Staff Report 2022-0041

Meeting Date:	February 15, 2022
Subject:	Proposed Corporate Green Building Standard
Submitted By:	Craig Stephens, Specialist, Energy and Environment, Corporate Strategy and Innovation

RECOMMENDATIONS

That the proposed Corporate Green Building Standard attached as Schedule A to Staff Report 2022-0041, be adopted;

That any new Town buildings or renovations entering the design phase shall comply with Level 1 of the updated Corporate Green Building Standard; and

That the Town's Proposed Corporate Green Building Standard as outlined in Staff Report 2022-0041, be circulated to the Region of Peel for information purposes.

REPORT HIGHLIGHTS

- The current Corporate Green Building Standard (CGBS) has been in place since 2012 and is based on a LEED (Leadership in Energy and Environment Design) Silver framework.
- The existing CGBS was evaluated against several third-party building certification programs and approaches to align with the goals of the Resilient Caledon Plan. It was determined that a "made in Caledon" outcomes-based standard was the preferred approach.
- The proposed CGBS update is performance based and prioritizes GHG emissions reduction and energy performance. There are 18 mandatory and five non-mandatory prescriptive measures for new buildings and renovations to ensure that the Town's broader sustainability objectives are integrated into new Town buildings and site design.
- The proposed Standard sets requirements for three increasing levels of performance, with levels advancing approximately every four years, with the goal to align with 'net-zero ready' buildings by 2030, as recommended in the Resilient Caledon Plan.
- Level 1 of the proposed Standard has an estimated capital cost premium ranging from 0% to 5%, Level 2, 1% to 6%, and Level 3, 3% to 14%, dependent on building type.

DISCUSSION

In April 2021, Council endorsed the Town's Resilient Caledon Climate Action Plan (Resilient Caledon Plan), that outlines actions for the Town to achieve net-zero emissions by 2050, including that new buildings be constructed to net-zero by 2030. This followed a 2019 Council endorsement for a Corporate GHG reduction strategy, which highlights that buildings are responsible for the majority (54%) of corporate emissions (2017), and outlines actions to achieve a corporate emissions reduction of 24% by 2024 (below 2017 levels). This proposed update to the CGBS is the result of these commitments.

Existing Corporate Green Building Standard

The Town adopted its existing CGBS in 2012, based on the Leadership in Energy and Environmental Design (LEED) Silver standard. The existing Standard, has several challenges including:

- Accessing the necessary credits to meet Silver certification. For example, due to the rural nature of Caledon, the Town is ineligible for multiple credits, such as transit availability or infill development;
- Projects must include a LEED consultant as a third-party verifier and have the project certified at the end of construction, which can add additional levels of complexity and cost;
- A transition towards a standard that has more flexibility in the pathways of achieving a building that is energy efficient and lower emissions, can allow for more innovation in building design.

Development of the Proposed CGBS Update

An outline of the phases of work undertaken to update the CGBS include:

- **Phase 1 Current Conditions & Visioning Workshop:** This phase consisted of reviewing the Town's existing Standard and hosting a staff workshop to understand the challenges and benefits associated with the existing CGBS and staff priorities for the update.
- **Phase 2 Best Practice Research Scan:** This phase entailed a best practice research scan of various prescriptive and performance-based building standards. Staff from across various departments reviewed the best practice research scan and committed to moving forward with a new custom "made in Caledon" CGBS, based on building performance targets with prescriptive measures.
- **Phase 3 Performance & Financial Analysis**: This phase consisted of modelling six building archetypes for common buildings types within the Town. The energy and emissions performance of the archetypes was modelled against five performance levels ranging from the Ontario Building Code to net-zero ready. The premium capital cost of construction and lifecycle cost analysis were also developed during this phase. Lastly, 18 mandatory and five non-mandatory prescriptive measures with cost guidance were also developed to ensure the broader sustainability goals of the Town are met.
- **Phase 4 Presentation of Results:** This phase consisted of meetings with key stakeholders in order to review the direction of the proposed performance targets and prescriptive measures and receive feedback on how the Standard could be improved. Staff also consulted with a General Contractor for an ongoing Town project for further feedback on the Standard.
- **Phase 5 Updated CGBS:** This phase included drafting and finalizing the new CGBS.

The Proposed Corporate Green Building Standard Update

The proposed CGBS, (attached as Schedule A), presents a strategy to ensure new builds, renovations and expansions of Town buildings are constructed to achieve energy performance and GHG emissions targets. The target-based approach will enable the Town to meet its GHG reduction goals in future years and provide flexibility in how targets are achieved. In addition, the

Standard includes a series of prescriptive measures to improve the overall sustainability and resilience of Town buildings for potential future weather events.

