TORONTO

REPORT FOR ACTION

Toronto Green Standard Update: Advancing Net Zero Emissions in New Development

Date: April 11, 2023
To: Planning and Housing Committee
From: Chief Planner and Executive Director, City Planning
Wards: All

SUMMARY

This report presents a revision to the Toronto Green Standard Version 4 (TGS v4) 2022 embodied emissions performance measures and information on the Toronto Green Standard Communication Strategy. The proposed revision is in response to a July 2021 Council request to provide an update on the outcome of the 2022 study work on embodied emissions and opportunities to improve the uptake of higher levels of performance through the Toronto Green Standard. The revision to the Toronto Green Standard would further advance net zero emissions in new development through the incorporation of embodied emissions caps and is a critical component of the City's efforts to achieve zero emissions buildings by 2030 as set out in TransformTO.

Since 2010, the Tier 1 of the Toronto Green Standard has been required for development applications. The objective is to influence and support change to achieve more sustainable development in the City. Based on tiers of increasingly sustainable performance, the Toronto Green Standard provides a clear pathway to achieve the City's climate change objectives and expectations for future updates. Builders who are market leaders in sustainability are eligible for an incentive under the City's Toronto Green Standard Development Charge Refund Program if constructing at higher tiers.

Embodied carbon has become an area of focus in mitigating climate change. Studies indicate that embodied emissions in construction materials can account for up to 80% of a large buildings' total emissions from extraction to decommissioning. Toronto's Green Standard Version 4 included requirements for the Tier 2 and Tier 3 levels to track and report upfront embodied carbon in construction, but did not set performance targets or 'caps' pending the results of two Toronto area studies. This report describes the study findings and recommendations for changes to the Toronto Green Standard to address this important issue and future work being undertaken. In addition, this report clarifies that the performance standards of the Toronto Green Standard applicable at the time of a complete site plan application will apply. Where a development proposal consists of more than one building this will provide clarity that the applicable standard will apply upon receipt of each complete site plan application.

The Toronto Green Standard performs an important role as a market transformation tool to progressively push development beyond the minimum standards of the Ontario Building Code towards Toronto's zero-emissions targets. Despite its success and recognition as a leader in its applicability, the TGS is not well known by the public and investment in the higher, voluntary performance measures are not perceived as a marketable premium by developers. In 2022, City Planning hired a consultant to develop a TGS Communications Strategy to improve the uptake and desirability of achieving adoption of Tier 2 and Tier 3 standards in new developments. The work included consultation with designers, developers and industry associations on their understanding and experience with the Standard. The TGS Communications Strategy sets out a plan for new graphics, focused content messaging, redesigned case studies and social media marketing to be advanced this spring.

RECOMMENDATIONS

The Chief Planner and Executive Director, City Planning recommends that:

1. City Council direct that development will be in accordance with the performance standards of the Toronto Green Standard applicable at the time of a complete site plan application.

2. City Council adopt the revised performance measures as shown in Attachment 1 for Toronto Green Standard Version 4 (2022) Low-Rise Residential; Mid- to High-Rise Residential and All Non-Residential and City Agency, Corporation & Division-Owned Facilities to be applied to new development applications deemed complete as of the date of this City Council decision.

3. City Council direct the Chief Planner and Executive Director, City Planning in consultation with the Executive Director, Environment and Climate, the Chief Building Official and Executive Director, Toronto Building, and the City Solicitor, to report to the Planning and Housing Committee in Q2 2024 on the feasibility of requiring mandatory embodied emissions caps for new development as part of the update of the Toronto Green Standard to Version 5.

4. City Council direct the Chief Planner and Executive Director, City Planning, in consultation with the Executive Director, Environment and Climate, Executive Director, Corporate Real Estate Management, Chief Building Official and Executive Director, Toronto Building, and other relevant Divisions, to report to the Planning and Housing Committee in Q2 2024 on the results of further analysis on embodied emissions including approaches to effectively manage embodied carbon in City-owned infrastructure, impacts of demolition, and ways to incentivize adaptive reuse of building structures.

FINANCIAL IMPACT

The City Planning Division confirms that there are no financial implications resulting from the recommendations included in the report in the current budget year or in future years.

