Greater Sudbury CEEP Implementation: Municipal Actions – Phase ONE (2021 to 2025)

PURPOSE

This report responds to the direction given by the City of Greater Sudbury through the following resolution:

> **CC2020-233**
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> THAT the City of Greater Sudbury approves the Greater Sudbury Community Energy and Emissions Plan (CEEP) and authorizes staff to proceed with the next steps in the implementation of the CEEP, as outlined in the report entitled “Final Community Energy & Emissions Plan (CEEP)”, from the General Manager of Growth and Infrastructure, presented at the City Council meeting on September 22, 2020.

Matters associated with Resolution CC2019-151 (Climate Emergency Declaration) are addressed at the end of this report.

INTRODUCTION

The United Nations has declared climate change the defining issue of our time. Media coverage of record-breaking heat waves, droughts, wild fires, floods, hurricanes and rainfalls appears almost daily. People are concerned and anxious as their homes, livelihoods and very existence are threatened and want to take action to help avert the mounting impacts of climate change. Actions most often target the reduction of greenhouse gases (GHGs), such as carbon dioxide, which are seen by most scientists as strongly associated with the human-induced warming of our planet. GHG emissions have risen steadily with the extensive burning of fossil fuels as nations industrialize. Scientists now warn that without a significant move away from fossil fuels to power our economies, GHG levels in the atmosphere may be reaching a tipping point beyond which further climate warming will be unstoppable despite any actions we take. The resulting effects of runaway climate warming would be unparalleled in human existence and would lead to the displacement of millions of people.

Governments at all levels are taking action to stem the tide of rising GHGs. Thousands of local governments worldwide are declaring climate emergencies to mobilize actions to help reduce GHG emissions. On May 28, 2019, the City of Greater Sudbury Council declared a Climate Emergency and requested that staff prepare a report that outlined the actions necessary to reduce municipal carbon emissions to net zero by 2050. This ambitious target provided the focus of the Greater Sudbury Community Energy & Emissions Plan (CEEP), which Council approved on September 22, 2020.

The CEEP lays out 18 goals to reach the Climate Emergency target by 2050. Meeting these goals requires taking action – by the City, by companies, by organizations, by everyone. Environmental, financial and community benefits will result from reducing energy use and enabling a transition away from energy derived from fossil fuels. The CEEP's financial modelling, for example, reveals that taking action to reduce energy and GHGs will result in net savings of $14.6 billion and create 40,000 person years of employment between 2020 and 2050.

This report focuses on the actions to be undertaken by the municipality between 2021 and 2025 that will bring Greater Sudbury closer to reaching the net-zero target by 2050. The municipal actions list presented herein is not intended to be complete, but rather one to which other actions will be added during the Phase ONE period. Regular updates will be presented through reports to City Council and the City's website.

CEEP IMPLEMENTATION ACTIONS - CONSIDERATIONS

Climate change is complex and setting a course for GHG reductions is equally complex and multi-layered. Required actions are of different types, serve different purposes and might rely on other preceding actions. For example, constructing a large facility or changing a major process usually relies on undertaking a feasibility study before moving forward; the feasibility study then is the action that must precede further actions. In addition to the timing of actions, the following considerations must be taken into account:

- Dealing with uncertainties associated with a 30-year implementation timeframe;
- Greater Sudbury is one of many municipalities world-wide faced with implementing plans to reduce GHG emissions;
- Strong ties to other municipal implementation mechanisms;
- GHG reduction opportunities related to COVID-19 recovery; and,
- All actions are important

<u>Dealing with Uncertainties</u>

The CEEP's model and implementation framework are based on assumptions, which may be perfectly valid today but not so in 10 years, let alone 30 years. The longer the timeframe, the greater the influence of uncertainty on factors determining future realities and forecasting systemic change is difficult to predict beyond 10 years with any accuracy due to developments in three key areas: technology, policy and society.

Given these inherent uncertainties, especially over a 30-year timeframe, the CEEP will be reviewed and updated on a 5-year basis. Its model will be applied every five years to ascertain

whether the CEEP objectives are being met and, if not, determine where areas of additional focus should lie.

