



Policy

POL.COR.23.05 Municipal Net Zero Emissions Buildings

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Department:	Operations
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By-Law No.:	Not Applicable

Policy Statement

The Blue Mountains recognizes the importance of reaching climate mitigation goals and adopting policy that will intentionally work towards meeting the Town's corporate greenhouse gas (GHG) reduction targets and the County's community greenhouse gas targets. This policy aims to reduce and avoid operational carbon emissions resulting from energy consumption by municipal buildings.

The Town's goal, as outlined in the Declaration of a Climate Change Emergency on October 21, 2019, is to enhance and accelerate action on the Town's commitment to protect the community, economy, and ecosystems from the impacts of climate change.

Town policies can be considered in the context of three greenhouse gas (GHG) reduction targets: the Town's corporate targets; Grey County's community-scope targets (influencing the Town and other member municipalities); and the national greenhouse gas reduction targets. These are outlined below:

- Town corporate target: reduce GHG emissions by 40% below 2005 levels by 2025 and achieve carbon neutrality by 2050. These targets were first established by the Town's Sustainable Path sustainability plan (2010), more recently in the Town's most recent Energy Conservation and Demand Management Plan (ECDMP) (see [CSOPS.20.004](#)) and [CSOPS.22.001 Municipal Response to the Climate Emergency Declaration](#).
- Grey County community-wide target: relative to a 2018 baseline, Grey County's communities will seek to reduce GHG emissions by 15% in 2026, 30% in 2030, 50% in 2035, 60% in 2040, 75% in 2045 and to achieve net zero emissions by 2050 (Grey County, 2022)
- National target: reduce Canada-wide GHG emissions by 40-45% below 2005 levels by 2030, and achieve net zero emissions by 2050.

Purpose

The purpose of this policy is to establish a transition to a low carbon community, with the Town leading by example and requiring that new municipal buildings are designed, constructed and operated to enable the Town to achieve its net-zero by 2050 GHG reduction target.

Investment in the energy performance of Town buildings will support resiliency and mitigate the anticipated effects of climate change. Notable expected outcomes include:

- Reduced annual Town facility emissions;
- Lower utility bills and capital costs;
- Fossil fuel switching and divestment;
- Improvements in local air quality;
- Avoidance of potential climate change-related risks;
- Building quality, comfort, health and resilience; and
- Local job creation.

Pathways to Carbon Neutrality by 2050

The following pathways are a full suite of methods that will be necessary in The Blue Mountains' overall journey to achieve the net zero emissions reduction target (carbon neutrality) for corporate operations by 2050. This policy currently focuses on the first two pathways, which primarily address operational carbon: Net Zero Energy Emissions for New Buildings, and Fuel Switching and Efficiency Retrofits. The remaining pathways are either common practice (see Pathways 5 and 6), may be undertaken for future projects as feasible, and/or may be addressed in future updates to this policy.

1. Net Zero Energy Emissions for New Buildings

This obligation aims to design and construct major renovations and new corporate builds as net zero emissions buildings by significantly improving energy efficiency, reducing energy demand, and selecting and managing refrigerants to reduce operational carbon as much as possible such that renewable energy solutions will be enough to cover remaining energy demand. Building designs may adhere to an established design criteria or 3rd party certification system such as Passive House Canada or Canada Green Building Council's Zero Carbon Building Performance standard. These certification systems aim to improve buildings thermal energy demand intensity, total energy use intensity and airtightness over current building code. Reducing energy use intensity also allows for the building to be powered by on-building/on-site renewables.

2. Fuel Switching and Efficiency Retrofits

The Town can most significantly reduce utility consumption and greenhouse gas emissions through fuel switching. Fuel switching focuses on replacing combustion heating and hot water systems to high-efficiency heat pump and solar technologies. In addition, efficiency retrofits may be considered, which include energy conservation measures that can be made to improve the overall performance and reduce utility consumption and costs.

