panel with foam insulation in between. New U-value of 0.203 with additional 2" of insulation. Saving is 0.75-1.0% of heating energy consumption.
03 Seniors Drop In	15	B3010 Roof Coverings BUR	Upper	Built-up asphalt and gravel roof with prefinished metal flashings, and area drains. Some UV deterioration at upturns to mechanical units. No leakage reported.	Complete localized repairs at a cost below report threshold. Replace roofing at end of lifespan. Service life extended due to good condition.	We have assumed an existing U-value of 0.514 based on built-up asphalt and gravel roof with concrete deck. New U value of 0.25 with additional 2" of insulation. Saving is 0.5-1.0% of heating energy consumption.
12 Fire #1	25	D3030 Cooling Generating Systems	Low roof	A Carrier 50TJ-005---501QE rooftop unit heats and cools the dormitory with direct expansion	Replace at end of lifespan.	Converting to natural gas could save approximately

				cooling and electric heating. Cooling capacity appears to be approximately 5 tons.		60% off the cost to heat domestic water.
12 Fire #1	41	D502002 Lighting Equipment	Site & Exterior	There are five single- and double-head bollards at the parking lot and wall-packs above the bay doors. Staff reported lights are problematic.	Investigate the system for faults. Unless the investigation shows localized repairs will be sufficient, plan to replace to coincide with pavement replacement. This work requires excavation within the parking lot, and should be completed with pavement replacement to reduce costs. If not completed at this time, the system could fail completely within the next few years, causing safety hazards and costing substantially more to replace.	Electricity usage for lighting can be reduced by approximately 44% based on the following wattage reductions (existing to new LED): 75 to 31; 150 to 70
13 Fire #2	16	D302004 Fuel-fired Unit Heaters	Garage	The garage is heated by two Duomatic Olsen gas-fired heaters rated at 160 MBH maximum input.	Replace both heaters at end of lifespan	We assume the existing system heats with 80% efficiency and a new system would be 85% efficient. This would result in a 6% reduction in gas consumption for this unit.

14 Fire #3	16	D302004 Fuel-fired Unit Heaters	Garage	The garage is heated by two Duomatic Olsen gas-fired heaters rated at 160 MBH maximum input.	Replace both heaters at end of lifespan	We assume the existing system heats with 80% efficiency and a new system would be 85% efficient. This would result in a 6% reduction in gas consumption for this unit.
14 Fire #3	28	D502002 Lighting Equipment	Exterior	Exterior lighting includes high-power sodium discharge wall packs, sconces at doors, and one pole-mounted light at the parking lot.	Replace at end of lifespan. Timing is discretionary.	Electricity usage for exterior lighting can be reduced by approximately 60% based on the following wattage reductions (existing to new LED): 100 to 22; 150 to 70.
15 Fire #4	67	D3050 Terminal & Package Units		There is one Temprite make-up air unit with indirect gas-fired heater, Model GTDM25-CAW , rated at 243,750 max Btu/hr. The exposed rooftop gas lines show surface corrosion. Age estimated	Repaint gas piping as part of roof replacement above. Replace unit at end of lifespan. This unit supplies fresh air to the building, and is required for ventilation.	We assume the existing system heats with 80% efficiency and a new system would be 85% efficient. This would result in a 6% reduction in gas consumption for this unit.

18 Police HQ	10	82020 Exterior Windows	Original Building	The windows are prefinished aluminum with casement operating and fixed sealed double-glazed panes. Glass block glazed units were noted at the west and north elevation of the walkout basement and ground floor levels. There are many complaints about drafts or water penetration through the window frames. The casement operating portion of the windows are sealed closed. Water penetration was noted at various window perimeters. Most of the damages was at the stained adjacent ceiling tiles and sill interior finishes. Two glazing panels were shattered at the south west corner of the building near the roof access stairwell.	Windows have reached the end of their service life.	We have assumed an existing U-value of 0.55 based on aluminum windows and a new Uvalue of 0.48 for double panel low e and thermally broken windows. Saving is 1.0 - 1.5% of healing energy consumption.