EQUITY IMPACT

The Toronto Green Standard contributes to a number of strategies and actions that support equity-deserving groups, including: the Resilience Strategy, TransformTO and the HousingTO 2020-2030 Action Plan. The TGS performance requirements result in housing built to the highest standards and qualities with reduced energy, emissions and environmental impacts. The requirements result in new development that is more affordable in the long term due to significantly reduced costs for heating and cooling utility bills, addresses climate change and provides high quality landscapes and public spaces. High performance buildings are also resilient during extreme weather or power outages allowing home owners to shelter in place and reducing demand on emergency services.

The TGS is a market transformation tool, readying and supporting the development industry in making positive changes to sustainable development. The impact of this work supports the City's climate action, economic recovery and social resilience goals.

DECISION HISTORY

On July 4, 5, 6 and 7, 2017 City Council adopted PE19.4 - TransformTO, a report recommending seven long-term goals to realize a low-carbon Toronto in 2050 that achieves an 80 percent reduction in greenhouse gas emissions against 1990 levels, including 100 percent of new buildings designed and built to be near zero greenhouse gas emissions by 2030; and the design and build of new City-owned facilities to be near zero greenhouse gas emissions by 2026. The City Council decision can be found at: http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2017.PE19.4

At its meeting on July 14, 15 and 16, 2021, City Council adopted PH25.17 Toronto Green Standard Review and Update which presented the Version 4 changes to the Toronto Green Standard to be applied to new development applications commencing May 1, 2022. Council also directed that City Planning consult with industry stakeholders and marketing professionals on the Toronto Green Standard branding including options to update the brand to improve the uptake and desirability of achieving the adoption of Tier 2 and higher standards in new developments; and to report on any further updates resulting from studies, consultations or other relevant considerations with respect to performance measures for embodied emissions. The City Council decision can be found at:
https://secure.toronto.ca/council/agenda-item.do?item=2021.PH25.17

At its meeting on June 15, 2022, Council adopted PH34.1 OPA 583, Environment and Climate Change Official Plan Policy Updates, which included updated policies requiring assessments for opportunities to achieve net zero development, including embodied carbon emission (2.2.2 Centres, 3.3 New Neighbourhoods, 5.2.1 Secondary Plans). OPA 583 is currently pending a decision by the Minister of Municipal Affairs and Housing. The City Council decision can be found at: https://secure.toronto.ca/council/agenda-item.do?item=2022.PH34.1

BACKGROUND

The Toronto Green Standard (TGS) is a critical tool in implementing Official Plan policies to advance sustainable city building and the climate action directions. The TGS was introduced as a voluntary measure in 2006, Tier 1 became mandatory in 2010 and was last updated in July 2021 (TGS v4). The TGS is comprised of five categories of performance measures for sustainable development: Air Quality; Building Energy, Emissions and Resilience; Water Quality and Efficiency; Ecology and Biodiversity; and Waste and The Circular Economy. Tier 1 of the TGS is mandatory for development applications, while Tier 2 and Tier 3 are voluntary higher performance levels supported by a Development Charges Refund program. This program provides an incentive for leading edge developments that have been certified as having met Tier 2 levels of performance or higher. The amount of the Development Charge refund was increased by Council in August 2022 to encourage new development to meet the City's net-zero target sooner. Under TGS V4, City-owned facilities are required to be designed to net-zero emissions and the equivalent of Tier 2 performance pathway.

The TGS is secured via all Site Plan Control applications as embedded conditions of approval. Since 2010, 155 Site Plan Applications (out of approximately 3000 City-wide) have demonstrated they will achieve TGS Tier 2+ levels in their design, with over 85 of those certified as Tier 2 post-construction and profiled on the TGS website: www.toronto.ca/greendevelopment

Staff continue to monitor implementation to ensure that mandatory performance measures are understood and are implemented by applicants and staff across Divisions.

COMMENTS

Embodied Carbon: Buildings Energy, Emissions & Resilience in the TGS

As building operational energy performance requirements evolve over time, embodied carbon, or the "upfront" energy and emissions of extraction, processing and transporting building materials to the construction site, become more prominent within the buildings' overall emissions profile from "cradle" (materials sourcing) to "grave" (decommissioning). Studies indicate that embodied emissions in construction materials can account for up to 80% of a large buildings' total emissions from extraction to decommissioning. Embodied carbon has become an area of focus in mitigating climate