The move away from carbon-intensive equipment is a cost-avoidance action that reduces both operating expenditures and emissions. In the next 20 to 30 years, it is anticipated that the carbon tax will make fossil fuels, such as natural gas, more expensive than electricity on a per unit of energy basis. In addition, upgrading equipment, improving the thermal performance of building walls and roofs, and high efficiency heat pumps will help the Town avoid increased utility consumption costs. The move away from carbon-intensive fuel sources and equipment also supports cost avoidance through operational efficiencies, including the application of carbon budgets to buildings, remote monitoring and management of building systems, and staff training on efficient energy management.

Fuel switching and efficiency retrofits can be the highest cost initiatives contemplated in the Energy Conservation and Demand Management Plan (ECDMP). However, they also account for a high percent of the total reduction envisioned by the ECDMP. The 2019 Update to the Town's Energy Conservation and Demand Management Plan can be found [here](#).

3. Strategic Divestment

The ECDMP recommends that the Town divest from carbon-intensive assets and focus on the creation of low-carbon buildings, either by constructing new buildings or, for existing buildings, undertake fuel switching in combination with efficiency retrofits. Strategic divestment involves the creation of a process to guide decisions towards lower-carbon options.

Strategic divestment can include methods and tools to reduce the embodied carbon of building materials in new construction and renovation projects. This may result in selecting materials and/or construction practices to reduce embodied carbon, and/or the use of reclaimed materials from building deconstruction.

4. On-site Renewables and Storage

On-site renewable energy generation and storage remains rare at Town facilities. Net zero energy emissions buildings may incorporate on-site renewable energy generation to address remaining emissions after reductions are seen through highly efficient building envelope design and efficient building systems. Inclusion of on-site renewables

and storage coordinates with strategic divestment. On-site renewables and energy storage are also important to consider as part of resilience planning for power outages and continued service delivery.

5. Training and Education

Achieving emissions reductions also requires investment in training for staff that are involved in building maintenance activities so that they can effectively operate the new technology, software and systems associated with fuel switching and efficiency retrofits. The Town's Manager of Fleet and Facilities can support these efforts and ensure a Town wide approach to maintaining efficient building operations.

6. Enhanced Use of Building Performance Data

Building performance data will allow the Town to track and analyze utility consumption and then use those data to calculate carbon emissions reductions. Monitoring will also ensure buildings are operated and are performing as intended.

7. Carbon Offsets

This is the last pathway to address the GHG emissions of Town buildings. It is anticipated that the other six pathways will greatly reduce the Town's GHG emissions; however, buildings will still be using grid electricity that could be consuming fossil fuels, and building construction and renovations will involve the use of materials that add embodied carbon to the overall carbon emissions of the project. To offset remaining emissions where further direct and indirect reductions do not appear to be possible, the Town may consider investing in certified carbon offsets to meet the Town's net zero by 2050 emissions target.

Application

This policy applies to Town of The Blue Mountains buildings, employees, members of Council and Boards.

Definitions

Buildings: for the purpose of this policy and the intent of emissions calculations, a building is any vertical structure that has or will have an indoor controlled climate. This will include pump houses, but not stand-a-lone chambers. Emissions calculations will be related only to the energy associated with the vertical structure and the related equipment operating within the building. If the building is associated with a larger system (e.g. water or sewage distribution) the emissions calculations of that building do not need to include energy associated with operating a system outside of that building. However, emission reduction efforts for that building could include waste heat and power associated with the system. A building's backup power system is also included in this definition of 'building'.

Embodied Carbon: GHG emissions derived from the manufacturing, transport, installation, use, and end-of-life of building materials. A building's embodied carbon can be reduced using lower-carbon building materials and components, with the remainder needing to be offset.

Greenhouse Gas: gases that trap heat in the atmosphere, including carbon dioxide, methane, nitrous oxide, and many more. Greenhouse gases (GHGs) are released into the atmosphere primarily due to fossil fuel combustion, chemicals manufacturing and use (such as refrigerants), and various biogenic processes. GHGs are often measured and compared in equivalent units of carbon dioxide (CO₂e), which is why GHGs are sometimes referred to simply as "carbon".