21 John Rhodes	39	D304008 Air Handling Units	Roof, Pad 2	AC-8 is a Carrier rooftop unit that provides 26 tons of direct expansion cooling and has a maximum heating gas input of 360 MBH. AC-8 serves the Gym.	Replace AC-8 at the end of its service life.	We assume the system operates cooling at approximately 1 kW/ton, and heating at 80% efficiency. A new unit could operate at 0.8 KW/ton cooling and 85% efficiency heating. This could result in up to 20% savings on electricity used for cooling with this unit, and a 6% savings in natural gas used for heating.
21 John Rhodes	58	F104005 Ice Rinks	Compressor room	Chilled glycol for ice making is generated in three Frick ammonia chillers. Two chillers are equipped with 100 hp compressors and one is equipped with a 60 hp compressor. The equipment is controlled by a Cimco control panel.	Replace the chillers at the end of their service life. Ice making capability will be lost if the chillers fail.	We assume the existing units operate at approximately 1kW/ton, and new units could operate at 0.8 KW/ton cooling. This would allow a 20% reduction in electricity use for ice making equipment.

Appendix 3.3. New Retrofits Identified by FutureSSM

Since June 2019, FutureSSM has been working with City staff on identifying energy efficiency opportunities beyond the existing City plans and sourcing funding through either the IESO Save on Energy Program on the Enbridge Commercial Retrofit Program. Estimates indicate a total of 14.57 tCO2e (or 0.13%) saved from these projects. The following are a list of pending and in-progress projects not identified in the 2010 IB Story Audits or the 2019 Energy Conservation and Demand Management Plan.

City of Sault Ste. Marie Retrofit List with Save on Energy

Possible Projects

Line No.	Project Name	Estimated kWh Savings	Estimated GHG	Estimated Incentive	Install Year
1	John Rhodes Community Centre (JRCC) LED Lighting	273,054	4.72	$39,988	2021
2	John Rhodes Variable Frequency Drive (VFD)	TBD		$3,220	TBD
3	Bondar Road Signs				2021
4	JRCC Energy Performance	TBD			TBD
5	Bondar Waterfront - Pavilion Peak Lighting	37,467	1.11	$1,873	2021
6	Northern Community Centre - LED Lighting 44	TBD		$6,000.00	
7	Fire Hall 2 and 3 electric furnace replacement and AC	TBD			

Projects Submitted to IESO for Pre-Approval

Line No.	Project Name	Estimated kWh	Estimated Incentive	GHG Savings (tCO2e)	Install Year
1	Seniors Centre - 619 Bay St	20,569.84	$1,932.00	0.61	2020

Projects submitted to IESO for Post-Approval

Line No.	Project Name	Estimated kWh	Estimated Incentive	GHG Savings (tCO2e)	Install Year
1	Transit Garage	123,903.43	$14,711.00	3.66	2020
2	GFL Memorial Gardens	151,409.75	$12,240.00	4.47	2020

Appendix 4: City of Sault Ste. Marie Renewable Energy Projects[12]

In 2011, the City of Sault Ste. Marie retained AECOM to complete a structural assessment and feasibility study of installing solar voltaic panels on roof areas at the Transit Building and the Public Works and Transportation Building. Below is a summary of the estimated costs, generation capacity and annual revenue for both properties is below.

Table 11: Transit Building Solar System Installation

System Cost	$1,165,000
Annual Energy Generation	187,000 kWh
Annual Revenue	$133,000
Annual GHG Savings	3.23 tCO2e
Payback (not including interest costs)	12.4 years

This project is planned for 2023.

Table 12: Public Works and Transportation Building Solar System Installation

System Cost	$842,000
Annual Energy Generation	66,000 kWh
Annual Revenue	$47,000
Annual GHG Savings	1.95 tCO2e
Payback (not including interest costs)	17.9 years

This project is currently not planned.

[12] AECOM. (2011). *The Corporation of the City of Sault Ste. Marie Rooftop Solar Photovoltaic System at Transit Services and Public Works and Transportation – Feasibility Study.*

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