The proposed Standard is applicable to all new Town buildings and expansions that are equal to or greater than 500m^2 with a total design and construction budget over $1,000,000 or $250,000 for building renovations. For any new build or renovation project that is excluded from the Standard, the project team shall meet with the Energy & Environment Division to determine if any broader GHG reduction considerations can be embedded into the project's scope.

Proposed Performance Targets

Three building performance targets were established for six common Town building types (Work Yard, Fire Hall, Community Centre, Administration Centre, Ice Rink and Swimming Pool). The three performance targets used in this proposed standard include:

1. **Greenhouse Gas Intensity (GHGI)**: This represents the annual amount of GHG's emitted from a building's operations, divided by the total floor area.
2. **Energy Use Intensity (EUI):** This is the annual amount of all energy consumed by a building's operations, divided by the total floor area.
3. **Thermal Energy Demand Intensity (TEDI)**: This is the annual amount of energy consumed by the building's space heating systems, for the building's operations, divided by the total floor area.

The targets correspond with three increasing levels of performance, advancing every four years, to align with net-zero ready level by 2030. Figures 1 and 2 shown below, demonstrate how a Work Yard building increases performance through Levels 1 to 3 and compares the performance to current Ontario Building Code.

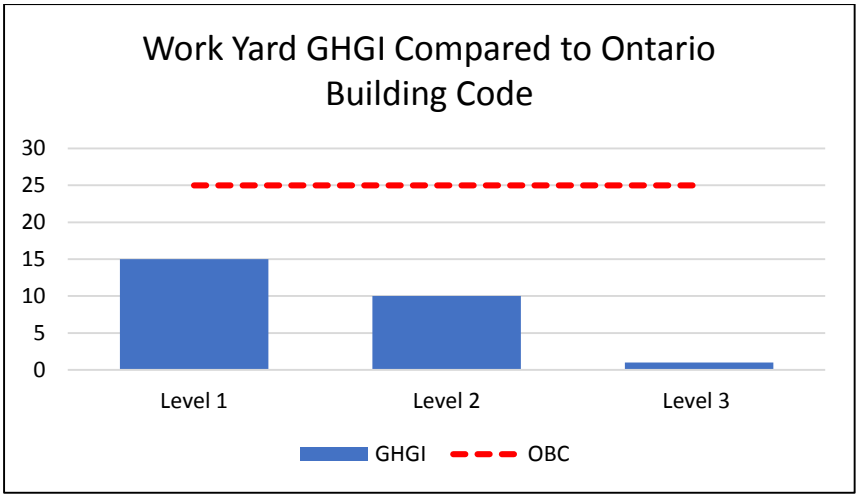

Figure 1. Work Yard GHGI Compared to OBC

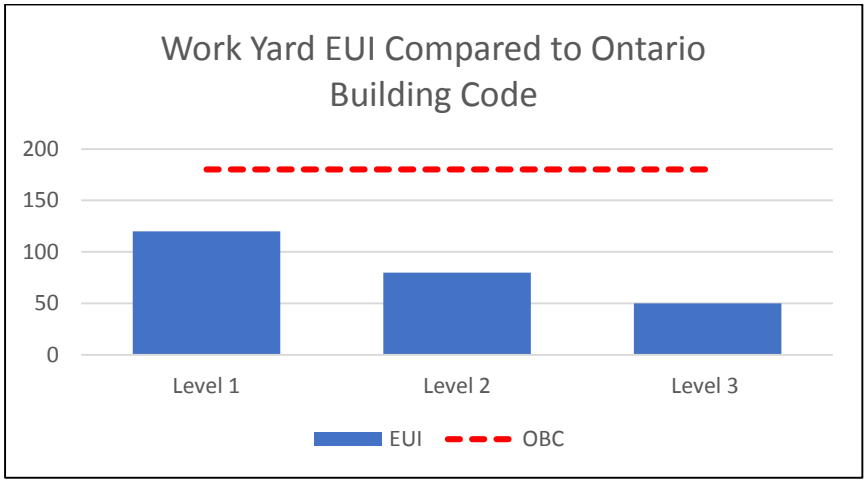

Figure 2. Work Yard EUI compared to OBC

Level 1 targets are intended to be easily achieved through good building practices and technologies that are widely used and available. Levels 2 and 3 require further design and implementation of more advanced technologies. Building designs are encouraged to meet the higher Levels of performance when feasible, prior to the mandatory four-year transition.

Proposed Prescriptive Measures

While the core of the Standard focuses on reducing GHG emissions and energy consumption, there are several other sustainability objectives the Town would like to incorporate into the building and/or site design. The prescriptive measures follow the same three levels of performance, advancing every four years, at the same time as the performance targets. Outlined below is a list of the 18 mandatory prescriptive measures. For a full description of the mandatory and non-mandatory prescriptive measures please refer to Schedule B.