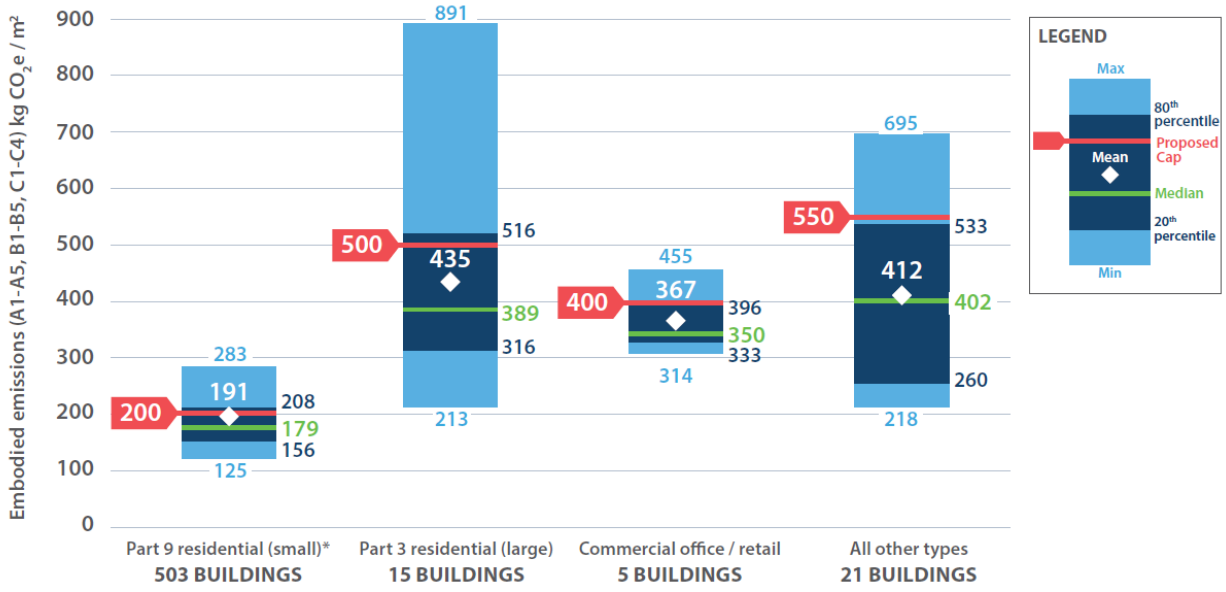
change with some leading jurisdictions and the federal government moving towards setting performance targets and requirements.

Results of Studies on Embodied Emissions of Buildings

In the development of TGS Version 4 the merits of incorporating new performance measures for embodied carbon was evaluated through research and discussion with a number of experts. At that time it was determined that more data was needed on local Toronto area projects in order to set appropriate performance targets. To facilitate this, the City partnered on two studies on embodied carbon with support of funding from The Atmospheric Fund (TAF) for (i) low rise housing (working with Builders for Climate Action); and (ii) large residential and non-residential buildings (working with Mantle Developments Inc. and the University of Toronto, Ha/f Studio). Both studies were designed to be shared with other GTHA municipalities.

The studies reviewed real building projects and conducted a materials contributions analysis for over 500 small (Part 9) buildings and 41 large (Part 3) buildings to determine the total amounts of embodied carbon in the building materials used and to set "benchmarks" by building type. In Figure 1 below, the building type-specific proposed cap or limit is shown just above the median.

Figure 1: Proposed initial (2024) caps in red lines shown in relation to Ontario benchmarking



The Study evaluated two city-owned facilities, a community centre and police station, to calculate their embodied carbon and provide recommendations to reduce it.

The research approach and results were vetted with a project Advisory Committee made up of architects, engineers, product manufacturers and policy makers to ensure that the targets were reasonable and acceptable. Advisory Committee members are listed in Attachment 3. The results were shared in five large information session workshops for industry and government staff with over 350 participants including:

designers, specifiers, consultants; manufacturers and material producers; and developers, owners and constructors, prior to preparing the final report recommendations. The reports are available on the TGS website under Current and Recent Studies found here.

Proposed Revised Performance Measures TGS v4

TGS Version 4 included requirements for the voluntary incentivized Tier 2 and Tier 3 levels to track and report upfront embodied carbon in construction, including the requirement to conduct a material emissions assessment (also known as a life cycle analysis) on the project's envelope, structural materials and assemblies, and to set out an optional 20% reduction target.

Based on the results of the analysis undertaken in the studies, a revision is proposed to the TGS v4 Embodied Emissions in Materials performance requirements to introduce an embodied emissions intensity cap (see Attachment 1 for proposed changes; see Attachment 2 for redline version of changes to performance measures and specifications). The proposed change aligns with the CAGBC Zero Carbon Standard and the recommended targets of the "Embodied Carbon Benchmarking Study 2022".