Greater Sudbury is Not Alone in its Efforts to Reduce GHG Emissions

Climate change affects everyone and reducing GHG emissions is a shared responsibility. We are all in this together. Greater Sudbury is joining the ranks of thousands of municipalities around the world taking action to reduce energy and GHG emissions and stimulate a green economy. While each municipality faces its own unique set of challenges, CGS staff will follow Council's lead in continuing to strengthen relationships with other municipalities to discuss best practices, common barriers and solutions, future initiatives and potential collaborations. Local stakeholders will also maintain a shared experience in climate-related initiatives with peers in other jurisdictions.

Strong Ties to Other Municipal Implementation Mechanisms

The CEEP and its implementation are not the only mechanisms available for addressing GHG emission reduction. The City's Official Plan, Transit Plan, and Active Transportation Plan will continue to play an important role in Greater Sudbury becoming a net-zero GHG community by 2050. As such, the implementation of the CEEP is strongly tied to the implementation of these other plans as well.

GHG Reduction Opportunities Related to COVID-19 Recovery

Government responses to the COVID-19 pandemic have significantly changed patterns of energy demand around the world. In an article published on May 19, 2020, in the journal Nature Climate Change, scientists estimate that the daily global CO_2 emissions were reduced by 17% by early April 2020 compared with the mean 2019 levels, just under half from changes in surface transportation. As the world begins planning for a post-pandemic recovery, the United Nations is calling on governments to green their recovery plans and shape the 21st century economy in ways that are clean, green, healthy, safe and more resilient.

City staff estimate that with 22% of the Greater Sudbury municipal workforce working from home for at least some of the time between April 4 and July 18, 2020 (75 work days), GHG emissions were reduced by about 117 tonnes. Annually, this translates into a potential reduction of 407 tonnes from the over 2 million kilometers that would not need to be traveled to get to and from work. Of course, this is a rough estimate based on a number of assumptions, but it does demonstrate what could be achieved through relatively simple changes to the structure of work (i.e., work from home option for some employees). Scaling up a 'work from home' policy to an equivalent portion of the entire Greater Sudbury workforce (i.e., 22%) could result in a reduction of nearly 12,000 tonnes of GHG per year.

All Actions are Important

Certain actions involve the construction of an energy-efficient building, installing very energy-efficient lighting, or putting energy-efficient water pumps online. These actions have measurable

outcomes in terms of energy and GHG reductions. Other actions involve the creation of new policies and processes as well as education and outreach campaigns, whose impact on energy and GHG reductions are not directly measurable. Although not all actions can be directly linked to GHG reductions, every action plays a role in moving our community toward net-zero GHG emissions.

CEEP IMPLEMENTATION – MUNICIPAL ACTIONS

The actions to be undertaken by the City of Greater Sudbury within the first five years of the CEEP implementation period (i.e., 2021 to 2025) are outlined below beginning with three foundational actions followed by those actions categorized under 7 of the CEEP's 8 Strategy Sectors. (The Industrial Efficiency Strategy Sector as understood in the CEEP does not apply to municipal operations). Actions associated with each Strategy Sector are outlined in Appendix 1 in both tabular form and as Action Summaries.

Foundational Actions

Three actions are highlighted as being foundational to the success of the CEEP's implementation and are discussed first. These actions include:

- The development of a framework for collaborative implementation;
- The development of a system for tracking and reporting success in achieving GHG reduction goals; and,
- The development of a climate lens.

A Framework for Collaborative Implementation

As previously stated, attaining net-zero GHG emissions by 2050 will require everyone's participation. As such, implementation of the CEEP is dependent on close collaboration not only between municipal divisions but also with a variety of local stakeholders, including residents. Development of a framework for collaboration will be a key action to be completed within the first year of the Phase One implementation period and will be established and maintained through the active participation of local stakeholders. Quarterly meetings will be held to provide equal representation of all stakeholders the opportunity to network and share experiences, successes, challenges and influence the CEEP's implementation. Working groups will be established for addressing sector-specific interests, such as communications, industry and electric vehicles.

Tracking and Reporting Implementation Success

The development of robust and relevant means of tracking, assessing and reporting change in energy use and GHG emissions will be another key action to be accomplished within the first two years of the Phase One implementation period. These methods will be developed through the collaborative efforts of local stakeholders.

