

March 21, 2022

Dear Member of Vancouver's Building Industry:

RE: Climate Emergency New Building Updates to the *Vancouver Building By-law*, the *Green Building Policy for Rezonings* and supporting documents

In January 2019, Vancouver Council declared a climate emergency in recognition of the urgent threat posed by climate change. As part of the Climate Emergency Action Plan approved by Council in November 2020, reductions in carbon pollution from buildings were prioritized as two (2) of six (6) Big Moves to scale up Vancouver's efforts to cut carbon pollution. The City seeks to achieve these Big Move targets in ways that also bring financial, health and economic benefits to Vancouver. The goals of these Big Moves are:

- Big Move 4: By 2030, the carbon pollution from buildings will be cut in half from 2007 levels.
- Big Move 5: By 2030, the embodied emissions from new buildings will be reduced by 40% compared to a 2018 baseline.

Council has also updated our Climate Change Adaptation Strategy in 2018 to ensure a vibrant, livable and resilient city in the face of climate change. A main objective of this Strategy is to design robust buildings that will do well in current and future climates while providing co-benefits such as seismic resilience, energy efficiency, accessibility, and supporting health and well-being.

The proposed amendments to the *Vancouver Building By-law*, the *Green Buildings Policy for Rezonings*, and supporting documents serve to reinforce the initiatives identified within the Climate Emergency Action Plan and the Climate Change Adaptation Strategy. Staff will present this work as a package called "Climate Emergency New Buildings Update" to City Council on May 18th, 2022. These amendments are summarized in the following pages.

We would appreciate your written feedback on these proposals, sent to **Charling.Li@Vancouver.ca** and **Patrick.Enright@Vancouver.ca**, before **Friday, April 8th, 2022**. For more information, please join us for one of 5 consultation sessions hosted by City staff in March. Three of the 5 sessions will discuss the general set of changes; two sessions will discuss the overall changes but with a special focus on embodied carbon. Please feel free to attend a session on the general changes as well as the session focused on embodied carbon; however, note there will be some repetition in the technical content.

General set of changes:

- 1) Tuesday March 15th, 10 AM- 12:00 PM – contact staff for slides
- 2) Wednesday March 23rd, 9:30 - 11:30 AM
- 3) Wednesday March 30th, 9:30 - 11:30 AM

Register here: <https://www.eventbrite.ca/e/consultation-on-climate-emergency-new-building-updates-general-registration-291580584377>

Focus on Embodied Carbon changes:

- 1) Thursday March 17th, 1:30 - 3:30 PM – contact staff for slides
- 2) Thursday March 31st, 9:30- 11:30 AM

Register here: <https://www.eventbrite.ca/e/consultation-on-climate-emergency-new-building-updates-embodied-carbon-registration-292826841967>

Yours truly,

Green Buildings Team – New Construction

Patrick Enright, P.Eng. | Senior Green Building Engineer | *He/him/his*
Patrick.Enright@vancouver.ca

Charling Li, P.Eng., M.Urb. | Green Building Engineer | *She/her/hers*
Charling.Li@vancouver.ca

Section 1: The following proposals are applicable to Part 3 large new construction, through the Vancouver Building By-law:

Item	Description	Proposal
1.1 Updates to the Vancouver Building By-law Effective July 1st, 2023		

- | | | |
|-------|--|--|
| 1.1.1 | Update Energy & Emissions Performance Requirements | <ul style="list-style-type: none"> • Reduce the GHGI limit to 3 kgCO_{2e}/m²a for Group C occupancies in buildings up to 6 storeys, except Hotel and Motel in <i>Tables 10.2.2.5.A1 and 10.2.2.5.C</i> (excerpts below) • For occupancy types without a GHGI limit (i.e. Groups A, B and F), introduce a 50% GHGI reduction target compared to the minimum performance baseline with fossil fuel systems, as shown in <i>Table 10.2.2.5.A1</i> (excerpt below); or design as per the applicable prescriptive requirements of <i>Division B Articles 10.2.2.2 or 10.2.2.3</i> and incorporate electric space heating and electric service water heating. <ul style="list-style-type: none"> ○ Note: this reduction applies to all buildings with these occupancy types, even those without residential or commercial components (i.e. those included in <i>Article 10.2.1.2</i>) |
|-------|--|--|