In addition, revisions are proposed to the TGS v4 Operational Emissions and Energy performance measures for City Agency, Corporation & Division-Owned Facilities to ensure alignment with the criteria in the Offset Credits Policy being proposed in a separate report ("Carbon Accountability: Institutionalizing governance, a Carbon Budget and an Offset Credits Policy") to be considered at the April 26 Infrastructure and Environment Committee.

The proposed revisions to the Embodied Emissions in Materials; Building and Material Reuse and Operational Emissions and Energy for TGS v4 are as follows:

- All standards: Material Emissions Assessment has been revised to Upfront Embodied Carbon Assessment to align with industry terminology.

Low Rise Residential: the Tier 2 target for low rise housing will remain the same. The target was reviewed and confirmed through the low rise Part 9 study referenced above.

- Mid-High Rise & Non-Residential: Tier 2 cap of 350kgCO2e/m2; Tier 3 cap at 250 kgCO2e/m2. With the introduction of the caps, there is no longer a need for the whole building lifecycle assessment. The Building and Materials Reuse option for whole building lifecycle assessment has been updated to align with the Tier 3 cap.

- City Agency, Corporation & Divisions-Owned Facilities: caps for City-owned facilities are set at 350 kgCO2e/m2 with an option of an enhanced Upfront Embodied Emissions Assessment cap of equal to or less than 250 kgCO2e/m2. A technical revision is proposed to the CAGBC Zero Carbon Building Standard modelling option to clarify use of the current CAGBC Zero Carbon Building Design Standard.

The feasibility of requiring mandatory performance measures for embodied emissions in materials for buildings requires further review and consultation, specifically in light of

changes under the More Homes Built Faster Act, 2022 (Bill 23). The Act allows the City of Toronto to have a Green Standards Bylaw under section 108.1 of the City of Toronto Act, once regulations issued under the Ontario Building Code are released. It is proposed that a review of mandatory performance measures for embodied emissions in materials be explored as part of the update to TGS Version 5, anticipated in Q2 2024.

Bill 109, More Homes for Everyone Act, 2022 amended the Planning Act and City of Toronto Act to establish complete application requirements for Site Plan Control effective as of July 1, 2022. On March 29, 30 and 31, 2023, City Council enacted an amendment to Chapter 415 of the Toronto Municipal Code and adopted an amendment to the City of Toronto's Official Plan to establish complete application requirements for Site Plan Control, among other matters.

To align with those legislative and policy changes, this report also clarifies that the performance standards of the in effect version of the Toronto Green Standard at the time of each complete site plan application will apply. Where a development proposal may require multiple site plan applications, this will provide clarity that the applicable standard will apply upon receipt of each complete site plan application.

Further Work

Additional work is underway and planned to further address embodied emissions including partnering with the University of Toronto to study the embodied carbon of typical "missing middle" housing forms. Phase 2 to the Embodied Carbon Benchmarking study entitled "Development of Embodied Carbon Management Toolkit for Ontario Municipalities" will assess the City's urban design guidelines to support low carbon sustainable design and materials use; evaluate the impacts of demolition and ways to incentivize adaptive reuse of building structures; and assess opportunities to reduce embodied carbon through procurement policy for City-owned buildings and infrastructure in 2023/2024. This work will contribute to the Transform TO Net Zero Strategy and the City’s consumption-based emission inventory related to building construction and embodied carbon management, to help inform and ensure alignment with the municipal embodied carbon reduction target setting being led by other City divisions.

Toronto Green Standard Communication Strategy

The TGS has been a successful tool in advancing sustainable city building and the climate action agenda by requiring sustainable performance measures through the planning process since 2010. Despite its success, the TGS is not well known by the public and investment in the higher, voluntary performance measures are not perceived as a marketable premium by developers. While the public is increasingly aware of issues related to climate change, there is often not a connection to choice in the purchase or rental of a more sustainable home or work space. Awareness will increase consumer demand, which should result in more developers choosing to design to the higher performance measures of the Toronto Green Standard.

In 2022, the City hired a consultant to develop a TGS Communications Strategy to improve the uptake and desirability of achieving adoption of Tier 2 and Tier 3 standards.