Successful implementation of the CEEP will depend on the ability to accurately track, assess and report on changes in energy use in various sectors through metering or fuel sales. GHG emissions in turn are estimated from the energy use based on modeling. All of the actions initiated to meet one of more goals of the CEEP are expected to lead to either energy reductions or GHG reductions, often both. While the status of all CEEP actions can be monitored and reported, not all actions will lead to direct and measurable energy reductions. Some actions will entail the development of policies, education campaigns, or incentive programs that may influence energy use but in themselves do not lead to directly measurable energy reductions. Active transportation infrastructure, for example, can lead to fewer trips by private vehicle but its use is highly dependent on weather, time of year, social acceptance and willingness to personally adopt new transportation routines. Other actions lead to energy reductions that not only can be measured directly but can also be reliably predicted through modeling. Street light conversion to LED technology, for example, leads to predictable outcomes in terms of reduced electricity use and concomitant reductions in GHG emissions.

Wherever possible, CEEP actions will be assessed by directly measuring their impact on energy use and resulting GHG emissions. Where direct energy measurement is not possible, the actions' influence on energy will be estimated based on modeling and related assumptions. Where energy measurement can neither be directly measured nor estimated, an action's influence on energy will be inferred through energy or other data related to the action. For example, the influence of active transportation infrastructure on energy use and GHG emissions will, in the end, only be reflected by annual liquid fuel sales in the City, which of course could also be influenced by other factors, such as wider adoption of electric vehicles.

Climate Lens

The decisions we all need to take, whether mundane or of strategic importance, should wherever possible be weighed and evaluated in relation to their influence on energy and GHG emissions. A few municipalities and other organizations have begun discussions on the notion of a climate lens through which options for particular decisions can be assessed in terms of climate influences. A climate lens would need to consider not only influences on GHG emissions, but also potential cost and energy reductions, as well as climate adaptation implications. For example, a decision may not have significant implications for GHG reductions if the energy used is electricity since Ontario's electricity supply mix has a relatively low GHG emissions profile. But the decision could lead to large reductions in electricity use that lead to significant cost savings. These savings, in turn, could be used to make changes in other areas of the municipal operations that result in significant GHG reductions. The development of a climate lens will be yet another key project to be undertaken early in the first phase of CEEP implementation.

Municipal Actions by Strategy Sector

Each of the CEEP's 8 Strategy Sectors are outlined below along with a mention of its relation to municipal actions. Additional information on the Sectors can be found in the CEEP.

Strategy Sector 1 – Complete, Compact Communities

Creating compact, well-designed neighbourhoods where work places, shops, and schools are easily accessible by walking, biking and transit help reduce the number of trips by private vehicle and the required infrastructure footprint to provide the necessary services. Smaller homes and ones that share at least one wall (e.g., semi-detached) or multiple walls (e.g., some condominium and apartment buildings) help reduce the energy requirements for heating and cooling per living unit and the associated GHG emissions.

Under CEEP implementation, residential development would focus on multi-family and mixed-use buildings. By 2050, the share of new single-family homes being built would decrease to 10% of total housing starts. In addition, new homes would be 25% smaller than existing homes on average.

Policies that enable the establishment of energy-efficient housing and land-use are very low cost, yet result in GHG reductions that persist for decades or longer.

Strategy Sector 2 – Efficient Buildings

As in most other municipalities, heating and cooling of existing buildings represents one of the two largest sources of GHG emissions in Greater Sudbury. Modifying existing buildings for greater energy efficiency can require expensive retrofits to the building envelope, windows, doors and heating systems. In contrast, new buildings can be more easily constructed from the start to meet stringent energy standards, such as Passive House, which result in buildings consuming up to 90% less heating and cooling energy than conventional buildings. Unless enabled through legislation, however, municipalities in Ontario cannot impose stricter new building standards than the Ontario Building Code although builders can build to a higher energy standard.

Community Efficiency Financing (CEF) provides an incentive for financing energy retrofits to existing homes. For example, a CEF financing mechanism can allow retrofit costs to be attached to the property and the principal and interest to be paid back through a supplement to the municipal tax. In this way, the expense is amortized over several years and allows energy benefits to be derived by the existing and future owner of the home.