- Domestic Water Consumption
- BAS and Submetering
- Refrigerants
- Bird Friendly Development
- Embodied Carbon
- On-Site Renewables
- Bicycle Infrastructure
- Stormwater Management
- Education
- Heat Pump Readiness
- Building Commissioning
- Ventilation Air Heat Recovery
- Indoor Lighting
- Outdoor Lighting
- Electric Vehicle Infrastructure
- Reduced Heat Vulnerability
- Biodiversity
- Construction Waste Management

Achieving Net Zero Carbon Buildings

To align with the Town's Resilient Caledon Plan, new buildings must be built to net-zero energy by 2030. In the proposed CGBS, Level 3 performance targets come into effect in the year 2030 and conform to net-zero ready by requiring all new buildings to have heating and cooling provided by electricity, which has a much lower GHG impact than natural gas. For buildings to become fully net-zero carbon, buildings will need to incorporate solar PV into their design, to avoid emissions

associated with the electricity grid. Table 1 below, shows the estimated electrical demand, required roof space, and capital cost for each building archetype. To achieve net-zero, the Town has included requirements for rooftop solar, as a mandatory prescriptive measure as part of the Standard.

Table 1. roof capacity and estimated capital cost per building type

Type of Building	PV Capacity (kW-DC)	Required Roof Space (% of total)	Estimated Capital Cost
Work Yard	200	30%	$400,000
Fire Hall	40	30%	$80,000
Community Centre	80	90%	$160,000
Administrative Centre	80	90%	$160,000
Ice Rink	400	120%	$800,000
Swimming Pool (room only)	270	340%	$540,000

For the building types that cannot fully offset their energy and emissions use with rooftop solar, some alternative options include:

- Ground mounted solar systems and parking lot solar canopies;
- More densely locating solar panels on a roof, using alternative mounting technologies;
- Virtual net metering, that allows solar production from another Town property to offset the additional energy demand. It is important to highlight that this legislation has been discussed but not implemented at the Provincial level;
- The Town could have the option to purchase Renewable Energy Certificates to offset the emissions of a building, from other renewable energy projects.

Updating the Corporate Green Building Standard

Town staff will monitor the success of the updated CGBS and make any amendments to the Standard as required prior to transitioning to a higher Level in 2026 and 2030. This will allow for the continued evaluation of best practices in building technology and sustainable site design.

Ongoing Building Projects

Staff have been working to embed the proposed CGBS Update into the Caledon East Community Complex (CECC) expansion using the City of Mississauga's current CGBS (very similar to the model proposed for Caledon) as a baseline in the absence of this standard being completed at the start of design and construction. The Work Yard 2 renovation project has incorporated the Level 1 energy performance targets of the Town's proposed CGBS update into the design.

FINANCIAL IMPLICATIONS

Outlined in Table 2 below, are the estimated capital cost premiums associated with the construction of a building through the proposed CGBS update (outlined in Schedule B). Staff worked with a consultant to create this guideline to support the budget development process for

major renovations and new builds, using parameters known at the earliest stages of a project. This guideline, which provides financial guidance for costs that are above common practice for projects, will be used by the Town's Project Management Office to support the ongoing development of a budgeting tool, pending Council approval of the proposed Standard.

Table 2. Estimated Capital Cost Premium

Building Archetype	Level 1	Level 2	Level 3
Work Yard	4%	5%	8%
Fire Hall	5%	6%	9%
Community Centre	3%	1%	6%
Administrative Centre	2%	1%	3%
Ice Rink	4%	5%	14%
Swimming Pool	0%	0%	1%

The estimated capital cost premiums account for current inflated market prices due to the global pandemic. There is uncertainty as to whether market prices will return to pre-pandemic levels. The premiums will be revisited and updated prior to transitioning to each subsequent Level of this Standard.

All future budgets pertaining to new builds and major renovations will be brought forward as part of the annual budget process and be subject to Council approval. In addition, this standard and the associated cost premiums will also be incorporated into future updates of the Town's Development Charge By-Law and Background Study, where applicable.

COUNCIL WORK PLAN

Connecting Caledon - Develop a five-year Corporate Greenhouse Gas Reduction Framework including energy consumption in facilities, corporate fleet and fuel use, water conservation strategies in facilities and parks and waste diversion strategy

ATTACHMENTS

Schedule A to Staff Report 2022-0041- Proposed Corporate Green Building Standard
Schedule B to Staff Report 2022-0041- Prescriptive Measures and Cost Guidance