Net Zero Energy Emissions: a building constructed and/or renovated to be highly energy efficient, with remaining energy demand satisfied by onsite renewable energy. It involves disconnecting from fuel sources with high GHG emissions, employing passive and active energy saving strategies, and installing renewable energy systems that generate renewable energy equal to the quantity of energy used on an annual basis. Net Zero Energy Emissions buildings aim to accomplish all this while also satisfying equivalent or growing service levels. Design standards recognize that there are many strategies for reducing carbon emissions at the design and operating stages. Certification systems provide flexibility for buildings of all sizes and uses. A Town project may also employ net zero energy emissions calculations outside of a 3rd party certification system, as may be approved by the Manager of Fleet and Facilities. This policy focuses on reducing and avoiding operational carbon and does not yet require reductions in embodied carbon of new buildings.

Net Zero Energy Emissions Ready: a building constructed and/or renovated to be as energy efficient and low-carbon as possible, such that future investments in onsite renewable energy will be enough to achieve Net Zero Energy Emissions. Net Zero Energy Emissions Ready buildings are also prepared to become Net Zero Energy Emissions if the provincial grid divests entirely of carbon-emitting electricity generation.

Operational Carbon: GHG emissions associated with energy use and the fugitive emissions (leakage) of refrigerants during regular building operations.

Renovation: work on a building that results in the removal or dismantling of some existing building materials and/or components, such as (but not limited to): updating or replacing the building envelope, roof or other structural components; updating flooring, walls, light fixtures, building systems or interior design elements; and/or expanding the building footprint with an addition. For the purpose of this policy and to align with the Municipal Building Construction Waste and Deconstruction Policy, a 'major' renovation is defined as one affecting more than 25% of a building's existing footprint.

Social Cost of Carbon: an estimate of the marginal costs caused by one additional unit of GHG emissions. The Federal government has established a carbon tax following a schedule of gradually increasing carbon prices beginning in 2020 at \$30/tonne and culminating in a price of \$170/tonne of CO₂e in 2030. The schedule of carbon tax increases is an attempt to gradually influence

decision-making to incorporate the Social Cost of Carbon. By incorporating the Social Cost of Carbon/carbon tax into the Town's building- and energy-related decision making, options that will cost more in the future – both monetarily due to paying the carbon tax, and socially due to the impacts of climate change – will be compared more fairly with options that may cost more up front but emit fewer GHGs.

Procedures

Interim 2040 Target for Net Zero Energy Emissions Buildings

While the Town's long-term GHG reduction target for all corporate operations is net zero emissions by 2050, this policy sets an interim long-term target to achieve Net Zero Energy Emissions Ready for the Town's portfolio of buildings by 2040. This interim target attempts to recognize the long-lived nature of most buildings, and how investments in building systems and designs made today will still be operational decades later. It is important for the Town to lock-in GHG reductions sooner and avoid investing in soon-to-be stranded fossil-fuel assets well before 2050.

Net Zero Energy Emissions New Buildings

All new municipal buildings must be budgeted, designed, constructed, and operated as Net Zero Energy Emissions or Net Zero Energy Emissions Ready buildings beginning in 2024. In addition, all new municipal buildings are prohibited from installing fossil fuel-based space and water heaters (including natural gas, propane, or oil-fired units) beginning in 2024.

New and existing municipal buildings may still need to install fossil fuel-fired backup power units to ensure key services, such as water and wastewater, are able to continue in the event of a power outage. The viability of battery backup to replace existing fossil-fuel generators will be evaluated on a case-by-case basis. New building projects initiated prior to 2024 will not be required to interrupt the project or revise already-established building design requirements.

The designs of new municipal buildings are encouraged to refer to the principles of Passive House or Zero Carbon Building Design standards to satisfy this procedure; however, adhering to a standard or certification system is not a requirement.