Strategy Sector 3 – Water, Wastewater, and Solid Waste

Treating and distributing water and wastewater represents the highest use of electricity within municipal operations. Two major efforts can reduce the energy used in the system: reducing leaks in the distribution system and in end water use volumes and increasing the efficiency of the mechanical systems used in treatment and distribution. Programs aimed at controlling inflow and infiltration (I & I) and incentive programs to promote water conservation can help with the former. Pump replacements and pumping station upgrades are required for the latter. Wastewater anaerobic treatment plants have the potential to produce renewable natural gas. The Water/Wastewater Division continues to effect change to its many operations and processes to yield greater energy efficiencies.

Waste represents an important source of GHGs not only through the vehicles and equipment required to collect and treat waste, but mostly through fugitive or escaping gases like methane produced from decomposing organic matter. As a greenhouse gas, methane is 28 to 36 times more potent than carbon dioxide at trapping heat in the atmosphere. To partially address this problem, a landfill gas capture system and electricity generating plant were constructed at the Sudbury Landfill Site in 2006 and 2007. The plant currently generates 1.35 MW of electricity, enough to power about 1000 homes. The Environmental Services Division also continues to develop programs to help residents and businesses reduce and separate waste at source, which further contributes to lowering GHG emissions over the long-term.

Strategy Sector 4 – Low-carbon Transportation

The CEEP identifies vehicles powered by gasoline or diesel as being one of the two largest local sources of GHG emissions. Reducing these emissions will require a multi-pronged approach involving greater participation in active transportation and transit use and the eventual switch to electric private vehicles and buses. Post-COVID-19 recovery strategies that involve greater work-from-home participation could also result in GHG reductions from avoided commutes to and from the work place.

With the launch of its new GOVA service in August 2019, the City now offers improved routes and schedules to encourage greater transit ridership. Transit Services Division will continue to make modifications to routes and schedules as necessary and to offer new incentives and programs to further expand ridership.

In addition, the City will continue to improve its active transportation network and improve the efficiency of its vehicle fleet.

Strategy Sector 5 – Industrial Efficiency

Local industry will continue to play an important role in the reduction of GHG emissions. Vale's Clean AER project, for example, is estimated to have reduced GHGs from the smelter by 40%. Although the City has no municipal actions relating to this Strategy Sector, industrial stakeholders are expected to benefit from the networking opportunities offered through the CEEP's collaborative implementation model coordinated by Local the City.

Strategy Sector 6 –Clean Energy Generation

Energy generation that becomes less and less reliant on fossil fuel will be key to becoming a community that is net-zero GHG emissions by 2050. Well-known examples such as solar and wind farms are dependent on favourable financing programs, such as the provincial FIT (Feed-In Tariff) programs. Such incentives allowed widespread construction of renewal energy generation projects, such as the 10 MW solar farm in Capreol. The final FIT application period for large projects was held in 2016 and Ontario's IESO (Independent Electricity System Operator) ceased accepting applications under the FIT program.

Expansion of Greater Sudbury's central district energy systems will make heating energy delivery more efficient. Infill development will provide greater building density, making the systems more effective. Although these systems currently operate on natural gas, the facilities could retrofit to use one or a combination of renewable energy sources like geothermal exchange heat pumps or renewable natural gas. Generating electricity from landfill gas capture systems at other municipal landfill sites may be another source of renewable energy.

Strategy Sector 7 – Low-carbon Energy Procurement

Procuring renewable electricity and renewable natural gas is intended to make up any short-falls in GHG reductions later in the time line to 2050. Neither of these sources is currently plentiful and make up a relatively small proportion of the electricity and natural gas mix. The future is expected to yield far greater quantities of these types of energy and the City will maintain its vigilance and assess procurement opportunities as these arise.

Strategy Sector 8 – Carbon Sequestration

Greater Sudbury's award-winning Regreening Program has been applying crushed limestone and planting tree and shrub seedlings since 1978. Over this period, the Regreening Program has planted nearly 10 million seedlings; a few million more have been planted through the combined efforts of Vale and Glencore, other companies and by community groups. According to a recent research paper, these efforts have resulted in an estimated 1 million tonnes of carbon sequestered to date.