In developing the Strategy, interviews and focus groups were held to understand how various stakeholders perceive the TGS. The stakeholders included developers, architects, landscape architects, energy consultants, and relevant groups including Passive House Canada, The Atmospheric Fund, Clean Air Partnership, Real Property Association of Canada, the Residential and Civil Construction Alliance of Ontario and RioCan (see list of groups consulted with in Attachment 4). Development of the TGS Communications Strategy was supported by an inter-divisional reference group including Corporate Communications and the Environment and Climate Division.

The consultations revealed that the highest awareness of the TGS was amongst consultants, then developers, with little or no awareness from the broad general public. Participants also noted that the tiered system of the TGS was confusing and lacked specific industry communications and support for marketing the value of the program to the industry/public. Further, the analysis suggests that although the TGS is not a traditional consumer brand, a need for broad public awareness is essential to promote more uptake amongst designers and builders. Systematic change across the development industry requires a public understanding of the importance of the TGS and the goals of the City. Like a traditional brand, the TGS has a mission and a target audience, a purpose for existing and goals to be achieved. The TGS must address different audiences with a clear voice and mission of generating awareness. As designers and developers are influenced by market perception, the City of Toronto must influence the consumer market and industry with a clearer value proposition to achieve its green standard goals.

Recommendations of the TGS Communications Strategy include, among other things, the following:

- Develop public relations (PR) tools that developers can market their brand/buildings to create demand similar to Environmental Social Governance (ESG) investing and building development techniques;
- Clarify the value and better communicate the benefits of higher tiers (return on Investment, environmental impact etc.) highlight more specific accomplishments;
- Showcase successful projects and benchmark best in class to other developers (provide PR templates, case studies and information regarding positive impacts on investor and market evaluations);
- Expand the visibility of the TGS through ribbon cutting events, engaging Toronto communities and promoting user generated content (UGC); and
- Speak to the consumer in simple terms, such as why purchasing/renting a TGS building makes a positive difference and brings associated financial benefits.

The TGS Communication Strategy includes new graphics for focused content messaging, redesigned case studies and a social media marketing plan. The campaign will launch in late spring with updated web pages and social media posts on newly certified TGS Tier 2 + developments.

Conclusion

The Toronto Green Standard is a critical component of the City's commitment to achieve zero emissions buildings by 2030 and meet 2040 city-wide greenhouse gas

reduction targets. Embodied carbon from building materials has become an area of focus in mitigating climate change and this report proposes a revision to the Toronto Green Standard Version 4 (TGS v4) 2022 performance measures to set caps on embodied emissions. The report also presents information on the Toronto Green Standard Communications Strategy, intended to increase awareness and demand for greener development amongst investors and consumers in response to a July 2021 Council request.

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SIGNATURE

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ATTACHMENTS

Attachment 1: Revised TGS v4 Performance Measures for Embodied Emissions and Building Materials Reuse

Attachment 2: Redline version showing proposed changes to TGS v4 Performance Measures for Embodied Emissions and Building Material Reuse

Attachment 3: Embodied Emissions Study: Advisory Committee and Workshops

Attachment 4: List of Stakeholders Consulted on TGS Communication Strategy

Attachment 1: Revised TGS v4 Performance Measures for Buildings Energy, Emissions and Resilience and Waste and the Circular Economy

(provided separately)

Attachment 2: Redline version showing proposed changes to TGS v4 Performance Measures for Buildings Energy, Emissions and Resilience and Waste and the Circular Economy

(provided separately)

Attachment 3: Embodied Emissions Study: Advisory Committee and Workshops

The Embodied carbon study conducted five workshops and was advised by an Advisory Committee consisting of the following representatives:

B+H Architects	BDP Quadrangle	Blackwell
Canada Green Building Council	City of Vancouver	Clean Air Partnership
Concrete Ontario	Deltrerra/Tridel	EllisDon
Endeavour Centre	Entuitive	National Research Council
TAS	University of Toronto - Mass Timber Institute	Waterfront Toronto

Attachment 4: List of Stakeholders Consulted on TGS Communication Strategy

Clean Air Partnership	Collecdev Inc.	Daniels Corp
EQ Building	Ferris & Associates	Haven Developments
IBI	Janet Rosenberg Studio	Kilmer Brownfield Management Limited
Mattamy	Minto	Passive House Canada
Public Work	Quadrangle	Real Property Association of Canada (REALPAC)
Residential & Civil Construction Alliance of Ontario	RHauz	RioCan REIT
SOCA	SVN	TAS
Tenblock	The Atmospheric Fund (TAF)	Toronto Community Housing Corporation
Tridel	Urban Equation	Well Grounded
Windmill	WSP	