Table 10.2.2.5.A1 Maximum Energy Use and Emissions Intensities Forming part of Sentence 10.2.2.5.(2)			
Occupancy Classification ⁽¹⁾	Total Energy Use Intensity (kWh/m ² a)	Thermal Energy Demand Intensity (kWh/m ² a)	Greenhouse Gas Intensity (kgCO _{2e} /m ² a)
Group C occupancies in buildings up to 6 Storeys, except Hotel and Motel	110	25	5.5 3
... no change to other rows		
<u>All other occupancies</u>	<u>GHGI: 50% reduction compared to the minimum building performance modelled based on fossil-fuel systems as per Subsections 10.2.2.2 and 10.2.2.3; or designed as per the prescriptive requirements of 10.2.2.2 or 10.2.2.3 and incorporate electric space heating and electric service water heating.</u>		

Item	Description	Proposal		
	Table 10.2.2.5.C Maximum Energy Use and Emissions Intensities Forming part of Sentence 10.2.2.5.(5)			
	Occupancy Classification	Total Energy Use Intensity (kWh/m ² a)	Thermal Energy Demand Intensity (kWh/m ² a)	Greenhouse Gas Intensity (kgCO ₂ e/m ² a)
	Group C occupancies in buildings up to 6 Storeys, except Hotel and Motel	110	25	5.5 3

NOTE: The tables above only show the rows with changes, not the entire table in its final state. Other rows in the existing tables will remain unchanged.

1.1.2	Embodied Carbon Reporting	<ul style="list-style-type: none"> All new Part 3 buildings will be required to calculate the embodied carbon performance as compared to a functionally equivalent baseline, using the guidance in the <i>City of Vancouver Embodied Carbon Guidelines</i> (Note: these guidelines are currently in draft, to be published later this year). All new Part 3 buildings must be designed and constructed to achieve embodied carbon performance not more than 100% greater (i.e. worse) than that of the baseline.
1.1.3	Copy overheating limits for passively cooled buildings from <i>City of Vancouver Energy Modelling Guidelines</i> to <i>Vancouver Building Bylaw</i>	<ul style="list-style-type: none"> Administrative change to copy overheating limits from Section 4 Passively Cooled Buildings of the <i>City of Vancouver Energy Modelling Guidelines</i> to the Vancouver Building By-law in an appropriate new section. Add the definition of 'vulnerable populations' to <i>Division A Section 1.4.1.2 Defined Terms</i> as "those residing in seniors' housing or shelter and/or supportive housing; those occupying daycares, schools, healthcare facilities".
1.1.4	Add requirement for MERV 13 filtration for ventilation air	<ul style="list-style-type: none"> Add new requirement for MERV 13 filtration. Proposed text to be added in the appropriate section of the Vancouver Building By-law: "Ventilation required by Sentence 6.3.1.1(1) shall be provided by a ventilation system designed to include filtration devices with a Minimum Efficiency Reporting Value (MERV) of 13 prior to the introduction of outdoor air into indoor occupied spaces."
1.1.5	Update Climatic Design Data	<ul style="list-style-type: none"> Update Table C-2 of <i>Division B Appendix C – Climatic and Seismic Information for Building Design in Vancouver</i> to reflect 2020s climatic design data.

Item	Description	Proposal
------	-------------	----------

1.2 Update to the Vancouver Building By-law
Effective January 1st, 2025

- | | | |
|-------|--|---|
| 1.2.1 | Update Energy & Emissions Performance Requirements | <ul style="list-style-type: none"> • Reduce the GHGI limits by half for the following occupancy classifications in <i>Tables 10.2.2.5.A1</i> and <i>10.2.2.5.C</i> (excerpts below): <ul style="list-style-type: none"> ○ Group C occupancies in buildings over 6 Storeys, except Hotel and Motel ○ Hotel and Motel occupancies • For Groups A, B and F occupancy types, increase the GHGI reduction target to 85% compared to the minimum performance baseline with fossil fuel systems, as shown in <i>Table 10.2.2.5.A1</i> (except below); or design as per the applicable prescriptive requirements of <i>Division B Articles 10.2.2.2. or 10.2.2.3</i> and incorporate electric space heating and electric service water heating. • Reduce the TEDI limit to 15 kWh/m²a for Group C occupancies in buildings up to 6 storeys, except Hotel and Motel in <i>Table 10.2.2.5.A1</i> (excerpt below). • GHGI limits referenced in <i>Tables 10.2.2.5.A1</i> and <i>10.2.2.5.C</i> will include the greenhouse gas intensity impact of refrigerants (GHGI-R) used for the building's heating, cooling and domestic hot water heating systems. <ul style="list-style-type: none"> ○ Note: this change will be reflected in the <i>City of Vancouver Energy Modelling Guidelines</i>, and will become effective for <i>Vancouver Building By-law</i> at the same time the 2025 code changes. |
|-------|--|---|