Soil creation from the leaf and yard waste collected by the City allows continued rehabilitation of mine tailings, which further contributes to carbon storage through revegetation.

CLIMATE EMERGENCY DECLARATION – CC2019-151

On May 28, 2019 City Council re-emphasized the importance of the Climate Change priority it had set in its Strategic Plan by passing Resolution CC2019-151, as follows:

> "WHEREAS the UN Intergovernmental Panel on Climate Change 'Global Warming of 1.5 °C' report states that we have less than 12 years to avert the worst impacts of climate change and identifies cities and urban areas as one of four critical global systems that can accelerate and upscale climate action;
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> AND WHEREAS cities around Canada and the world are taking the lead on acting on climate change;
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> AND WHEREAS Greater Sudbury is a member of the Federation of Canadian Municipalities' Partners for Climate Protection program, and a member of the Federation of Canadian Municipalities which adopted a resolution in 2016 recognizing the need to pursue efforts to limit global temperature increases to 1.5°C;

AND WHEREAS Greater Sudbury will be completing its Community Energy and Emissions Plan and undertaking its Climate Change Adaptation Plan in 2019;

AND WHEREAS Sudbury has received international recognition for achievements in regreening and municipal energy retrofits, and is making important progress in areas such as sustainable transportation that will assist in meeting carbon reduction goals;

AND WHEREAS there are significant economic opportunities if Greater Sudbury were to become a leader on climate change mitigation, adaptation and technology in Northern Ontario;

AND WHEREAS Greater Sudbury is already experiencing large and rising costs and risks from climate change impacts such as extreme weather events, flooding and forest fires;

AND WHEREAS as of February 22, 2019, 288 Municipal and City Councils in Canada have declared a climate emergency;

AND WHEREAS climate change solutions not only reduce carbon output, but they also offer multiple benefits including improved heath and air quality, greater community resilience, economic development and reduced costs;

THEREFORE BE IT RESOLVED that the City of Greater Sudbury officially declare a climate emergency to name and deepen our commitment to protecting our economy, our eco systems, and our community from climate change;

BE IT FURTHER RESOLVED THAT the City of Greater Sudbury reaffirms action on climate change as a strategic priority;

BE IT FURTHER RESOLVED THAT the City of Greater Sudbury direct staff to bring a report to City Council for its consideration before the end of 2019 that describes an approach for creating a Climate Change Adaptation & Mitigation Plan that includes adaptation or mitigation measures including, but not limited to:

a) The reduction of municipal carbon emissions including the identification of specific targets and, ultimately, net zero carbon emissions by 2050;
b) Policy choices that increase the proportion of residents that can choose active transportation modes or public transit for their daily needs;
c) Operating standards for municipal facilities and technical specifications for municipal construction contracts that reduce carbon pollution;
d) The development of measurement and reporting systems for energy utilization and carbon reduction to inform policy and budgeting choices;
e) Collaboration with other governments, institutions and industry associations to improve standards and protocols that can positively address climate adaptation and mitigation;
f) The potential to create an advisory committee that provides guidance and support for the City’s efforts to respond to the climate emergency;
g) A Business Case for consideration as part of the 2020 Budget that secures the resources required to develop the Plan.”

The Greater Sudbury CEEP, which was approved by the City on September 22, 2020, satisfies this resolution's request for a Climate Change Mitigation Plan. A Climate Change Adaptation Plan will be in development in 2021. Item a) has been addressed through the development of the CEEP, which outlines 18 goals under 8 strategy sectors. The City's Active Transportation Plan, Transit Plan and Official Plan identify the policy choices requested by Item b). Item c) will be addressed through the municipal actions to be undertaken during the Phase ONE implementation period. Item d) will be addressed through of the development of a tracking and reporting system as one of the foundational CEEP implementation actions. Items e) and f) will be addressed through the development and application of a framework for collaborative implementation as one of the foundational CEEP actions. Item g) has been addressed as the CEEP has been completed.

SUMMARY

Greater Sudbury's CEEP outlines 18 goals that need to be met to attain City Council's target of becoming a net-zero GHG emission community by 2050. As its contribution to the first phase of the implementation of the CEEP (i.e., 2021 to 2025), the City proposes undertaking up to 45 actions across various divisions, some pending funding approval.