Retrofits and Equipment Replacement

While any equipment replacement or retrofit should strive for emission reductions, all major renovations of existing municipal buildings (over 25% of existing building footprint) or major building equipment replacement (over \$25,000) must include design modifications and implement measures that achieve improved carbon emissions over the equipment being replaced or building envelope being renovated beginning in 2024.

As part of the tendering process for applicable retrofits and equipment replacements, the Manager of Facilities and Fleet should be consulted to explore lower carbon options.

Performance-Based Contracts

New buildings and major retrofit projects (over 25% of existing building footprint) or equipment replacements (over \$25,000) may require performance-based contracts to ensure the Town realizes energy cost savings and/or GHG emissions reductions as promised by successful contractors. The Manager of Facilities and Fleet should be consulted by the project manager to consider if a performance-based contract would be appropriate for new buildings and major retrofits.

Plans for Deep Retrofits and Fuel Switching

Future Energy Conservation and Demand Management Plans (ECDMPs), beginning with the 2024 update, must include long-term plans to transition all existing buildings towards Net Zero Energy Emissions by 2040 with deep retrofits and fuel switching, as applicable.

These plans should include the phasing out and replacement of fossil fuel fired space and water heating equipment with electrical or renewable alternatives, alongside other energy demand and efficiency initiatives. Transition plans can consider anticipated equipment replacement schedules as opportunities to pursue adjacent efficiency and/or decarbonizing retrofits, potentially ahead of schedule and/or at reduced costs due to bundling.

Building performance data shall be monitored and analyzed by the Manager of Facilities and Fleet, and this information will inform ECDMP updates to ensure retrofit and fuel switching initiatives are functioning correctly and having the expected benefits on energy costs and GHG emissions.

Social Cost of Carbon

All future ECDMPs, beginning with the 2024 update, shall consider a social cost of carbon as established by the federal carbon pollution pricing system. The social cost of carbon will be an integral part of evaluating the best upgrade, retrofit and fuel-switching options for municipal buildings by including future carbon pricing in cost comparisons of various project options.

The carbon pollution price will increase on a schedule from 2020 to 2030 in increments of \$15/tonne beginning in 2022 (\$50/tonne). Table 1 includes marginal carbon price increases and fuel charge rates as provided by Department of Finance Canada. Fuel charge rates take current (as of 2021) average renewable content into account and could change slightly in the future.

Table 1: Schedule of Carbon Pollution and Fuel Cost Increases, 2023 - 2030

Year	2023	2024	2025	2026	2027	2028	2029	2030
Carbon Tax (\$/tonne)	65	80	95	110	125	140	155	170
Natural gas (\$/m3)	0.1239	0.1525	0.1811	0.2097	0.2383	0.2669	0.2954	0.3240
Propane (\$/litre)	0.1006	0.1238	0.1470	0.1703	0.1935	0.2167	0.2399	0.2631

Projects with operating costs anticipated to last beyond the 2040 interim target shall use the \$170/tonne carbon cost as an estimate for the entire project. Incorporating the highest carbon cost is an attempt to incorporate the social cost of carbon for upgrades initiated prior to 2030, but which are expected to operate or exist well beyond 2030, as these will have long-lasting impacts on the Town’s building-related GHG emissions.

Exclusions

None

References and Related Policies

The Blue Mountains:

- Partners for Climate Protection Declaration (2006)
- The Sustainable Path – Corporate GHG Targets (2010)
- Climate Emergency Declaration (2019)
- Energy Conservation and Demand Management Plan (2019)
- Integrated Community Sustainability Plan “TBM Future Story” (2022)

Grey County:

- Climate Change Action Plan “Going Green in Grey” (2022)

Consequences of Non-Compliance

Proposed municipal projects that do not comply with this policy will not receive budget approval.

Review Cycle

This policy will be reviewed every two years by the Senior Management Team. Any proposed changes will be reported to Council in open session.