Table 10.2.2.5.A1			
Maximum Energy Use and Emissions Intensities			
Forming part of Sentence 10.2.2.5.(2)			
Occupancy Classification ⁽¹⁾	Total Energy Use Intensity (kWh/m ² a)	Thermal Energy Demand Intensity (kWh/m ² a)	Greenhouse Gas Intensity (kgCO ₂ e/m ² a)
Group C occupancies in buildings up to 6 Storeys, except Hotel and Motel	110	25 15	3
Group C occupancies in buildings over 6 Storeys, except Hotel and Motel	120	30	6 3
Hotel and Motel occupancies	140	20	8 4
All other occupancies	GHGI: 50% 85% reduction compared to the minimum building performance modelled based on fossil-fuel systems as per Subsections 10.2.2.2 and 10.2.2.3; or designed as per the prescriptive requirements of 10.2.2.2 or 10.2.2.3 and incorporate electric space heating and electric service water heating.		

Item	Description	Proposal
------	-------------	----------

Table 10.2.2.5.C Maximum Energy Use and Emissions Intensities Forming part of Sentence 10.2.2.5.(5)			
Occupancy Classification	Total Energy Use Intensity (kWh/m ² a)	Thermal Energy Demand Intensity (kWh/m ² a)	Greenhouse Gas Intensity (kgCO ₂ e/m ² a)
Group C <i>occupancies</i> in buildings over 6 <i>Storeys</i> , except Hotel and Motel	130	40	6 <u>3</u>
Hotel and Motel occupancies	170	30	8 <u>4</u>

NOTE: The tables above only show the rows with changes, not the entire table in its final state. Other rows in the existing tables will remain unchanged.

1.2.3

Embodied Carbon Reductions

- All new Part 3, 1-6 storey buildings that can be built of wood or mass timber construction must achieve whole-building embodied carbon reductions of at least 20%, as compared to a functionally equivalent baseline, using the guidance in the new *City of Vancouver Embodied Carbon Guidelines*
 - Note: these guidelines set the baseline for comparison as a concrete building
- All new Part 3, 7+ storey buildings, and 1-6 storey buildings that can only be built of non-combustible construction, must achieve whole-building embodied carbon reductions of at least 10%, as compared to a functionally equivalent baseline, using the guidance in the new *City of Vancouver Embodied Carbon Guidelines*.
- All new Part 3 buildings must achieve the criteria of one responsible materials category, as shown in the table below.

Responsible Materials Category	Criteria
Sustainable and Ethical Materials	<p>The majority (≥50% by volume or weight) of the wood of the <i>building</i> is sustainably and equitably sourced according to one of the following standards and practices:</p> <ul style="list-style-type: none"> - Certification by the Forest Stewardship Council (FSC); - Certification by the Sustainable Forestry Initiative (SFI); - Certification by the Canadian Standards Association (CSA); - Indigenous-managed or community-based forestry; or, <p>alternates provided and documented to the satisfaction of the <i>Chief Building Official</i>.</p>
Healthy and Transparent Materials	<p>At least 50% by count or 20 distinct, permanently installed products (including at least 25% by count or 3 products from flooring, insulation, wet-applied products, ceiling and wall assemblies and systems) of the <i>building</i> transparently disclose their ingredients according to one of the following standards and practices:</p> <ul style="list-style-type: none"> - A Declare label, operated by the International Living Future Institute; - A Health Product Declaration (HPD) published in the HPD Public Repository, operated by the Health Product Declaration Collaborative; - A Cradle-to-Cradle Certified product, or a product with a Material Health Certificate from the Cradle to Cradle Products Innovation Institute; - A Product Lens Certification, Operated by UL; - A Product Health Declaration, operated by Global Green Tag; - A manufacturer's inventory containing CAS numbers of all individual compounds down to 1,000 ppm (0.1%). If the product contains a trade secret compound, GHS hazards of category 1 or 2 are listed and a concentration range is provided for each undisclosed component; - products created by Indigenous peoples using traditional ecological knowledge; or, <p>alternates provided and documented to the satisfaction of the <i>Chief Building Official</i>.</p>
Circular Materials	<p>The <i>building</i> is designed and constructed to create and achieve the following plans:</p> <ul style="list-style-type: none"> - a construction and demolition Waste Management Plan, achieving at least 75% diversion of construction and demolition waste from landfills; - a Material Re-use Plan, identifying where and how re-used or recycled systems, elements, assemblies, sub-components, or materials are included in the <i>building</i>, if any; and,

Item	Description	Proposal
		<ul style="list-style-type: none"> - a Deconstruction Plan, identifying where and how <i>building</i> systems, elements, assemblies, sub-components, or materials are designed for adaptability and disassembly, generally in accordance with ISO 20887:2020; or, <p>alternate waste management and circular design performance provided and documented to the satisfaction of the <i>Chief Building Official</i>.</p>
1.2.4	Require mechanical cooling for all Part 3 homes	<ul style="list-style-type: none"> • All dwelling units within Part 3 buildings must be served by active mechanical cooling capable of maintaining an indoor air temperature of 26°C, with windows closed.

Section 2: The following proposals are applicable to new construction, through the Green Buildings Policy for Rezoning for all new rezoning applications received on or after May 19th, 2022

Item	Description	Proposal
2.1 Changes to the <i>Green Building Policy for Rezoning</i> Effective May 19th, 2022		
2.1.1	Delete the existing requirements under A) Near Zero Emissions Buildings and B) Low Emissions Green Buildings; Add 2 requirements	<ul style="list-style-type: none"> • The updated Green Building Policy for Rezoning will consist of only the following two requirements: <ul style="list-style-type: none"> ○ Integrated Rainwater Management and Green Infrastructure (applicable to all projects) – technical requirements and processes remain unchanged from previous version of the <i>Green Buildings Policy for Rezoning</i> ○ Green and Resilient Building Reporting (applicable to all Part 3 buildings) <ul style="list-style-type: none"> ▪ Energy & Emissions Design Report – formerly known as the ‘ZEBP Rezoning Energy Checklist’ ▪ Embodied Carbon Design Report – new ▪ Building Resilience Planning worksheet – new
2.1.2	Options for in-stream Rezoning projects	<ul style="list-style-type: none"> • Projects that already have an accepted rezoning application and have not been referred to Public Hearing to the current Council (i.e. before the municipal elections in October) may choose to adopt the new version of the <i>Green Buildings Policy for Rezoning</i>.

Section 3: Items identified for future work to be carried out beginning Q3 2022 to support changes proposed in Sections 1 and 2.

Item	Description	Proposal
<p>3.1 Updates to the City of Vancouver Energy Modelling Guidelines v2.0 – to be effective no later than July 1, 2023.</p> <ul style="list-style-type: none"> - Further engagement with industry to begin by Q4 2022. 		
3.1.1	Include refrigerant life-cycle emissions in GHGI limits	<ul style="list-style-type: none"> • The calculation of the life-cycle equivalent annual carbon dioxide emissions resulting from assumed refrigerant leakage, GHGI-R [kgCO_{2e}/m²a], is to be counted in the whole building GHGI limit shown in <i>Tables 10.2.2.5.A1 and 10.2.2.5C</i>. The updated definition for GHGI and calculation methodology for refrigerant emissions will be reflected in the update to the <i>City of Vancouver Energy Modelling Guidelines</i>. <ul style="list-style-type: none"> ○ This change will be applicable to the same buildings as the <i>2025 Vancouver Building By-law</i> changes noted in Section 1.2 of this letter
3.1.2	TEDI and GHGI adjustments for corridor pressurization	<ul style="list-style-type: none"> • Reduce the maximum TEDI adjustment for corridor pressurization in MURBS (as described in 2.5.2 of the <i>City of Vancouver Energy Modelling Guidelines</i>) by half, to a maximum value of 5 <ul style="list-style-type: none"> ○ This will also by definition reduce the TEUI adjustment to a maximum value of 5 • Eliminate the GHGI adjustment for corridor pressurization in MURBS (as described in 2.5.2 of the <i>City of Vancouver Energy Modelling Guidelines</i>).
3.1.3	Use of 2020s weather files	<ul style="list-style-type: none"> • Projects must use Pacific Climate Impacts Consortium (PCIC) 2020s weather files for modelling compliance to energy, carbon, and overheating limits.

3.2 Future Work and Other Housekeeping Changes

- | | | |
|-------|---|---|
| 3.2.1 | Future code changes | <ul style="list-style-type: none">• Explore future VBBL amendments relating to requirements in 2017 version of the Green Building Policy for Rezoning:<ul style="list-style-type: none">○ Low-Emissions Materials○ Enhanced Commissioning○ Indoor Air Quality○ Energy Systems Sub-metering |
| 3.2.2 | Housekeeping of existing policies and by-laws | <ul style="list-style-type: none">• Bring amendments to the following policies and district schedule to remove energy and emissions requirements made redundant changes named in Section 1:<ul style="list-style-type: none">○ Secured Rental Policy○ C-2 District Schedule |
| 3.2.3 | Amendments to VBBL 1-3 storey residential energy requirements | <ul style="list-style-type: none">• A future report to Council will also include various corrections and clarifications to the 1-3 storey residential Part 10 energy requirements• These corrections are intended to be effective immediately following Council consideration (i.e. May 18th, 2022) and subsequent enactment. |

END